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BW305

BI - Enterprise Reporting, Query & Analysis (Part I)

mySAP Business Intelligence

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Participant Handbook

Course Version: 2006 Q2
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Type Style	Description
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Example text	Emphasized words or phrases in body text, titles of graphics, and tables
EXAMPLE TEXT	Names of elements in the system. These include report names, program names, transaction codes, table names, and individual key words of a programming language, when surrounded by body text, for example SELECT and INCLUDE.
`Example text`	Screen output. This includes file and directory names and their paths, messages, names of variables and parameters, and passages of the source text of a program.
`Example text`	Exact user entry. These are words and characters that you enter in the system exactly as they appear in the documentation.
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Icon	Meaning
	For more information, tips, or background
	Note or further explanation of previous point
	Exception or caution
	Procedures
	Indicates that the item is displayed in the instructor's presentation.

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Course Overview

The *Business Explorer (BEx)* is a component of *SAP BI* that provides flexible reporting and analysis tools that you can use for strategic analysis and supporting the decision-making process in your organization. You can use the *BEx* tool to display past and present data in differing levels of detail and from different perspectives, on the Web and in *Microsoft Excel*.

In this course, you learn about the basic functions of *SAP BI* reporting, starting with navigation in existing reports, continuing on to creating your own query definitions in the Query Designer, and taking you through to using analyses on the Web.

Target Audience

This course is intended for the following audiences:

- Project team members with a basic knowledge of data warehousing

Course Prerequisites

Required Knowledge

- Basic knowledge of data warehousing

Recommended Knowledge

- Experience and sound knowledge of the subject matter in at least one SAP ERP application course

Course Goals

This course will prepare you to:

- Use *NetWeaver BI* as a flexible analytical tool and structure reports for decision-making support in your organization.
- Evaluate past and current data to different levels of detail and from different perspectives on the Web and in *Microsoft Excel*

Course Objectives

After completing this course, you will be able to:

- Outline the architecture and reporting structure in *NetWeaver BI*

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- Analyze reports in the *Business Explorer Analyzer (BEx Analyzer)* and on the Web by using the navigation functions
- Evaluate the data set in SAP BI by defining queries using the *BEx Query Designer* or the *BEx Web Analyzer* and executing them in the *BEx Analyzer* and in the standard layouts on the Web
- Use Information Broadcaster to distribute reports via Email and the Enterprise Portal
- Integrate documents in reports
- Configure the Report-Report-Interface for navigating within *NetWeaver BI* and for jumping into other attached systems
- Evaluate reports in the Business Content by using the Metadata Repository and the Business Content Browser

SAP Software Component Information

The information in this course pertains to the following SAP Software Components and releases:

- BW 3.5

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Unit 1

Introduction to BI Enterprise Reporting

Unit Overview

This lesson deals with the fundamental structures of *SAP BI*.

Unit Objectives

After completing this unit, you will be able to:

- Give an SAP NetWeaver overview
- Describe the fundamental structures of *SAP BI*
- Explain the reporting functions of *SAP BI*
- Define the most important terminology used in the context of Enterprise Reporting

Unit Contents

Lesson: SAP BI Overview 2

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Lesson: SAP BI Overview

Lesson Overview

This lesson deals with the fundamental structures of *SAP Business Intelligence* in NetWeaver 2004s.

Lesson Objectives

After completing this lesson, you will be able to:

- Give an SAP NetWeaver overview
- Describe the fundamental structures of *SAP BI*
- Explain the reporting functions of *SAP BI*
- Define the most important terminology used in the context of Enterprise Reporting

Business Example

You need a good overview of the structures and important terms in *SAP BI within SAP NetWeaver* in order to be able to use the available functions. This overview will help you to reinforce the BI functions and develop solutions for different tasks you have in your daily work, such as launching and creating reports within your business area.

SAP NetWeaver Overview

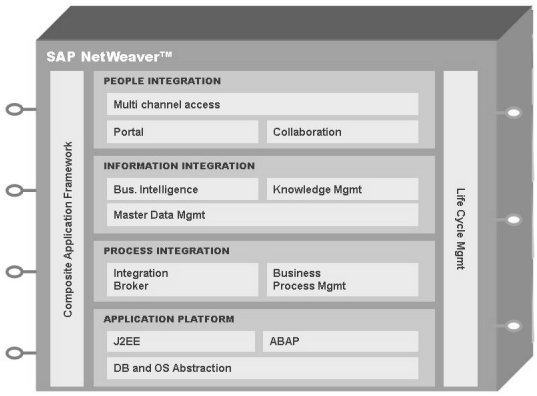

Figure 1: The SAP NetWeaver Platform

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SAP NetWeaver is an integration architecture for all the business applications and processes in a modern enterprise. This architecture integrates people, information and processes within a framework that provides for incremental implementation of its capabilities.

Business Intelligence is a primary component of the Information Integration layer of SAP NetWeaver. The SAP NetWeaver Portal is a component of the People Integration layer. These two components work closely together providing users powerful business information reporting and analysis features. SAP NetWeaver 2004s is the mySAP Business Suite edition of SAP NetWeaver 2004.

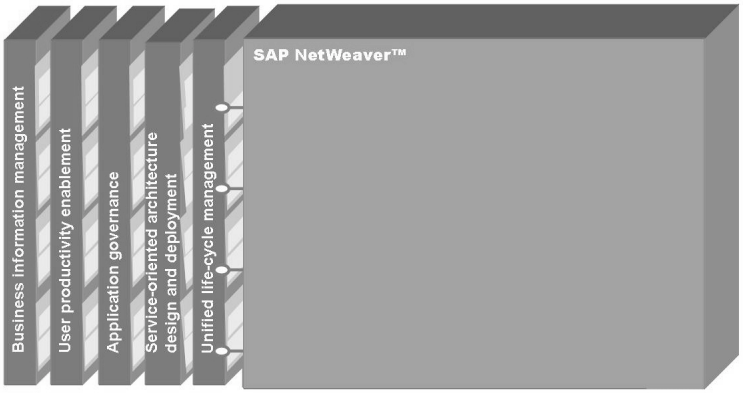

Figure 2: SAP NetWeaver IT Practices

Organizations use the SAP NetWeaver platform to implement solutions to critical IT pain points in a low-cost, step-by-step approach without compromising their flexibility to deliver business process requirements. SAP provides all the information, services, tools and expertise that organizations need to craft their own *IT practice roadmaps* through SAP NetWeaver. Organizations can implement IT practices projects in stages, addressing their immediate IT needs. For each of these IT practices, SAP delivers a variety of key IT scenarios, all of which are straightforward to implement.

For this course, the IT practice of *Business Information Management* is our focus.

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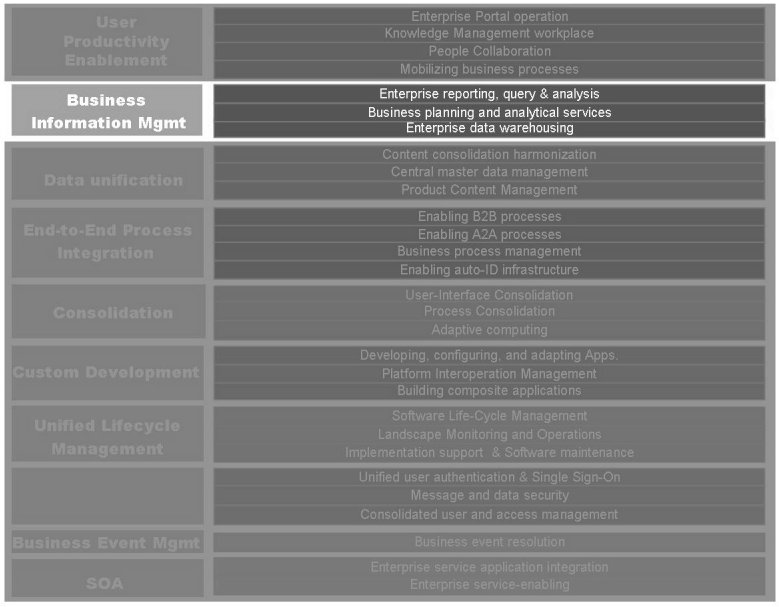

Figure 3: SAP NetWeaver IT Practices and Scenarios

Business Information Management is about managing all types of information (structured and unstructured) from integration to delivery – with a focus on achieving transparency and broad reach within and outside of the organization . In the Business Information management IT practice, there are three IT scenarios.

- Enterprise Reporting, Query and Analysis
- Business Planning and Analytical Services
- Enterprise Data Warehousing

These IT scenarios describe how organizations use the functionality of SAP NetWeaver to carry out the work of the Business Information Management IT practice. Each IT scenario includes everything organizations need through the life cycle phases of Discovery, Evaluation, Implementation and Operations.

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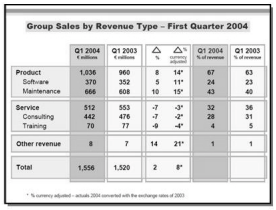
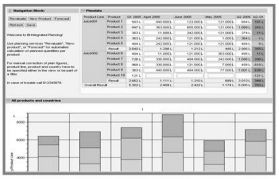
- **Enterprise Reporting, Query & Analysis**
  - High Focus on User Productivity
  - Formatted Reporting
  - Intuitive Ad-hoc Analysis
  - Advanced Excel Integration
  - Model-driven BI Applications
- **Business Planning and Analytical Services**
  - Business Planning integrated in BI Platform and Suite
- **Enterprise Data Warehousing**
  - High Performance with BI Accelerator
  - Flexibility by enhanced data modeling capabilities
  - Data Transfer Process
  - Real-Time Data Acquisition
  - Web-based Administrator Cockpit





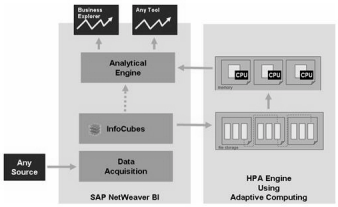


Figure 4: Business Intelligence Scenarios in NetWeaver 2004s

SAP NetWeaver BI provides a foundation for reporting and analytics in business applications. It will extend the reach towards masses of end-users, integrate planning into user interfaces and services and push forward its role as a strategic data warehouse platform. The IT scenarios map exactly to these goals:

- Enterprise Reporting, Query and Analysis → Extend the reach
- Business Planning and Analytical Services → Integrate planning
- EDW → Strategic data warehouse platform

Data Warehouse Systems

A data warehouse system serves primarily to stage information from various data sources. This data and information, and the reports resulting from them, constitute the basis of successful business processes within a company. This type of system can be used by all employees in a company (that is, by managers, departmental heads, and all other employees).

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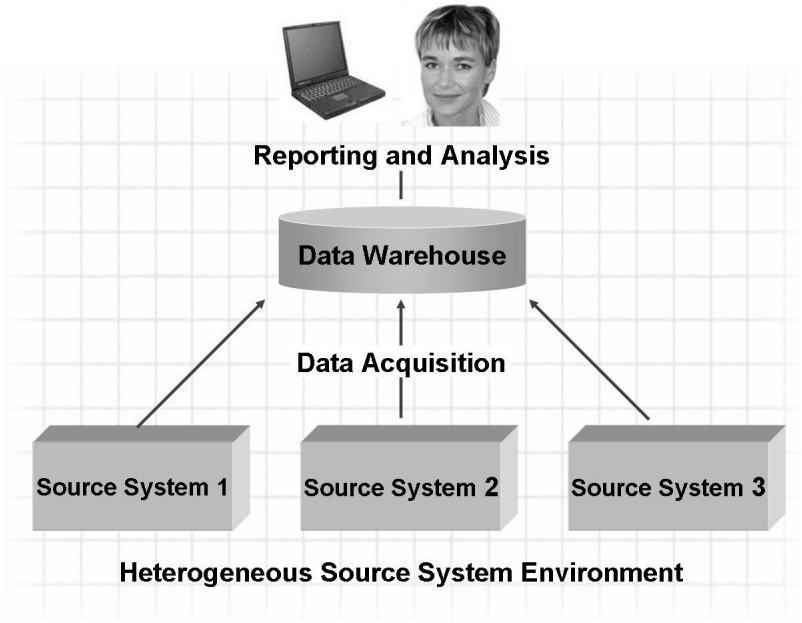

Figure 5: Data Warehouse System

The information is staged in various forms including personalized reports, freely definable queries, and predefined reports. Recipients of information can use these reporting and analysis functions to analyze the data for deviations and significant facts. In the Planning and Campaign Management areas, a data warehouse is used to carry out data analysis. The following issues might arise when using a data warehouse in the Retail Sector area:

- Checking ranges of goods in order to identify slow moving items and big sellers
- Analyzing regional locations to investigate the profitability of different branches
- Investigating the effectiveness of market analyses
- Evaluating customer surveys and complaints
- Analyzing warehouse stock levels
- Analyzing shopping carts using cash register receipts

A concrete query might be:

- What were the sales volumes for the Cosmetics, Electrical Goods, and Household Goods departments in the years 2005 and 2006 in New York and Washington, DC?

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In brief, a data warehouse can:

- Pool data from different, mostly heterogeneous sources
- Overcome this heterogeneity on different levels (system, schema, and data)
- Stage data in the form required by the user

What We Expect from a Data Warehouse

Decision-makers urgently need reliable information from Production, Purchasing, Sales and Distribution, Finance, and Human Resources departments. They require an up-to-date and comprehensive picture of each individual business area and of the business as a whole. This places considerable demands on data staging from the underlying data sources.

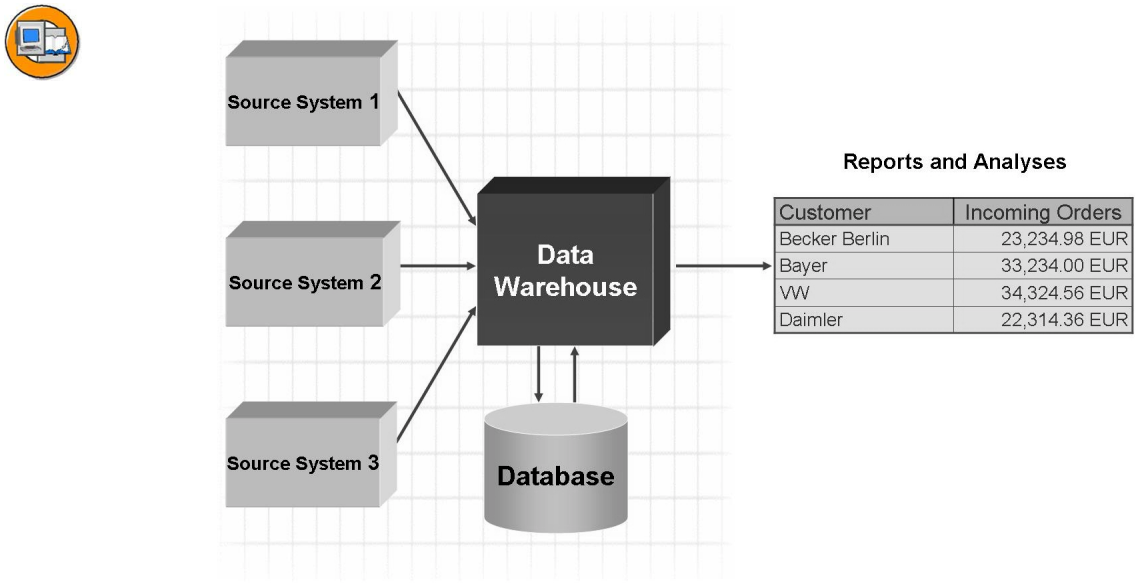

Figure 6: What We Expect from a Data Warehouse

The information must be stored in a homogeneous and consistent form at a central location where it can be called up. Therefore, modern data warehouses require a separate database that an independent application environment can use to provide the required services objectively.

Efficient analysis techniques with powerful multi-dimensional visualization are indispensable on the presentation side of the data warehouse. The system must be able to cope with the information needs of the various user groups.

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The demands made on the source systems are not so high. What is needed here is an economic and comprehensive preparation of the data that is required by the data warehouse.

The following demands are made on a data warehouse:

- Standardized structuring and presentation of all company information
- An easy-to-use, single point of access to all company information
- Sophisticated business reporting methods for self-service analysis at all levels
- Fast and cost-effective installation
- A high performance environment
- Data staging from a heterogeneous environment
- Release of source systems and IT organization
- Data access independent of the source system
- Analysis of data over a specific period of time, and the storage of historical information (time-dependent master data)

SAP Business Intelligence

SAP BI allows you to analyze data from operational SAP applications or any other business application. You can also extract and analyze data from external sources such as databases, online services, and the Internet.

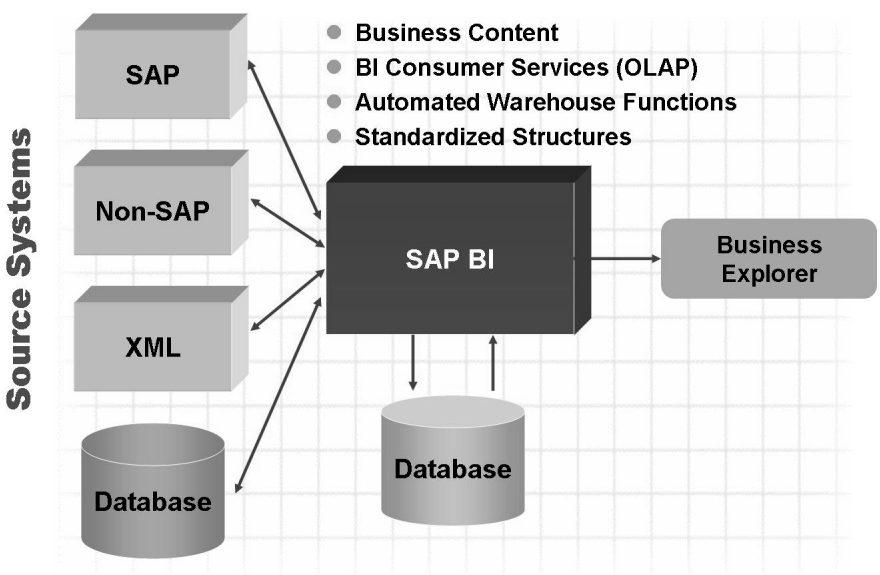

Figure 7: SAP Business Intelligence

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The system (data storage, loading and reporting), which is pre-configured by Business Content for core areas and processes, allows you to examine the relationships in every area of your company.

The realization of *SAP BI* aimed for the following:

- Data warehousing system with optimized data structures for reporting and analysis
- Separate system
- OLAP engine and tools
- Comprehensive data-warehousing architectural base
- Automated data warehouse management
- Pre-configuration using SAP global business know-how

With these goals in mind, SAP has opted for a separate data-warehousing solution that handles reporting activities as an autonomous business component, even providing a separate server with its own database and SAP system: *SAP Business Intelligence*.

All of the requirements and objectives mentioned so far have been met in the conception and architecture of *SAP BI*.

Having implemented *SAP BI* and its metadata repository (description of data), the customer has the clear advantage of being able to use the entire SAP know-how built up over the many years of experience in developing business software solutions. All SAP systems can be configured as source systems, and provide data for all SAP Business Content. This is described later in more detail.

Terminology and Objects in *SAP BI*

Now, an introduction to the important terms that are used in *SAP BI*will allow you to obtain an overview of terminology. This overview will be consolidated for the individual topical areas in the corresponding units of *SAP BI* courses.

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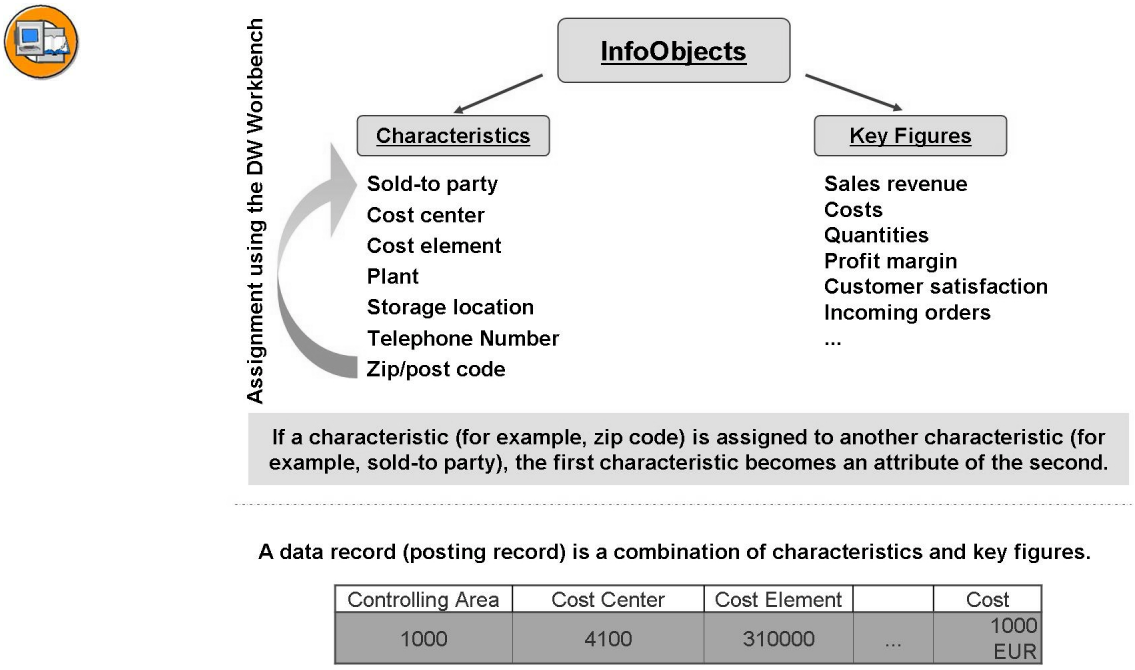

Figure 8: Terminology I

InfoObject

Business analysis-objects (customers, sales volumes, and so on) are called InfoObjects in *SAP BI*. These InfoObjects can be divided into characteristics and key figures. Characteristics can be further divided into units, time characteristics, and technical characteristics (for example, request ID). Key figures are all data fields that are used to store values or quantities (sales volumes, kilowatt-hours, costs, and so on). Characteristics describe the affiliation of key figures. For example, costs belong to a cost center, whereby the cost center is a characteristic.

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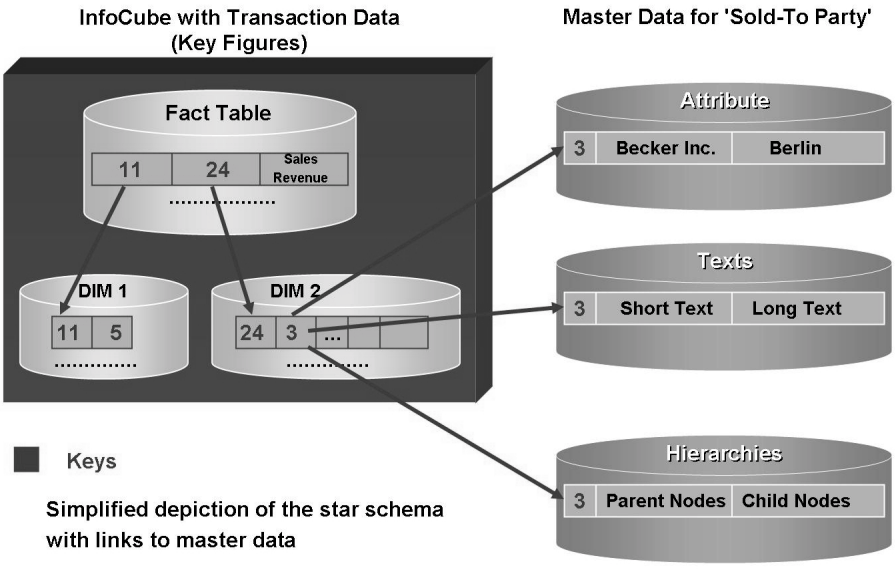

Figure 9: Terminology II

InfoCube

The central data containers that form the basis for reports and analyses in *SAP BI* are called InfoCubes. They contain key figures (sales volumes, incoming orders, actual costs, and so on) and a link to the characteristics (master data of the *SAP BI* system such as cost centers, customers, materials, and so on). Key figures and characteristics are InfoObjects. Each individual InfoCube should contain a self-contained dataset, since queries refer primarily to one InfoCube.

Master data in the BI system consists of attributes of a characteristic (for example, the person responsible for a cost center), as well as hierarchies and texts of a characteristic.

An InfoCube consists of several database tables that are linked according to the star schema. They include a fact table that contains the InfoCube key figures, as well as several surrounding dimension tables that store the links to the characteristics.

- Each InfoCube has one fact table and a maximum of 16 dimension tables.
- Each fact table can contain a maximum of 233 key figures.
- A dimension can contain up to 248 freely available characteristics.

InfoCubes are stored in structures in the *SAP BI* system. If you want to store an InfoCube, you create a new folder or use an existing one. This is similar to the method used when storing data on your PC: These folders are called InfoAreas in *SAP BI*.

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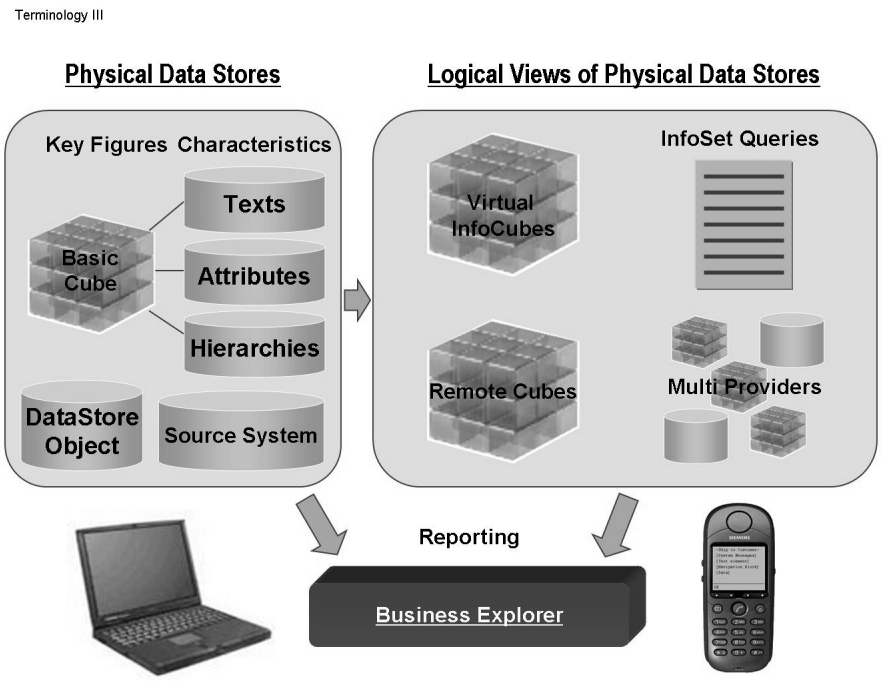

Figure 10: Terminology III

InfoProvider

InfoProvider is the super-ordinate term for an object that you can use to create reports in Business Explorer (BEx). InfoProviders are objects or views that are relevant to reporting.

InfoProviders include various database metaobjects that deliver data for query definitions. The type of data procurement differs depending on the InfoProvider used. However, the type of data procurement has no influence on reporting. InfoProviders deliver data that can be analyzed using a query.

There are two types of data stores. Physical stores include:

- InfoCubes
- DataStore Objects
- InfoObjects

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Logical views of physical data stores include:

- InfoSets
- RemoteCubes
- Virtual InfoCubes
- MultiProviders

The previous figure gives an overview of *SAP BI* reportable objects, divided into data targets that contain physical data, and InfoProviders that only contain logical views. From the BEx view, only InfoProviders are accessed. The way in which the data is modeled is inconsequential to the BEx toolset.

DataStore Object

A DataStore Object stores data at the basic level (document level). It is normally used to resolve and consolidate datasets. These datasets are often from various data sources and/or source systems.

Data Warehousing Workbench

The Data Warehousing Workbench is a workplace for SAP BI administrators. Data Warehousing Workbench functions are used to configure, control, and administrate SAP BI.

SAP Business Intelligence Architecture

SAP BI enables the analysis of data from operative SAP applications as well as all other business applications and external data sources such as databases, online services, and the Internet.

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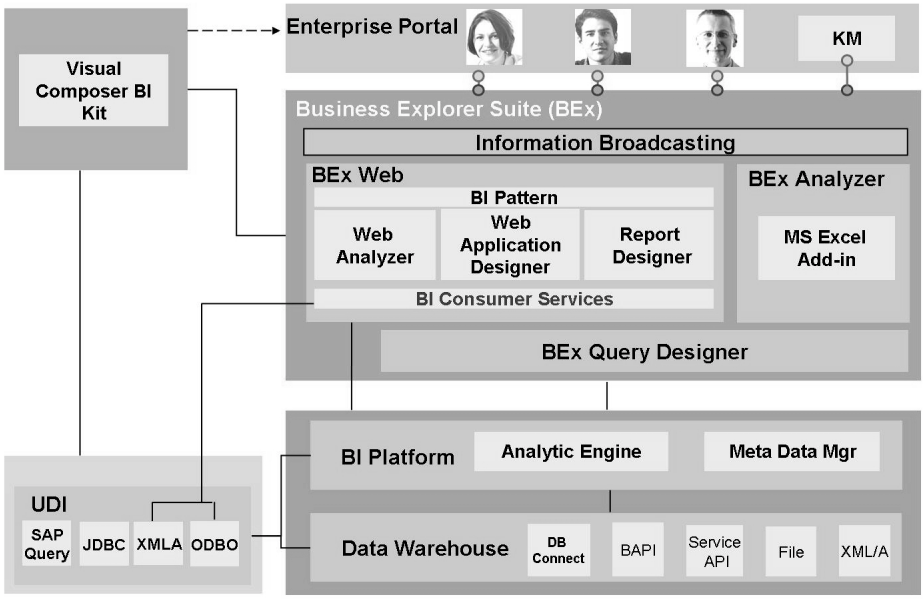

Figure 11: SAP BI Architecture

As shown above, the SAP BI architecture provides for the acquisition, transformation, storage, analysis, access and distribution of data from both SAP and non-SAP sources. The Business Explorer Suite (BEx) includes a variety of tools to make this possible. In this course, we will first focus on the BEx Query Designer.

The BEx Query Designer is the tool for creating query definitions. These query definitions structure how data from a variety of sources will be structured for presentation to the user. Power users can use the BEx Query Designer to create queries based on data stored in BI data providers in an easy and intuitive manner using Drag and Drop. Analyses and reports can draw on components that need to be created only once but can be reused in many queries. BEx queries and query views are the basis for analyses, reports, and planning scenarios in the BEx Web Application Designer, BEx Report Designer, and BEx Analyzer (Excel Add-in).

The BI server, which is pre-configured by Business Content for core areas and processes, allows you to examine the relationships in every area within your company. Business Content provides targeted information to companies, divided into roles. This helps your employees to carry out their tasks. As well as roles, Business Content includes other pre-configured objects such as InfoCubes, queries, key figures, and characteristics. These objects facilitate the implementation of *SAP BI*.

Within the BEx Web area, the Web Analyzer provides for web-based execution of queries as well as ad hoc analysis of data from a wide array of sources. The BEx Web Application Designer is a complete toolset for designing and deploying custom

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web applications within the organization. These applications often contain data from queries, but could also provide access to other structured and unstructured data. The BEx Report Designer allows for a high degree of control over the formatting of query output. They can change the layout of reports individually, add headers and footers to reports and pages, integrate texts, pictures, and charts, enter page breaks etc. The Web Item Report enables power users to include formatted reports in BEx Web applications.

Queries can be executed within several different user interfaces. The BEx Analyzer makes use of Microsoft Excel to provide a well-understood interface for viewing and analyzing data. Information Broadcasting is accomplished by the BEx Broadcaster that provides all the functions necessary to distribute queries, reports and analyses to end users and to the Enterprise Portal. In addition, the BEx Broadcaster provides a wide range of functions such as alerting and the pre calculation of results.

The SAP NetWeaver Portal serves as the main interface for users wanting to access business information. With powerful Knowledge Management features for a wide range of collaboration and feedback activities, the SAP NetWeaver Portal integrates the reporting and analysis tasks of users of all types. BEx Web Applications and BEx reports are deployed in SAP NetWeaver Portal. They are easily converted into PDF format and printed.

- Empower business users
- Design queries in an easy and intuitive way and use as the basis for a user-oriented presentation of information and effective analysis
- Design presentation-quality, print-optimized formatted reports
- Wizard-based creation of Web applications for all user types – no coding necessary
- Provides BI data in a user-oriented and flexible way
- Information is provided for all types of BI users
- Personalized access to BI information in SAP NetWeaver Portal supports quick and efficient decision making
- Simple conversion of reports and Web applications to PDF files allowing BI information to be printed as required

Different User Types in *SAP BI*

New studies have shown that up to 70 percent of all OLAP system users are basic users. Compared to the advanced users and query developers, basic users only use the system's analytical functions on a very small scale. This is because the basic users usually carry out predefined queries with fixed datasets. Therefore, most SAP users need a simple user interface.

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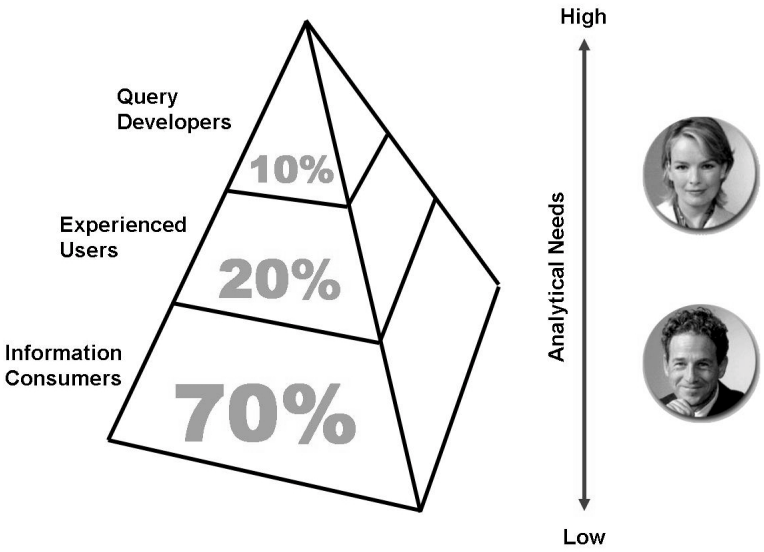

Figure 12: Different User Types

However, the experienced users and query developers who design and carry out information analyses on several levels must be able to use a comprehensive and effective range of tools for their analyzing options.

SAP catered to these various user needs when developing *SAP BI*.

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Lesson Summary

You should now be able to:

- Give an SAP NetWeaver overview
- Describe the fundamental structures of *SAP BI*
- Explain the reporting functions of *SAP BI*
- Define the most important terminology used in the context of Enterprise Reporting

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Unit Summary

You should now be able to:

- Give an SAP NetWeaver overview
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- Explain the reporting functions of *SAP BI*
- Define the most important terminology used in the context of Enterprise Reporting

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Test Your Knowledge

1. What type of source systems can be connected to *SAP BI*?

   Choose the correct answer(s).

   - □ A Data sources based on XML
   - □ B SAP systems
   - □ C Databases
   - □ D Fax machines)

2. Which of the following statements are true regarding InfoObjects?

   Choose the correct answer(s).

   - □ A Characteristics and key figures are InfoObjects.
   - □ B An InfoObject can also be an InfoProvider.
   - □ C All attributes are characteristic or key figure InfoObjects.
   - □ D All characteristic InfoObjects carry attribute, text and hierarchy data.

3. What are the important structural aspects of an InfoCube structure?

   Choose the correct answer(s).

   - □ A An InfoCube consists of a maximum of 16 fact tables.
   - □ B An InfoCube has a primary fact table and a maximum of 16 dimension tables.
   - □ C A dimension table consists of characteristics and key figures.
   - □ D A dimension table consists of characteristics and attributes.
   - □ E A dimension table contains key links to attributes.

4. What options does *SAP BI* reporting offer for creating reports?

   Choose the correct answer(s).

   - □ A You can display analyses in *Microsoft Excel* using the *BEx Analyzer*.
   - □ B You can display analyses on the web using the Enterprise Portal and the Web Analyzer.
   - □ C You can export a web report to a BEx Analyzer report.
   - □ D You can convert a *Microsoft Excel* table query into a BW report.

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Answers

1. What type of source systems can be connected to *SAP BI*?

   Answer: A, B, C

   Fax machines cannot be directly connected to *SAP BI* as a source system. A facsimile image could be stored in SAP BI as a document through document integration. This topic is discussed later in this course.

2. Which of the following statements are true regarding InfoObjects?

   Answer: A, B, C

   Characteristic InfoObjects may carry attribute, text and hierarchy master data, but each type of master data can be specified in the InfoObject definition as needed. InfoObjects are dealt with in detail in BW310 and TBW10.

3. What are the important structural aspects of an InfoCube structure?

   Answer: B, E

   There is only one fact table in an InfoCube and a maximum of 16 dimension tables. The dimension table contains characteristics while the fact table contains key figures. The dimension tables are linked to attribute, text and hierarchy master data. This topic is dealt with in detail in BW310.

4. What options does *SAP BI* reporting offer for creating reports?

   Answer: A, B, C

   The Business Explorer tool set is capable of producing both *Microsoft Excel*-based reports and web-based reports. Each type can be easily exported to the other format. A *Microsoft Excel* table query cannot communicate directly with *SAP BW* directly, however. You will learn more about these issues during this course.

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Unit 2

Navigating in Reports

Unit Overview

In this lesson, you use the various navigation options in the *Business Explorer Analyzer (BEx Analyzer)* and in a Web query, and you become familiar with the options of the *Business Explorer Browsers (BEx Browsers)*.

Unit Objectives

After completing this unit, you will be able to:

- Use the navigation options in the *BEx Analyzer* and the*Web Analyzer* .
- Use the functions of the context menu
- Use the functions of drag and drop navigation

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Lesson: Navigating in Reports

Lesson Overview

This lesson deals with the different options for navigating in the *BEx Analyzer* and in the *Web Analyzer*.

Lesson Objectives

After completing this lesson, you will be able to:

- Use the navigation options in the *BEx Analyzer* and the*Web Analyzer* .
- Use the functions of the context menu
- Use the functions of drag and drop navigation

Business Example

You want to analyze business key figures (for example, sales volumes or costs) within existing BI reports. You use BI reporting options to analyze key figures. There are *BEx Analyzer* and *Web Analyzer* reports.

The 'Open' Dialog

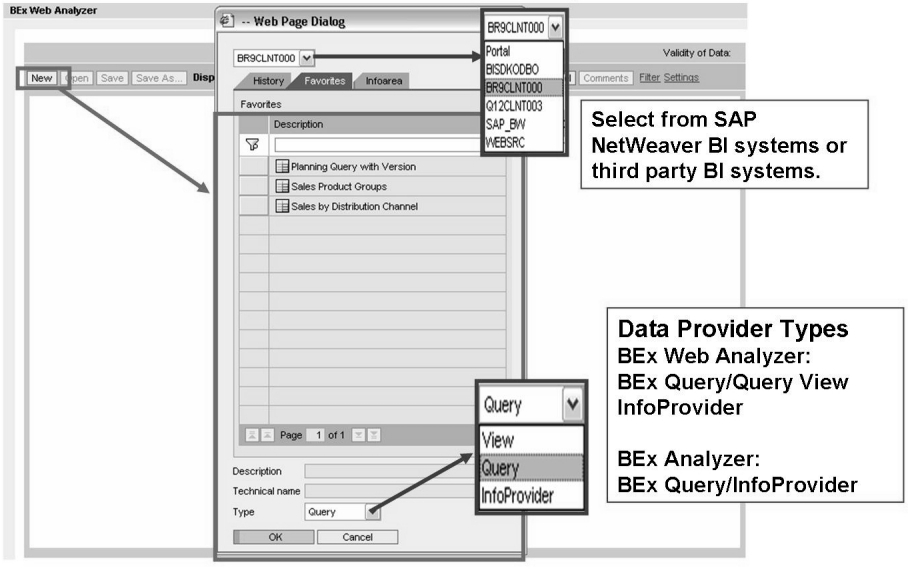

Figure 13: The 'Open' Dialog

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When you begin an analysis in the *Web Analyzer* or the *BEx Analyzer*, you begin with the *Open* dialog. In this dialog, you are able to choose:

1. The system from which you will retrieve data
2. The object type (query, query view or InfoProvider) you will access
3. The grouping of objects of the chosen type (History, Favorites or InfoAreas) to be displayed
4. Any filtering value to limit which objects are displayed.

These settings serve to quickly lead you to the desired query, view or InfoProvider for execution.

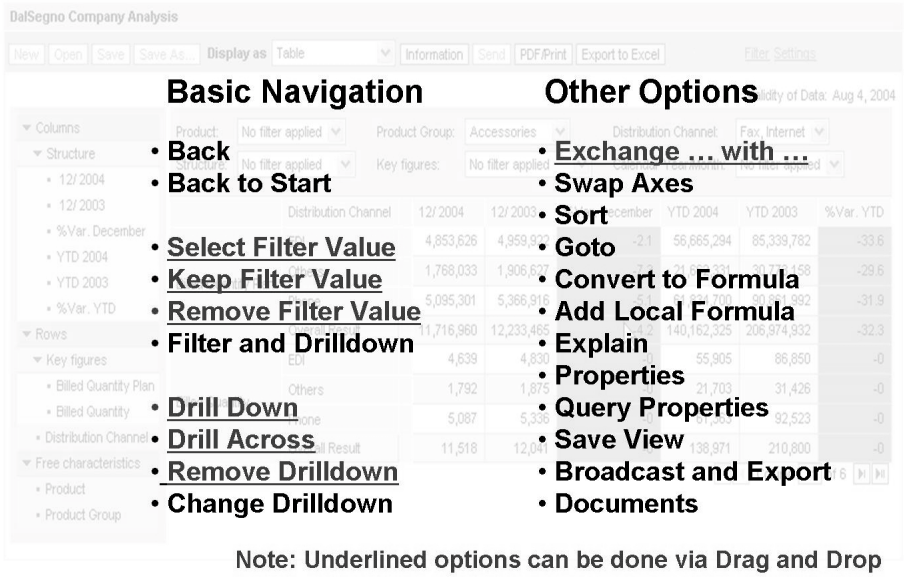

Figure 14: Navigation Options

Shown above is a list of the first level navigation options you can access from both the *BEx Analyzer* and the *Web Analyzer*. Bear in mind that not all options are available in all context menus, and that many of the first level choices have additional options available. The list above is just to give you an idea of the scope of possible navigational techniques.

You call the context menu using the right mouse button in both the *BEx Analyzer* and the *Web Analyzer*. The choices available in the context menu will depend on where you call the context menu. The context menu allows you to navigate in different ways within the report output and offers various functions depending on the cell context.

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Additionally, you can use *Drag and Drop* navigation for many of the basic navigation options. This is often quicker and more intuitive to the user than using the context menu. Not all navigation options can be done with drag and drop, but many of the most common navigation options can be done either way.

In the graphics that follow, we will explore some of the most frequently used navigation options.

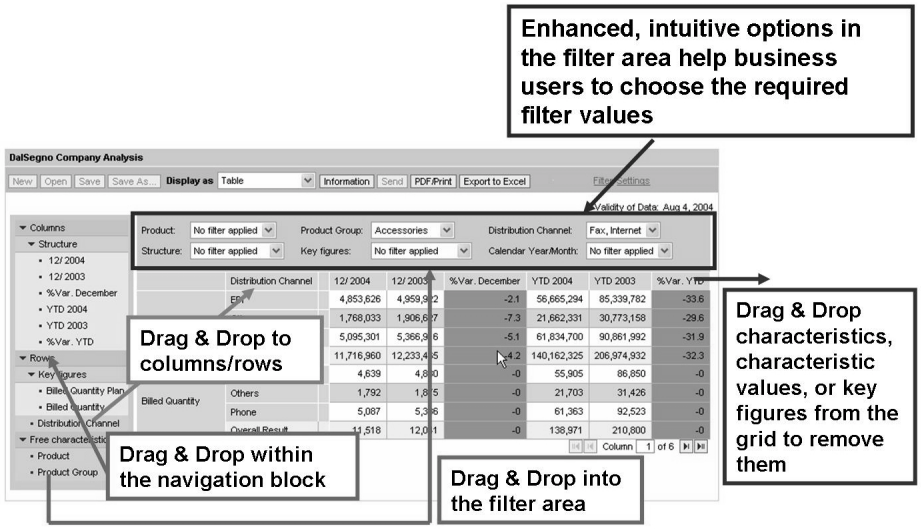

Figure 15: Drag and Drop Navigation/Filtering Options

Shown above are some of the ways in which drag and drop navigation can be used. Additionally, you also see the display of the *Filter* area that allows for several styles of filtering activity.

Users are free to drag characteristic and key figure values to various areas of the analysis area to dynamically change the layout of the analysis.

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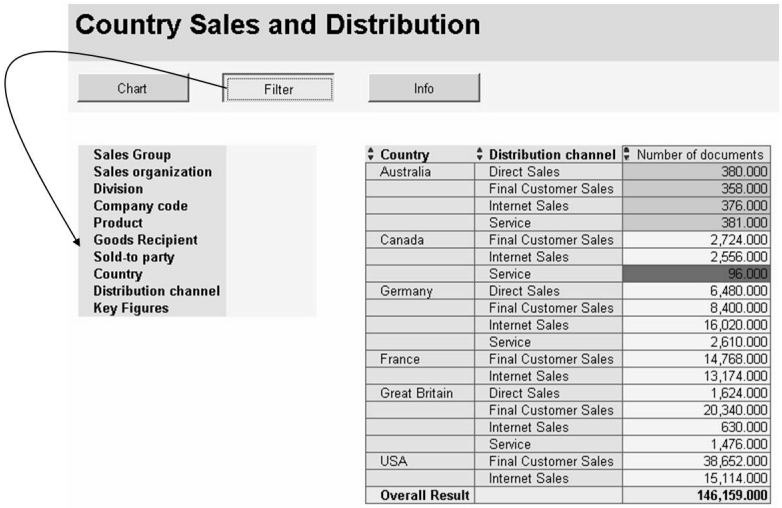

Figure 16: BEx Analyzer Navigation Buttons

In the BEx Analyzer, three buttons are provided to the user for frequently-used navigations. The *Filter* button, when selected, opens a *Navigation Area* within the analysis. This navigation area allows the user to change the drilldown, select filter values and swap the location of characteristics and key figures in the analysis.

The *Chart* button, if selected, changes the analysis table into a chart. Once the chart is displayed, the title on the button changes to *Table* in order to toggle the display back to a tabular view.

The *Info* button, when selected, displays a variety of text elements which serve to give the user a better context for the analysis results.

The following pages will explore some of the most common navigation techniques using drag and drop functionality.

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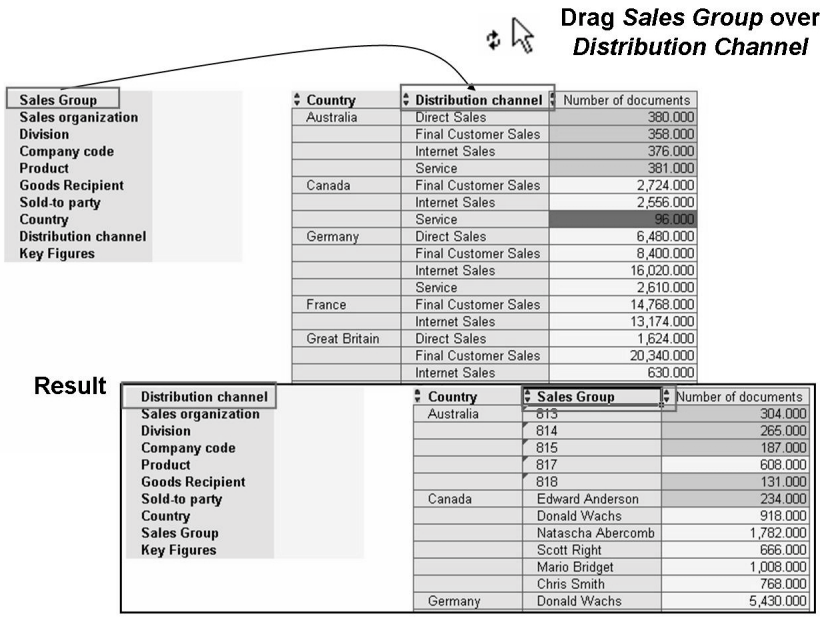

Figure 17: Exchange ... with ...

Any time you want to swap the location of one object in the analysis with another object, you may simply drag one item on top of the other and the change will be made automatically. Above, the user swaps *Distribution channel* for *Sales Group*. The user could have also brought up the context menu for either characteristics and selected *Exchange ... with ...* to effect the swap.

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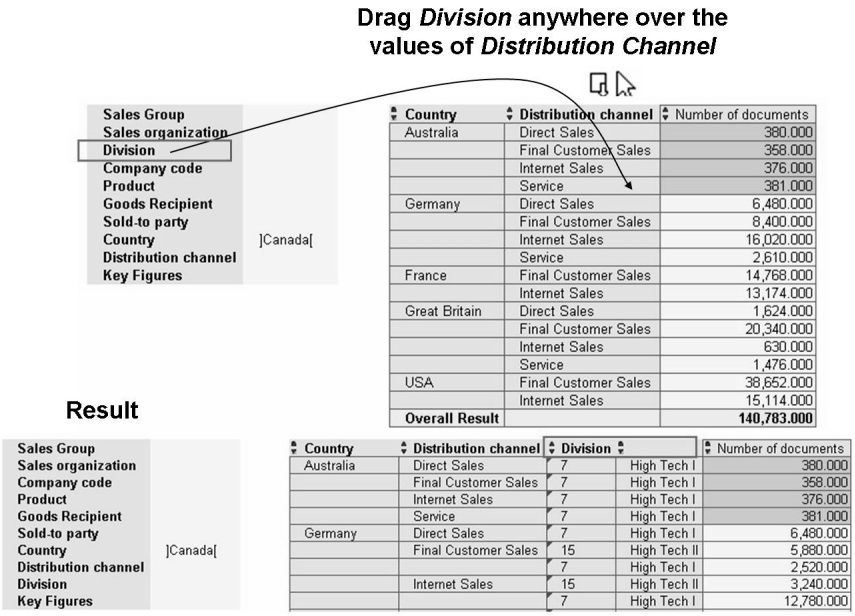

Figure 18: Drill Down

One of the most common navigation functions is the *Drill Down* (or *Drill Across)*. In the graphic above, the user drags *Division* from the navigation area and drops it on top of the values for *Distribution channel*. This has the effect of adding an additional level of detail for *Division* to the analysis.

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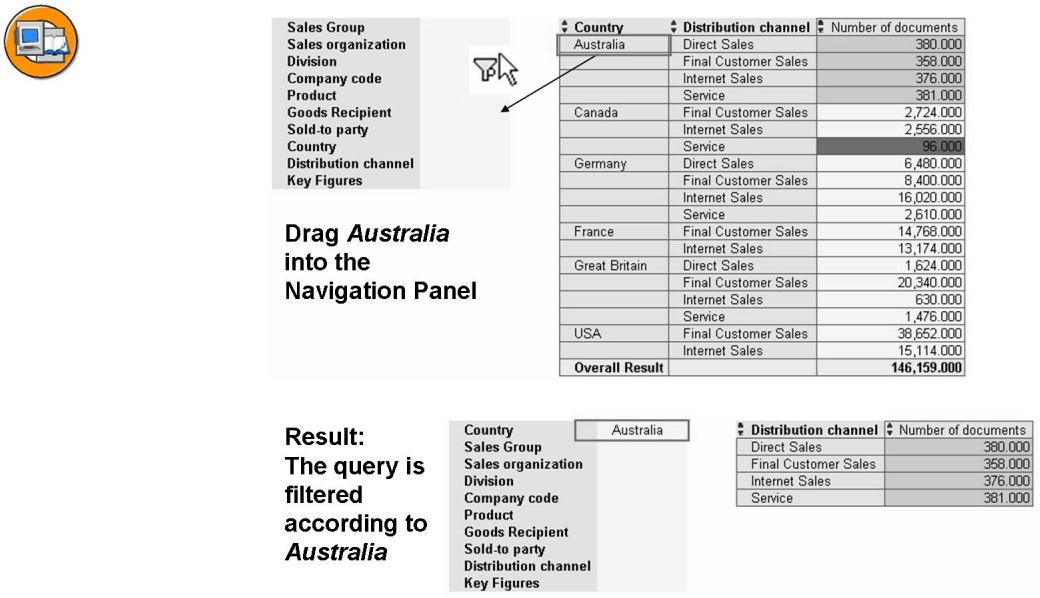

Figure 19: Keep Filter Value

You can select as filter value directly from the results area of an executed report. To do this, you could position the cursor on the filter value required, and choose *Keep Filter Value* from the context menu. The filter value is then displayed in the report and the report results are restricted to the filter value in question. Or you could, as the graphic shows, simply drag the characteristic value you want to use as a filter to the right side of the navigation area and drop it. The value will automatically be used as a filter for the analysis.

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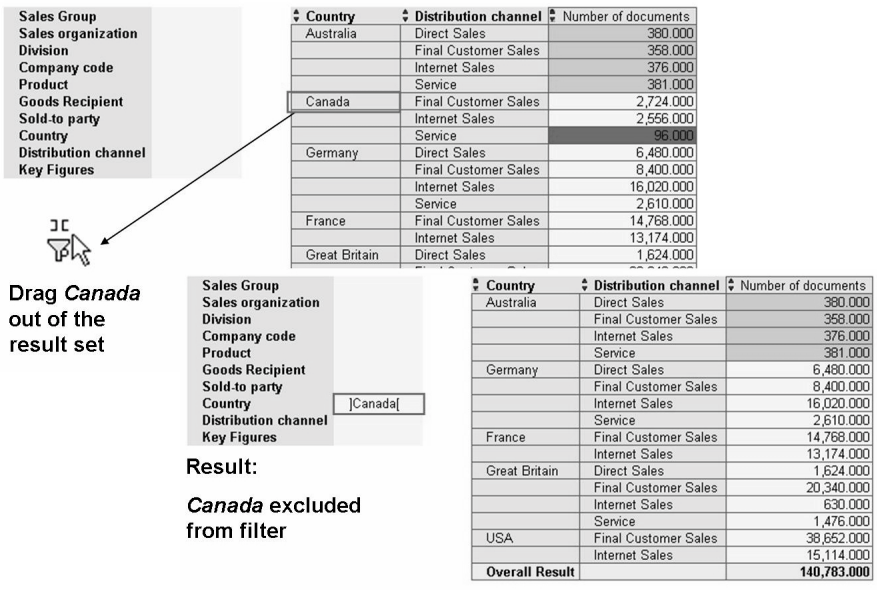

Figure 20: Remove Filter Value

With the *Remove Filter Value* option, you can *exclude* certain values from appearing in the analysis. Often, this is easier than trying to include many values as filter values.

Simply drag the characteristic value outside of the analysis area and it will exclude any data for that characteristic value.

There are many more navigation options you can use in the analysis, but most are very intuitive and can be mastered quickly by even casual users. Many of these options will be explored in various lessons within the course.

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Exercise 1: Navigating in Reports

Exercise Objectives

After completing this exercise, you will be able to:

- Use the navigation options in the BEx Analyzer via the context menu and via drag & drop.

Business Example

You want to analyze business key figures (for example, sales volumes or costs) within existing BI reports by using the different navigation options.

Task:

In the BEx Analyzer, execute the query *Sales Analysis (PM_SALES_ANALYSIS)* and use the different navigation options to analyze the business key figures within the report.

1. Start the BEx Analyzer and execute the query *Sales Analysis (PM_SALES_ANALYSIS)*. Use the *Find* function to search by either the description or technical name.
2. Exchange *Net Value* and *Orders Sold* key figures via Drag & Drop.
3. Remove *Open Orders* key figure via Drag & Drop, then display the *Filter* area.
4. Display the *Country* using the external hierarchy *PM_COUNTRY*. After checking the result displayed using the hierarchy, undo this step.
5. Exclude the *Distribution Channel* value *Direct Sales (10)* from the results using drag and drop.
6. Exclude *Net Value* key figure via drag and drop.
7. Exclude *Distribution Channel* characteristic via drag and drop.
8. Show results only for *Country 'USA'* and then add an additional drill down by *Material* using only drag and drop to find out which products make up the total.
9. Compare the result of the previous navigation option with the result of the following one: go 2 steps back and from *Country 'USA'* choose the context menu function *Filter and Drill Down → Product*.
10. Go back to the initial view of the query.
11. Exchange *Distribution Channel* with *Material* using drag and drop.

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12. In order to change the drill down you also can use the *Query Properties* function of the context menu. Place the *Country* characteristic in the columns by using this possibility. Furthermore, document links for master data should be displayed to inform the users of assigned master data documents. View one of these documents.

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Solution 1: Navigating in Reports

Task:

In the BEx Analyzer, execute the query *Sales Analysis (PM_SALES_ANALYSIS)* and use the different navigation options to analyze the business key figures within the report.

1. Start the BEx Analyzer and execute the query *Sales Analysis (PM_SALES_ANALYSIS)*. Use the *Find* function to search by either the description or technical name.

   a) Choose *Start → Programs → Business Explorer → Analyzer*

   b) Logon with your user ID and password when prompted.

   c) Click on the *Open* button in the BEx Analysis toolbar.

   d) Select *Open Query*.

   e) Click on the *Find* button on the right and then enter either the technical name or description. Select the *Find* button. When the query is found, select the *Open* button at the bottom.

2. Exchange *Net Value* and *Orders Sold* key figures via Drag & Drop.

   a) Highlight the heading *Net Value* and drag and drop this directly over the heading *Orders Sold* to swap the sequence of the key figures.

3. Remove *Open Orders* key figure via Drag & Drop, then display the *Filter* area.

   a) Highlight the heading *Open Orders* and drag and drop this outside the results area. When the mouse pointer changes to show a black filter icon you can then release the mouse button. The *Open Orders* key figure is now gone.

   b) Press the *Filter* button to display the filter area.

4. Display the *Country* using the external hierarchy *PM_COUNTRY*. After checking the result displayed using the hierarchy, undo this step.

   a) Highlight the heading *Country* and select from the context menu *Properties*. From the *Hierarchy* tab choose the hierarchy *PM_COUNTRY* from the drop down box. Click OK to see the result displayed using the hierarchy.

   b) From any cell of the report: *Right click → Context menu → Back*.

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5. Exclude the *Distribution Channel* value *Direct Sales (10)* from the results using drag and drop.

   a) Highlight any of the cells which contain the *Distribution Channel* value *Direct Sales (10)*, then drag and drop this anywhere outside the results area. Wait until you see the mouse pointer change to show a black filter before releasing the mouse button.

6. Exclude *Net Value* key figure via drag and drop.

   a) Highlight the heading of the key figure *Net Value* and drag and drop this anywhere outside the result area. Wait until you see the mouse pointer change to show a black filter before releasing the mouse button.

7. Exclude *Distribution Channel* characteristic via drag and drop.

   a) Highlight the heading of the characteristic *Distribution Channel* and drag and drop this anywhere outside the result area. Wait until you see the mouse pointer change to show a black filter before releasing the mouse button.

8. Show results only for *Country 'USA'* and then add an additional drill down by *Material* using only drag and drop to find out which products make up the total.

   a) Highlight the cell containing the *Country* value *'USA'* then right click to show the context menu. Select *Keep Filter Value* menu option. Then drag the Material characteristic from the filter area and drop it under the *Country* characteristic to add a drill down.

9. Compare the result of the previous navigation option with the result of the following one: go 2 steps back and from *Country 'USA'* choose the context menu function *Filter and Drill Down → Product*.

   a) From any cell of the report: *Right click → Context menu → Back* (2 times).

   b) Highlight the cell containing the *Country* value *'USA'*, then right click to show the context menu. Select *Filter and Drill Down → Material*.

10. Go back to the initial view of the query.

    a) From any cell of the report: *Right click → Context menu → Back to Start*.

11. Exchange *Distribution Channel* with *Material* using drag and drop.

    a) Highlight the *Material* characteristic from the filter area, then drag and drop it directly over the *Distribution Channel* characteristic in the filter area or over the *Distribution Channel* heading in the results area. When the mouse pointer changes to show two arrows in a circular motion you are ready to release the mouse button.

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12. In order to change the drill down you also can use the *Query Properties* function of the context menu. Place the *Country* characteristic in the columns by using this possibility. Furthermore, document links for master data should be displayed to inform the users of assigned master data documents. View one of these documents.

    a) From any cell of the report: *Right click* → *Context menu* → *Query Properties*.

    b) *Navigation State* tab page: Transfer the characteristic *Country* from the *Rows* area into the *Columns* area under *Key Figures* by using drag & drop or the *Arrow* button.

    c) *Display Options* tab page: Check the box for *Display Document Links on Master Data*.

    d) Press *OK*.

    e) From a cell containing a *Product* value with the document link symbol: *Right click* → *Context menu* → *Go to* → *Documents*. Log on with your user ID and password when prompted to access the *Document Browser* where the document can be viewed.

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Lesson Summary

You should now be able to:

- Use the navigation options in the *BEx Analyzer* and the*Web Analyzer* .
- Use the functions of the context menu
- Use the functions of drag and drop navigation

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Unit Summary

You should now be able to:

- Use the navigation options in the *BEx Analyzer* and the*Web Analyzer* .
- Use the functions of the context menu
- Use the functions of drag and drop navigation

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Unit 3

First Steps in the BEx Query Designer

Unit Overview

This unit gives an overview of the *BEx Query Designer* tool and the individual objects that you require to create a query definition – the basis of every report.

Unit Objectives

After completing this unit, you will be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis
- Describe the differences between the various InfoProviders
- Select the InfoProviders according to their use in creating reports
- Use the different elements of the InfoProvider in the Query Designer

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Lesson: Query Designer

Lesson Overview

This lesson presents the *BEx Query Designer* as an independent tool for defining queries in the *SAP BI*.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis

Business Example

You use *SAP BI* to define reports that enable standardized navigation functions in analyses, independent of the source operational system.

You want to define simple reports, execute these, and make changes to the report definition.

Calling the *BEx Query Designer*

Using the *SAP BI* reporting functions, you can evaluate a dataset from an InfoProvider according to various characteristics and key figures. To do this, you define a query for your chosen InfoProvider in the *BEx Query Designer*.

By selecting and combining the InfoObjects in a query, you determine the way in which data from the chosen InfoProvider is evaluated.

You have various options for calling up the Query Designer:

- From the *BEx Analyzer*
- As a separate program using *Start* → *Programs* → *Business Explorer* → *Query Designer*
- Using the *Web Application Designer* (see the *BEx Web Application Designer* unit)
- From the *BEx Report Designer*
- With Crystal Reports (Crystal Reports >=8.5 including CR add-ons for SAP)

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The Open Dialog Box

The following illustration shows how the dialog appears if you are creating a new query. The requirement here is to simply choose the InfoProvider. First choose one of the three button on the left side of the dialog box:

- Find (use search options to locate an InfoProvider)
- History (Your most recently used InfoProviders are listed)
- InfoAreas (A list of all InfoProviders organised by InfoAreas is shown)

Figure 21: New Query Dialog

Functions of the *BEx Query Designer* – different panes: InfoProvider, Filter, Row/Columns, Properties, Tasks

The following figure gives an overview of the *BEx Query Designer* functions that you can call from the Query Designer toolbar. The functions are described within the context of query definition. Please note, toolbar functions are context sensitive which means that certain buttons may be inactive if they are not valid for your context. (i.e. the Save button is inactive until there is something to save!)

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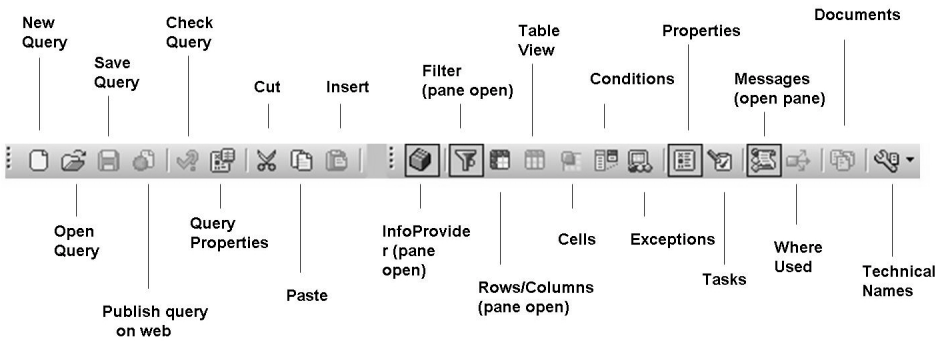

Figure 22: Query Toolbar

New Query: With this function, you are able to define a new query.

Open Query: Choose this function if you want to open an existing query.

Save Query: Using this function, you can save your query.

Execute: Choose this function if you want to display your query results via the portal.

Check Query: This function will perform a validity check on your query and inform you of any errors.

Properties: Choose this function if you want to change the description of the query or define the settings for the result position, display options, numeric display, zero display and key date of the query.

Cut: You use this function to remove a query object ready for inserting into another section of the query definition.

Copy: You use this function to identify a query object in preparation for an insert of the object into another section of the query definition.

Insert: This function is used to insert either the copied or cut object in query definition. Be sure to mark the place where you want the query object to inserted.

InfoProvider: This function will open the InfoProvider pane.

Filter: This function will open the Filter pane.

Rows/Coumns: This function will open the Rows/Columns pane.

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Table View : You can create a query for tabular reporting (each query element in a separate column), as well as for Online Analytical Processing (OLAP) reporting, by activating or deactivating the *Table View* mode in the query definition when defining a query. This function is only available for queries with one structure. You can only have queries with two structures in the multi-dimensional display. They are not suitable for OLAP reporting.

Cells : This function is only available for queries with two structures. You can define formulas and selection conditions for cells explicitly. In this way, you control the values of cells that appear at the intersections of structural components. This function enables you to access individual cells in queries or to assign special values to these.

Conditions : You use this function to define conditions for a query. For each characteristic, you can give limit conditions to the key figure values in order to determine, for example, all sales revenues above or below a specified threshold value. The chosen characteristics are displayed in the query with restricted key figures.

Exceptions : You use this function to define exceptions for a query. Exceptions are deviations from normal key figure values, as defined by you, and are highlighted in color in the query view.

Query Properties :Choose this function if you want to change the description of the query or define the settings for the result position, display options, numeric display, zero display and key date of the query. .

Tasks : Using this function, you can display the actions which are valid for the query object you have highlighted.

Messages : This function opens the messages pane. In the messages pane there is a llist of the outstanding messages relating to the status of the query. These messages may be informational i.e. 'Query is successfully saved' or warning i.e. 'No filter specified'. Use the *Check Query* function to display a list of messages in the messages pane relating to the correctness of the query.

Query Where-Used List : Using this function, you can find out in which objects (Workbooks, Web templates) the query is used.

Technical Name : Using this function, you can show/hide the technical names of the query components.

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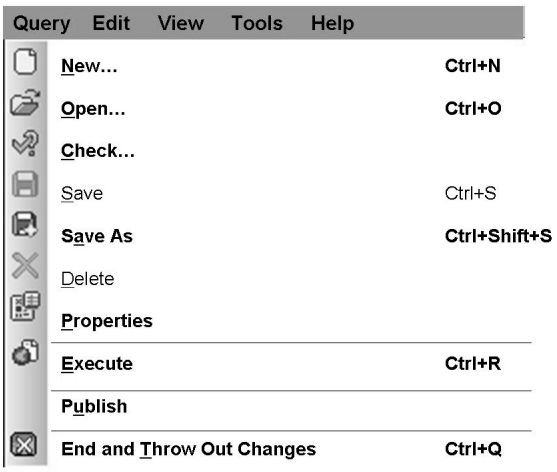

Figure 23: Query Designer Menus

Don't forget you can also access the Query Designer functions via the menus, you will notice the icon appears alongside the menu option.

Hint: You an also access the Query Designer functions via the keyboard shortcuts i.e. Ctrl+S, the keyboard shortcuts are provided alongside the menu options.

Creating a Query

This section describes the most important functions required for creating, saving and modifying a query.

To define a new query, start the *Query Designer* and choose the function *New Query* .

In the *New Query: Select InfoProvider* dialog box, select the required InfoProvider. The following example uses the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* under *InfoAreas → BW Training → BW Customer Training → BW305 Reporting*.

Once you have selected the InfoProvider, the Query Designer displays as shown in the following graphic.

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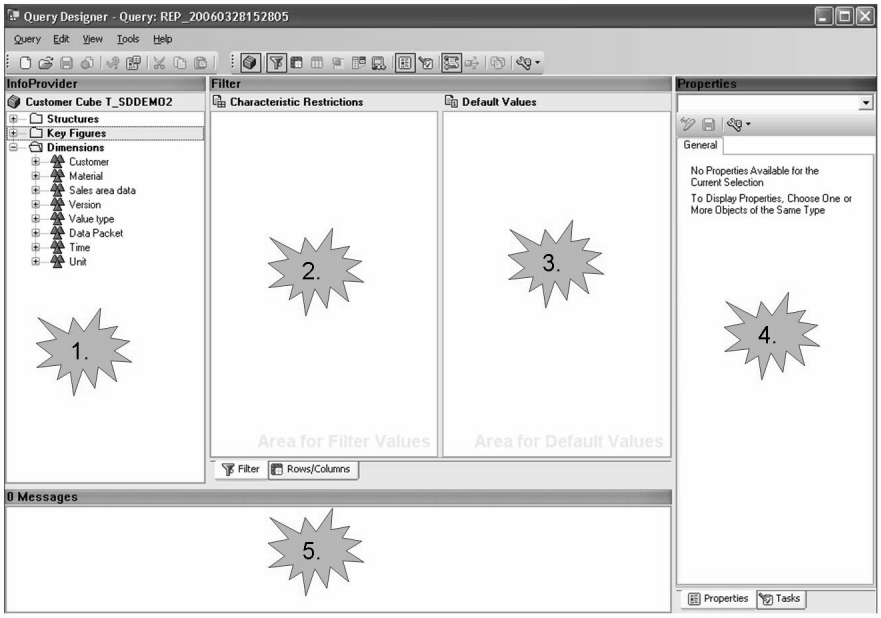

Figure 24: Query Designer Layout (filter view)

The Query Designer contains many different panes, some panes are only displayed when a function button is pressed. However, we will now describe the key panes:

1. Directory tree of the selected InfoProvider.

Once you have selected the required InfoProvider, all available objects (dimensions, key figures, structures) display in the directory tree in the left screen area of the Query Designer.

In this example, you can see the directory tree for the InfoProvider *InfoCube Customer Cube T_SDDEMO2*.

2. Characteristic Restrictions

Here you define the characteristic filter values which apply to the entire result set.

3. Default Values

In this pane you define the characteristic filter values which should be used for the initial view of the result set. The user may choose to modify these filters in the result.

4. Properties

Here is where the settings relevant to the currently highlighted query object are displayed. You can also make changes to the setting here. Often there will be multiple tabs used to organize the settings in this pane.

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5. Messages

This pane is where informational or error messages are displayed.

1.

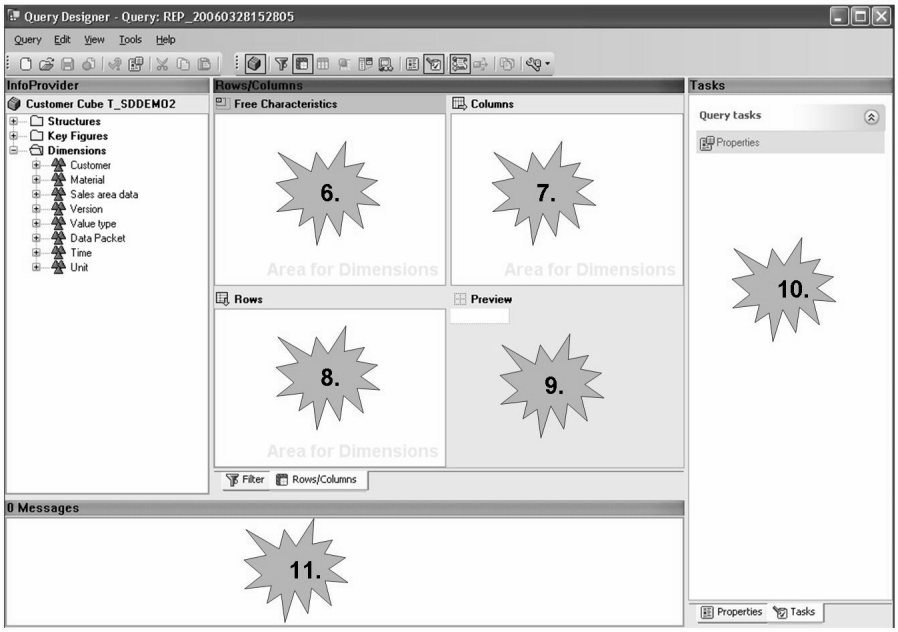

Figure 25: Query Designer Layout (rows/columns view)

6. Free Characteristics.

Put the characteristics which you want to offer to the user for navigation purposes in this pane. These characteristics do not appear in the initial view of the query result set, the user must use a navigation control in order to make use of them. You do not define the filter values here.

7. Columns

Here is where the query objects (key figures or characteristics) must be placed if you want them to appear in the columns of the results set.

8. Rows

Here is where the query objects (key figures or characteristics) must be placed if you want them to appear in the rows of the results set.

9. Preview

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This pane gives you an idea of what the layout of the results set will look like when you execute the query.

10. Tasks

A list of suitable tasks relating to highlighted query object are displayed here, you can click on any of the tasks in the list to go directly to the settings.

11. Where Used

This pane provides information relating to the use of the query object.

Note: You will only see the tab for *Where Used* once you insert you first query object in the definition. We are simply showing you in the graphic where this pane will appear.

To create a query, you can expand or collapse the InfoProvider directories by choosing the plus or minus symbol. By expanding the key figure node in the InfoProvider tree, for example, you can display a list of all the key figures for the InfoProvider.

- Use Drag&Drop to transfer the characteristics, key figures, and structures of the InfoProvider into the various panes within the Query Designer.

  Note: You can also transfer these characteristics using the keyboard and the clipboard. Choose CTRL+C to copy and CTRL+V to paste.

  You can also include characteristic attributes and variables in the query definition in this way.
- You can use the right mouse button to call all of the valid functions that are in the current context menu. To do this, first select the required query component, then select a menu entry from the context menu.
- By double-clicking on an element in the query designer, you call a dialog box that offers the default function for that element. For example, if you double-click on a characteristic, the dialog box for restricting characteristics appears.
- If you click on an element you will notice that the suitable tasks are also displayed in the *Task Pane.* Simply click on one of the tasks to open up the dialog box to make the settings.

The following graphic shows the Query Designer with a query definition.

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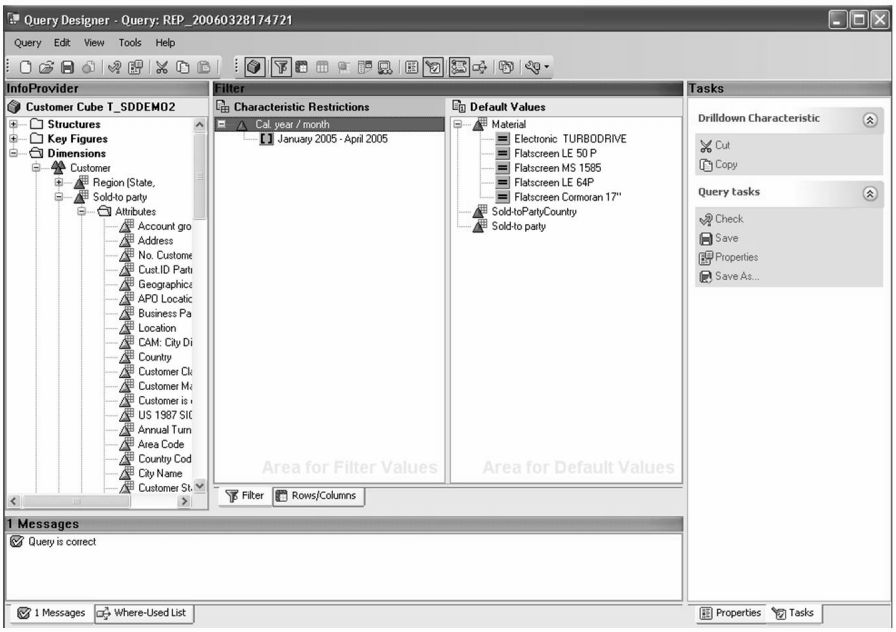

Figure 26: Example defined query (filter view)

The following definitions were made:

- The characteristic *Cal. Year/Month (0CALMONTH)* was chosen as a global filter and restricted to the range of months *January* to *April 2005* in the Characteristic Restrictions pane.
- The characteristic *Material* was restricted to a small number of the single values that will appear as the default filters when the query is executed.

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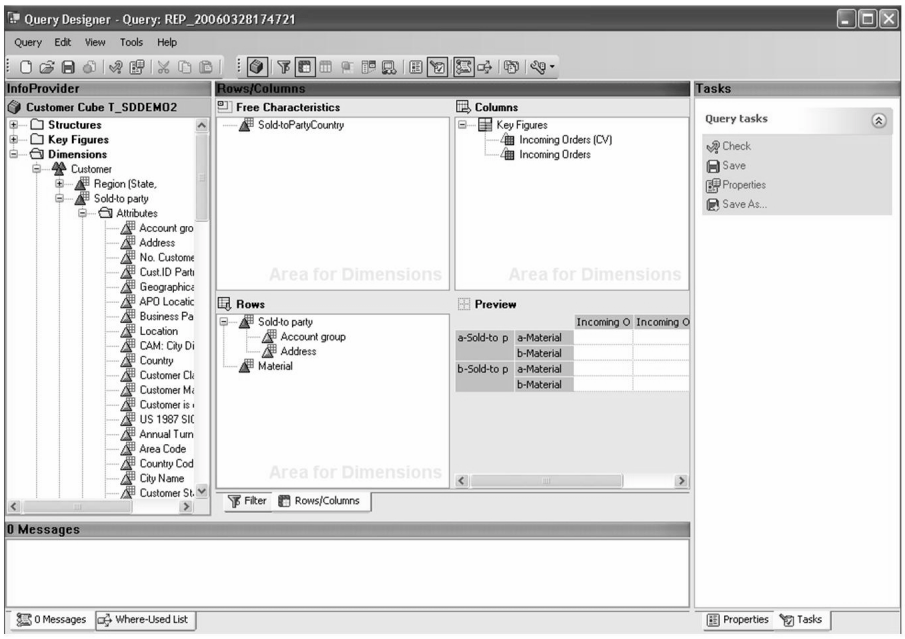

Figure 27: Example defined query (rows/column view)

The following definitions were made in the columns/rows view::

- The characteristic *SoldToCountry* was selected as a Free Characteristic.
- The key figures *Incoming Orders (CV)* and *Incoming Orders* were placed in the columns.
- The *Sold-to Party* characteristic, with attributes for address and account group, was included in the rows. The material was also included in the rows. This was restricted to a range of materials in the default filter pane.
- The preview area shows how the report is structured.

Once you have defined a query, choose *Save Query* or *Save As...* .

If you have not yet saved the query, you must enter a query description and a unique technical name. You can also choose where you want to save the query (in your roles or in your favorites folder). You can use *Save Query As...* to save existing queries under a different name. You will notice a default description and technical name are proposed, these are made up of *REP_* followed by the date and time. Simply overwrite these if you prefer to use your own names.

.You are able to save a query even though it may contains errors. This means you can return to the query at a later time and correct the errors.

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Once you have saved the query, you have the following options:

- You can execute the query in the BEx Analyzer and include it in a workbook. To do this, choose *Quit and Use Query* However you must first have launched the Query Designer from the BEx Analyzer in order to see the required function. .
- You can display the query on the Web via the NetWeaver Portal. To do this, choose *Execute* .
- You can use the query in the Web Application Designer as a data provider for Web items.
- You can use the query in the Report Designer as a dataprovider.
- You can use the query in the tabular display in Crystal Reports as a data source for formatted reports.

The individual steps for creating a query and the various options for defining a query are described in more detail in the following section.

Finding a Query

In order to find a query for which you already know a part of the description or other information, choose *Find* .

In the *Search for Queries* dialog box, enter the technical name or description of the query. If necessary, you can restrict the search to additional criteria. Choose *Find*.

- If you are in the BEx Analyzer and have called the search function from the *Choose Query* dialog box, the query result displays as an Analyzer report.
- If you are using the search function from the Query Designer, the query definition displays.

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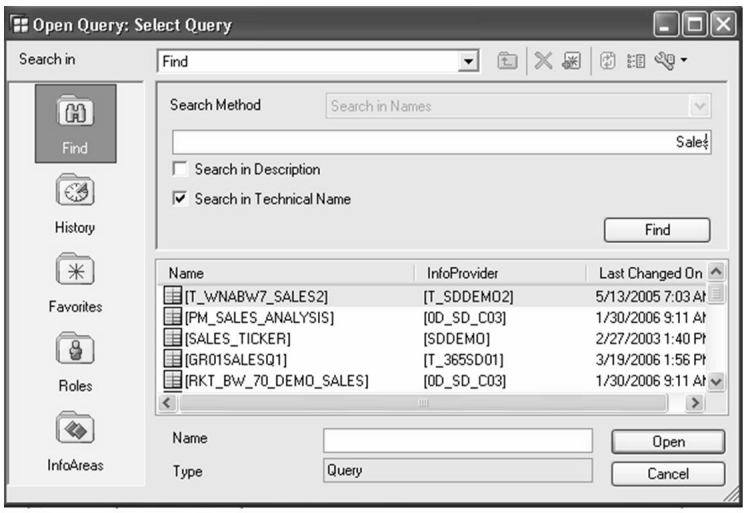

Figure 28: Finding a Query

Filtering Data in the Query Definition

It is often necessary to restrict the characteristics to specific values in your reports. For example, you are interested only in the results of a specific sales team but the InfoProvider on which the query is assigned contains sales results for all sales teams, you can restrict the query by defining a filter on the required characteristic. The result will be that your report will only show the results for the required sales team.

The filters are defined under the tab *Filter.* Be sure to select this tab before attempting to define any filters. Once you are displaying the *Filters*tab you can define the filters in either the*Characteristic Restrictions* pane or the *Default Values* pane.

- Filters set in the *Characteristic Restrictions*pane are always applied to the query result and cannot be modified by the user in the result. These are often regarded as *global or static filters.*
- Filters set in the *Default Values* pane are applied immediately once the query is executed. However, the user is able to navigate freely ***within*** these filters. The user cannot add additional filters to the default values i.e. the filters in the query definition set out the maximum range of the result data a user can display, this may produce more data than the user requires so the user simply navigates to a reduced result set by modifying the filters in the report.

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There are two basic ways to restrict a characteristic in the query definition:

1. By selecting a characteristic value from the InfoProvider tree (on the left side of the query designer). Simply open the tree to display the required characteristic within the appropriate dimension and then open the characteristic node to reveal the sub folders, one will be called *Characteristic Values*. Open this folder to display the values and then drag and drop these to the required pane. You don't need to have previously dragged the characteristic into the pane beforehand, the act of dragging the first characteristic value will also drag the characteristic into the pane.
2. You can also restrict a characteristic you have already included in the query definition by calling the context menu for the characteristic and choosing *Restrict.* You could also highlight the characteristic and then display the *Tasks* tab to show the suitable tasks, one of them will be *Restrict.* And finally a double-click on the characteristic would also open the default task which for a characteristic in the filter view would be *Restrict.*

The following figure shows the selection dialog box for the *material* characteristic.

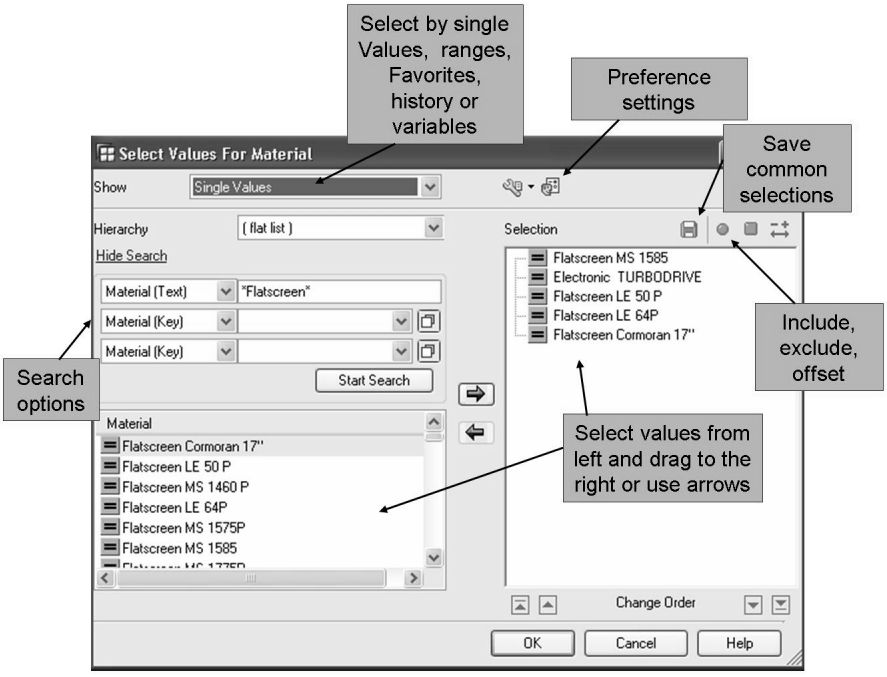

Figure 29: Selecting filter values

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You can find the values for the characteristic on the left side of the screen. Be careful, there may be many values so use the search options to limit what you are looking for. It is also possible to display attributes alongside the list of characteristics, i.e display the color of the products. It is also possible to search for filter values via hierarchies, simply select the hierarchy in the drop down list and then select the required node.

You can save frequently used filter values so they can easily be recalled for later re-use. You supply a suitable name for the filter collection when you open your favorites the collections are displayed with their names.

A useful list of recently used filter values appears in the history.

It is possible to switch any filter values to exclusion. The offset feature is used with variables only (this is discussed in the variables lesson).

Query Properties

There are a number of settings which you can make which will affect the presentation and/or the behavior of the query, these are called query properties. Query properties are accessed via the right most pane of the query designer. Be sure to select the *properties*tab at the bottom of the pane and also be sure that you have selected the top-most item in the drop down list of the properties pane (this pane is also used to access the characteristic and key figure properties). The top most item is where you will see the query name. The query properties are organized via tabs as follows:

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General Tab

- Description

  Enter some text which describes the query. This text will appear as the title of the query in the output. This can be changed at any time in the query. It is also possible to insert text variables so that he description is dynamic and determined at run-time ((i.e. report date, product division chosen by user).

- Technical Name

  A technical must be unique in the BI system and is used to identify your query. Once a technical name is entered and the query is saved you cannot change this, if you wanted to use a different technical name you would have to use the *Save as* option.

  Hint: Think about a consistent naming convention for any BEx technical names. For example the first two characters might relate to the business area, the second two characters may relate to the author etc. This will certainly help with authorizations planning.

- InfoProvider

  Here you will find a reminder of the InfoProvider the query is assigned to.

- Key Date

  If time dependant master data is used in the query (attributes, hierarchies, text) this date (which can be fixed or supplied by a variable) is used to select the correct master data. The checkbox *Use standard date* is used to tell the query to use the **current date** at query run-time.

Also in the general tab you will find information relating to the owner of the query and the person who last changed the query and date and times.

Variable Sequence Tab

- Variables Sequence

  You can change the sequence of the variables to ensure they are presented to the user in a logical order.

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Display Tab

- Adjust Formatting after Refreshing

  The default action is that whenever a query is refreshed the result cells will be formatted so that the meaning of the cells is emphasized. To prevent this from happening (perhaps to improve query performance or you want to use your own format templates) you need to make sure this box is unchecked.

- Hide Repeated Key Values

  This function also activates by default, which means that when the query is executed only the first key or description displays for each characteristic and any additional identical keys or descriptions are suppressed.

- Display Scaling Factors for Key Figures

  This function allows you to include any scaling factors in the row or column header (for example *1000 EUR).

- Document Links

  Here you choose the document class which you would like to make available to the query, this means a user can display or maintain documents for these checked classes.

Rows / Columns Tab

- Result Position (Rows and Columns)

  You can choose where to position the results along the rows and columns. The default settings will present the row results at the bottom and the column results to the right. When you make changes you will see the preview diagram at the foot of the pane also changes.

- Suppress Zeros

  If any rows or columns produce a **result** of zero, with these settings you can hide the complete row or column. You can decide if the **entire** row or column should be zero or simply the net result is zeros before suppressing. Use the preview to help you decide.

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Value Display Tab

- Display of the +/- sign

  Decide how you would like to present the negative values.

- Zero Value Display

  These settings help you choose a suitable method of presenting zero values in the result.

Planning Tab

- Startup View

  This setting determines whether the query is started in display or change (planning) mode. Planning mode allows the results cells to be changed.

Extended Tab

- Release for OLE DB for OLAP

  If you want to expose the data from this query to a third-party BI tool then this check box must be marked so the Microsoft ODBO interface is filled.

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Exercise 2: Query Designer

Exercise Objectives

After completing this exercise, you will be able to:

- Use the BEx Query Designer to create your own queries
- Change existing queries
- Open queries in the BEx Analyzer and in a Web browser

Business Example

In order to evaluate the data from an InfoProvider, you require queries that are tailored to your individual requirements. You have been given the task of creating these query definitions.

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Task 1:

You are interested in finding out the incoming order values and the incoming order quantities of your customers for specific materials between January and April 2001. You want to enable the users of your report to select by specific countries. Create a new query with the following layout:

Cal. Year/Month	01.2001 ... 04.2001			
Country				
Sold-to Party		**Material**	**Incoming Orders**	**Order Entry Quantity**
1000	Becker Berlin	Standard Keyboard	10,000	142
		Professional Keyboard	15,000	156
	Result		25,000	298
2000	Carbo GmbH		20,000	332

1. Create a new query using the *Customer Cube T_SDDEMO2* InfoProvider in the *BW305 Reporting* InfoArea with the characteristic *Sold-to party (0SOLD_TO)* in the rows.

   Use the basic key figures *Incoming Orders (T_INCORDV)* and *Order Entry Quantity (0INCORDQTY)* in the columns.

2. Save the query in your *Training BW305 Reporting* role under:

   Unit: First Steps in the BEx Query Designer → Lesson: Query Designer in the *Exercise* folder with the name:

   Description: **`GR## BW305 Customer Query 1`**

   Technical name: **`BW3054F##`**

   Execute the query, view the results, then close the query results (do not close the BEx Analyzer).

3. In the next step, you want to change the query definition. Find the query you created (*GR## BW305 Customer Query 1*) using the search function.

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In the query definition, Include the material in the report in order to display the incoming orders for each material for the customers. You also want to filter the data with a characteristic restriction to only report data for the months 01.2001 to 04.2001.

4. Enable the users of your report to select data related to specific countries. Then save and execute the query. In the local view of the query, remove the material from the drilldown and include the country in the drilldown before sold-to party to list the sold-to parties by country. Also in the local view, restrict the country to Germany and Norway. In order to enhance the readability of the report, suppress the repeated key values.
5. In a further step, in the global definition of the query, establish the restriction for the country to Germany and Norway as default values, and furthermore the suppression of repeated key values. Execute the report and make a note of which sold-to parties are listed in your report. Are you able to select other countries in the report?
6. Now execute your query on the Web.

Task 2:

(Optional)

Create a report for the time period from May to July 2002 about the sales volumes of your customers from the sales organization Germany Frankfurt, with the option of navigating by division, and of a drilldown for the sales volumes on the months May to July 2002.

1. Define a new query. Include the *Sold-to Party (0SOLD_TO)* in the rows and the key figure *Sales Volume EUR (T_INVCD_V)* in the columns of your query definition. Choose *Sales Organization (0SALESORG)* as the global filter, restricted to *Germany Frankfurt (1000)*. Use *Division (0DIVISION)* and the time characteristic *Cal. Year/Month (0CALMONTH)* as free characteristics. You are only interested in the months May to July 2002.
2. Save the query in your Training BW305 Reporting role under:

   Unit: First Steps in the BEx Query Designer → Lesson: Query Designer in the *Exercise* folder under the name:

   Description: **`GR## BW305 Customer Query 2`**

   Technical name: **`BW3054G##`**

   Now execute the query.
3. Now publish your query on the Web.

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Solution 2: Query Designer

Task 1:

You are interested in finding out the incoming order values and the incoming order quantities of your customers for specific materials between January and April 2001. You want to enable the users of your report to select by specific countries. Create a new query with the following layout:

Cal. Year/Month	01.2001 ... 04.2001			
Country				
Sold-to Party		**Material**	**Incoming Orders**	**Order Entry Quantity**
1000	Becker Berlin	Standard Keyboard	10,000	142
		Professional Keyboard	15,000	156
	Result		25,000	298
2000	Carbo GmbH		20,000	332

1. Create a new query using the *Customer Cube T_SDDEMO2* InfoProvider in the *BW305 Reporting* InfoArea with the characteristic *Sold-to party (0SOLD_TO)* in the rows.

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Use the basic key figures *Incoming Orders (T_INCORDV)* and *Order Entry Quantity (0INCORDQTY)* in the columns.

a) To open the BEx Analyzer, choose *Start → Programs → Business Explorer → Analyzer* .

b) Microsoft Excel will be launched in a separate window. In that window, from the BEx toolbar, choose *Tools → Create New Query*.

c) The BEx Query Designer opens, to create a new query, choose the icon *New Query* from the toolbar.

d) Choose InfoArea *BW Training → BW Customer Training → BW305 Reporting* to find the *Customer Cube T_SDDEMO2* InfoProvider.

e) Select that InfoProvider and choose *Open*.

f) From the *Customer* dimension, transfer the *Sold-to party (0SOLD_TO)* into the *Rows* using Drag&Drop.

g) From the *Key Figures* folder, transfer *Incoming Orders (T_INCORDV)* and *Order Entry Quantity (0INCORDQTY)* into the *Columns* using Drag&Drop.

2. Save the query in your *Training BW305 Reporting* role under:

Unit: First Steps in the BEx Query Designer → Lesson: Query Designer in the *Exercise* folder with the name:

Description: **GR## BW305 Customer Query 1**

Technical name: **BW3054F##**

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Execute the query, view the results, then close the query results (do not close the BEx Analyzer).

a) To save the query, choose *Save Query*

b) Choose *Roles → Training BW305 Reporting → Unit: First Steps in the BEx Query Designer → Lesson: Query Designer → Exercise → GR## BW305 Customer Query 1* and enter the following description and technical name:

Description: **GR## BW305 Customer Query 1**

Technical name: **BW3054F##**

c) Choose *Save*.

d) Execute the query as a report in the BEx Analyzer by choosing *Exit and use the Query*.

e) View the results, then close the report results without saving them. Leave the BEx Analyzer open for the next exercise step.

3. In the next step, you want to change the query definition. Find the query you created (*GR## BW305 Customer Query 1*) using the search function.

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In the query definition, Include the material in the report in order to display the incoming orders for each material for the customers. You also want to filter the data with a characteristic restriction to only report data for the months 01.2001 to 04.2001.

a) Choose *Tools → Create New Query* to enter the BEx Query Designer.

In the BEx Query Designer choose *Open Query* and then *Find*.

b) Test the search restrictions. Search for:

- The technical name of your query. Choose *Search Method → Search in Names*. Enter **`BW3054F`**

c) Select the query *GR## BW305 Customer Query 1* from the selection list and choose *Open*.

d) In the Query Designer, move the characteristic *Material (0MATERIAL)* from the *Material (T_SDDEMO22)* dimension into the *Rows*, and position it under the characteristic *Sold-to party*.

e) Choose *Cal. year / month (0CALMONTH)* characteristic from the *Time (T_SDDEM02T)* dimension, and place it into the *Characteristic Restriction* area on the *Filter* tab page using Drag&Drop.

f) From the context menu for *Cal year / month*, choose *Restrict* .

g) In the screen *Select Values for .....* , choose *Value Ranges* and then *Between*.

h) Select *01.2001* and *04.2001*, and transfer the selection using the *Arrow* button.

i) Choose *OK*.

4. Enable the users of your report to select data related to specific countries. Then save and execute the query. In the local view of the query, remove the material from the drilldown and include the country in the drilldown before sold-to party

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to list the sold-to parties by country. Also in the local view, restrict the country to Germany and Norway. In order to enhance the readability of the report, suppress the repeated key values.

a) From the *Customer* dimension, transfer the *Sold-toPartyCountry (0SOLD_TO__COUNTRY)* into the *Free Characteristics* area using Drag&Drop.

b) Save the query and then execute it.

c) Launch the context menu by right mouse click in the result area and choose *Query Properties* to open the *Local Query Properties* window.

d) Use the different *Arrow* buttons to transfer *Material* from the *Rows* into the *Free Characteristics* and *Sold-toPartyCountry* from the *Free characteristics* into the *Rows* and to position *Sold-to Party* below *Sold-toPartyCountry*.

e) Right click on *Sold-toPartyCountry* and choose *Select Filter Value*. Select *More* to open the *Selection* window, if necessary. Choose *Single Values*, select *Germany* and *Norway*, then transfer the selection using the *Arrow* button.

f) Go to the *Display options* tab page and check the box for *Suppress Repeated Key Values*. Choose *OK*.

g) View the results.

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5. In a further step, in the global definition of the query, establish the restriction for the country to Germany and Norway as default values, and furthermore the suppression of repeated key values. Execute the report and make a note of which sold-to parties are listed in your report. Are you able to select other countries in the report?

   a) In order to change the global definition of the query, choose *Tools* and *Edit Query*. The BEx Query Designer opens.

   b) Go to the *Default Value* area on the *Filter* tab page . From the context menu for *Sold-toPartyCountry*, choose *Restrict*. In the selection screen, choose *Single Values*. Select *Germany* and *Norway*, and transfer the selection using the *Arrow* button. Choose *OK*.

   c) In the *Properties* area of the Query Designer choose the *GR## BW305 Customer Query 1* object in the dropdown-box, open the *Display* tab page and check the box for *Hide Repeated Key Values*.

   d) Choose *Exit and Use the Query* to save and execute the query. Only those sold-to parties for the countries in the *Default Value* area of the filter are listed in the initial view, but it is possible to change the filter and to analyze the other countries as well.

6. Now execute your query on the Web.

   a) From the BEx toolbar, choose *Tools* → *BEx Web Analyzer*.

   b) When prompted, log on with your assigned user ID and password.

Task 2:

(Optional)

Create a report for the time period from May to July 2002 about the sales volumes of your customers from the sales organization Germany Frankfurt, with the option of navigating by division, and of a drilldown for the sales volumes on the months May to July 2002.

1. Define a new query. Include the *Sold-to Party (0SOLD_TO)* in the rows and the key figure *Sales Volume EUR (T_INVCD_V)* in the columns of your query definition. Choose *Sales Organization (0SALESORG)* as the global filter,

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restricted to *Germany Frankfurt (1000)*. Use *Division (0DIVISION)* and the time characteristic *Cal. Year/Month (0CALMONTH)* as free characteristics. You are only interested in the months May to July 2002.

a) In the BEx Analyzer, from the BEx toolbar, choose *Tools → Create New Query*.

b) The BEx Query Designer opens, to create a new query, choose the icon *New Query*.

c) Choose the *Customer Cube T_SDDEMO2* InfoProvider.

d) From the *Customer* dimension, drag *Sold-to party (0SOLD_TO)* to the Rows area.

e) From the *Key Figures* folder, drag *Sales Volume EUR (T_INVCD_V)* into the columns area.

f) From the *Sales area data* dimension, place the *Sales Organization (0SALESORG)* characteristic into the *Characteristic Restrictions* area of the *Filter* tab page.

g) In the context menu for *Sales Organization*, choose *Restrict*.

h) In the selection screen, choose *Single Values*. Select *Germany Frankfurt (1000)*. Adopt the selection using the *Arrow* button.

i) Choose *OK*.

j) From the *Sales area data* dimension, transfer the *Division (0DIVISION)* characteristic into the *Free Characteristics* section.

k) From the *Time* dimension, transfer the *Cal. year / month (0CALMONTH)* characteristic into the *Free Characteristics* section.

l) In the *Default Values* area of the *Filter* tab page, enter the context menu for *Cal year / month* and choose *Restrict* .

m) In the selection screen, choose *Value Ranges* and *Between*. Select *05.2002* and *07.2002*. Adopt the selection using the *Arrow* button.

n) Choose *OK*.

2. Save the query in your Training BW305 Reporting role under:

Unit: First Steps in the BEx Query Designer → Lesson: Query Designer in the *Exercise* folder under the name:

Description: **GR## BW305 Customer Query 2**

Technical name: **BW3054G##**

Continued on next page

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Now execute the query.

a) To save the query, choose *Save Query*

b) Choose *Roles → Training BW305 Reporting → Unit: First Steps in the BEx Query Designer → Lesson: Query Designer → Exercise* and enter the following description:

Description: **GR## BW305 Customer Query 2**

Technical name: **BW3054G##**

c) Choose *Save*.

d) Execute the query. In order to list the sales volumes for the individual months in your report, drill across on *Cal. year/month*.

3. Now publish your query on the Web.

a) To do this, choose *Tools → BEx Web Analyzer* from the BEx-toolbar.

b) When prompted, log on with your assigned user ID and password.

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Lesson Summary

You should now be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis

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Lesson: InfoProviders in the BEx Query Designer

Lesson Overview

The lessons deals with InfoProviders, which are used in Business Explorer reporting (BEx reporting).

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the differences between the various InfoProviders
- Select the InfoProviders according to their use in creating reports
- Use the different elements of the InfoProvider in the Query Designer

Business Example

Your enterprise uses the *SAP BI* system to create many different reports. Among others, you need to use reports about consolidated data, individual record reporting on document level, and master data reporting.

You also want to find out the options for combining different data sources for reporting, without having to change the data store or the update mechanism.

InfoProviders in *SAP BI* Reporting

InfoProviders are objects for which you can create and execute queries in *SAP BI*. These include objects that physically store data - the data targets, such as InfoCubes, DataStore Objects, and InfoObjects (characteristics with attributes or texts). They also include objects that do not contain any physical data, such as InfoSets, VirtualProviders and MultiProviders. InfoProvider is the generic term used to describe any objects or views relevant to reporting.

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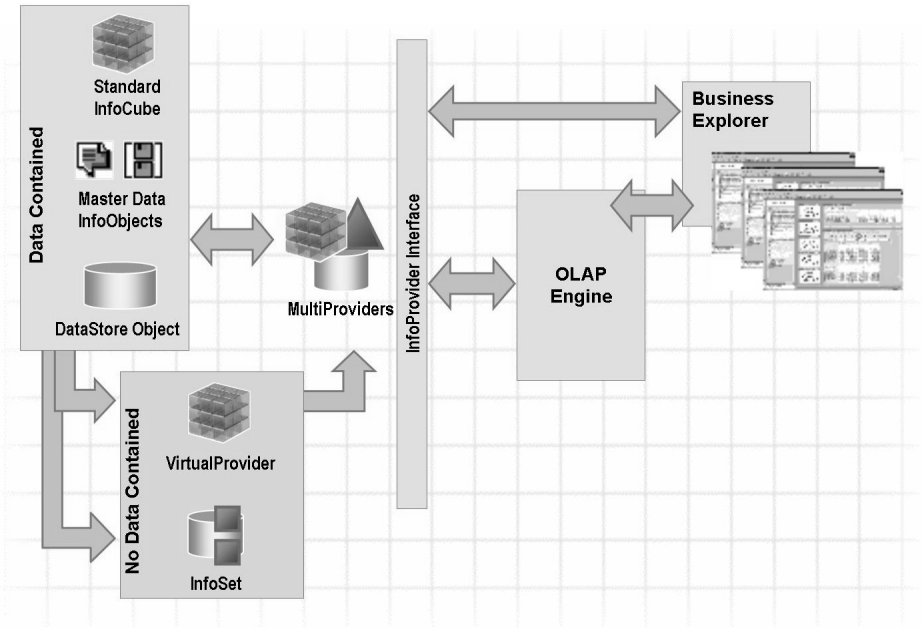

Figure 30: InfoProvider Overview

- **Data Targets**

  Data targets are *SAP BI* objects that have their own data store (which means they physically contain data). These objects include InfoCubes, DataStore Objects and InfoObjects (characteristics with attributes or texts). The system supplies data targets with data from the source systems using a load process (or by writing directly into the tables for real-time object types). Data targets become InfoProviders if they are used in BEx reporting.

  Note: Characteristic InfoObjects have to be included in the InfoProvider tree in the Data Warehousing Workbench to make them available as data targets for flexible updates and as InfoProviders for reporting.

  InfoCubes

  An InfoCube is the central evaluation object for reports which need aggregated (compressed) data. In reporting, an InfoCube is a self-contained dataset (for example, a business area). You can analyze this data in a BEx query. The tables in an InfoCube are structured in a star schema (multi-dimensional data model).

  Note: InfoCubes that have a data store in the *SAP BI* system are called Standard InfoCubes (type of InfoCube that distinguishes them from virtual types, see below).

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DataStore Objects

DataStore Objects store consolidated and cleansed data on a detailed (atomic) level. In reporting, you use DataStore Objects for detailed reporting in *SAP BI*, for example, for reporting on individual business documents (orders, invoices etc).

A DataStore Object describes a consolidated data set from one or more data sources. DataStore Objects are available for **transaction data** and for **master data**. You can analyze this data set in a BEx query.

In contrast to multi-dimensional data stores for InfoCubes, data in DataStore Objects is stored in flat database tables. A DataStore Object contains a key (for example, document number, item number), as well as data fields, which can contain key figures or characteristics (for example, customer, invoice quantity). You can transfer DataStore Object data into connected InfoCubes or into additional DataStore Objects in the same system or even in a different system.

Characteristic InfoObjects

Characteristic InfoObjects can have tables into which the master data information (attributes, texts, hierarchies) is loaded from the source system.

Once you have included a characteristic InfoObject in the InfoProvider tree, you can use it as an InfoProvider for BEx reporting.

You use these InfoProviders for master data reporting in *SAP BW*.

- **InfoProviders Without Their Own Data Store**

VirtualProvider

A VirtualProvider is an InfoCube whose transaction data is not physically managed in *SAP BI*, but stored externally in the source system.

Only the multi-dimensional structure of the VirtualProvider is defined in the*SAP BI* system. The data for reporting is read online from another system. In reporting, you define queries on VirtualProviders in the same way as you define queries on Standard InfoCubes.

Note: However, since the data is read online from the source system, the performance differs when you execute reports for VirtualProvider and, therefore, we recommend that you only use VirtualProvider in specific, well planned, scenarios (with small quantities of data, relatively infrequent data requests with a restricted number of users).

BI InfoSets

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BI InfoSets do not have a data store of their own, but instead connect flat tables using joins and, therefore, provide an additional semantic layer (reporting-relevant view) for BEx reporting.

You can create BI InfoSets from InfoCubes (only Standard type), DataStore Objects and characteristic InfoObjects with master data.

Note: BI InfoSets enable temporal joins with which you can create reports depicting changes over time. For example, a link from document data in an DataStore Object to time-dependent master data (for example, link a sales transaction to the master data of the person who was head of the department **at the time of the transaction**).

- **MultiProviders**

A MultiProvider combines data from several InfoProviders and makes it available for use in reporting. The MultiProvider does not contain any data itself. Its data comes exclusively from the InfoProviders on which it is based. You can create a MultiProvider from any combination of InfoProviders.

Note: MultiProviders are based on a union connection (union), unlike joins in BI InfoSets (intersection).

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InfoProviders in the Query Designer

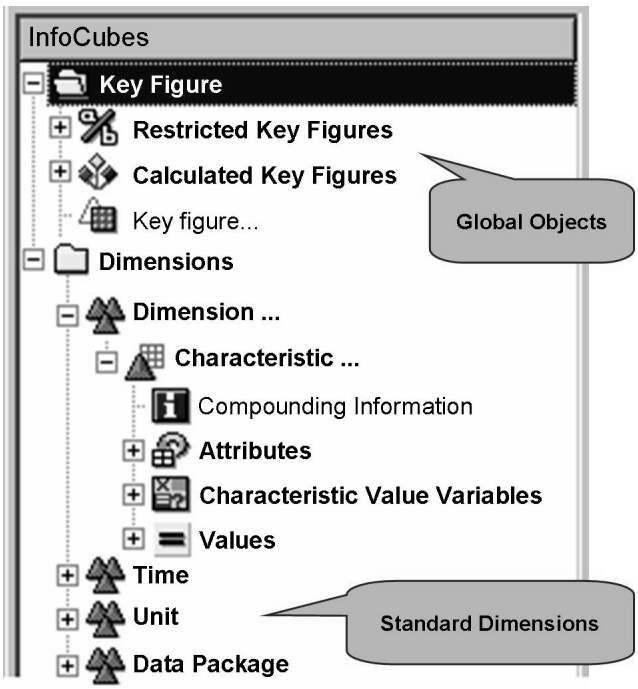

Figure 31: InfoCube Elements in the Query Designer

Global Objects

An InfoCube can contain global elements, such as, *Calculated Key Figures* (as can all other InfoProviders) that are available for all query definitions for this InfoProvider. These elements are defined on a global level for the InfoProvider and you can use them in many different reports.

Hint: Detailed information about creating global objects is provided in a later chapter.

InfoCube Elements

In accordance with its multi-dimensional structure, an InfoCube has *Key Figures* that display in their own folder in the Query Designer.

Characteristics display in *Dimensions*.

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There are additional entries in the selection tree for a characteristic for its *compounding information* (if the characteristic is compounded with a different characteristic, for example, cost center to controlling area). If you include a characteristic that has compounding information in the query definition, the compounded characteristic is also automatically included in the definition.

From the list of entries for *Attributes, Characteristic Value Variables*, and *Values*, you can use Drag&Drop to include the required elements in the query definition.

Hint: Detailed information about working with attributes and variables is provided in a later lesson.

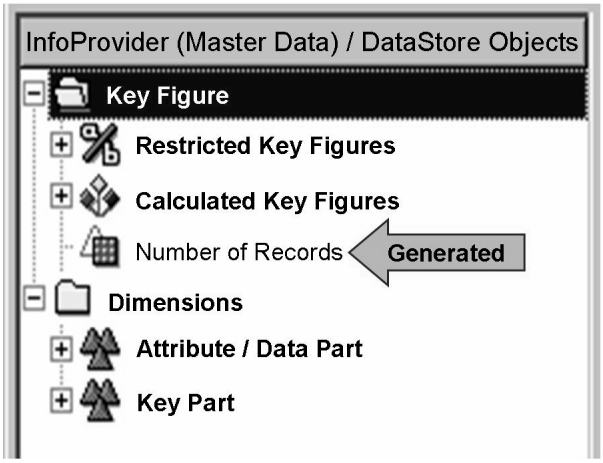

Figure 32: DataStore Object and InfoObject Elements in the Query Designer

Elements of InfoObject and DataStore Objects in the Query Designer

The system generates the key figure *Number of Records (1ROWCOUNT)* for characteristic InfoProviders and for DataStore Objects and places them in the *Key Figures* folder.

In the *Dimensions* folder, you find two different dimensions for each object type. For characteristic InfoProviders, the dimensions are *Attributes* and *Key Part*, in accordance with the definition of the master data tables. For DataStore Objects, the dimensions are *Data Part* and *Key Part*.

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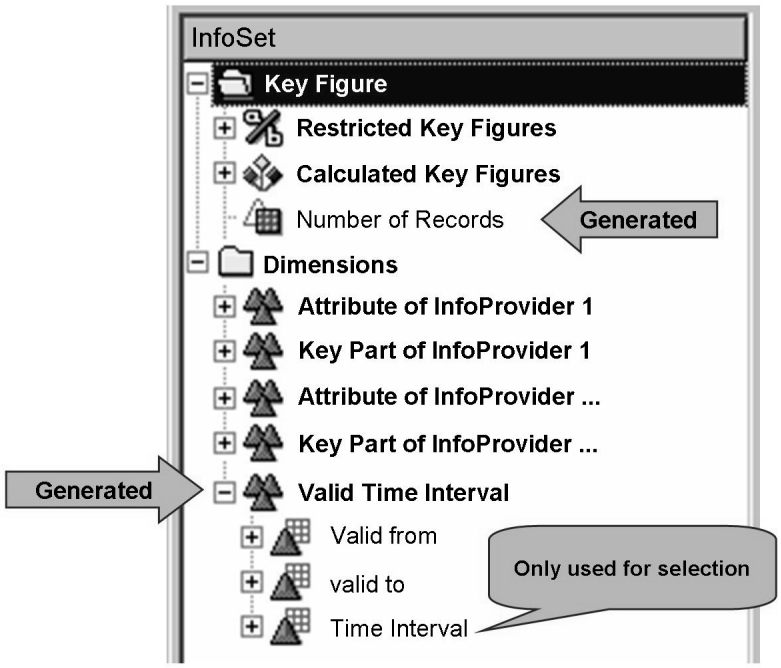

Figure 33: InfoSets in the Query Designer

InfoSets in the Query Designer

The system also automatically generates the key figure *Number of Records (1ROWCOUNT)* for InfoSets.

Two dimensions are provided for each InfoProvider in the InfoSet: *Attribute* and *Key Part*. Therefore, for an InfoSet composed of an DataStore Object connected to a characteristic, four dimensions display. The respective characteristics are then assigned to the dimensions.

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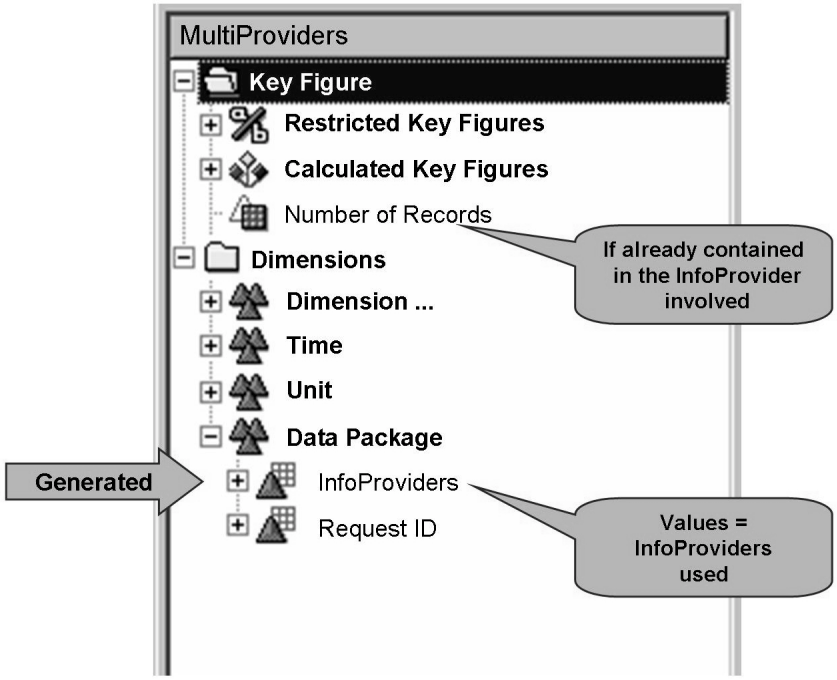

Figure 34: MultiProviders in the Query Designer

MultiProviders in the Query Designer

In the *Key Figure* folder of a MultiProvider, you can find the generated key figure *Number of Records (1ROWCOUNT)*, if one of the InfoProviders included already contains this key figure, for example, in DataStore Objects.

The *Data Package* dimension contains the generated characteristic *InfoProvider (0INFOPROV)*, which enables you to specify a unique InfoProvider in the selection or the display to supply data for the query. The values of this characteristic are formed from the (technical) names of the InfoProviders involved.

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Exercise 3: InfoProviders in the Query Designer (optional)

Exercise Objectives

After completing this exercise, you will be able to:

- Name the different InfoProviders that you use as the basis of your reports

Business Example

Your system administrators have provided a variety of InfoProviders for you to use in reporting. To produce a report, you have to know about the different kinds of InfoProviders and their uses.

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Task:

1. Specify which of the InfoProviders you can use in reporting.

2. Describe the two categories into which InfoProviders are divided.

3. What conditions does an InfoObject have to fulfill in order to be used as an InfoProvider?

4. What InfoProviders are available for master data reporting?
Choose the correct answer(s).
   - □ A InfoCubes
   - □ B InfoSet
   - □ C All InfoObjects
   - □ D Characteristics with master data

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5. What InfoProviders can contain generated characteristics or key figures?
Choose the correct answer(s).

□ A InfoCubes
□ B Data Store Objects
□ C InfoProviders for Characteristic InfoObjects
□ D InfoSets
□ E MultiProviders

6. What InfoProvider combinations can you use in a MultiProvider?
Choose the correct answer(s).

□ A InfoCube with InfoCube
□ B InfoCube with Characteristic InfoObject
□ C InfoCube with InfoSet
□ D Only DataStore Objects and Characteristic InfoObjects.
□ E Any combination
□ F You can use a maximum of two InfoProviders.

7. What InfoProviders can I combine in a BW InfoSet?
Choose the correct answer(s).

□ A InfoCubes
□ B Data Store Object
□ C Characteristic InfoObjects with master data
□ D InfoSets
□ E MultiProviders

8. How many dimensions are displayed for an InfoSet in the Query Designer, if the InfoSet consists of a Data Store Object and a Characteristic InfoObject?
Choose the correct answer(s).

□ A 2 dimensions
□ B 4 dimensions
□ C 6 dimensions
□ D Only characteristics without dimensions are displayed.

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Solution 3: InfoProviders in the Query Designer (optional)

Task:

1. Specify which of the InfoProviders you can use in reporting.

   Answer: You can define reports based on the following InfoProviders:

   - InfoCubes
   - Data Store Objects
   - InfoObjects (characteristic InfoObjects with master data)
   - InfoSets
   - RemoteCubes
   - MultiProviders

2. Describe the two categories into which InfoProviders are divided.

   Answer: The term InfoProvider can describe objects where data is physically present. These objects are called data targets:

   - InfoCubes
   - Data Store Objects
   - InfoObjects

   InfoProviders can also be objects that do not store data physically, but that display a logical view:

   - InfoSets
   - RemoteCubes
   - MultiProviders

3. What conditions does an InfoObject have to fulfill in order to be used as an InfoProvider?

   Answer: A characteristic InfoObject needs to have master data (attributes and/or texts) and be assigned to an InfoArea in order to be an InfoProvider.

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4. What InfoProviders are available for master data reporting?

   Answer: B, D

   Complete master data reporting is not possible using InfoCubes. Master data reporting is possible with InfoSets if the InfoSet refers to Characteristic InfoObjects with master data.

5. What InfoProviders can contain generated characteristics or key figures?

   Answer: B, C, D, E

   MultiProviders contain generated characteristics or key figures, if at least one InfoProvider in it contains these.

6. What InfoProvider combinations can you use in a MultiProvider?

   Answer: A, B, C, E

   There are no restrictions on the combinations you use from a technical point of view.

7. What InfoProviders can I combine in a BW InfoSet?

   Answer: A, B, C

8. How many dimensions are displayed for an InfoSet in the Query Designer, if the InfoSet consists of a Data Store Object and a Characteristic InfoObject?

   Answer: B

   Two dimensions (Attribute and Key) are created for each Data Store Object and Characteristic InfoObject.

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Lesson Summary

You should now be able to:

- Describe the differences between the various InfoProviders
- Select the InfoProviders according to their use in creating reports
- Use the different elements of the InfoProvider in the Query Designer

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Unit Summary

You should now be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis
- Describe the differences between the various InfoProviders
- Select the InfoProviders according to their use in creating reports
- Use the different elements of the InfoProvider in the Query Designer

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Unit 4

Key Figures

Unit Overview

This unit deals with how to define restricted key figures on InfoProvider and query levels.

The properties of key figures are also discussed. The lesson shows an example of formula collision and explains the functions of the cell editor that can be used when implementing two structures in a query definition.

Unit Objectives

After completing this unit, you will be able to:

- Explain the objectives and use of restricted key figures in information analyses
- Define restricted key figures at the InfoProvider and query level
- Use the enhanced selection function for selecting restriction values
- Use the *Exclude from Selection* and *Include in Selection* functions
- Explain the use of constant selection
- Define new calculated key figures and explain their usage in reports
- Define a calculated key figure when using a restricted key figure and include it in the analysis
- Define a calculated key figure and creating dependant objects directly
- Identify the General, Display and Calculations options within the properties of key figures
- Carry out Currency Translation and Unit Conversion in the Business Explorer
- Use the Exception Aggregation to deliver many additional options for analysis
- create and reuse global structures
- use the cell editor

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Lesson: Restricted Key Figures

Lesson Overview

This lesson deals with how to define restricted key figures at the InfoProvider and query level.

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the objectives and use of restricted key figures in information analyses
- Define restricted key figures at the InfoProvider and query level
- Use the enhanced selection function for selecting restriction values
- Use the *Exclude from Selection* and *Include in Selection* functions
- Explain the use of constant selection

Business Example

You need restricted key figures in order to be able to define detailed reports. For example, you want to list sales volumes for individual time segments next to each other in the report. If you create them at the InfoProvider level, you are then able to reuse the individual key figures in other reports.

Defining Restricted Key Figures

Restricted key figures are (basic) key figures of the InfoProvider that are restricted (filtered) by one or more characteristic selections. The key figure that is restricted by one or more characteristic selections can be a basic key figure, a calculated key figure, or a key figure that is already restricted.

By using restricted key figures, you can focus the query result on certain values. Unlike a filter, whose restrictions are valid for the entire query, for a restricted key figure, only the key figure in question is restricted to its allocated characteristic value or characteristic value interval. Scenarios such as comparing a particular key figure for various time segments, or plan/actual comparison for a key figure if the plan data is stored using a particular characteristic can be realized using restricted key figures.

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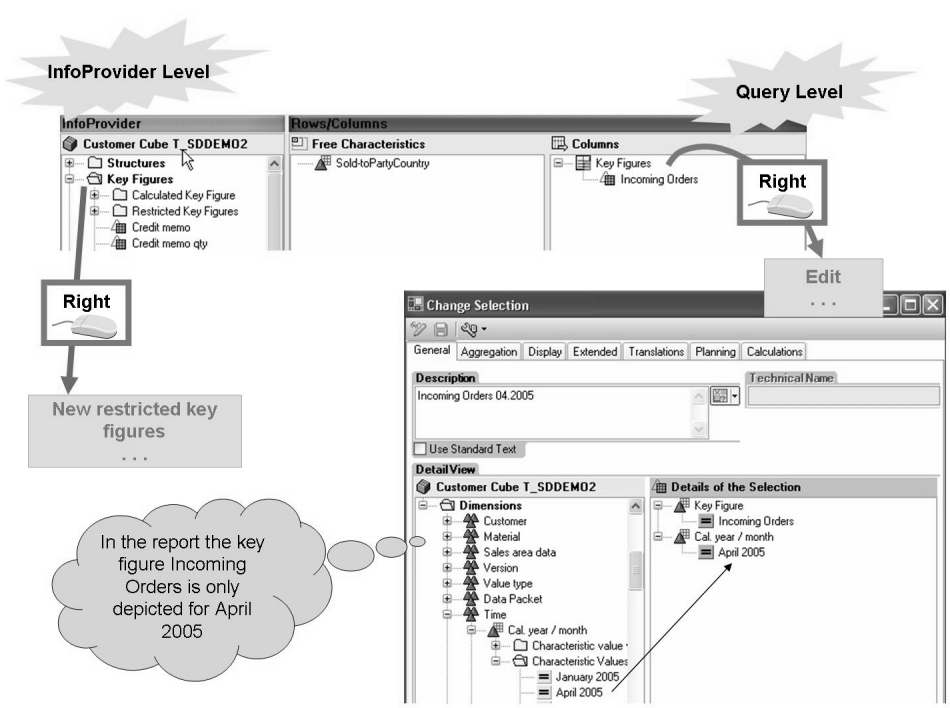

Figure 35: Defining Restricted Key Figures

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Defining Restricted Key Figures

Use

You can create restricted key figures at the InfoProvider level, or locally in the query definition. Restricted key figures that are defined at the InfoProvider level are available in every query definition of the InfoProvider in question.

Procedure

1. To define a restricted key figure at the InfoProvider level, from the *Query Designer*, choose *Restricted Key Figure* in the context menu on the left-hand side under *Key Figure*.

   To define a restricted key figure at the query level, use Drag&Drop to drag the key figure to be restricted into a Query Designer directory. In the context menu, choose *Edit*, or select the heading of the *Rows* or *Columns* directory and use the right mouse button to choose *New Structure*. Select the structure directory and use the right mouse button to choose *New Selection* from the context menu. The *New Selection* dialog box appears.
2. Enter a description of the restricted key figure into the text field.
3. If you select another key figure, use Drag&Drop to choose the key figure of the InfoProvider and place it on the right-hand side of the *Selection* window.
4. Use Drag&Drop to move the characteristic whose characteristic value you want to use to restrict the key figure to the right-hand side of the *Selection* window.
5. From the context menu of the characteristic, choose *Restrict*.
6. Select the characteristic values you require for the restriction.
7. Confirm your entries by choosing *OK*.
8. For the definition at the InfoProvider level, you enter a technical name in the dialog box, and confirm your entry by choosing *OK*. The newly defined key figure can be found in the *Restricted Key Figures* directory.

   In the case of definition at the query level, the new restricted key figure is already part of the structure.

Selection Conditions for the Selection of Filter Values

When defining a restricted key figure you first must decide how you would like the filter values to be presented to you. You make your choice my selecting the *Show* drop down in the filter selection dialog box. You have the following options:

When selecting value ranges, the following operations are available:

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History

- Here you will find the most recently used selections

Favorites

- You can save frequently used selections, you provide a name for the collection, then retrieve the collection from the Favorites.

Single Values

- This list display each individual characteristic value. Here you can also use the search features and also select the single values from a hierarchy (there is also a search feature within the hierarchy).

  The search option allows you to enter either the characteristic key (i.e. product number) or characteristic text (i.e. Pump) or you can enter any of the attribute values of the characteristic (i.e color, speed). You can mix up your choices but you are limited to a maximum of three search criteria.

Value Range

- Instead of selecting single values you can quickly gather multiple characteristic values using this next option. This choice provides the following additional options:

1. Between
2. Greater than or equal to
3. Less than or equal to
4. Greater than
5. Less than

Variables

- Instead of selecting absolute filter values you can choose to use a variable which will be filled at run time, perhaps from a user input.

You can **include values in the selection** or **exclude values from the selection** by selecting the green or red buttons in the selection dialog box once you have highlighted the required filter value.

Hint: If your selection criteria returns a large result set then you should maximize the selection window so you can see more of the results before you need to scroll.

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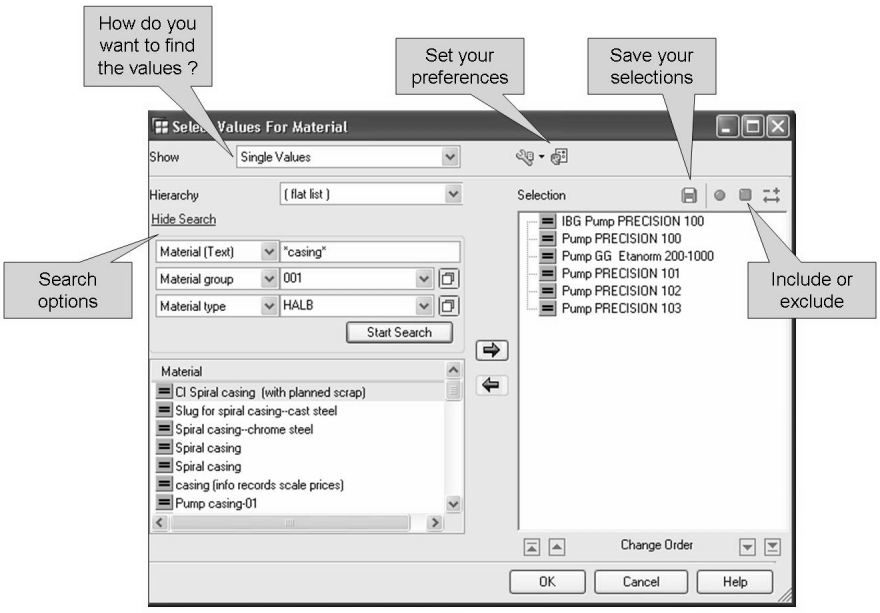

Figure 36: Formulating a Selection Condition

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Formulating Selection Conditions

Use

You can select individual values and value ranges from a list or from a selected hierarchy in the selection dialog box. The values available in the left-hand window are restricted to a maximum number which you define in the settings dialog. You want only characteristic values that match your specific criteria to be offered in the selection dialog.

Prerequisites

You have selected the characteristic for which you want to use characteristic values for restriction and chosen *Restrict* in the context menu using the right mouse button.

Procedure

1. From the *Show* drop down choose the option *single values.*
2. In the first search field ensure that the (Text) option is selected for the characteristic and enter the text surrounded by the symbol '*' which acts as a wild card in the search.
3. Enter any further criteria in the remaining search fields.
4. Press the *Start Search* button to see the results appear.
5. Drag and drop (or highlight then use the arrow button) to the right side of the dialog box to select the filters. The list of available values is now restricted according to your formulated selection condition.

Determining Constant Selection

In the Query Designer, you use selections when defining a restricted key figure to determine the data that you want to display at runtime. You can use navigation steps to further restrict your selections at runtime. The **Constant Selection** function allows you to mark a defined selection as being constant. As a result of this setting, navigation and filters no longer have an effect on the selection in question. This feature is often used when you would like to ensure that a particular restricted key figure remains the same in the result so it can be used for comparisons to other key figures which may have a different filter value due to navigation. (i.e. compare the

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Team A Sales against the other Team Sales, I will decide at run time which other teams to choose with a navigation filter, but the key figure for Team A should always remain constant (as defined in the query).

- Additional function for restricted key figures
- When activated, navigation and filtering have no effect on the restricted key figure
- To activate, select *Constant Selection* from the context menu of the **restricting characteristic** while editing the restricted key figure

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Determining Constant Selection

Use

Constant selection allows you to easily select reference variables that do not change at the report's runtime.

Procedure

1. In the context menu of the restricted key figure, choose *Edit*, or in the context menu of a structure, choose *New Selection* if you want to make the setting as soon as the selection is created. You reach the *Edit Restricted Key Figure* or *New Selection* dialog box.
2. In the context menu of the characteristic InfoObject that you want to use to restrict the key figure, or that you want to use in the selection, choose *Constant Selection*.

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Exercise 4: Restricted Key Figures

Exercise Objectives

After completing this exercise, you will be able to:

- Define restricted key figures at InfoProvider and query level
- Use the enhanced selection function for selecting restriction values
- Use the Exclude from Selection and Include in Selection functions

Business Example

In order to analyze the sales volumes of your customers, you need additional key figures that are not contained in the InfoCube.

In your report you want to generate an overview of the sales volumes in various time periods for each sold-to party. You also need detailed information on sales volumes, restricted to particular materials, for your individual sold-to parties. You need four different restricted key figures to do this. In each case, you use the basic key figure Sales Volume EUR, and then proceed according to the view you want.

Task 1:

Define two restricted key figures that depict the sales volume for the period leading up to 2001 and for the year 2001 itself. For the definition of two additional key figures, you use the enhanced selection conditions to restrict the sales volume for each sold-to party to the selected materials.

1. Create a new query using the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea with the characteristic *Sold-to party (0SOLD_TO)* in the rows.

   As a global filter, use *Division (0DIVISION)* restricted to *High Tech*, and *Sales Organization (0SALESORG)* restricted to *Germany Frankfurt (1000)*.

   Define a new restricted key figure at the InfoProvider level:

   Description: **`GR## Sales Volume before 2001`**

   Technical name: **`BW3057A##`**

   Limit the basic key figure *Sales Volume EUR* (T_INVCD_V) to the period before 2001.

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2. In the same query, define a restricted key figure **Sales Volume 2001** at **query level**. This key figure displays the *Sales Volume EUR (T_INVCD_V)* for the year 2001.

3. Define the third restricted key figure.

   Description: **Sales Volume 2001 Flatscreen MS**

   Use the *Sales Volume 2001* key figure as a template, and further restrict it to the range of materials from *Flatscreen MS 1460 P (M-06)* to *Flatscreen MS 1775P (M-10)*.

4. You need the fourth key figure for the sales volume in 2001 for the hard disks with the capacity of 1080 MB. The material description for them always begins with: *Harddisk 1080 MB*. Give this key figure the description **Sales Volume 2001 Harddisks 1080 MB**.

5. Save the query in your Training BW305 Reporting role under:

   Unit: Key Figures → Lesson: Restricted Key Figures → Exercise .

   Description: **GR## BW305 Restricted Key Figures**

   Technical name: **BW3057B##**

   Now execute the query.

Task 2:

You use selections when defining the restricted key figure to determine the data that you want to display at runtime. Use the *Constant Selection* function to easily select reference values that cannot change at runtime.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEM02)* in the *BW 305 Reporting* InfoArea. Place the *Material (0MATERIAL)* characteristic into the rows. Use the *Sales Organization (0SALESORG)* characteristics as the global filter, restricted to the sales organization *Germany Frankfurt (1000)*. Place the InfoObject *Cal. year / month (0CALMONTH)* into the Free Characteristics, but do not restrict it.

   Define two new key figures.

   Description: **Sales Volume 1- 3 2001**

   Description: **Sales Volume 1- 3 2001 Constant Selection**

   They both restrict the basic key figure *Sales Volume EUR (T_INVCD_V)* to the period January to March 2001.

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For the second key figure, use the *Constant Selection* function.

2. Save the query in your Training BW305 Reporting role under:

   Roles → Training BW305 Reporting → Unit: Key Figures → Lesson: Restricted Key Figures → Exercises:

   Description: **GR## BW305 Constant Selection**

   Technical name: **BW3057C##**

   Now execute the query.

   Filter the report by January 2001 in order to compare the behavior of both key figures.

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Solution 4: Restricted Key Figures

Task 1:

Define two restricted key figures that depict the sales volume for the period leading up to 2001 and for the year 2001 itself. For the definition of two additional key figures, you use the enhanced selection conditions to restrict the sales volume for each sold-to party to the selected materials.

1. Create a new query using the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea with the characteristic *Sold-to party (0SOLD_TO)* in the rows.

   As a global filter, use *Division (0DIVISION)* restricted to *High Tech*, and *Sales Organization (0SALESORG)* restricted to *Germany Frankfurt (1000)*.

   Define a new restricted key figure at the InfoProvider level:

   Description: **GR## Sales Volume before 2001**

   Technical name: **BW3057A##**

   Limit the basic key figure *Sales Volume EUR* (T_INVCD_V) to the period before 2001.

   a) To define a new query, open the *Query Designer* and choose *New Query*.

   b) Choose *InfoAreas →BW Training → BW Customer Training → BW305 Reporting → Customer Cube T_SDDEMO2 (T_SDDEMO2)→ OK.*

   c) From the *Customer* dimension, place the *Sold-to party (0SOLD_TO)* characteristic into the *Rows* section.

   d) In the *Sales area data* dimension, highlight both the *Sales Organization (0SALESORG)* characteristic and the *Division (0DIVISION)* characteristic and drag them both together into the *Characteristics Restrictions* section on the *Filter* tab page.

   e) In the context menu for the characteristic *Sales Organization*, choose *Restrict*. In the selection screen, choose *Single Values*. Select *Germany Frankfurt (1000)* and adopt the selection using the *Arrow* button. Choose *OK*.

   f) In the context menu for the characteristic *Division*, choose *Restrict*. In the selection screen, choose *Single Values*. Select *High Tech (07)* and adopt the selection using the *Arrow* button. Choose *OK*.

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g) To define the first restricted key figure at **InfoProvider level**, choose *New Restricted Key Figure* in the context menu of the *Key Figures* folder. Then choose *Edit* from the context menu of the new restricted key figure.

Description: **GR## Sales Volume before 2001**

Technical Name: **BW3057A##**

h) Use Drag&Drop to place *Sales Volume EUR (T_INVCD_V)* into the *Details of the Selection* area.

i) Choose the *Cal. year / month (0CALMONTH)* characteristic under the *Time (T_SDDEM02T)* dimension, and place it into the *Details of the Selection* area.

j) In the context menu for *Cal year / month*, choose *Restrict*. In the selection screen, choose *Value Ranges*. Choose *Less than*. Select *01.2001* and adopt the selection using the *Arrow* button. Choose *OK*.

k) Confirm with *OK*.

l) To add the newly defined key figure to the query definition, use Drag&Drop to place *GR## BW305 Sales Volume before 2001 (BW3057A##)* into the *Columns* section.

2. In the same query, define a restricted key figure **Sales Volume 2001** at **query level**. This key figure displays the *Sales Volume EUR (T_INVCD_V)* for the year 2001.

a) To define the second restricted key figure at the query level, choose *Sales Volume EUR (T_INVCD_V)* from the *Key Figures* folder, and place it into the *Columns* section.

b) In the context menu for *Sales Volume EUR* (T_INVCD_V), choose *Edit*.

c) Choose the *Cal. year / month (0CALMONTH)* characteristic under the *Time (T_SDDEM02T)* dimension, and place it into the *Details of the Selection* area.

d) In the context menu for *Cal year / month*, choose *Restrict* . In the selection screen, choose *Value Ranges*. Choose *Between*.

e) Select *01.2001* and *12.2001* and adopt the selection using the *Arrow* button. Choose *OK*.

f) Description: **Sales Volume 2001**.

g) Confirm with *OK*.

3. Define the third restricted key figure.

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Description: **Sales Volume 2001 Flatscreen MS**

Use the *Sales Volume 2001* key figure as a template, and further restrict it to the range of materials from *Flatscreen MS 1460 P (M-06)* to *Flatscreen MS 1775P (M-10)*.

a) To define this key figure at the query level, select *Sales Volume 2001*. Copy it using *Copy* and *Paste* from the context menu of the key figure.

b) Select the copy, and choose *Edit* in its context menu.

c) Change the description into: **Sales Volume 2001 Flatscreen MS**

Note: Note that several lines are available for key figure names. This is to control the column width in the report.

d) Choose the characteristic *Material (0MATERIAL)* from the *Material* dimension and place it into the *Details of the Selection* area.

e) In the context menu for *Material*, choose *Restrict*.

In the *Show* field, choose *Value Ranges*.

Press the *Display Key/Text* button and choose *Key*.

Take the default value *Between*. For the first value enter **M-06**, for the second one **M-10**, and transfer them using the *Arrow* button. Confirm with *OK*.

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4. You need the fourth key figure for the sales volume in 2001 for the hard disks with the capacity of 1080 MB. The material description for them always begins with: *Harddisk 1080 MB*. Give this key figure the description **Sales Volume 2001 Harddisks 1080 MB**.

   a) To define this restricted key figure at the query level, select *Sales Volume 2001 Flatscreen MS*. Copy it using *Copy* and *Paste* from the context menu of the key figure.

   b) Select the copy and choose *Edit* in its context menu.

   c) Change the description into: **Sales Volume 2001 Harddisks 1080 MB**

   d) In the context menu for *Material*, choose *Restrict* . Delete the existing restriction for the flatscreens by dragging it to the left side of the *Select Values* window.

   e) In order to define the new restriction, go to the *Show* field and choose *Single Values*. Select the *Search* link. Beside *Material (Text)* enter **1080 MB**, then select the button *Start Search*. Transfer the found values to the right side (*Selection* area) using the *Arrow* button. Choose *OK*.

   f) Confirm with *OK*.

5. Save the query in your Training BW305 Reporting role under:

   Unit: Key Figures → Lesson: Restricted Key Figures → Exercise .

   Description: **GR## BW305 Restricted Key Figures**

   Technical name: **BW3057B##**

   Now execute the query.

   a) To save the query under your role, choose *Save Query*.

   b) Then choose *Roles → Training BW305 Reporting → Unit: Key Figures → Lesson: Restricted Key Figures → Exercise*.

      Description: **GR## BW305 Restricted Key Figures**

      Technical name: **BW3057B##**

   c) Execute the query.

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Task 2:

You use selections when defining the restricted key figure to determine the data that you want to display at runtime. Use the *Constant Selection* function to easily select reference values that cannot change at runtime.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEM02)* in the *BW 305 Reporting* InfoArea. Place the *Material (0MATERIAL)* characteristic into the rows. Use the *Sales Organization (0SALESORG)* characteristics as the global filter, restricted to the sales organization *Germany Frankfurt (1000)*. Place the InfoObject *Cal. year / month (0CALMONTH)* into the Free Characteristics, but do not restrict it.

   Define two new key figures.

   Description: **`Sales Volume 1- 3 2001`**

   Description: **`Sales Volume 1- 3 2001 Constant Selection`**

   They both restrict the basic key figure *Sales Volume EUR (T_INVCD_V)* to the period January to March 2001.

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For the second key figure, use the *Constant Selection* function.

a) To define a new query for the same InfoProvider, open the *Query Designer*, and choose

New Query→ History → Customer Cube T_SDDEMO2 (T_SDDEMO2) → Open.

b) Place the *Sales Organization (0SALESORG)* characteristic under the *Sales area data* dimension into the *Filter*.

c) In the context menu for *Sales Organization*, choose *Restrict*. In the selection screen, choose *Single Values*. Select *Germany Frankfurt (1000)* and adopt the selection using the *Arrow* button. Choose *OK*.

d) Choose the *Cal. year / month (0CALMONTH)* characteristic under the *Time (T_SDDEM02T)* dimension, and place it into the *Free Characteristics* area.

e) Use Drag&Drop to place *Material (0MATERIAL)* from the *Material* dimension into the rows.

f) To define the restricted key figures, place the key figure *Sales Volume EUR (T_INVCD_V)* in the *Columns* section.

g) In the context menu for *Sales Volume EUR*, choose *Edit*. Choose the *Cal. year / month (0CALMONTH)* characteristic under the *Time (T_SDDEM02T)* dimension, and place it into the *Details of the Selection* area.

h) In the context menu for *Cal year / month*, choose *Restrict*. In the selection screen, choose *Single Values*. Select *01.2001, 02.2001*, and *03.2001*, and adopt the selection using the arrow button. Choose *OK*.

i) Description: **`Sales Volume 1 - 3 2001`**

Choose *OK*.

j) Now you create the second key figure as a copy of the one you just defined.

Copy *Sales Volume 1- 3 2001* using *Copy* and *Paste* from the context menu of the key figure.

k) In the context menu for the copied key figure, chose *Edit*. In the *Details of the Selection* area, enter the context menu for *Cal. year / month* and check the *Constant Selection* function.

l) Description: **`Sales Volume 1 - 3 2001 Constant Selection`**

Choose *OK*.

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2. Save the query in your Training BW305 Reporting role under:

   Roles → Training BW305 Reporting → Unit: Key Figures → Lesson: Restricted Key Figures → Exercises:

   Description: **GR## BW305 Constant Selection**

   Technical name: **BW3057C##**

   Now execute the query.

   Filter the report by January 2001 in order to compare the behavior of both key figures.

   a) To save the query, choose *Save Query*.

   b) Then choose *Unit: Key Figures → Lesson: Restricted Key Figures → Exercises*

   c) Enter:

      Description: **GR## BW305 Constant Selection**

      Technical name: **BW3057C##**

   d) To execute the query in the BEx Analyzer, choose *Exit and use the query.*

      In order to filter by January 2001, choose the *Filter* button, choose *Select Filter Value* in the context menu of the *Cal. year / month* characteristic and select the *Single Value January 2001*.

   e) To execute the query on the web, choose *Execute*.

      In order to filter by January 2001, choose *Filter* from the web toolbar and select *01.2001* for the characteristic *Cal year / month*.

   f) The values of the key figure with the Constant Selection remain unchanged, still representing the sales volume from January to March 2001, while the values of the key figure without Constant Selection have been influenced by the filter setting. In this way, you can easily select reference values that can be used for additional calculations.

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Lesson Summary

You should now be able to:

- Explain the objectives and use of restricted key figures in information analyses
- Define restricted key figures at the InfoProvider and query level
- Use the enhanced selection function for selecting restriction values
- Use the *Exclude from Selection* and *Include in Selection* functions
- Explain the use of constant selection

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Lesson: Calculated Key Figures

Lesson Overview

This lesson deals with how to define calculated key figures at InfoProvider and query level.

Lesson Objectives

After completing this lesson, you will be able to:

- Define new calculated key figures and explain their usage in reports
- Define a calculated key figure when using a restricted key figure and include it in the analysis
- Define a calculated key figure and creating dependant objects directly

Business Example

The use of complicated calculations for information analysis is the order of the day. This requires various mathematical functions such as percentage functions and totals functions. You can take basic key figures, restricted key figures or calculated key figures to define new calculated key figures. For example, you use the restricted key figures for two specific years to calculate the difference between the sales volumes of the years in question.

Functions for Defining Calculated Key Figures

In the Query Designer, you can use a formula to calculate key figures that are not in the InfoProvider by using basic key figures, restricted key figures and existing calculated key figures in the formula definition.

Below are examples and explanations of the functions available as operators when you define a calculated key figure.

Percentage Functions

Percentage Variance (%)

<Operand 1> % <Operand 2>

gives the percentage variance of operand 1 from operand 2.

Example: Planned Sales Volume % Actual Sales Volume gives the percentage by which the actual sales volume exceeds the planned sales volume.

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Percentage Share (%A)

<Operand 1> %A <Operand 2>

Gives the percentage share of operand 1 of operand 2.

Example: Sales Volume %A Incoming Orders specifies the percentage share of sales volume made up of incoming orders.

Percentage Share of Result (%CT)

%CT<Operand>

Specifies how high the percentage share is in relation to the result. The result means the result of aggregation at the next level (interim result).

%CT Incoming Orders specifies the share of incoming order values of each individual characteristic value (for example of each customer) in relation to the characteristic's result (for example, customer of a division).

Percentage Share of Overall Result (%GT)

%GT <Operand>

Specifies how high the percentage share is in relation to the overall result. The overall result means the result of aggregation at the next level in the list. In the calculation of the overall result, the dynamic filters (filters that were not already defined in the Query Designer) are included.

Example of the Usage of Percentage Functions CT and GT

Division	Sold-to Party	Sales Volume	Sales Volume %CT	Sales Volume %GT
Pumps	Becker Berlin	200	33%	11%
	A.I.T. GmbH	400	66%	22%
	Result	**600**	**33%**	**33%**
Motorbikes	J & P	300	25%	17%
	Motor Sports	900	75%	50%
	Result	**1200**	**66%**	**66%**
Overall Result		**1800**	**100%**	**100%**

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Data Functions

Counts

COUNT(<Expression>)

Delivers the value 1 if the expression named in <Expression> is not equal to 0. Otherwise, delivers the value 0.

NDIV0 (x): Is equal to 0 with division by 0, otherwise x.

NDIV(<Expression>)

Delivers 0 if the expression named in <Expression> gives a division by 0 in the calculation. Otherwise, the result is the value of the expression.

Is used to

- Avoid the output of an error message
- Continue calculating with a defined result

Result

SUMCT <Operand>

Delivers the result of the operand in all rows or columns (see Percentage Functions %CT).

Overall Result

SUMGT<Operand>

Delivers the overall result of the operand (see Percentage Functions %GT).

Report Result

SUMRT<Operand>

Delivers the report result of the operand (to distinguish between the overall and the report result, see also Percentage Functions %GT and %RT).

Mathematical Functions

These include:

Maximum

Minimum

Absolute Value

Smallest integer value larger than operand

Division (integers)

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Defining Calculated Key Figures at the Query Level

You can use all basic key figures of the InfoProvider in question, as well as the newly defined restricted and calculated key figures of the InfoProvider, to define new calculated key figures. You can define calculated key figures at both the query level and the InfoProvider level. At the query level, the calculated key figure is valid only for the query in question. If you create a calculated key figure at the InfoProvider level, you can use it in all queries that are based on the same InfoProvider.

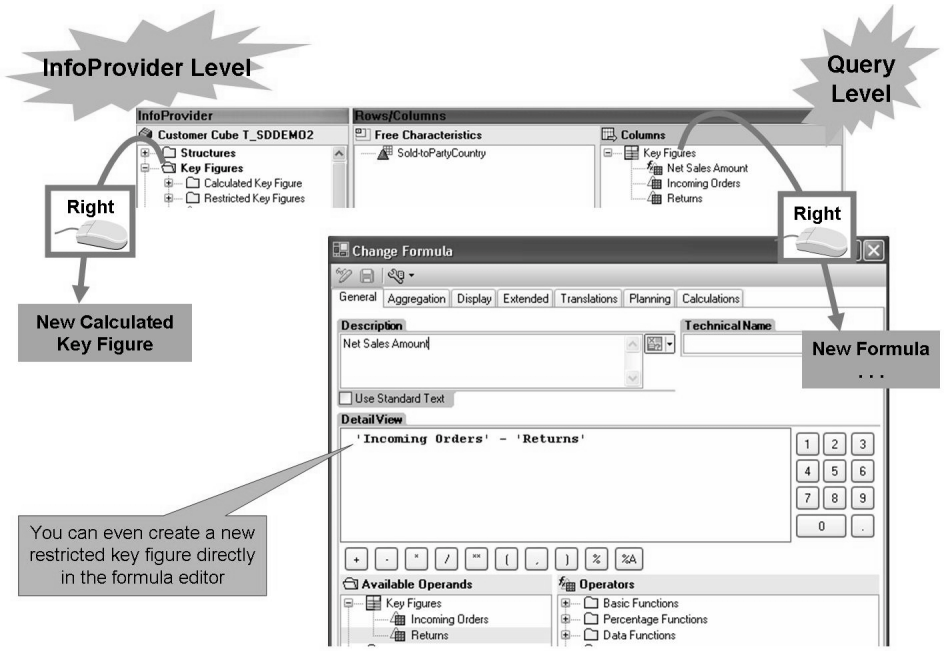

Figure 37: Calculated Key Figures

To define calculated key figures at the query level, you have to include key figures needed for the calculation in the query definition, and choose *New Formula* from the context menu of the Key Figure structure. These formulas are available only locally in the query definition.

If you are defining calculations in the columns as well as in the rows, a formula collision can occur in the interfaces of the two formulas. You can therefore, define which of the formulas is to be used.

Defining Calculated Key Figures at the InfoProvider Level

To define calculated key figures at the query level, you can include all types of key figures which are defined at the InfoProvider level, these include basic key figures, restricted key figures and, of course, calculated key figures. However you must

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remember that you do not have access to all operators as some operators only make sense at the query level. Don't forget that once you have defined the calculated key figure at the InfoProvider level it is not automatically included in your query, you must drag and drop it to where it should be used !.

Caution: Any calculated key figure defined at the InfoProvider level can be used in others queries. Query developers may want to try to change the definition (or just the name) of your calculated key figure so it fits their purpose. They will receive a warning message if they try to do this, but assuming they do have the correct authorizations they can make the changes. These changes will affect all queries where the calculated key figure is used.

Defining Missing Objects Directly.

It is possible to create a new restricted key figure directly in the formula editor dialog box. This means you do not have to leave the formula dialog box to create the missing key figure. This feature is only relevant to query level calculations.

1. Right click in the place where you want the new restricted key figure to appear in the formula and use the *New Selection*menu option. This will create a dummy key figure in the correct place.
2. Right click on the dummy key figure and use the menu option *Edit* to define the key figure and filters (exactly as you would for defining any restricted key figure).

Hint: The new restricted key figure will appear in the key figure structure and therefore will be part of the result (as well as the new formula). If you don't want to see the restricted key figure in your result simply use the *hide* feature under the properties.

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Defining Calculated Key Figures at the InfoProvider level

1. Select the *Key Figure* folder, and choose *New Calculated Key Figure* from the context menu. A dummy calculated key figure appears in the InfoProvider tree under *Calculated Key Figures* folder. Double click on this dummy key figure to open the *calculated key figure* dialog box.
2. Enter a description of the calculated key figure into the *Description* field.
3. Define the required formula using basic key figures, restricted key figures, formula operators, and functions. You can use Drag&Drop to transfer the formula components into the formula field.

   Note: Key figures always have the same units when a query is executed. This means that the formula is semantically incorrect if you add a currency unit (for example, EUR) to a unit of weight (for example, kg). If you want to calculate values without using units, you should use the *Value Without Dimension* function. See Data Functions.

4. Choose *OK*. In the *Properties* pane, you can override the technical name which was automatically generated.
5. The new calculated key figure is available under the *Calculated Key Figures* folder, and can be included in the definition using Drag&Drop.

Boolean Operators

Boolean operators constitute a particular example of functions that are available as operators when you define a calculated key figure. With the help of the Boolean operators, you can make comparisons within formulas.

You can use the following operators:

- is less than <
- is not equal to <>
- is greater than >
- is less than or equal to <=
- is equal to =
- is greater than or equal to >=
- logical NOT, AND, OR, and logical exclusive OR XOR

Example: **Costs < Sales Volume**. This expression delivers 1 if the sales volume is larger than costs. It delivers 0 if the costs are larger or the same as the sales volume.

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Example: **Costs and Sales Volume**. This expression delivers 1 if the values for costs and sales volume are not equal to 0. Otherwise, it delivers 0.

You formulate if - then - else queries in this way.

Example: IF sales volume > 100,000 THEN sales volume * 5% ELSE sales volume * 2%

can be described using the following formula:

(Sales volume >100000) * sales volume * 0.05 + (sales volume <= 100000) * sales volume * 0.02

This works because at least one side of the calculation will always be multiplied by zero.

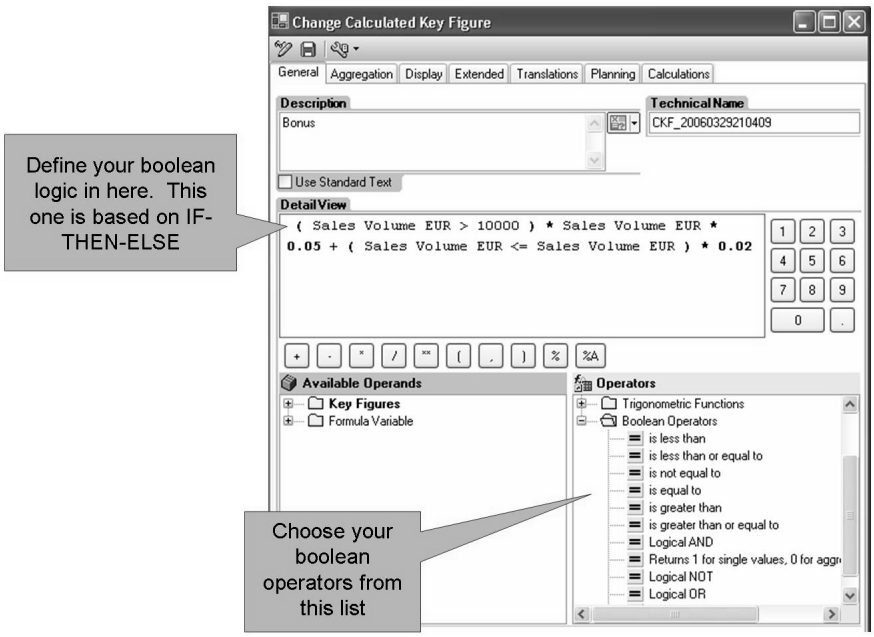

Figure 38: Boolean Operators

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Exercise 5: Calculated Key Figures

Exercise Objectives

After completing this exercise, you will be able to:

- Define new calculated key figures at the InfoProvider and query level, and include them in a query definition
- Define new calculated key figures using Boolean operators

Business Example

You need additional calculations for the analysis of sales volumes in order to carry out a comparison between the sales volumes of two different time periods. You want to show the difference, the percentage variance of the sales volumes, and the share of sales volumes for each sold-to party in relation to the total sales volume of the time period in question.

Task 1:

You should create a report that allows you to compare the sales volumes of your individual sold-to parties of sales organization 1000 within two time periods. Define four new calculated key figures or new formulas that list the difference and percentage variation of the sales volumes of November and December 2001.

You also need information on the percentage share of the sales volume of a sold-to party in relation to the total sales volume for December. You should use an additional column to display the subtotals of the sales volumes for December, so that you can hide the subtotal rows in your report.

1. Create a new query using the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea with the characteristic *Sold-to party (0SOLDTO)* in the rows.

   Use the *Division (0DIVISION)* as a free characteristic. Add *Sales organization (0SALESORG)* to the Filter area as a Characteristic Restriction and filter according to *Germany Frankfurt (1000)*.

   In your query, use the two restricted key figures that have already been defined as *GR00 Sales Volume 11/01 (T_BW3058AAA)* and *GR00 Sales Volume 12/01 (T_BW3058BAA)* in the columns.

   Define a new calculated key figure at the **InfoProvider level**:

   Description: **`GR## Sales Volume Diff.  11/12 2001`**

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Technical name: **BW3058F##**

This is calculated as the difference of the two restricted key figures that have already been defined: *GR00 Sales Volume 11/01 (T_BW3058AAA)* and *GR00 Sales Volume 12/01 (T_BW3058BAA)*. When finished, place the new key figure into the columns.

2. In the same query, define a second calculated key figure at **InfoProvider level**.

   Description: **GR## % Variance Sales Volume**

   Technical name: **BW3058C##**

   This key figure is for calculating the percentage variance of the sales volumes for the months November and December 2001. Once you have defined this key figure, place it in the Columns area of the query definition.

3. Now define a new formula, this time at **Query level**.

   Description: **% Share 12/01 to Overall Sales Volume**

   This calculates, for the month of December, the percentage share of sales volume for a sold-to party in relation to the overall result . Place the new key formula as the last element in the key figure structure.

4. To display the subtotal of the sales volumes for December in a separate column, define a new formula in the same query. Position it as the last key figure in the structure.

   Description: **Result of Sales Volumes 12/01**

5. Save the query in your Training BW305 Reporting role.

   Roles → Training BW305 Reporting → Unit: Key Figures → Lesson: Calculated Key Figures in the *Exercises* under the name:

   Description: **GR## BW305 Calc. Key Figure**

   Technical name: **BW3058D##**

   Now execute the query.

   Add the *Division* to your report as the first column in a drilldown, and evaluate the behavior of the last two calculated key figures in the report.

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Task 2:

You have calculated the percentage variance of the sales volumes achieved in the months November and December 2001. You give a staggered bonus for an increase in sales volume for each sold-to party.

1. In the query definition *GR## BW305 Calc. Key Figure (BW3058D##)*, define a new formula called **`Bonus`** that calculates a bonus of 5% for percentage sales volume increases of more than 10%, and a 1% bonus for percentage increases between 0 and 10%, based on December 2001.

2. For sold-to parties who achieved no sales volume in November, the error message *DIV/0* appears when the bonus and percentage variance are calculated. However, you want this sold-to party to be included in bonus calculation with a bonus of 1%. Therefore, you use the data function *NDIV0(x)* on the calculated key figure *GR## % Variance Sales Volume* to receive the value zero instead of an error message. This value allows the bonus calculation to be carried out appropriately.

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Solution 5: Calculated Key Figures

Task 1:

You should create a report that allows you to compare the sales volumes of your individual sold-to parties of sales organization 1000 within two time periods. Define four new calculated key figures or new formulas that list the difference and percentage variation of the sales volumes of November and December 2001.

You also need information on the percentage share of the sales volume of a sold-to party in relation to the total sales volume for December. You should use an additional column to display the subtotals of the sales volumes for December, so that you can hide the subtotal rows in your report.

1. Create a new query using the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea with the characteristic *Sold-to party (0SOLDTO)* in the rows.

   Use the *Division (0DIVISION)* as a free characteristic. Add *Sales organization (0SALESORG)* to the Filter area as a Characteristic Restriction and filter according to *Germany Frankfurt (1000)*.

   In your query, use the two restricted key figures that have already been defined as *GR00 Sales Volume 11/01 (T_BW3058AAA)* and *GR00 Sales Volume 12/01 (T_BW3058BAA)* in the columns.

   Define a new calculated key figure at the **InfoProvider level**:

   Description: **`GR## Sales Volume Diff.  11/12 2001`**

   Technical name: **`BW3058F##`**

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This is calculated as the difference of the two restricted key figures that have already been defined: *GR00 Sales Volume 11/01 (T_BW3058AAA)* and *GR00 Sales Volume 12/01 (T_BW3058BAA)*. When finished, place the new key figure into the columns.

a) To define a new query, open the Query Designer.

Choose *New Query* .

Select InfoProvider: *InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Customer Cube T_SDDEMO2 (T_SDDEMO2)*

Choose *OK*.

b) Place the *Sold-to party* characteristic found in the *Customer* dimension into the *Rows* section.

Place the *Division (0DIVISION)* characteristic found in the *Sales area data* dimension into the *Free Characteristics* section.

c) Place the *Sales Organization (0SALESORG)* characteristic found in the *Sales area data* dimension into the *Characteristic Restriction* section.

In the context menu for *Sales Organization*, choose *Restrict → Single Values*. Select *Germany Frankfurt (1000)* and adopt the selection using the *Arrow* button. Choose *OK*.

d) In the InfoProvider area, expand the *Key Figures* folder to show the *Restricted Key Figures* folder. From the *Restricted Key Figures* folder, place *GR00 Sales Volume 11/01 (T_BW3058AAA)* and *GR00 Sales Volume 12/01 (T_BW3058BAA)* into the *Columns* using Drag&Drop.

e) To define the first calculated key figure at **InfoProvider level**, choose *New Calculated Key Figure* in the context menu of the *Key Figures* folder. Then choose *Edit* in the context menu of the *New Calculated Key Figure*.

Description: **`GR## Sales Volume Diff. 11/12 2001`**

Technical name: **`BW3058F##`**

f) From the *Available Operands* window, drag *GR00 Sales Volume 12/01* from the *Restricted Key Figures* folder into the *Detail View* section using Drag&Drop. Choose *Minus (-)* and then place *GR00 Sales Volume 11/01* into the *Detail View* section using Drag&Drop. Choose *OK*.

g) To add the newly defined key figure to the query definition, use Drag&Drop to place *GR## Sales Volume Diff. 11/12 2001* into the *Columns* section of your query.

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2. In the same query, define a second calculated key figure at **InfoProvider level**.

   Description: **GR## % Variance Sales Volume**

   Technical name: **BW3058C##**

   This key figure is for calculating the percentage variance of the sales volumes for the months November and December 2001. Once you have defined this key figure, place it in the Columns area of the query definition.

   a) To define the second calculated key figure, again at **InfoProvider level**, choose *New Calculated Key Figure* in the context menu of the *Key Figures* folder. Then choose *Edit* in the context menu of the *New Calculated Key Figure*.

      Description: **GR## % Variance Sales Volume** .

      Technical name: **BW3058C##**

   b) Use Drag&Drop to place *GR00 Sales Volume 12/01 (T_BW3058BAA)*, *Operators → Percentage Functions → Percentage Variance (%)* and *GR00 Sales Volume 11/01 (T_BW3058AAA)* into the *Detail View* section.

      Choose *OK*.

   c) Drag the new calculated key figure into the *Columns* section of your query.

3. Now define a new formula, this time at **Query level**.

   Description: **% Share 12/01 to Overall Sales Volume**

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This calculates, for the month of December, the percentage share of sales volume for a sold-to party in relation to the overall result . Place the new key formula as the last element in the key figure structure.

a) For the definition of the new formula, choose *New Formula* in the context menu for the *Key Figures* Structure. Then choose *Edit* in the context menu of the new *Formula*.

Description: **`% Share 12/01 to Overall Sales Volume`**

Note: Use the Enter key for line breaks.

b) Use Drag&Drop to place the *Percentage share of overall result (%GT)* function found in *Operators → Percentage Functions* into the *Detail View* section. Then do the same with *GR00 Sales Volume 12/01 (T_BW3058BAA)* found in *Available Operands*.

Choose *OK*.

c) Drag the new formula to be the last element in the key figure structure.

4. To display the subtotal of the sales volumes for December in a separate column, define a new formula in the same query. Position it as the last key figure in the structure.

Description: **`Result of Sales Volumes 12/01`**

a) For the definition of the new formula, choose *New Formula* in the context menu for the *Key Figures* structure. Then choose *Edit* in the context menu of the new *Formula*.

Description: **`Result of Sales Volumes 12/01`**

b) Use Drag&Drop to place the *Result (SUMCT)* function found in *Operators → Data Functions* into the *Detail View* section. Then do the same with the structure element *GR00 Sales Volume 12/01 (T_BW3058BAA)* found in *Available Operands*.

Choose *OK*.

c) Drag the new formula to be the last key figure in the structure.

5. Save the query in your Training BW305 Reporting role.

Roles → Training BW305 Reporting → Unit: Key Figures → Lesson: Calculated Key Figures in the *Exercises* under the name:

Description: **`GR## BW305 Calc. Key Figure`**

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Technical name: **BW3058D##**

Now execute the query.

Add the *Division* to your report as the first column in a drilldown, and evaluate the behavior of the last two calculated key figures in the report.

a) To save the query, choose *Save Query*.

   Select *Unit: Key Figures → Lesson: Calculated Key Figures* in the *Exercises* folder.

b) Enter:

   Description: **GR## BW305 Calc. Key Figure**

   Technical name: **BW3058D##**

c) Execute the query.

d) Include the *Division* in the drilldown in front of the *Sold-to Party* by using drag and drop navigation.

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Task 2:

You have calculated the percentage variance of the sales volumes achieved in the months November and December 2001. You give a staggered bonus for an increase in sales volume for each sold-to party.

1. In the query definition *GR## BW305 Calc. Key Figure (BW3058D##)*, define a new formula called **`Bonus`** that calculates a bonus of 5% for percentage sales volume increases of more than 10%, and a 1% bonus for percentage increases between 0 and 10%, based on December 2001.

   a) Open the query definition.

   In the context menu for the *Key Figures* Structure, choose *New Formula*. Then choose *Edit* in the context menu of the new *Formula*.

   b) Description: **`Bonus`**

   c) Create the following formula in the *Detail View* section by using *Boolean Operators* :

   (GR## % Variance Sales Volume > 10) * (GR00 Sales Volume 12/01 * 0.05) + (GR## % Variance Sales Volume >= 0 AND GR## % Variance Sales Volume < = 10) * (GR00 Sales Volume 12/01 * 0.01)

   d) Position the new formula as the last key figure in the structure.

   e) Save the query and then execute it again to view the results.

2. For sold-to parties who achieved no sales volume in November, the error message *DIV/0* appears when the bonus and percentage variance are calculated. However, you want this sold-to party to be included in bonus calculation with a bonus of 1%. Therefore, you use the data function *NDIV0(x)* on the calculated key figure *GR## % Variance Sales Volume* to receive the value zero instead of an error message. This value allows the bonus calculation to be carried out appropriately.

   a) Open the query definition.

   b) Locate (at the InfoProvider level) your calculated key figure *GR## % Variance Sales Volume*. In the context menu, choose *Edit*.

   c) Position the cursor at the beginning of the formula. In the *Data Functions* folder, double-click on the **NDIV0(x)** function to insert this function at the start of the formula.

   d) Delete the close bracket. Then add the close bracket to the end of the formula.

   e) Choose *OK* to close the formula editor.

   f) Save the query, and execute it.

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Lesson Summary

You should now be able to:

- Define new calculated key figures and explain their usage in reports
- Define a calculated key figure when using a restricted key figure and include it in the analysis
- Define a calculated key figure and creating dependant objects directly

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Lesson: Properties of Key Figures

Lesson Overview

This lesson deals with the properties of key figures. The lesson also provides an example of formula collision and explains the functions of the cell editor that can be used when implementing two structures in a query definition.

Lesson Objectives

After completing this lesson, you will be able to:

- Identify the General, Display and Calculations options within the properties of key figures
- Carry out Currency Translation and Unit Conversion in the Business Explorer
- Use the Exception Aggregation to deliver many additional options for analysis

Business Example

Your company has asked you to optimize reports. You are going to make various settings in the properties of the key figures.

You need additional information out of the restricted number of key figures provided in the InfoProvider you want to analyse.

Settings for Key Figure Properties

The various components of a query have specific properties that reproduce important functions. These properties can have either an effect on the presentation of the key figure or the function or both. Call the *Properties* pane by clicking on the tab at the bottom right of the screen (the other tab is *Tasks*). Now select the required key figure by either clicking once on the object in the query, or use the drop down list at the top of the properties pane. The properties are organized into various tabs. Simply click the tab to display the current settings for that group.

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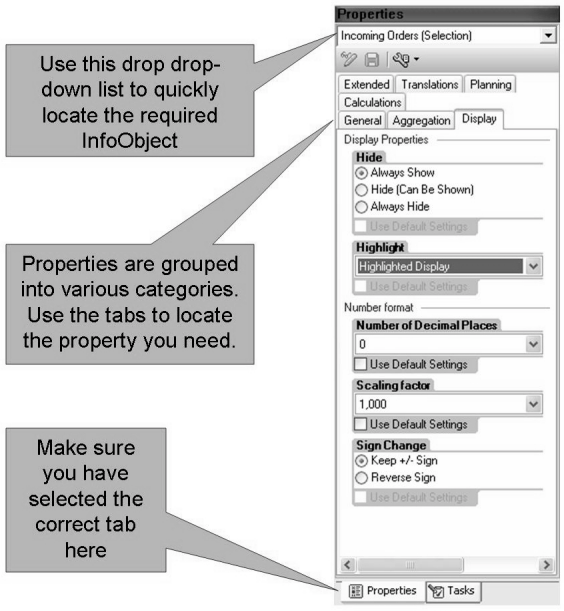

Figure 39: Properties Entry Pane

A general feature found in many of the properties is the *Use Default Setting.* If this box is checked the setting from the InfoObject meta data will be used. Once you override the default setting this check box will automatically be unchecked to show that the setting has been changed and is now non-standard. If you then check the box the setting returns to the default.

It is possible to maintain properties of multiple characteristics simultaneously. Simply highlight all the characteristics you want to include, the properties pane will then display the properties. If there are any conflicts between the different characteristics i.e. one characteristic uses long description whereas another characteristic uses the medium description then you will see the text 'Multiple Values Selected' where the setting would normally appear. In this case you will need to select the individual characteristics to see their respective settings.

- **Description**

  Here you can change the automatically determined key figure description (basic key figure, restricted key figure, calculated key figure) here. You can also use text variables which will be used to provide all or part of the text at query run-time.

  For key figure descriptions you can force a new line by pressing the enter key.

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Caution: The total length of all characters in all lines including the line break character is limited to 60 characters.

Note: It is also possible to edit the description 'in-line' using the standard Microsoft Windows feature. This means you are able to change the description directly on the key figure by simply clicking once on the key figure, the cursor becomes positioned at the start of the description ready for you to start editing.

- **Technical name**

  You can assign a unique technical name to structure parts such as key figures. This is optional.

  Note: When accessing external interfaces (such as Crystal reports, in URLs, or through OLE DB for OLAP), the structure parts must have a technical name so that it can be accessed without error.

- **Hide**

  You can hide key figures that you only need for calculating formulas and do not want to display in the analysis. If you use the *Hide (can be shown)* then the key figure will not be shown by default in the result however the user can select this key figure in the navigation controls to display this in the result.

- **Highlight**

  You can choose whether the key figure is to be highlighted in the report here. This will allow the presentation tool (i.e Excel or web) to identify the key figures which need additional formatting so that the values are very clearly shown in the result. The actual formatting is taken care of in the front end tool, and not here.

- **Number of Decimal Places**

  You can set the number of decimal places here.

- **Scaling Factor**

  You can set the scaling factor, this is helpful when you have large numbers in your result and you want to improve the presentation.

  Caution: The scaling factor does not automatically display in the report. You have to set the scaling factor display separately in the query properties.

- **Sign Change**

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You can choose to remove the sign or reverse it.

Caution: The reverse +/- signs is only a display function. It has no influence on calculation in formulas.

- **Exception Aggregation**

  For a formula you can choose how the result is calculated. Use the drop down list to select the required behavior such as Min, Max,Count. You can also select the reference object which is used in the aggregation. See the next section for more information on how to define an exception aggregation.

- **Local Calculations**

  *Calculate Result As..*allows you to choose a method by which the totals are calculated, such as average, count, min, max etc.

  Example: You want to calculate the result on the basis of the average of all displayed sales volumes instead of on the basis of total sales volume.

  Caution: Use the setting *Total* to ensure that the totals are recalculated locally once a condition has been applied. Otherwise the totals will not be the sum of the result rows displayed, the total will include rows which have been excluded from the condition.

  *Calculate Single Values As..*As well as the totals you can also set the calculation behavior of the single values.

  *Also Apply to Results.*Allows you to cause the results to follow the calculation behavior of the single values.

  Cumulative causes the results to calculate over a series of values.

  Calculation Direction allows you to choose whether the calculation is performed in the rows or column, depending on your layout and the calculation methods you have chosen, not setting this correctly may cause unexpected results.

- **Currency Translation**

  In the Query Designer, you can set a currency conversion key and a target currency. You can also use a variable to allow the translation setting to be determined at run time. See the next section for more general information relating to currency conversion.

- **Unit Conversion**

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In the Query Designer, you can set a Unit of Measurement conversion key and a target unit. You can also use a variable to allow the translation setting to be determined at run time.

- **Constant Selection**

  Check this box to determine that for this key figure the result remains constant during navigation, regardless of the filtering set by the user at run time.

- **Formula Collision**

  The *Formula Collision* function only displays in the *Properties* dialog box if two structures are used in the query definition and both contain formulas. In places where the two formulas collide, it is not clear how the system should calculate. You can therefore choose the formula you want to use to calculate the value.

- **Change Data**

  You can decide if the cells are input ready for this key figure so users can enter values directly into the cells. This setting is used for planning applications. Here you can also decide if the key figure can be changed by a planning function (a background planning task which modifies or generates planning data, such as copy data, revalue data).

Currency Translation

A currency translation in the *Business Information Warehouse* can take place at two points.

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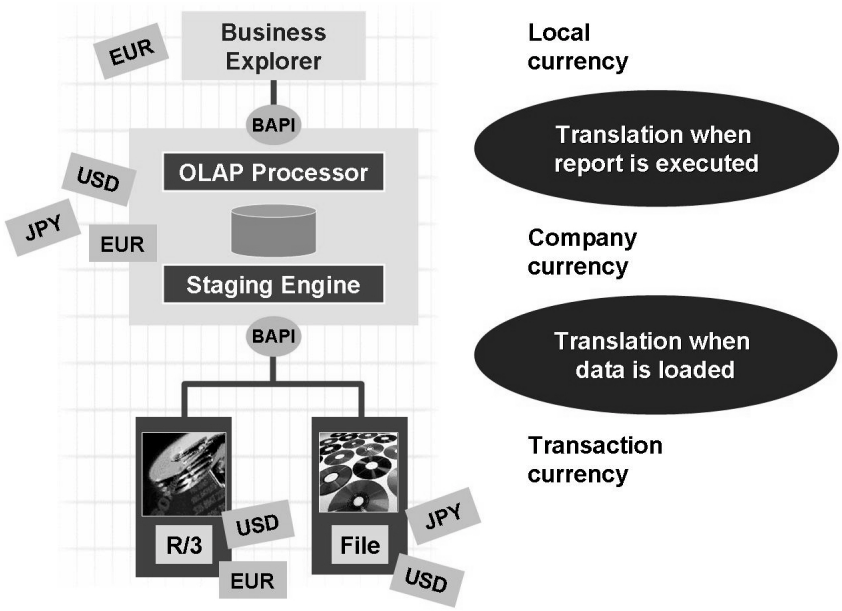

Figure 40: Currency Translation

When the data is updated in the InfoProvider, a currency can be determined for use with each key figure.

When analyzing data in the Business Explorer, you can determine the currency conversion key and target currency for each structure part separately. You choose a currency conversion key that has been created in the *Administrator Workbench*. If necessary, enter the required target currency into the *Target Currency* dropdown box.

If you want the target currency to be flexibly determined at the runtime of the report, you can include a currency variable. Choose *Variable Entry* to do this. A default menu appears when you start the report, where you can select the target currency you want.

All value key figures of the query can be translated into one common target currency with a currency translation key in the report.

Exception Aggregation

Use exception aggregation to derive additional information out of a limited number of key figures provided in the InfoCube you want to analyze. Using the new functions of exception aggregation, you can create calculated key figures using a formula that uses exception aggregation itself (this is a nested exception aggregation). You can also use calculated key figures created on cell level (using the cell editor) with the new functions of exception aggregation.

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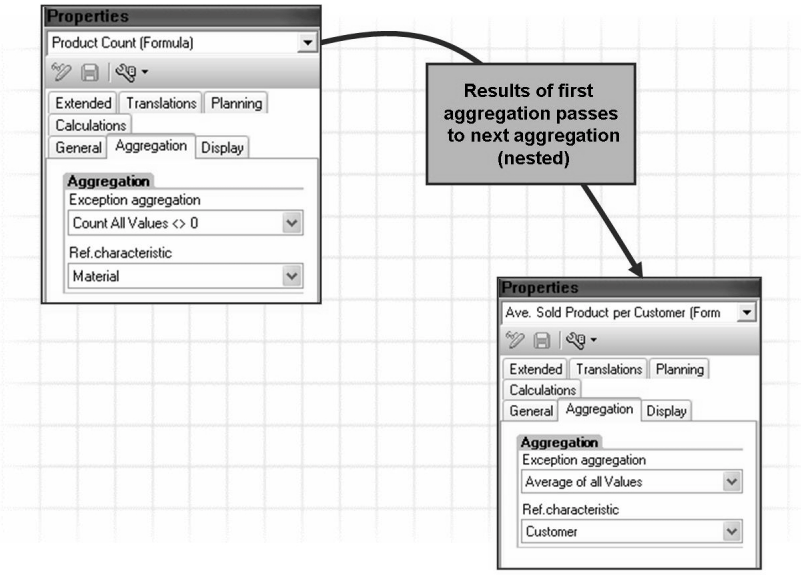

Figure 41: Exception Aggregations

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Defining Nested Exceptions

Use

Example: As a sales manager, you want to analyze the number of products sold and the average number of different products sold to different customers for each sales year. In your InfoCube only a key figure of the net weight for the different sold products is provided. Using the new functions for exception aggregation, you can derive the additionally required two key figures just from the net weight for sold products. Here's how you do it:

Procedure

1. Create a query that contains the characteristics "Sold-to party" (customer) and "Product" in the free characteristics, the characteristic "Calendar year" in the rows, and the key figure "Net weight in kg".
2. Next define a new formula "Different Products" which simply includes the query key figure 'Net Weight in kg' (no operators required in this example). Then access the properties of this formula and choose the exception aggregation setting "Count all values <> 0" for the reference characteristic "Product". In this way you have defined a counter for your sold products derived from the key figure "Net weight in kg". You have simply counted the number of occurrences of net weight to give you the new key figure 'Different Products'.
3. Now lets nest the exceptions. We are now able to count the number of products we sold in each year for all customers using the step above, but we want to know what is the average number of products our customers bought in each year. To achieve this we must define another formula called "Avg. Sold Products/ Customer' which simply refers to the first formula, again no other operators are required. Access the properties of the second formula and choose the exception aggregation "Average of all values" for the reference characteristic "Sold-to Party". The key thing here is that the results of the first aggregation are further processed by the second aggregation.

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Exercise 6: Properties of Key Figures

Exercise Objectives

After completing this exercise, you will be able to:

- Use the various settings that can be made for properties of key figures in reports

Business Example

An ABC analysis of your customers based on their sales volume delivers very appropriate information to reorganize the relationship to them.

Task:

You are asked to generate an ABC analysis of your customers based on their sales volume. Answer the following question:

"With what percentage of my sold-to parties do I reach 80% of overall sales volume? "

Create a new query using the *Customer Cube* InfoCube in the *BW305 Reporting* InfoArea with the name **`GR## BW305 ABC Analysis`**. The report should have this layout:

Sold-to Party	Sales Volume EUR	%Share Sold-to Parties	%Share Sales Volume EUR

You need an additional calculated key figure **`%Share Sold-to Parties`** based on the key figure *Sales Volume EUR* that determines the percentage share of the single sold-to party to all sold-to parties additionally using Exception Aggregation, Normalization and Accumulation within its properties.

The last column represents again the key figure *Sales Volume EUR*, normalized and accumulated.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2* in the *BW305 Reporting* InfoArea.

   Place the characteristic *Sold-to party (0SOLD_TO)* into the rows and the *Sales Volume EUR (T_INCD_V)* key figure into the columns.

   In the key figure structure, define a new calculated key figure.

   Description: **`%Share Sold-to Parties`**

   Use the *Sales Volume EUR (T_INCD_V)* key figure to do this.

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For this key figure enter the appropriate settings in order to count the sold-to parties and to display the count in a normalized and accumulated way, displayed with 3 decimal places.

Then, drag the *Sales Volume EUR (T_INCD_V)* key figure into the key figures structure and display it normalized and accumulated, displayed with 3 decimal places.

Finally, save the query:

Description: **GR## BW305 ABC-Analysis**

Technical Name: **BW3059E##**

Execute the query and sort the report descending by the *Sales Volume EUR (T_INCD_V)* key figure.

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Solution 6: Properties of Key Figures

Task:

You are asked to generate an ABC analysis of your customers based on their sales volume. Answer the following question:

"With what percentage of my sold-to parties do I reach 80% of overall sales volume? "

Create a new query using the *Customer Cube* InfoCube in the *BW305 Reporting* InfoArea with the name **GR## BW305 ABC Analysis**. The report should have this layout:

Sold-to Party	Sales Volume EUR	%Share Sold-to Parties	%Share Sales Volume EUR

You need an additional calculated key figure **%Share Sold-to Parties** based on the key figure *Sales Volume EUR* that determines the percentage share of the single sold-to party to all sold-to parties additionally using Exception Aggregation, Normalization and Accumulation within its properties.

The last column represents again the key figure *Sales Volume EUR*, normalized and accumulated.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2* in the *BW305 Reporting* InfoArea.

   Place the characteristic *Sold-to party (0SOLD_TO)* into the rows and the *Sales Volume EUR (T_INCD_V)* key figure into the columns.

   In the key figure structure, define a new calculated key figure.

   Description: **%Share Sold-to Parties**

   Use the *Sales Volume EUR (T_INCD_V)* key figure to do this.

   For this key figure enter the appropriate settings in order to count the sold-to parties and to display the count in a normalized and accumulated way, displayed with 3 decimal places.

   Then, drag the *Sales Volume EUR (T_INCD_V)* key figure into the key figures structure and display it normalized and accumulated, displayed with 3 decimal places.

   Finally, save the query:

   Description: **GR## BW305 ABC-Analysis**

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Technical Name: **BW3059E##**

Execute the query and sort the report descending by the *Sales Volume EUR (T_INCD_V)* key figure.

a) To define a new query, open the Query Designer and choose *New Query* .

b) Choose *InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Customer Cube T_SDDEMO2 (T_SDDEMO2) → OK*.

c) Place the *Sold-to party (0SOLD_TO)* characteristic under the *Customer* dimension into the *Rows* section.

d) Place the *Sales Volume EUR (T_INCD_V)* key figure into the *Columns* section.

e) In the context menu of the key figures structure define a new calculated key figure by choosing *New Formula*. Then choose *Edit* from the context menu of the new formula.

Description: **%Share Sold-to Parties**

Use Drag&Drop to place *Sales Volume EUR (T_INCD_V)* into the *Detail View* area.

On the *Aggregation* tab page, select the *Exception Aggregation* ***Counting All Values***. Choose ***Sold-to Party (0SOLD_TO)*** as the *Reference characteristic* for the exception aggregation.

On the *Calculations* tab page, go to *Calculate Single Values As*, select ***Normalization of Result*** and check the box ***Cumulative***. The box *Also Apply to Results* has to be unchecked.

On the *Display* tab page, choose ***0.000*** for the *Number of Decimal Places*.

Choose *OK*.

f) Position the new formula as the last element in the structure.

g) Once again, drag the *Sales Volume EUR (T_INCD_V)* key figure into the key figures structure.

Description: **% Share Sales Volume EUR**

On the *Calculations* tab page, go to *Calculate Single Values As*, select ***Normalization of Result*** and check the box ***Cumulative***. The box *Also Apply to Results* has to be unchecked.

On the *Display* tab page, choose ***0.000*** for the *Number of Decimal Places*.

h) Save the query in your Training BW305 Reporting role under:

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Unit: Key Figures → Lesson: Properties of Key Figures → Exercise .

Description: **GR## BW305 ABC Analysis**

Technical name: **BW3059E##**

i) Choose *Save* and execute the query.

Go to the key figure *Sales Volume EUR (T_INCD_V)* and sort the values in descending order using the icons in the column heading.

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Lesson Summary

You should now be able to:

- Identify the General, Display and Calculations options within the properties of key figures
- Carry out Currency Translation and Unit Conversion in the Business Explorer
- Use the Exception Aggregation to deliver many additional options for analysis

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Lesson: Structures and Cells

Lesson Overview

In this lesson we take a detailed look at structures and how they can be saved and reused in various queries. We will also describe formula collision and how we can resolve them. Finally we finish off with a look at how we can take control of the query right down the cell level.

Lesson Objectives

After completing this lesson, you will be able to:

- create and reuse global structures
- use the cell editor

Business Example

You need query definitions with two structures for more complex analyses. Eventually there will be the need to resolve Formula collision. You also need the option of using the cell editor to address each individual cell of the matrix that is used by both structures.

Structures in Queries and Reuse of Structures

Structures are combinations of characteristics and key figures (of basic key figures, calculated key figures, or restricted key figures) of the InfoProvider. A structure can be used in a planned/actual comparison or in a contribution margin scheme.

Structures can also be used in several queries for the same InfoProvider. In order for this to be possible, you need to save them as **reusable structures**.

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In order to make a distinction, we call structures that are not stored as reusable structure **local structures**. Local structures are only used in one query.

1. Call up the context menu in the heading of the *Rows* or *Columns* directory. Choose *New Structure*.
2. In the context menu of the new structure, choose *New Selection*. In the *New Selection* dialog box, use drag and drop to choose characteristics and key figures of the InfoProvider that you want to use in the new structure. Restrict one characteristic or key figure. Define a new formula for calculations.

Note: A query can have a maximum of two structures, there is no restriction as to where these structures appear in the layout, i.e. you could put both structures in the columns. You can create some very flexible layouts using two structures.

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Creating Reusable Structures

1. Select the structure that you want to reuse. Choose *Save as...* from the context menu (right mouse-click) and enter a technical name and a description.
2. The saved structure is now available in the structure directory of the InfoProvider tree. You can use the structure for the definition of new queries for this InfoProvider.

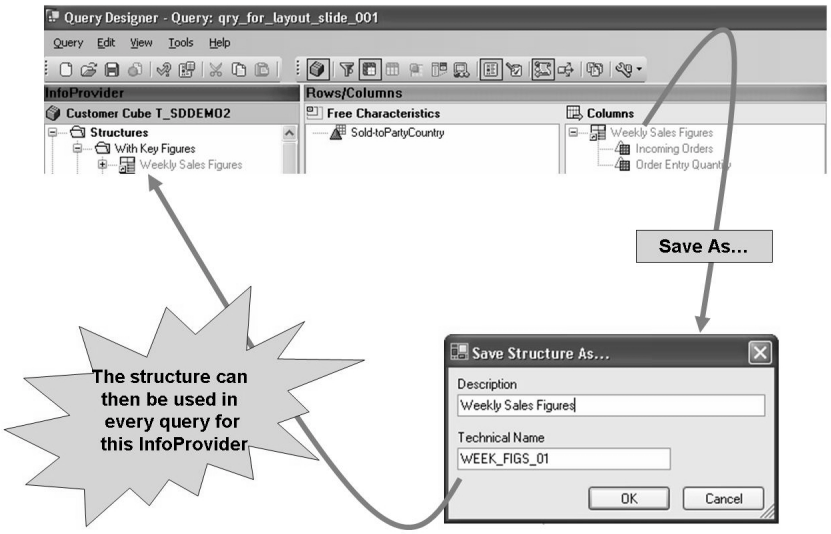

Figure 42: Creating A Reusable Structure

Note: Changes made later to global structures affect all queries in which they were used. If you only want to make local changes in a particular query, you can choose *Remove Reference* in the context menu for the structure, and thereby, change the reusable structure into a local structure.

Changes made later do not affect the definition of the reusable structure, nor the queries that you made with this reusable structure.

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Formula Collision

A formula collision occurs when the query uses two structures and there are formula in both structures. The point at which the formula intersects is called a formula collision. You need to tell the system how to resolve the collision (only one formula can be carried out for the cell !) by making the appropriate setting in the *Properties* dialog.

Note: The *Formula Collision* function only displays in the *Properties* dialog box if two structures are used in the query definition and both contain formulas.

In places where the two formulas collide, it is not clear how the system should calculate. You can therefore choose the formula you want to use to calculate the value.

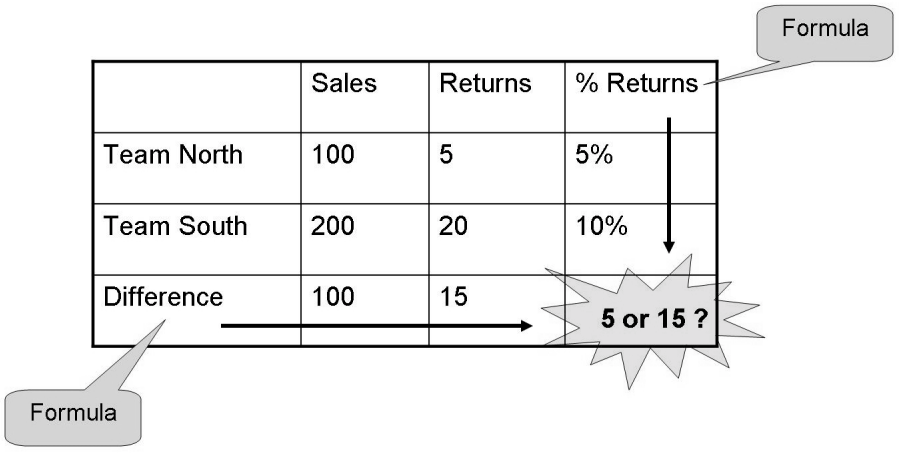

Figure 43: Formula Collision

Cell Editor

- Cell editor allows direct definition of specific **cells** in a query.
- The Cell Editor also allows you to mark a specific cell as a 'reference cell' so that it can be referenced in further calculations
- Cells are the intersection of two structures in a query definition therefore the Cell Editor can only be used in query definitions where there are two structures.
- **Note:** One structure will hold only characteristics while the other structure holds only key figures.
- Cells can be formulas, selections, references or auxiliary cells.

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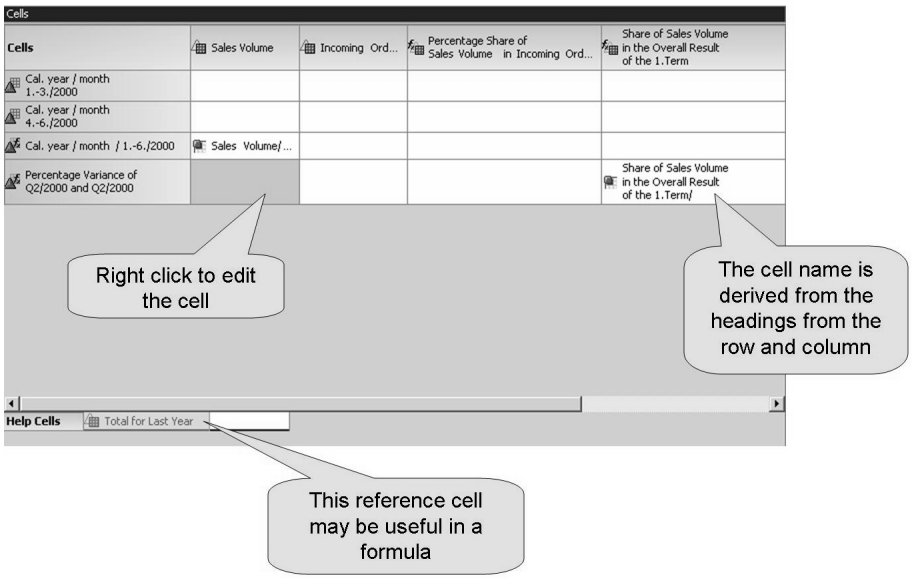

Figure 44: Cell Editor

The Cell Editor is a function of the BEx Query Designer. You can select the editor **only** if the query definition contains two structures. You can define a maximum of two structures in a query definition (discussed earlier).

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Defining Exception Cells

Use

Cell-specific definitions allow you, in addition to the implicit cell definitions resulting from the formulas created, to explicitly define formulas and selection conditions for cells, thereby overwriting the implicitly generated values. This function allows you to create more detailed queries.

You can also define cells that have no direct relationship to the corresponding structure parts. These cells do not display; they do serve as containers for auxiliary selections or formulas.

Caution: A cell is the intersection of two structure elements. The term **Cell** in the function of *Defining Exception Cells* should not be confused with cells in MS-Excel.

The formulas or selection conditions that you define for a cell are always effective at the intersection of two structure elements. If a drilldown characteristic has various characteristic values, the cell definition is always effective at the intersection of the characteristic value with the key figure.

Procedure

1. In the Query Designer, choose *Cells (open)* from the toolbar or use the menu option under *View* to reach the Cell Editor functions.
2. You can now use four different functions.

   New Selection

   - Select a cell in the *Cells* dialog box, and use the right mouse button to choose *New Selection*.
   - Define the required selection.
   - Enter a description for the selection and choose *OK*.

   New Formula

   - Select a cell in the *Cell* dialog box, and use the right mouse button to choose *New Formula*.
   - Define the required formula. Enter a description for the formula and choose *OK*.

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New Cell Reference

Each cell that you define can be reused in formulas. If you want to reuse the value of the implicit generic cell definition that automatically occurs at the intersection of two structure parts of a query, select this cell in the *Cell Definition* dialog box, and choose *New Cell Reference* using the right mouse button. The description arising from the two structure parts automatically appears in the cell. You can now refer to this cell.

Additional cells

Click on the cell adjacent to the *Help Cells* and choose the required option if you need additional cells for auxiliary selections or formulas which are not already included in the query structure you have defined from the construction of rows and columns.

Queries with two structures

A query which uses two structures provides a very large number of opportunities for creative report design. A few points to remember:

- You can have a maximum of two structures in a query.
- You can place both structures in the rows or columns or you can put one structure in the row and one in the column.
- You can mix structures and characteristics in the rows or columns.
- You can provide your own descriptions for the rows/columns that are represented by structures members. (i.e. define the first row of a structure based on required values of 0PERSON and name the row 'My Team').
- You can define formulas in either structure (just watch the collisions! - see earlier topic)
- You can use all the usual filtering options to define the members of the structure, i.e. single values, ranges, hierarchy nodes. You can even use variables to keep the selections flexible.

Hint: When defining the descriptions for the structure members try indenting the text (add some leading blanks) to emphasize the section or the report.

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Exercise 7: Structures and Cells

Exercise Objectives

After completing this exercise, you will be able to:

- Define and reuse structures
- Handle formula collision
- Use the cell editor

Business Example

You use query definitions with two structures for more complex analysis, and some of the structures shall be saved as global elements in order to be used by other query definitions. Eventually you need to watch out for formula collisions and use the cell editor to address every single cell that is affected by both structures.

Task 1: Characteristic Structure and Key Figure Structure

Generate a report that represents the analysis of sales volumes for the whole year 2001 and December 2001 referring to all materials as well as to pumps.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea.

   In the rows, create a structure with the following name:

   Description: **`GR## Comparison Pumps`**

   This structure contains as the first structure element all materials and as second structure element only materials whose key begins with *P-10*.

2. In the columns, include the basic key figure *Sales Volume EUR* two times. Restrict one of them to all months in 2001 and restrict the other to December 2001. Define a new calculated key figure that calculates the percentage share of the sales volume for December 2001 in relation to the sales volume for the whole year 2001.

   Description: **`% Share Sales Volume Dec 2001 to 2001`**

3. Save the query in your Training BW305 Reporting role under:

   Unit: Key Figures → Lesson: Structures and Cells in the *Exercise* folder under the name:

   Description: **`GR## BW305 Structures 1`**

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Technical name: **BW3059A##**

Now execute the query.

4. In order to create a reusable structure, save the characteristic structure *GR## Comparison Pumps* as a global structure with the technical name of **BW3059B##**.

Task 2: Two Characteristic Structures

You want to create a new query containing two characteristic structures. For one of them, the global structure from the preceding task is to be used.

1. Create a new query using the InfoProvider *Customer Cube T_SDDEMO2* in the *BW305 Reporting* InfoArea. In the rows reuse the global structure *GR## Comparison Pumps* and enhance the structure - after changing it into a local structure - by adding a formula that calculates the percentage of the *Pumps* in relation to *All Materials*. Use **Pumps % Share of All Materials** as the description.

   Remove the reference to the global structure for the structure in your query so that changes will not affect other queries using the global structure.

2. For the columns, create a second characteristic structure named **GR## Comparison Countries**. The first structure element has to represent the characteristic country restricted to Germany, the second structure element all the other countries

3. The query definition is to be restricted to the months of the year 2001 and in the table built by the two characteristic structure elements, the key figure *Sales Volume EUR* is to be shown.

4. Save the query in your Training BW305 Reporting role under:

   Unit: Key Figures → Lesson: Structures and Cells in the *Exercise* folder under the name:

   Description: **GR## BW305 Structures 2**

   Technical name: **BW3059C##**

   Now execute the query.

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Task 3: Formula Collision and Cell Editor

Generate a report that represents the sales volumes and incoming orders of the first two quarters of 2000 as well as the first half year with percentage changes.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea.

   In the rows, create a structure with the following name:

   Description: **`Quarterly Comparison`**

   This structure contains the first and second quarters of 2000. The structure should also include the first half year as a sum of the first two quarters.

   You define the fourth part as a formula for calculating the percentage variance of the two quarters contained in the structure.

2. In the columns, include the basic key figures *Sales Volume EUR* and *Incoming Orders (T_INCORDV)*. Define a new calculated key figure that calculates the percentage share of the sales volume in relation to incoming orders.

   Description: **`Sales Volume % Share of Incoming Orders`**

3. Save the query in your Training BW305 Reporting role under:

   Unit: Key Figures → Lesson: Structures and Cells in the *Exercise* folder under the name:

   Description: **`GR## BW305 Formula Collision`**

   Technical name: **`BW3059D##`**

   Now execute the query.

4. At the points where the calculated key figure *% Share Sales Volume of Incoming Orders* in the column crosses both *Half Year 1/2000* and *Percentage Variance of Quarters 1 and 2/2000* in the rows, there are formula collisions.

   Make the necessary setting to have the desired calculations in the proper way.

5. You need information on the share of the sales volume for the individual quarters in relation to the first half year. You define a new calculated key figure **`Sales Volume Share of Overall Sales Volume - Half Year 1`** that uses the value from a particular cell for this calculation. Use the Cell Editor for selecting the sales volume for the first half year as a reference cell.

   Also, use the Cell Editor to suppress the cell results at the point were the calculated key figure *Sales Volume Share of Overall Sales Volume - Half Year 1* in the columns crosses with *Percentage Variance of Quarters 1 and 2/2000*in the rows.

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Solution 7: Structures and Cells

Task 1: Characteristic Structure and Key Figure Structure

Generate a report that represents the analysis of sales volumes for the whole year 2001 and December 2001 referring to all materials as well as to pumps.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea.

   In the rows, create a structure with the following name:

   Description: **`GR## Comparison Pumps`**

   This structure contains as the first structure element all materials and as second structure element only materials whose key begins with *P-10*.

   a) To define a new query, open the *Query Designer* from the BEx Analyzer.

      Choose *Tools → Create New Query → New Query→ InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Customer Cube T_SDDEMO2 (T_SDDEMO2) → Open.*

   b) Call up the context menu in the heading of the *Rows* area. Choose *New Structure* and fill in the description **`GR## Comparison Pumps`** in the *Properties* area.

   c) To define the first element of the structure, go to the context menu of the *GR## Comparison Pumps* structure, and chose *New Selection*. Enter **`All Materials`** as the description in the *Properties* area. In the context menu of the *All Materials* structure element, choose *Edit*. Under the *Material* dimension, choose the *Material* characteristic and place it in the selection window using Drag&Drop.

   d) For the definition of the second structure element, choose *New Selection* again in the context menu for structure *GR## Comparison Pumps*. Enter **`Pumps`** as the description in the *Properties* area. In the context menu of the *Pumps* structure element, choose *Edit*. Under the *Material* dimension, choose the *Material* characteristic, and place it in the selection screen using Drag&Drop.

   e) In the context menu for *Material*, choose *Restrict → Show: Single Values*. Select the *Search* link. In the *Material (key)* field, enter **`P-10*`**. Choose the *Start Search* button. Highlight all the found materials and transfer them to the right side by using the *Arrow* button. Choose *OK* two times.

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2. In the columns, include the basic key figure *Sales Volume EUR* two times. Restrict one of them to all months in 2001 and restrict the other to December 2001. Define a new calculated key figure that calculates the percentage share of the sales volume for December 2001 in relation to the sales volume for the whole year 2001.

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Description: **% Share Sales Volume Dec 2001 to 2001**

a) Use Drag&Drop to place the basic key figure *Sales Volume EUR (T_INVCD_V)* into the *Columns* area. In the context menu of the selected key figure choose *Edit*.

Under the *Time (T_SDDEM02T)* dimension, choose the *Cal. year / month* characteristic and place it in the *Details of the Selection* screen using Drag&Drop.

In the context menu for *Cal. year / month*, choose *Restrict → Show: Value Range → Between*: *January 2001* and *December 2001*. Use the arrow button to transfer the restriction to the right side. Choose *OK* .

In the *description* area, enter **Sales Volume EUR 2001**, split in two rows. Choose *OK*.

b) In the context menu of the key figure *Sales Volume EUR 2001*, choose *Copy*. In the context menu of the key figure structure, choose *Paste*. Enter the context menu of the new key figure and choose *Edit*. Change the description into **Sales Volume EUR December 2001**, split into two lines.

In the context menu for *Cal. year / month*, choose *Restrict → Show: Single Values* and select *December 2001*. Use the *arrow* button to transfer the restriction to the right side and use the other *arrow* button to transfer the *January 2001 to December 2001* restriction to the left side. Choose *OK* two times.

Make sure that this key figure is positioned last in the structure.

c) For the calculation of the percentage share of the sales volume for December 2001 in relation to the sales volume of the whole year 2001, choose *New Formula* in the context menu for the key figure structure. Then choose *Edit* from the context menu of the formula.

Description: **% Share Sales Volume Dec 2001 to 2001**

d) Use Drag&Drop to place *Sales Volume EUR December 2001* into the *Detail View* area. Under *Percentage Functions*, choose *Percentage Share* and use Drag&Drop to place it into the *Formula* area. Use Drag&Drop to place *Sales Volume EUR 2001* into the *Formula* field. Choose *OK*.

Make sure that this key figure is positioned last in the structure.

3. Save the query in your Training BW305 Reporting role under:

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Unit: Key Figures → Lesson: Structures and Cells in the *Exercise* folder under the name:

Description: **GR## BW305 Structures 1**

Technical name: **BW3059A##**

Now execute the query.

a) To save the query, choose *Save Query*

and save it under your Training BW305 Reporting role.

Unit: Key Figures → Lesson: Structures and Cells → Exercise

Description: **GR## BW305 Structures 1**

Technical name: **BW3059A##**

b) Execute the query on the web by pressing the *Execute* button .

4. In order to create a reusable structure, save the characteristic structure *GR## Comparison Pumps* as a global structure with the technical name of **BW3059B##**.

a) Go back into the Query Designer.

b) From the context menu of the *GR## Comparison Pumps* structure, choose *Save as...*. When prompted, enter the technical name **BW3059B##** and choose *OK*.

c) Note that you now can find the structure as a global structure under *Structures → Without Key Figures*.

Task 2: Two Characteristic Structures

You want to create a new query containing two characteristic structures. For one of them, the global structure from the preceding task is to be used.

1. Create a new query using the InfoProvider *Customer Cube T_SDDEMO2* in the *BW305 Reporting* InfoArea. In the rows reuse the global structure *GR## Comparison Pumps* and enhance the structure - after changing it into a local structure - by adding a formula that calculates the percentage of the *Pumps* in relation to *All Materials*. Use **Pumps % Share of All Materials** as the description.

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Remove the reference to the global structure for the structure in your query so that changes will not affect other queries using the global structure.

a) To define a new query, open the *Query Designer* from the BEx Analyzer.

Choose *Tools → Create New Query → New Query→ InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Customer Cube T_SDDEMO2 (T_SDDEMO2) → Open.*

b) From the *Structures → Without Key Figures* folder, transfer the *GR## Comparison Pumps* into the *Rows* using Drag&Drop.

c) In the context menu of the structure choose *New Formula*. Now the following message appears in the message area: " Info: GR## Comparison Pumps is reusable! Saving can influence other queries." From the context menu for *GR## Comparison Pumps*, choose *Remove Reference*.

d) In the context menu, you can choose now *New Formula* again. From the context menu of the new formula, choose *Edit*.

Enter the Description **`Pumps % Share of All Materials`**. Use Drag&Drop to place the structure element *Pumps* into the *Detail View* area. Under *Percentage Functions*, choose *Percentage Share* and use Drag&Drop to place it into the *Formula* area. Use Drag&Drop to place *All Materials* into the *Formula* field. Choose *OK*.

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2. For the columns, create a second characteristic structure named **GR## Comparison Countries**. The first structure element has to represent the characteristic country restricted to Germany, the second structure element all the other countries

   a) Call up the context menu in the heading of the *Columns* area. Choose *New Structure* and fill in the description **GR## Comparison Countries** in the *Properties* area.

   b) To define the first element of the structure, go to the context menu of the *GR## Comparison Countries* structure, and chose *New Selection*. Enter **Germany** as the description in the *Properties* area. In the context menu of the *Germany* structure element, choose *Edit*. Under the *Customer* dimension, choose the *Sold-to PartyCountry (0SOLD_TO__0COUNTRY)* characteristic and place it in the selection screen using Drag&Drop.

      In the context menu for *Sold-to PartyCountry*, choose *Restrict → Show: Single Values* and select *Germany (DE)* . Use the *Arrow* button to transfer the restriction to the right side . Choose *OK* two times.

   c) For the definition of the second structure element, choose *New Selection* again in the context menu for structure *GR## Comparison Countries*. Enter **Other Countries** as the description in the *Properties* area. In the context menu of the *Other Countries* structure element, choose *Edit*. Under the *Customer* dimension, choose the *Sold-to PartyCountry (0SOLD_TO__0COUNTRY)* characteristic, and place it in the selection screen using Drag&Drop.

      In the context menu for *Sold-to PartyCountry*, choose *Restrict →Show: Single Values* and select *Germany (DE)*. Use the *Arrow* button to transfer this restriction to the right side. Select the value for Germany in the righthand window and then choose *Exclude from Selection*. Choose *OK* two times.

   d) Make sure that the *Other Countries* structure element is last in the structure.

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3. The query definition is to be restricted to the months of the year 2001 and in the table built by the two characteristic structure elements, the key figure *Sales Volume EUR* is to be shown.

   a) Under the *Time (T_SDDEM02T)* dimension, choose the *Cal. year / month* characteristic and place it in the *Filter* tab under *Characteristic Restrictions* using Drag&Drop.

   In the context menu for *Cal. year / month*, choose *Restrict → Show: Value Range → Between*: *January 2001* and *December 2001*. Use the arrow button to transfer the restriction to the right side. Choose *OK* .

   b) Use Drag&Drop to place the basic key figure *Sales Volume EUR (T_INVCD_V)* into the *Characteristic Restrictions* area on the *Filter* tab.

4. Save the query in your Training BW305 Reporting role under:

   Unit: Key Figures → Lesson: Structures and Cells in the *Exercise* folder under the name:

   Description: **GR## BW305 Structures 2**

   Technical name: **BW3059C##**

   Now execute the query.

   a) To save the query, choose *Save Query*

   and save it under your Training BW305 Reporting role.

   Unit: Key Figures → Lesson: Structures and Cells → Exercises

   Description: **GR## BW305 Structures 2**

   Technical name: **BW3059C##**

   b) Execute the query by pressing the button *Exit and use the query*.

Task 3: Formula Collision and Cell Editor

Generate a report that represents the sales volumes and incoming orders of the first two quarters of 2000 as well as the first half year with percentage changes.

1. Create a new query based on the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* in the *BW305 Reporting* InfoArea.

   In the rows, create a structure with the following name:

   Description: **Quarterly Comparison**

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This structure contains the first and second quarters of 2000. The structure should also include the first half year as a sum of the first two quarters.

You define the fourth part as a formula for calculating the percentage variance of the two quarters contained in the structure.

a) To define a new query, open the *Query Designer* from the BEx Analyzer.

Choose *Tools → Create New Query → New Query→ InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Customer Cube T_SDDEMO2 (T_SDDEMO2) → Open.*

b) Call up the context menu in the heading of the *Rows* area. Choose *New Structure* and fill in the description **`Quarterly Comparison`** in the *Properties* area.

c) To define the first quarter as part of the structure, go to the context menu of the *Quarterly Comparison* structure, and chose *New Selection.* Enter **`Quarter 1/2000`** as the description in the *Properties* area.

In the context menu of the *Quarter 1/2000* structure element, choose *Edit*. Under the *Time (T_SDDEM02T)* dimension, choose the *Cal. year / month* characteristic and place it in the selection screen using Drag&Drop.

In the context menu for *Cal. year / month*, choose *Restrict → Show: Value Range → Between*: *January 2000* and *March 2000*. Use the arrow button to transfer the restriction to the right side. Choose *OK* .

d) For the definition of the second quarter as part of the structure, go to the context menu of the *Quarterly Comparison* structure, and chose *New Selection.* Enter **`Quarter 2/2000`** as the description in the *Properties* area. In the context menu of the *Quarter 2/2000* structure element, choose *Edit*. Under the *Time (T_SDDEM02T)* dimension, choose the *Cal. year / month* characteristic and place it in the selection screen using Drag&Drop.

In the context menu for *Cal. year / month*, choose *Restrict → Show: Value Range → Between*: *April 2000* and *June 2000*. Use the arrow button to transfer the restriction to the right side. Choose *OK* .

e) For the definition of the two new formulas in the structure, choose *New Formula* in the context menu for the structure *Quarterly Comparison*.

Description: **`Half Year 1/2000`**.

Use Drag&Drop to place *Quarter 1/2000* into the *Detail View* field. Choose *Plus* and place *Quarter 2/2000* into the *Detail View* field.

Confirm your entries with *OK*.

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f) In the context menu for the structure *Quarterly Comparison*, choose *New Formula*. Choose *Edit* from the context menu of the new formula.

Description: **Percentage Variance of Quarters 1 and 2/2000**

Use Drag&Drop to place *Quarter 2/2000* into the *Detail View* field. Choose the *Percentage Variance* function. Use Drag&Drop to place *Quarter 1/2000* into the *Detail View* field. Choose *OK*.

2. In the columns, include the basic key figures *Sales Volume EUR* and *Incoming Orders (T_INCORDV)*. Define a new calculated key figure that calculates the percentage share of the sales volume in relation to incoming orders.

Description: **Sales Volume % Share of Incoming Orders**

a) Use Drag&Drop to place the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Incoming Orders (T_INCORDV)* into the columns.

b) For the calculation of the percentage share of the sales volume in relation to incoming orders, choose *New Formula* in the context menu for the key figure structure. Then choose *Edit* from the context menu of the new formula.

Description: **Sales Volume % Share of Incoming Orders**

Use Drag&Drop to place *Sales Volume EUR (T_INVCD_V)* into the *Detail View* field. Under *Percentage Functions*, choose *Percentage Share* and use Drag&Drop to place it into the *Detail View* field. Use Drag&Drop to place *Incoming Orders (T_INCORDV)* into the *Detail View* field. Choose *OK*.

c) Make sure that the new formula is positioned last in the key figure structure.

3. Save the query in your Training BW305 Reporting role under:

Unit: Key Figures → Lesson: Structures and Cells in the *Exercise* folder under the name:

Description: **GR## BW305 Formula Collision**

Technical name: **BW3059D##**

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Now execute the query.

a) To save the query, choose *Save Query*

and save it under your Training BW305 Reporting role.

Unit: Key Figures → Lesson: Structures and Cells → Exercise

Description: **GR## BW305 Formula Collision**

Technical name: **BW3059D##**

b) Execute the query by pressing the button *Exit and use the query*.

4. At the points where the calculated key figure *% Share Sales Volume of Incoming Orders* in the column crosses both *Half Year 1/2000* and *Percentage Variance of Quarters 1 and 2/2000* in the rows, there are formula collisions.

Make the necessary setting to have the desired calculations in the proper way.

a) Go back to the query definition by choosing *Tools → Edit Query*.

b) In the *Properties* area for the formula *% Share Sales Volume of Incoming Orders*, choose *Extended → Eliminate Formula Collision → Use Results of this Formula*.

c) In the *Properties* area for the formula *Percentage Variance of Quarters 1 and 2/2000*, choose *Extended → Eliminate Formula Collision → Use Results of this Formula*.

d) Execute the query again by pressing the button *Exit and use the query* and check the resulting report.

5. You need information on the share of the sales volume for the individual quarters in relation to the first half year. You define a new calculated key figure **Sales Volume Share of Overall Sales Volume - Half Year 1** that uses the value from a particular cell for this calculation. Use the Cell Editor for selecting the sales volume for the first half year as a reference cell.

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Also, use the Cell Editor to suppress the cell results at the point were the calculated key figure *Sales Volume Share of Overall Sales Volume - Half Year 1* in the columns crosses with *Percentage Variance of Quarters 1 and 2/2000*in the rows.

a) Go back to the query definition by choosing *Tools* → *Edit Query*.

b) Use the *Cells* icon to call up the Cell Editor.

c) At the place where the *Half Year 1/2000* and *Sales Volume EUR* calculations cross, choose *New Cell Reference* in the context menu. Go back to the *Rows/Columns* tab page of the Query Designer.

d) For the definition of the share of the sales volume in relation to the sales volume of the first half year, choose *New Formula* in the context menu for the key figure structure.

Description: **`Sales Volume Share of Overall Sales Volume - Half Year 1`**.

Use Drag&Drop to place *Sales Volume EUR* into the *Detail View* field. Choose */ (divided by)*. Place *Sales Volume EUR/Half Year 1/2000* from the *Cells* section into the *Detail View* field. Choose *OK*.

e) Call up the Cell Editor again, and at the intersection of *Percentage Variance of Quarters 1 and 2/2000* and *Sales Volume Share of Overall Sales Volume - Half Year 1*, choose *New Cell Reference* in the context menu.

In the *Properties* area of the cell, choose *Display* → *Always Hide*.

f) Execute the query again by pressing the button *Exit and use the query* and check the resulting report.

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Lesson Summary

You should now be able to:

- create and reuse global structures
- use the cell editor

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Unit Summary

You should now be able to:

- Explain the objectives and use of restricted key figures in information analyses
- Define restricted key figures at the InfoProvider and query level
- Use the enhanced selection function for selecting restriction values
- Use the *Exclude from Selection* and *Include in Selection* functions
- Explain the use of constant selection
- Define new calculated key figures and explain their usage in reports
- Define a calculated key figure when using a restricted key figure and include it in the analysis
- Define a calculated key figure and creating dependant objects directly
- Identify the General, Display and Calculations options within the properties of key figures
- Carry out Currency Translation and Unit Conversion in the Business Explorer
- Use the Exception Aggregation to deliver many additional options for analysis
- create and reuse global structures
- use the cell editor

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Unit 5

Characteristics

Unit Overview

With *SAP BI* your managers are better informed on all levels in order to make decisions and react quickly, which is necessary in today's dynamic markets. In addition, the use of hierarchies and structures in combination with hierarchies is discussed in this unit.

You can create your own hierarchies in SAP BI. To do this, you use time-dependent hierarchy structures and linked nodes.

Unit Objectives

After completing this unit, you will be able to:

- Describe the various properties of characteristics and their use in adjusting reports to your requirements
- Demonstrate the benefit of using display attributes to describe characteristics in more detail
- Describe the difference between using display attributes and navigation attributes
- Display characteristics and key figures in a hierarchy
- Include external hierarchies in your reports
- Define how the hierarchy is displayed in the report
- Combine hierarchies and structures
- Restrict characteristics to hierarchy nodes
- Define your own hierarchies in SAP BI
- Create time-dependent hierarchy structures
- Use link nodes in the hierarchy definition

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Lesson: Properties and Attributes of Characteristics

Lesson Overview

This lesson deals with the properties of characteristics and the various options for enhancing reports with additional information in the form of attributes.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the various properties of characteristics and their use in adjusting reports to your requirements
- Demonstrate the benefit of using display attributes to describe characteristics in more detail
- Describe the difference between using display attributes and navigation attributes

Business Example

Reports are often used as the basis for decision-making. In order to implement measures resulting from these reports without losing time, it is often necessary to collect additional information quickly, such as a contact person and the telephone number of a sold-to party or the person responsible for a cost center. Including this information in your reports in the form of attributes saves valuable time.

Properties of Characteristics

The various components of a query have specific properties that reproduce important functions. You access the properties of a characteristic by simply clicking on the characteristic which then brings up the properties in the properties pane on the right side of the screen. Make sure the properties pane is displayed (and not *Tasks*) by clicking on the tab a the bottom of the screen. The properties are organized with tabs into three groups, these are described below.

Hint: Sometimes it is easier to view the properties if you re-size the properties pane.

It is possible to maintain properties of multiple characteristics simultaneously. Simply highlight all the characteristics you want to include, the properties pane will then display the properties. If there are any conflicts between the different characteristics i.e. one characteristic uses long description whereas another characteristic uses the

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medium description then you will see the text 'Multiple Values Selected' where the setting would normally appear. In this case you will need to select the individual characteristics to see their respective settings.

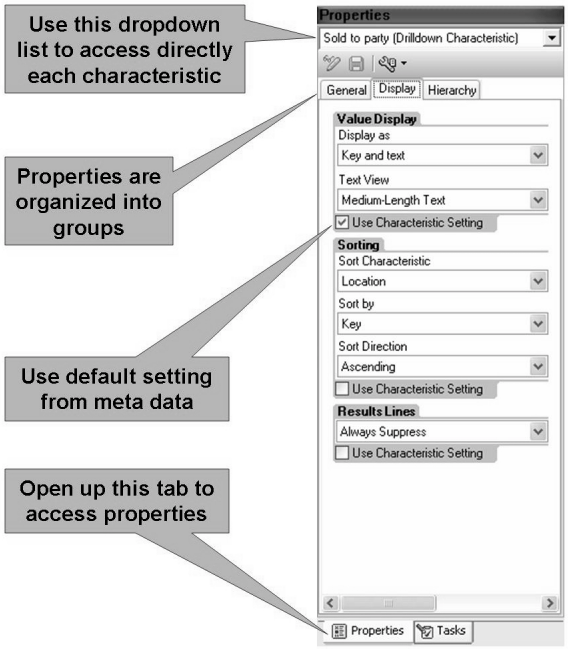

Figure 45: Properties for Characteristics

You will notice that it is possible to use the default settings from the InfoObject meta data by checking the box *Use default settings*. When you override any standard settings, this box becomes unchecked to show that the standard settings are not used. You can easily return to the standard settings by rechecking this box.

You can define the following properties for characteristics in the three tabs:

Description

The text provided in the InfoObject maintenance appears here. You can change the text and display it in the query.

Note: It is also possible to edit the description 'in-line' using the standard Microsoft Windows feature. This means you are able to change the description directly on the characteristic by simply clicking once on the characteristic, the cursor becomes positioned at the start of the description ready for you to start editing.

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Display As

This is where you determine how characteristic values display, as long as they values were created in the InfoObject maintenance for the characteristic:

No Display

Key and Name

Name and Key

Name

Key

Long or Medium Name

Text View

If you choose to display text (above) this is where you choose the length of the text requried. Remember there could be up to three lengths available.

Sorting

You can make settings for sorting within the characteristic. You can use the following:

The characteristic itself, sorted by key or name

All attributes of the characteristic sorted by *Key* or *Name*

The sort sequence is either *Ascending* or *Descending*.

Hint: You cannot use the attribute that you have selected for sorting in the display.

Results Line

- *Always display*

  Result for this characteristic are always displayed.

- *Display with more than one single value*

  The result will only display if there is more than one value, i.e. only when there is something to total !

- *Always suppress*

  Result for this characteristic are never displayed.

Display Hierarchy

You can display and make the necessary settings for the characteristic hierarchically. We cover the hierarchy setting in detail in the coming lessons.

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Attributes (Display and Navigation)

- Characteristics can be described in more detail through attributes.
- You assign attributes to characteristics in the InfoObject maintenance. You can maintain them as purely **Display Attributes** or as **Navigation Attributes**.
- You can use **Navigation Attributes** for defining queries in reporting in the same way as characteristics. They are displayed in the characteristic dimension.

Characteristics can be described in more detail through attributes. For example, you can assign the attribute *Telephone Number* to the characteristic *Sold-to Party* to display the telephone number of the sold-to party.

You assign attributes to characteristics in the InfoCube maintenance. You can maintain them as purely **Display Attributes** or as **Navigation Attributes**.

You can show **Display Attributes** in a report in the drilldown. However, navigation steps are not possible. (For example, you cannot choose values from a display attribute as a filter.)

To include a display attribute in the drilldown, open the folder for the characteristic within the InoProvider tree. Once in the *Attributes* folder, drag the required attribute into the query definition, you must drop it directly over the characteristic (the characteristic must first be dragged into the query definition!).

In the *Properties* for a specific attribute for a characteristic, you can set the display functions as key, name, and so on. You can also change the name to suit your requirements.

You can use **Navigation Attributes** for defining queries in reporting in the same way as characteristics. They always display in the dimension of the characteristic to which they belong.

In order to use an attribute as a navigation attribute, note the following:

1. You have to flag the attribute as a navigation attribute in the InfoObject maintenance of the characteristic.
2. You have to select that attribute from the list of possible navigation attributes in InfoCube maintenance.

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Note the following when using navigation attributes:

- Time-dependency of the navigation attribute.

  Navigational attributes enable you to view current data with characteristic values from the past or view past data with current characteristic values.
- Navigation attributes appear as characteristics in the query design.
- Very slight loss in query performance when compared to characteristics.

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Exercise 8: Properties and Attributes of Characteristics

Exercise Objectives

After completing this exercise, you will be able to:

- Make settings for the various functions of characteristic properties to structure your reports
- Use display attributes to describe characteristics in more detail

Business Example

In order to make decisions based on your reports without losing valuable time, you can integrate additional information, such as the telephone number of a sold-to party, into your reports.

In order to structure your reports more clearly, you can specify whether the results rows display for each characteristic.

Using navigation attributes, you can enable the users of your report to filter the report to the additional information.

Task:

Define a report that displays the sold-to parties, their materials, the relevant sales revenues, and the costs for the first two quarters of the year 2001.

Display the location, region, and telephone number for the sold-to parties as additional information. Make the necessary settings so that you can select data based on country and postal code later.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   In the columns, include the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   In the rows, include the *Sold-to Party (T_SOLD_TO)* and *Material (0MATERIAL)* characteristics.

   Restrict the data to the first two quarters of the year 2001 and enable navigation using both of these quarters.

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2. As additional information for the sold-to party, include the attributes location, region, and telephone number in your report. For the region, define that only the text is to be displayed.

3. Make the relevant settings so that users can select data in the report according to *Country (T_SOLD_TO__0COUNTRY)* and *Postal Code (T_SOLD_TO__0POSTAL_CD)*.

   Caution: Make sure the technical names display.

   The technical names are unique. The regular name can, as shown in this example, be used several times.

4. Determine properties for the characteristics in the query definition. Change the name *Sold-to Party* to *Customer*.

   Display only the name of the sold-to party and sort the values alphabetically in descending order by the attribute *Location*.

   In order to structure the report clearly, specify that the results rows do not display for *Cal. Year/Quarter (0CALQUARTER)* when the quarter is included in the drilldown.

5. Save the query in your Training BW305 Reporting role.

   Unit: Characteristics → Lesson: Properties and Attributes of Characteristics → Exercise

   Description: **`GR## BW305 Characteristics`**

   Technical name: **`BW30510B##`**

   Now execute the query.

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Solution 8: Properties and Attributes of Characteristics

Task:

Define a report that displays the sold-to parties, their materials, the relevant sales revenues, and the costs for the first two quarters of the year 2001.

Display the location, region, and telephone number for the sold-to parties as additional information. Make the necessary settings so that you can select data based on country and postal code later.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   In the columns, include the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   In the rows, include the *Sold-to Party (T_SOLD_TO)* and *Material (0MATERIAL)* characteristics.

   Restrict the data to the first two quarters of the year 2001 and enable navigation using both of these quarters.

   a) To define a new query, open the *Query Designer* from the BEx Analyzer.

      Choose *Tools → Create New Query → New Query→ InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → Open.*

   b) Use Drag&Drop to transfer the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)* into the columns.

   c) For the characteristics, choose:

      Dimensions → Customer → Sold-to Party (T_SOLD_TO) and use Drag&Drop to transfer it into the *Rows*.

      Dimensions → Material → Material (0MATERIAL) and use Drag&Drop to transfer it into the *Rows*.

      Dimensions→ Time → Cal. Year/Quarter (0CALQUARTER) and use Drag&Drop to transfer it into the *Free Characteristics*.

      Go to *Default Values* on the *Filter* tab page. Choose, from the context menu for *Cal. Year/Quarter→ Restrict → Show: Single Values*, select *1.2001* and *2.2001*, and transfer your selection using the arrow button. Choose *OK*.

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2. As additional information for the sold-to party, include the attributes location, region, and telephone number in your report. For the region, define that only the text is to be displayed.

   a) To include display attributes in the definition, from the *Attributes* folder under the *Sold-to party* characteristic transfer the required attributes *Location (0CITY)*, *Region (0REGION)*, and *Telephone 1 (0PHONE)* to the rows under *Sold-to party*.

   b) In the *Properties* area for the attribute *Region*: *Value Display* → *Display as* → *Text*.

3. Make the relevant settings so that users can select data in the report according to *Country (T_SOLD_TO__0COUNTRY)* and *Postal Code (T_SOLD_TO__0POSTAL_CD)*.

   Caution: Make sure the technical names display.

   The technical names are unique. The regular name can, as shown in this example, be used several times.

   a) From the *Customer* dimension, transfer the navigation attribute *Country (T_SOLD_TO__0COUNTRY)* using Drag&Drop into the *Free Characteristics*.

   b) From the *Customer* dimension, transfer the navigation attribute *Postal Code (T_SOLD_TO__0POSTAL_CD)* using Drag&Drop into the *Free Characteristics*.

4. Determine properties for the characteristics in the query definition. Change the name *Sold-to Party* to *Customer*.

   Display only the name of the sold-to party and sort the values alphabetically in descending order by the attribute *Location*.

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In order to structure the report clearly, specify that the results rows do not display for *Cal. Year/Quarter (0CALQUARTER)* when the quarter is included in the drilldown.

a) In the *Properties* area for the characteristic *Sold-to Party (T_SOLD_TO)*:

General → *Description*, change the name to **`Customer`**

Display → *Value Display* → *Display as* → *Text*

Display → *Value Display* → *Sorting*→ *Sort characteristic*, choose *Location*, to define *Sort by*, choose *Text*, and to define the *Sort Direction*, choose *Descending*.

b) To hide the results rows for the *Cal. Year/Quarter* characteristic, choose from the *Properties* area for this characteristic:

Display → *Results Lines*→ *Always Suppress*

5. Save the query in your Training BW305 Reporting role.

Unit: Characteristics → *Lesson: Properties and Attributes of Characteristics* → *Exercise*

Description: **`GR## BW305 Characteristics`**

Technical name: **`BW30510B##`**

Now execute the query.

a) To save the query, choose *Save Query* and save it under your Training BW305 Reporting role.

Unit Characteristics → *Lesson: Properties and Attributes of Characteristics* → *Exercises*

Description: **`GR## BW305 Characteristics`**

Technical name: **`BW30510B##`**

b) Execute the query using the BEx Analyzer.

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Lesson Summary

You should now be able to:

- Describe the various properties of characteristics and their use in adjusting reports to your requirements
- Demonstrate the benefit of using display attributes to describe characteristics in more detail
- Describe the difference between using display attributes and navigation attributes

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Lesson: Integrating Hierarchies into Reports

Lesson Overview

This lesson deals with using hierarchies and using structures in conjunction with hierarchies.

Lesson Objectives

After completing this lesson, you will be able to:

- Display characteristics and key figures in a hierarchy
- Include external hierarchies in your reports
- Define how the hierarchy is displayed in the report
- Combine hierarchies and structures
- Restrict characteristics to hierarchy nodes

Business Example

You can increase the clarity of your reports by arranging several characteristics and key figures hierarchically in your reports. In order to analyze the characteristics values of, for example, a cost center or a material, external hierarchies are often used. If may also be necessary to combine structures with hierarchies for presentation in the report.

Hierarchical Display in Reports

You have **two** options for hierarchical displays in reports:

1. You can display the characteristics included in the query definition as a hierarchy.
2. You can select an external hierarchy as a display hierarchy for a characteristic in the query definition.

Hierarchical Positioning of Characteristics and Key Figures

You can display characteristics and key figures in the rows and in the columns as hierarchies by selecting *Display As Hierarchy* from the context menu of the row or column header.

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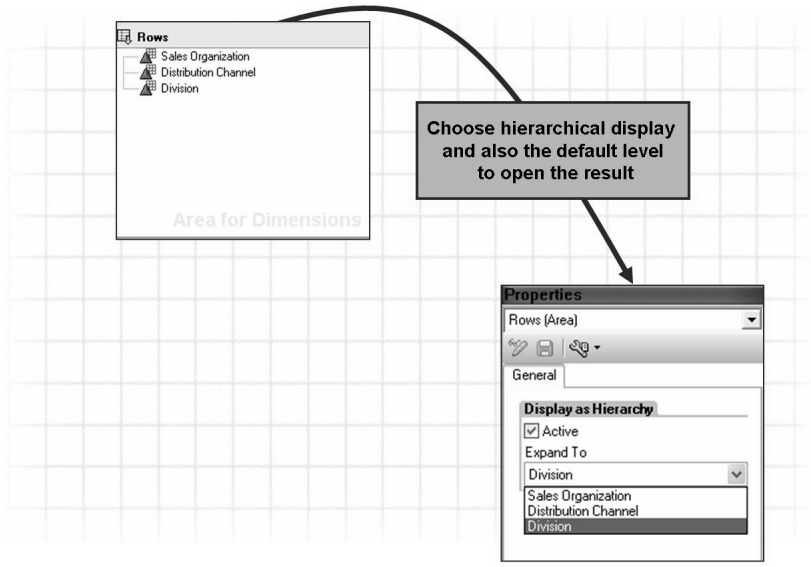

Figure 46: Hierarchical Positioning of Characteristics

Including Hierarchies in Reports

- You create hierarchies for basic characteristics, for example, *Cost Center (0COSTCENTER)*.
- External hierarchies are saved in special master data tables. They behave like master data and therefore, you can use and modify them in all InfoCubes.
- You can define several hierarchies for a characteristic. You can even use the feature (described earlier) to display the hierarchies in a hierarchical structure !

In order to make hierarchies available for a characteristic in BW, you can load characteristic hierarchies from a source system or create them in the Business Information Warehouse.

You determine whether a characteristic can have a hierarchy in the InfoObject maintenance. This is also where you define the properties of the permitted hierarchies (for example, hierarchy versions, time-dependent hierarchy structures).

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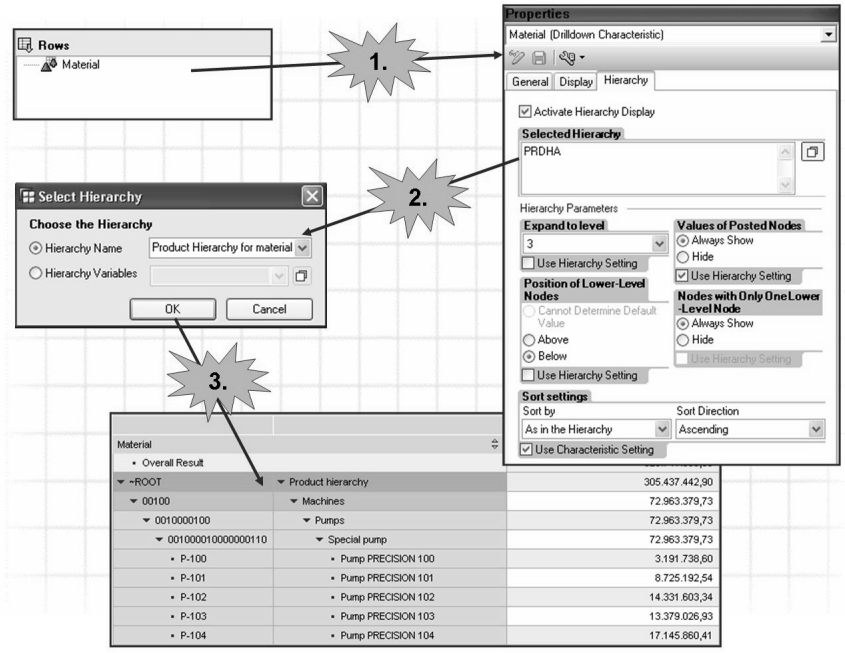

Figure 47: External Hierarchies in Queries

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Including Hierarchies in Reports

1. Click on the characteristic that you want to present in a hierarchy so that the *properties* are displayed.
2. In the *Properties* pane, select the *Hierarchies* tab.
3. Press the button adjacent to the *Selected Hierarchies*box and choose a hierarchy from the list, make the other settings to fine tune the presentation of the hierarchy.

Properties of the Display Hierarchy

Each hierarchy has the properties that were determined in the hierarchy definition. You can override the following hierarchy properties in the query definition for a hierarchy.

Sorting

Within the hierarchy, you can sort in *Descending* or *Ascending* order by *Key* or *Name*.

Expand to Level

To determine the hierarchy level to which the hierarchy is expanded in the report.

Position of Lower Level Nodes

Choose whether the subordinate nodes are positioned above or below a superior node.

Values of Posted Nodes

Choose whether you want to *Always Show* or *Hide* the values of posted nodes.

Nodes with Only One Lower-Level Node

Choose whether you want to *Always Show* or *Hide* nodes with only one lower level node.

Using Hierarchies to Make Restrictions

You can use hierarchies to select filter values for characteristics by selecting individual hierarchy nodes.

If you restrict the characteristic to one hierarchy node, the node hierarchy is automatically taken as the display hierarchy. However, you can switch the display hierarchy to not active.

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In order to restrict a characteristic to a hierarchy node, from the dialog box, select *Restrict* and then the hierarchy. Select the required hierarchy node and confirm with *OK*.

Combinations of Hierarchies and Structures

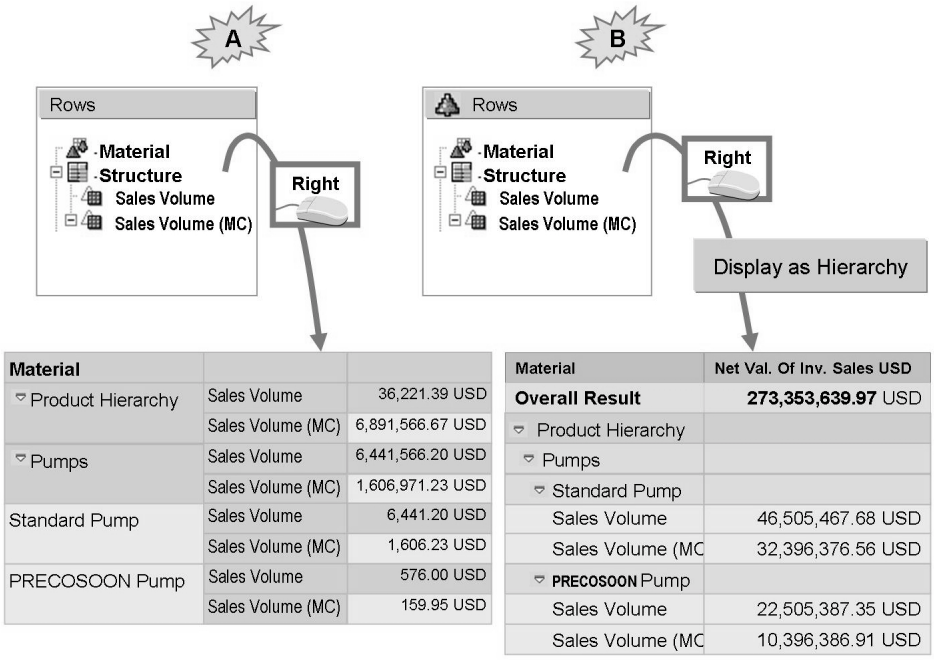

Figure 48: Hierarchies and Structures

You can combine hierarchies and structures in the display so that you can choose to display the characteristics in non-hierarchical form (example A) and hierarchical form (example B).

A:

If you combine a hierarchy with a structure but do not choose *Display as Hierarchy*, a column and a row are used for both the hierarchy and the structure.

B:

With the hierarchy display, the hierarchy appears with the structure in a column or a row.

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Exercise 9: Integrating Hierarchies into Reports

Exercise Objectives

After completing this exercise, you will be able to:

- Display characteristics and key figures in a hierarchy
- Include external hierarchies in your reports
- Define how the hierarchy displays in the report
- Combine hierarchies and structures
- Restrict characteristics to hierarchy nodes

Business Example

You can increase the clarity of your reports by arranging several characteristics and key figures hierarchically within the reports. You want to use an external hierarchy to analyze the characteristic values of the material. You need to combine a key figure structure with this hierarchy for use in this analysis.

Task 1:

You want to display an overview of specific sales volumes for the sales groups within individual sales organizations in your report. To structure the report clearly, display the characteristics *Sales Organization, Sales Office,* and *Sales Group* as a hierarchy.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   In the Columns, include the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   Transfer the characteristics *Sales Organization (0PLANT__0SALESORG), Sales Office (0SALES_OFF)* and *Sales Group (0SALES_GRP)* to the Rows in that sequence.

   Enable navigation by month in the report using *Cal. Year/Month (0CALMONTH)* in the Free Characteristics area.

2. Display the characteristics in the Rows as a hierarchy.

   Afterwards save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Integrating Hierarchies into Reports→ Exercises*

   Description: **`GR## BW305 Hierarchy 1`**

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Technical name: **BW30511A##**

Finally execute the query.

Task 2:

In another report, you want to display the materials with their sales volumes as a hierarchy (*Product Hierarchy for Material MARA (PRDHA)*). You also want to see the sales volumes for specific customers and display these with the relevant materials.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   In the Columns, include the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   Transfer the *Material (0MATERIAL)* characteristic into the Rows.

   Enable navigation in the report by month, for the months January 2001 to March 2001.

2. Display the material as a hierarchy using the *Product Hierarchy for Material MARA (PRDHA)*.

   For the report display, specify that the hierarchy is sorted by text and in descending order.

   Make the relevant settings so that when the query is executed, the hierarchy is expanded to level four, and the lower-level nodes are positioned below (Down) the upper-level nodes.

   Display the values of posted nodes and suppress those with only one value.

   Save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Integrating Hierarchies into Reports → Exercise*.

   Description: **GR## BW305 Hierarchy 2**

   Technical name: **BW30511B##**

   Now execute the query and view the results.

3. Open the query definition and Drag&Drop the *Sold-to party* characteristic into the Rows below the characteristic *Material*.

   Display the Rows as a hierarchy.

   Save the query and then execute it again.

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In the report, expand the hierarchy nodes to customer level and include the selected month in the horizontal drilldown.

Task 3:

To analyze sales volumes and profits that you have reached with your materials in the first and second quarters of the year 2001, you want to combine a display hierarchy with a structure.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW 305 Reporting→ Sales and Distribution* InfoArea.

   Transfer the characteristic *Material (0MATERIAL)* into the Rows.

   Display the material as a hierarchy using the *Product Hierarchy for Material MARA* hierarchy.

2. Create a key figure structure in the **Rows** that contains *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   Create a formula, **`Deviation`** for that structure that calculates the difference between the *Sales Volume EUR (T_INVCD_V)* and the *Sales Volume (MC) (0INVCD_CST)*.

   Display *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC)* as sub-items of the calculated key figure **`Deviation`** .

   The key figure structure is to be positioned under the *Material* characteristic.

3. As an additional characteristic, transfer *Cal. Year/Quarter (0CALQUARTER)* using Drag&Drop into the Rows below the key figure structure. Restrict the characteristic to the first and second quarters of 2001.

   Save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Integrating Hierarchies into Reports→ Exercise*

   Description: **`GR## BW305 Hier. and Structures 1`**

   Technical name: **`BW30511C##`**

   Now execute the query, and view the results by navigation through the different hierarchy types.

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Task 4:

You want to compare the various display formats for the report that you have just created. Copy the query that you defined and choose the hierarchical display for the Rows. Then select the node *Vehicles* for Material.

1. Save the query *GR##BW305 Hier. and Structures 1* under the new name

   Description: **GR## BW305 Hier. and Structures 2**

   Technical name: **BW30511D##**

   In the new query definition, display the Rows hierarchically.

   Restrict the material to the node *Vehicles*.

   Save the query and execute it. Compare the appearance of the two display formats.

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Solution 9: Integrating Hierarchies into Reports

Task 1:

You want to display an overview of specific sales volumes for the sales groups within individual sales organizations in your report. To structure the report clearly, display the characteristics *Sales Organization, Sales Office,* and *Sales Group* as a hierarchy.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   In the Columns, include the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   Transfer the characteristics *Sales Organization (0PLANT__0SALESORG), Sales Office (0SALES_OFF)* and *Sales Group (0SALES_GRP)* to the Rows in that sequence.

   Enable navigation by month in the report using *Cal. Year/Month (0CALMONTH)* in the Free Characteristics area.

   a) To define a new query, open the *Query Designer* from the BEx Analyzer.

      Choose *Tools → Create New Query → New Query→ InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → Open.*

   b) Use Drag&Drop to transfer the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)* into the Columns.

   c) For the characteristics, choose:

      Dimensions → Organization → Sales Organization (0PLANT__0SALE-SORG) and use Drag&Drop to transfer it into the *Rows* .

      Dimensions → Organization → Sales Office (0SALES_OFF) and use Drag&Drop to transfer it into the *Rows*.

      Dimensions → Organization → Sales Group (0SALES_GRP) and use Drag&Drop to transfer it into the *Rows*.

      Dimensions → Time → Cal. Year/Month (0CALMONTH) and use Drag&Drop to transfer it into the *Free Characteristics*.

2. Display the characteristics in the Rows as a hierarchy.

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Afterwards save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Integrating Hierarchies into Reports→ Exercises*

Description: **GR## BW305 Hierarchy 1**

Technical name: **BW30511A##**

Finally execute the query.

a) For the *Row* header, in the *Properties → General → Display as Hierarchy* area , check the box for *Active*.

b) To save the query, choose *Save Query* and save it under your Training BW305 Reporting role.

Unit: Characteristics → Lesson: Integrating Hierarchies into Reports → Exercise

Description: **GR## BW305 Hierarchy 1**

Technical name: **BW30511A##**

c) Execute the query and view the results.

Task 2:

In another report, you want to display the materials with their sales volumes as a hierarchy (*Product Hierarchy for Material MARA (PRDHA)*). You also want to see the sales volumes for specific customers and display these with the relevant materials.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   In the Columns, include the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   Transfer the *Material (0MATERIAL)* characteristic into the Rows.

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Enable navigation in the report by month, for the months January 2001 to March 2001.

a) To define a new query, open the *Query Designer* from the BEx Analyzer.

Choose *Tools → Create New Query → New Query→ InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → Open.*

b) Use Drag&Drop to transfer the basic key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)* into the Columns.

c) For the characteristics, choose:

Dimensions → Material → Material (0MATERIAL) and use Drag&Drop to transfer it into the Rows.

Dimensions → Time → Cal. Year/Month (0CALMONTH) and use Drag&Drop to transfer it into the Free Characteristics.

Go to *Default Values* on the *Filter* tab page. Choose, from the context menu for *Cal. Year/Month→ Restrict → Show: Single Values*, select *1.2001, 2.2001* and *3.2001*, and transfer your selection using the arrow button. Choose *OK*.

2. Display the material as a hierarchy using the *Product Hierarchy for Material MARA (PRDHA)*.

For the report display, specify that the hierarchy is sorted by text and in descending order.

Make the relevant settings so that when the query is executed, the hierarchy is expanded to level four, and the lower-level nodes are positioned below (Down) the upper-level nodes.

Display the values of posted nodes and suppress those with only one value.

Save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Integrating Hierarchies into Reports → Exercise*.

Description: **GR## BW305 Hierarchy 2**

Technical name: **BW30511B##**

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Now execute the query and view the results.

a) In the *Properties* area for the characteristic *Material (0MATERIAL)*, choose the *Hierarchy* tab page.

Hierarchie Selection: *Product Hierarchy for Material MARA (PRDHA)*.

Expand to Level : *4*.

Position of Lower-Level Nodes: *Below*.

Values of Posted Nodes: *Always Show*.

Nodes with Only One Lower-Level Node: *Always Show*.

Sorting: *Sort by* → *Text* and *Sort Direction* → *Descending*.

b) To save the query, choose *Save Query* and save it under your Training Bw305 Reporting role.

Unit: Characteristics → *Lesson: Integrating Hierarchies into Reports* → *Exercise*

Description: **GR## BW305 Hierarchy 2**

Technical name: **BW30511B##**

c) Execute the query and view the results.

3. Open the query definition and Drag&Drop the *Sold-to party* characteristic into the Rows below the characteristic *Material*.

Display the Rows as a hierarchy.

Save the query and then execute it again.

In the report, expand the hierarchy nodes to customer level and include the selected month in the horizontal drilldown.

a) From the BEx Analyzer, choose *Tools* → *Edit Query*. In the query definition choose:

Dimensions → *Customer* → *Sold-to party (T_SOLD_TO)* and Drag&Drop it into the *Rows* area below the characteristic *Material* .

b) For the *Row* header, in the *Properties* → *General* → *Display as Hierarchy* area , check the box for *Active*.

c) Save the query and then execute it again.

d) Drill across using the *Cal. year/month* characteristic.

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Task 3:

To analyze sales volumes and profits that you have reached with your materials in the first and second quarters of the year 2001, you want to combine a display hierarchy with a structure.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW 305 Reporting→ Sales and Distribution* InfoArea.

   Transfer the characteristic *Material (0MATERIAL)* into the Rows.

   Display the material as a hierarchy using the *Product Hierarchy for Material MARA* hierarchy.

   a) To define a new query, open the *Query Designer* from the BEx Analyzer.

      Choose *Tools → Create New Query → New Query→ InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → Open.*

   b) *Dimensions → Material → Material (0MATERIAL)* and use Drag&Drop to transfer it into the Rows.

   c) In the *Properties* area for the characteristic *Material (0MATERIAL)*, choose the *Hierarchy* tab page.

      Selected Hierarchy: *Product Hierarchy for Material MARA (PRDHA)*.

2. Create a key figure structure in the **Rows** that contains *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)*.

   Create a formula, **`Deviation`** for that structure that calculates the difference between the *Sales Volume EUR (T_INVCD_V)* and the *Sales Volume (MC) (0INVCD_CST)*.

   Display *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC)* as sub-items of the calculated key figure **`Deviation`** .

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The key figure structure is to be positioned under the *Material* characteristic.

a) Use Drag&Drop to move the key figures *Sales Volume EUR (T_INVCD_V)* and *Sales Volume (MC) (0INVCD_CST)* into the *Rows* area under the *Material* characteristic, the key figure structure is created automatically.

b) To define the new formula **`Deviation`** in the key figure structure, choose:

Context menu of structure → New Formula

Description: **`Deviation`**

c) Use Drag&Drop to transfer *Sales Volume EUR (T_INVCD_V) → Minus → Sales Volume (MC) (0INVCD_CST)* into the *Detail View* field, and choose *OK*.

d) Use Drag&Drop to transfer the calculated key figure *Deviation* to the first place in the key figure structure.

Drag both *Sales Volume EUR* and *Sales Volume (MC)* **onto** the calculated key figure *Deviation* in order to display them as sub-items.

3. As an additional characteristic, transfer *Cal. Year/Quarter (0CALQUARTER)* using Drag&Drop into the Rows below the key figure structure. Restrict the characteristic to the first and second quarters of 2001.

Save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Integrating Hierarchies into Reports→ Exercise*

Description: **`GR## BW305 Hier. and Structures 1`**

Technical name: **`BW30511C##`**

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Now execute the query, and view the results by navigation through the different hierarchy types.

a) *Dimensions → Time → Cal. Year/Quarter (0CALQUARTER)* and use Drag&Drop to transfer it into the Rows below the key figure structure.

b) Restrict *Cal. Year/Quarter (0CALQUARTER)* to the single values **1.2001** and **2.2001**.

c) To save the query, choose *Save Query* and save it under your Training BW305 Reporting role.

Unit: Characteristics → Lesson: Integrating Hierarchies into Reports → Exercise

Description: **GR## BW305 Hier. and Structures 1**

Technical name: **BW30511C##**

d) Execute the query, and view the results by navigation through the different hierarchy types.

Task 4:

You want to compare the various display formats for the report that you have just created. Copy the query that you defined and choose the hierarchical display for the Rows. Then select the node *Vehicles* for Material.

1. Save the query *GR##BW305 Hier. and Structures 1* under the new name

   Description: **GR## BW305 Hier. and Structures 2**

   Technical name: **BW30511D##**

   In the new query definition, display the Rows hierarchically.

   Restrict the material to the node *Vehicles*.

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Save the query and execute it. Compare the appearance of the two display formats.

a) Go back to the query definition *GR##BW305 Hier. and Structures 1* and choose *Query → Save As*.

Description: **GR## BW305 Hier. and Structures 2**

Technical name: **BW30511D##**

b) For the *Row* header, in the *Properties → General → Display as Hierarchy* area , check the box for *Active*.

c) To restrict the hierarchy to the node *Vehicles*, go to *Default Values* on the *Filter* tab page. From the context menu for *Material→ Restrict → Show: Single Values → Hierarchy: Product Hierarchy for Material MARA (PRDHA)*, select the node *Vehicles*, and transfer your selection using the arrow button. Choose *OK*.

d) Save the query and execute it and compare the appearance of the two display formats.

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Lesson Summary

You should now be able to:

- Display characteristics and key figures in a hierarchy
- Include external hierarchies in your reports
- Define how the hierarchy is displayed in the report
- Combine hierarchies and structures
- Restrict characteristics to hierarchy nodes

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Lesson: Creating User-defined Hierarchies

Lesson Overview

This lessons covers creating user-defined hierarchies in *SAP BI*. It also deals with time-dependent hierarchy structures and linked nodes for use in creating hierarchies.

Lesson Objectives

After completing this lesson, you will be able to:

- Define your own hierarchies in SAP BI
- Create time-dependent hierarchy structures
- Use link nodes in the hierarchy definition

Business Example

Along with external hierarchies that are loaded from the source systems, you may also need to include user-defined hierarchies in you reports. The hierarchy structures that you require are time-dependent so that they can portray restructuring in reports.

Hierarchy Components

A hierarchy gives an overview and the structure of a characteristic according to specific evaluation criteria.

Nodes

A hierarchy is made up of nodes. The relationship between the nodes is defined as follows:

- The uppermost node is the root.
- There can be several roots.
- Each node (except for the uppermost node) is assigned to one super-ordinate node.
- There is a distinction between postable and non-postable nodes.

Hierarchy Levels

All nodes that are on the same level in a hierarchy (nodes that are the same distance away from the root) form a hierarchy level. The root of a hierarchy forms the first level. The level of a node denotes the distance of the node from the root.

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Leaves

Hierarchy leaves contain the characteristic values for the basic characteristic and can therefore have entries in the fact table. In contrast to postable nodes, a leaf cannot have any subordinate nodes.

Intervals

Intervals contain a number of leaves that belong together, described by their upper and lower limits. You can create them for a node that has more than one leaf. By defining intervals, new characteristic values that are added to the master data automatically become assigned to the interval if the characteristic value is included in the interval range.

Basic Characteristic

You can create hierarchies only for those characteristics that do not relate to another characteristic.

Creating User-defined Hierarchies

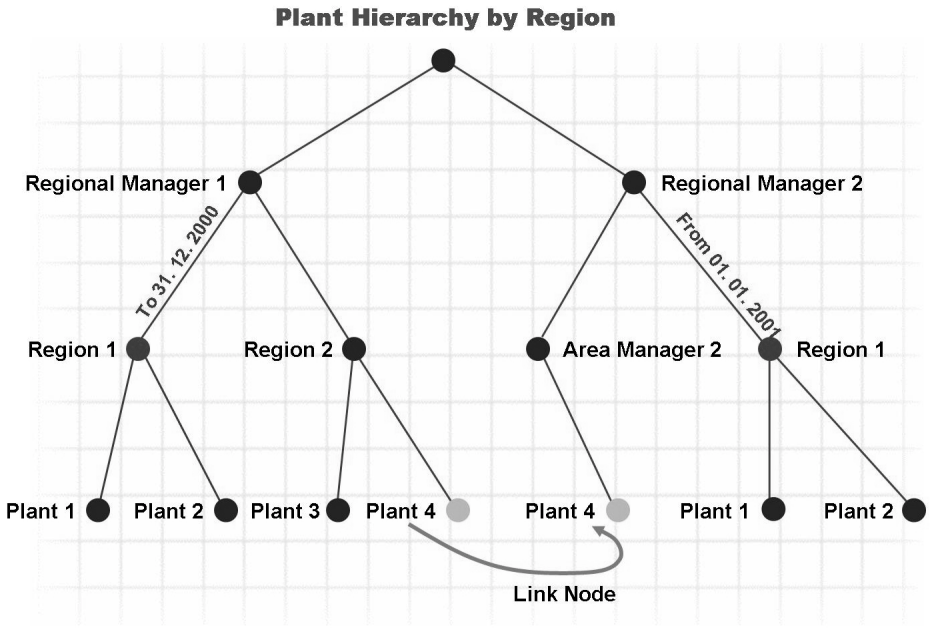

Figure 49: Creating User-defined Hierarchies 1

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As a prerequisite for creating hierarchies, in the InfoObject maintenance for the characteristic concerned, you have to set the *With Hierarchies* indicator, which states that the characteristic can have hierarchies. You also have to determine whether the hierarchy or hierarchy structure can be time-dependent, or whether versions can be created for it.

GR00 Customer Hierarchy by Region	Link Indicator	Valid From	Valid To
Customer Hierarchy by Region	☐	01.01.2000	31.12.9999
Regional Manager 1	☐	01.01.2000	31.12.9999
Greater London	☐	01.01.2000	31.12.9999
Bavaria	☐	**01.01.2000**	**31.12.2000**
Regional Manager 2	☐	01.01.2000	31.12.9999
Area Manager	☐	01.01.2000	31.12.9999
GM Store M313	☑	01.01.2000	31.12.9999
GM Store M312	☑	01.01.2000	31.12.9999
California	☐	01.01.2000	31.12.9999
GM Store M313	☐	01.01.2000	31.12.9999
GM Store M312	☐	01.01.2000	31.12.9999
Regional Manager 3	☐	01.01.2000	31.12.9999
Bavaria	☐	**01.01.2001**	**31.12.9999**

Figure 50: Creating User-defined Hierarchies 2

Hierarchy nodes appear twice in the hierarchy when nodes that have the same technical key and that appear more than once are leaves (postable nodes without lower-level nodes), and when they are not attached to the same super-ordinate node.

You can then either set the nodes as **link nodes** or make the **hierarchy structure time-dependent** and specify that the time intervals of all duplicate nodes with the same technical key do not overlap.

Link Nodes

You use link nodes to include a sub-tree in a hierarchy more than once. The name, the InfoObject and, if necessary, the from/to date fields of the nodes are identical. However, the link node is only a link to the original node that you cannot change independently. Link nodes cannot have their own lower-level nodes. They take on the lower-level nodes of the original node. These lower-level nodes do not display in the hierarchy maintenance.

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Creating User-defined Hierarchies

1. Call the *Administrator Workbench* and, under *Modeling*, choose the InfoObject tree.
2. Highlight the characteristic for which you want to create a hierarchy and, from the context menu, choose *Create Hierarchy*.
3. In the dialog box, enter the technical name of the hierarchy, the hierarchy version (if necessary), the time base, and at least a short description for the hierarchy. Once you have confirmed your entries, the *Maintain Hierarchy* screen appears.
4. To create nodes and leaves, choose the relevant pushbutton for the node that you want to create. You can choose from text nodes, characteristic nodes of external characteristics, leaves of the basic characteristic of the hierarchy, or intervals.

   Postable nodes (characteristic nodes of the basic characteristic in the hierarchy, intervals) are symbolized by the green *InfoObject* icon. Non-postable nodes (text nodes, external characteristic nodes) are symbolized by the yellow *InfoObject* icon or by the file folder icon.

   Note: You can arrange the nodes as you wish beneath one another as far as interval level. You cannot attach any additional nodes under intervals.
5. Repeat this step until you have determined the final hierarchy structure.
6. Save and activate your hierarchy.

Reporting-relevant Settings in the Hierarchy Maintenance

You have various options for hierarchy settings in the hierarchy maintenance.

Level Maintenance

A level encompasses all nodes in a hierarchy that are at the same stage in the drilldown. You can use *Level Maintenance* to determine names for the different levels of a hierarchy. These names are then used in the context menu of the query during navigation.

Hierarchy Attributes

You can set the presentation parameters for the hierarchy display in the query using *Hierarchy Attributes*.

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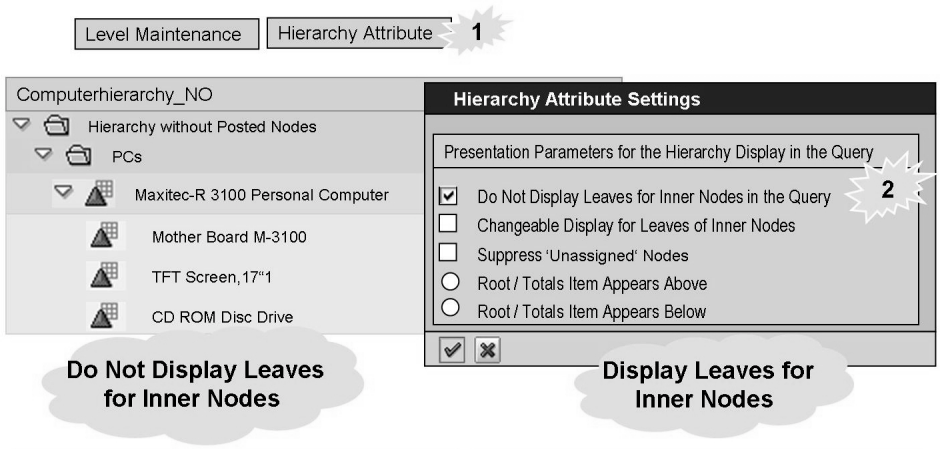

Material	Sales Volume in EUR
▽ T_COMPHIERKNOTEN_NO	1.697.115,88 EUR
▽ T_PCS	1.697.115,88 EUR
▽ R-1001	1.697.115,88 EUR
R-1111	396,30 EUR
R-1140	846.837,15 EUR
R-1180	16.807,50 EUR

Material	Sales Volume in EUR
▽ T_COMPHIERKNOTEN_YES	1.697.115,88 EUR
▽ T_PCS	1.697.115,88 EUR
▽ R-1001	1.697.115,88 EUR
R-1001	833.074,93 EUR
R-1111	396,30 EUR
R-1140	846.837,15 EUR
R-1180	16.807,50 EUR

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Figure 51: Showing/Hiding the Values of Posted Nodes

- **Do Not Display Inner Nodes in the Query**

  There are various display options for an inner, postable node, that is, an inner node that has subordinate postable nodes (lower-level nodes). You can either create a leaf for each inner node and insert it directly underneath the inner node, or choose not to display the additional nodes.

- **Changeable Display for Leaves of Inner Nodes**

  You can determine whether the user is able to change the display for the runtime of the query. The following values are possible:

  ' ': The display cannot be changed in the query.

  'X': The display can be changed in the query.

- **Suppress Unassigned Node**

  Here you can specify whether to suppress the node under which all postable characteristic values that do not appear in the hierarchy display.

- **Root/Totals Item Appears ....**

  You can determine whether the root and therefore, the totals item display at the end or start of the query and whether the leaves appear above or below.

- **Start Drilldown Level**

  You can set the default level to which the hierarchy is drilled down when you first call up the query. You can overwrite this setting in the query definition.

Hierarchy Properties on InfoObject Level

Hierarchies setting must be defined for the characteristic on which it is based. It is important you are familiar with these setting before you define a new hierarchy structure as the setting may limit what you are able to achieve. The settings are part of the meta data for the characteristic and so you access these from the InfoObject maintenance screen (use RSA1 or RSD1) and then navigate to the *Hierarchy* tab.

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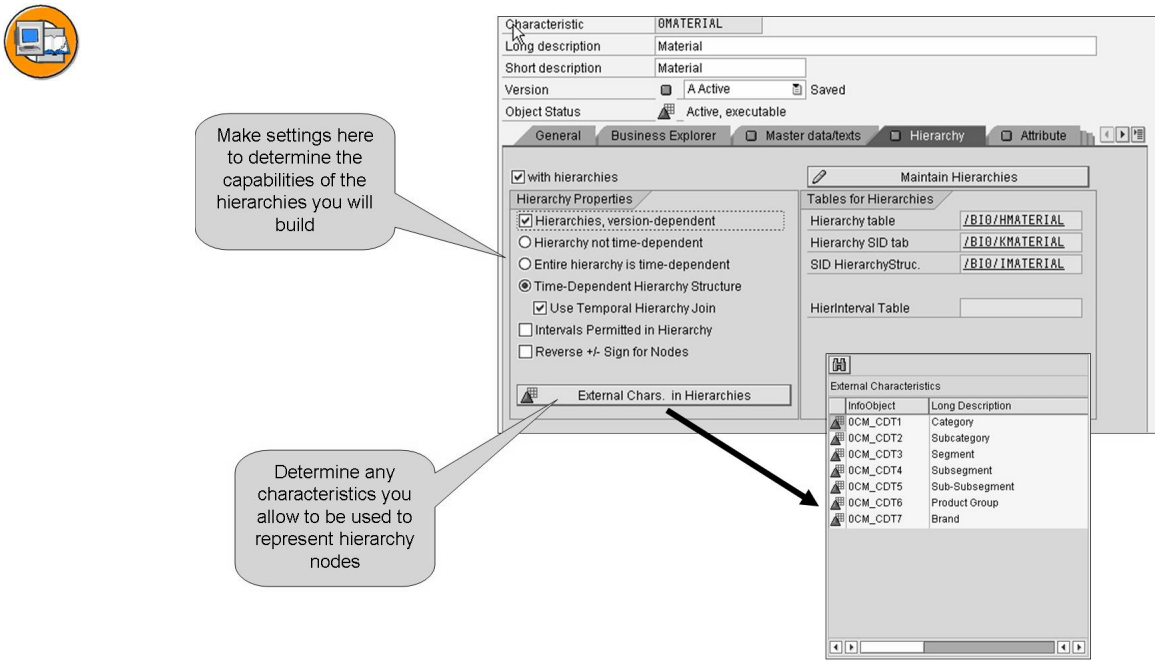

Figure 52: Hierarchy Properties set in the InfoObject definition

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The settings are:

- Hierarchies Version Dependant

  Check this box if you want to maintain different versions of the hierarchies. When you define each hierarchy you will need to supply a version identifier. This means whenever you select hierarchies in a query you are able to choose from the available versions.

- Hierarchies Not Time Dependant

  Select this radio button if you don't need to store the changes to the structure over time.

- Entire Hierarchy is Time Dependant

  Select this radio button if you want to define hierarchy structures in relation to time intervals. When you develop a query which uses the hierarchy you can also select the hierarchy valid for a specific date.

- Time Dependant Hierarchy Structure

  Select this radio button if you want to be able to define the individual nodes in relation to time intervals. When you develop a query which uses the hierarchy you can also select the hierarchy nodes valid for a specific date.

- Use Time Dependant Temporal Join

  If members appear in more than one node over a time period (i.e. a person is reassigned to a new team) then a check in this box will ensure you are able to report on these movements in the same result.

- Interval Permitted In Hierarchy

  Sometimes is more efficient to use intervals to specify the members of the hierarchy nodes. i.e. cost centers 1000 to 1999 = New Hire Costs, rather than defining members individually (a lot of work and ongoing maintenance). Any new cost centers you later add within the range will automatically be included in the hierarchy.

- Reverse +/- Sign for the Node

  Check this box if it makes sense to present the key figures with the sign reversed. This is purely a presentation feature and does not alter the actual value of the key figure.

Make sure you have maintained each valid characteristic you want to use to represent the node. i.e for material you may choose material group or material type. When you are developing the hierarchy structure only these characteristics will appear in the list of valid choices for characteristic nodes.

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Exercise 10: Creating User-defined Hierarchies

Exercise Objectives

After completing this exercise, you will be able to:

- Define your own hierarchies in the Business Information Warehouse (BW)
- Create time-dependent hierarchy structures
- Use link nodes in the hierarchy definition

Business Example

You require a hierarchy defined in *SAP BW* for analyzing your customer data. The hierarchy needs to have a time-dependent hierarchy structure in order to portray changes in the areas of responsibility for the sales managers.

Task 1:

You want to define a hierarchy for the Sold-to Party (T_SOLD_TO) InfoObject in which your customers are assigned to a sales managers according to region. You have to show any restructuring by using a time-dependent hierarchy structure.

1. Create a hierarchy for InfoObject *Sold-to Party (T_SOLD_TO)* with the following details:

   Hierarchy name: **`BW30512A##`**

   Description: **`GR## Customer Hier.`**

   Medium and long description: **`GR## Customer Hierarchy by Region`**

2. Create a text node as the uppermost node in the hierarchy:

   Text node for customer hierarchy by region:

   Hierarchy node: **`HIERKN1##`**

   Description: **`GR## Cust. Hier. Reg.`**

   Medium and long description: **`GR## Customer Hierarchy by Region`**

   Specify a *Validity period* from **`1.1.2000`** to **`31.12.9999`**.

   Then add the following **two** text nodes with these descriptions beneath the uppermost node:

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Text node for regional manager 1:

Hierarchy node: **HIERKN2##**

Short description: **Regional Manager 1**

Medium and long description: **Regional Manager 1**

Specify a validity period from **1.1.2000** to **31.12.9999**.

Text node for regional manager 2:

Hierarchy node: **HIERKN3##**

Short description: **Regional Manager 2**

Medium and long description: **Regional Manager 2**

Specify a validity period from **1.1.2000** to **31.12.9999**

3. Under the text node *Regional Manager 1*, add the following *Regions (0REGION)* as characteristic nodes:

   North Rhine Westfalia (DE 05) and *Bavaria (DE 09)*.

   Use the filter function to select the region to filter the country to Germany.

4. Under the *Regional Manager 2* text node, add the following *Regions (0REGION)* as characteristic nodes:

   Rhineland-Palatinate (DE 07) and *Bavaria (DE 09).* Create Copy Nodes for any nodes detected by the system as duplicates.

   Use the filter function to select the region to filter the country to *DE*.

   Hint: Specify a validity period from 1.1.2000 to 31.12.2000 for the Bavaria region under Regional Manager 1 and specify a different validity period from 1.1.2001 to 31.12.9999 for the Bavaria region under Regional Manager 2!

5. To add the customers, highlight the relevant region and choose *'Sold-to Party' Insert*.

   Restrict the list to the relevant region and add all customers for the filtered region.

6. *Regional Manager 1* is supported by an area manager, who manages as well the customers from *North Rhine Westfalia DE 05*. Include these customers as link nodes.

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The area manager is to be specified as follows:

Hierarchy node: **HIERKN4##**

Short description: **Area Manager 1**

Medium and long descriptions: **Area Manager 1**

Valid from: **01.01.2000**

Valid to: **31.12.9999**

7. In the *Hierarchy Attributes*, specify that the *Unassigned Node* should be suppressed in the report and as default value the *Drilldown Start Level* **02**.

   Finally save and activate your hierarchy.

Task 2:

You want to use the hierarchy that you defined, *GR## Customer Hier.*, in your report about customers to display the sales volumes of the customers.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting → Sales and Distribution* InfoArea.

   Transfer the basic key figure *Sales Volume EUR (T_INVCD_V)* into the Columns.

   Transfer the characteristic *Sold-to Party (T_SOLD_TO)* into the Rows.

   Display the customer as a hierarchy using the hierarchy *GR## Customer Hier.* .

2. Save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Creating User-defined Hierarchies → Exercise*.

   Description: **GR## BW305 Customers by Region**

   Technical name: **BW30512C##**

   After saving, execute the query.

   Be aware of the results concerning the assignment of the region *Bavaria (09)* and the effect of defining Link Nodes for the customers assigned to *North Rine Westfalia / Regional Manager 1* as well as to *Area Manager 1*.

3. Compare the result of the report, if the key date for the query is 02.02.2000. What is the effect on the assignment of the region *Bavaria (09)* and why?

   _____

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Solution 10: Creating User-defined Hierarchies

Task 1:

You want to define a hierarchy for the Sold-to Party (T_SOLD_TO) InfoObject in which your customers are assigned to a sales managers according to region. You have to show any restructuring by using a time-dependent hierarchy structure.

1. Create a hierarchy for InfoObject *Sold-to Party (T_SOLD_TO)* with the following details:

   Hierarchy name: **BW30512A##**

   Description: **GR## Customer Hier.**

   Medium and long description: **GR## Customer Hierarchy by Region**

   a) From the *SAP BI* main menu, call *Data Warehousing Workbench: Modeling* and, from the *Modeling* area, select *InfoObjects*.

   b) Search for the InfoObject *Sold-to Party (T_SOLD_TO)* and choose *Create Hierarchy* from the context menu.

   c) Enter the following descriptions:

      Hierarchy name: **BW30512A##**

      Short description: **GR## Customer Hier.**

      Medium and long description: **GR## Customer Hierarchy by Region**

      Choose *Enter*.

2. Create a text node as the uppermost node in the hierarchy:

   Text node for customer hierarchy by region:

   Hierarchy node: **HIERKN1##**

   Description: **GR## Cust. Hier. Reg.**

   Medium and long description: **GR## Customer Hierarchy by Region**

   Specify a *Validity period* from **1.1.2000** to **31.12.9999**.

   Then add the following **two** text nodes with these descriptions beneath the uppermost node:

   Text node for regional manager 1:

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Hierarchy node: **HIERKN2##**

Short description: **Regional Manager 1**

Medium and long description: **Regional Manager 1**

Specify a validity period from **1.1.2000** to **31.12.9999**.

Text node for regional manager 2:

Hierarchy node: **HIERKN3##**

Short description: **Regional Manager 2**

Medium and long description: **Regional Manager 2**

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Specify a validity period from **1.1.2000** to **31.12.9999**

a) Choose *Text Node*.

When prompted, make the following entries:

Hierarchy node: **HIERKN1##**

Short description: **GR## Cust. Hier. Reg.**

Medium and long descriptions: **GR## Customer Hierarchy by Region**

Valid from: **01.01.2000**

Valid to: **31.12.9999**

b) Highlight the text node *GR## Customer Hierarchy by Region* and choose *Create Text Node* again.

When prompted, make the following entries:

Hierarchy node: **HIERKN2##**

Short description: **Regional Manager 1**

Medium and long descriptions: **Regional Manager 1**

Valid from: **01.01.2000**

Valid to: **31.12.9999**

c) Highlight the text node *GR## Customer Hierarchy by Region* and choose *Create Text Node* again.

When prompted, make the following entries:

Hierarchy node: **HIERKN3##**

Short description: **Regional Manager 2**

Medium and long descriptions: **Regional Manager 2**

Valid from: **01.01.2000**

Valid to: **31.12.9999**

3. Under the text node *Regional Manager 1*, add the following *Regions (0REGION)* as characteristic nodes:

North Rhine Westfalia (DE 05) and *Bavaria (DE 09)*.

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Use the filter function to select the region to filter the country to Germany.

a) Highlight the text node *Regional Manager 1* and choose *Create Characteristic Nodes*.

Enter **0REGION** as the InfoObject.

From the list, choose the filter function. .

For the country, enter **DE** and confirm the entry by choosing the check mark.

Choose *05* for *North Rhine Westfalia* and *09* for *Bavaria*, and confirm.

4. Under the *Regional Manager 2* text node, add the following *Regions (0REGION)* as characteristic nodes:

Rhineland-Palatinate (DE 07) and *Bavaria (DE 09)*. Create Copy Nodes for any nodes detected by the system as duplicates.

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Use the filter function to select the region to filter the country to *DE*.

Hint: Specify a validity period from 1.1.2000 to 31.12.2000 for the Bavaria region under Regional Manager 1 and specify a different validity period from 1.1.2001 to 31.12.9999 for the Bavaria region under Regional Manager 2!

a) Highlight the *Regional Manager 2* text node and choose *Create Characteristic Nodes*.

Enter **`0REGION`** as the InfoObject.

From the list, choose the filter function .

Enter **`DE`** for the country. Confirm the entry by choosing the check mark.

Choose *07* for *Rhineland-Palatinate* and *09* for *Bavaria* . Confirm your selection.

In the *Warning: Duplicate Nodes* dialog box, choose that you want to **Copy the duplicate node**.

b) Double-click the node *Bavaria* under *Regional Manager 1* and make the validity period **`01.01.2000`** to **`31.12.2000`**.

If you are prompted with the *Warning: Duplicate Nodes* dialog box, choose that you want to **Copy the duplicate node**.

Double-click the node *Bavaria* under *Regional Manager 2* and make the validity period **`01.01.2001`** to **`31.12.9999`**

5. To add the customers, highlight the relevant region and choose *'Sold-to Party' Insert*.

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Restrict the list to the relevant region and add all customers for the filtered region.

a) Under *Regional Manager 1*, highlight the region *North Rhine Westfalia* and choose *'Sold-to Party' Insert*.

Filter to the country *DE* and the region *05* using the input help and, using *Select All* , choose all customers. Choose *Copy*.

b) Under *Regional Manager 1*, highlight the region *Bavaria* and choose *'Sold-to Party' Insert*.

Filter to the country *DE* and region *09* using the input help and, using *Select All* , select all customers. Choose *Copy*.

c) Under *Regional Manager 2*, highlight the region *Rhineland-Palatinate* and choose *'Sold-to Party' Insert*.

Filter to the country *DE* and region *07* using the input help and, using *Select All* , select all customers. Choose *Copy*.

d) Under *Regional Manager 2*, highlight the region *Bavaria* and choose *'Sold-to Party' Insert*.

Filter to the country *DE* and region *09* using the input help and, using *Select All* , select all customers. Choose Copy.

In the *Warning: Duplicate Nodes* dialog box, choose that you want to copy the duplicate node. Also set the indicator for *Execute Action for All Duplicate Nodes.*

6. *Regional Manager 1* is supported by an area manager, who manages as well the customers from *North Rhine Westfalia DE 05*. Include these customers as link nodes.

The area manager is to be specified as follows:

Hierarchy node: **`HIERKN4##`**

Short description: **`Area Manager 1`**

Medium and long descriptions: **`Area Manager 1`**

Valid from: **`01.01.2000`**

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Valid to: **31.12.9999**

a) Highlight the *Regional Manager 1* text node and choose *Create Text Node* again.

b) When prompted, make the following entries:

Hierarchy node: **HIERKN4##**

Short description: **Area Manager 1**

Medium and long descriptions: **Area Manager 1**

Valid from: **01.01.2000**

Valid to: **31.12.9999**

c) Highlight the new text node and choose *'Sold-to Party' Insert*.

Filter to the country *DE* and the region *05* using the input help and, using *Select All* , choose all customers. Choose *Copy*.

In the *Warning: Duplicate Nodes* dialog box, choose that you want to transfer the duplicate nodes as **Link Nodes** and also set the indicator for *Execute Action for All Duplicate Nodes*.

7. In the *Hierarchy Attributes*, specify that the *Unassigned Node* should be suppressed in the report and as default value the *Drilldown Start Level* **02**.

Finally save and activate your hierarchy.

a) Go to the *Hierarchy Attributes* button, and activate the setting *Suppress Unassigned Node*and specify the *Drill down Start Level* by entering **02**.

b) Save and activate your hierarchy.

Task 2:

You want to use the hierarchy that you defined, *GR## Customer Hier.*, in your report about customers to display the sales volumes of the customers.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting → Sales and Distribution* InfoArea.

Transfer the basic key figure *Sales Volume EUR (T_INVCD_V)* into the Columns.

Transfer the characteristic *Sold-to Party (T_SOLD_TO)* into the Rows.

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Display the customer as a hierarchy using the hierarchy *GR## Customer Hier.* .

a) To define a new query, open the *Query Designer* and choose *New Query*.

Choose *InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → Open.*

b) Transfer the basic key figure *Sales Volume EUR (T_INVCD_V)* into the Columns using Drag&Drop.

Transfer the characteristic *Sold to party (T_SOLD_TO)* from the *Customer* dimension into the Rows using Drag&Drop.

c) In the *Properties* area for the characteristic *Sold to party (T_SOLD_TO)*, choose the *Hierarchy* tab page.

Selected Hierarchy: *GR## Customer Hier.*.

2. Save the query in your Training BW305 Reporting role under *Unit: Characteristics → Lesson: Creating User-defined Hierarchies → Exercise*.

Description: **`GR## BW305 Customers by Region`**

Technical name: **`BW30512C##`**

After saving, execute the query.

Be aware of the results concerning the assignment of the region *Bavaria (09)* and the effect of defining Link Nodes for the customers assigned to *North Rine Westfalia / Regional Manager 1* as well as to *Area Manager 1*.

a) To save the query, choose *Save Query* and save it under your role.

Unit: Characteristics → Lesson: Creating User-defined Hierarchies→ Exercise

Description: **`GR## BW305 Customers by Region`**

Technical name: **`BW30512C##`**

b) Execute the query, and be aware of the results concerning the assignment of the region *Bavaria (09)* and the effect of defining Link Nodes for the customers assigned to *North Rine Westfalia / Regional Manager 1* as well as to *Area Manager 1*.

3. Compare the result of the report, if the key date for the query is 02.02.2000. What is the effect on the assignment of the region *Bavaria (09)* and why?

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a) Go back into the query definition.

b) Go to the *Properties* area and, for the query *GR## BW305 Customers by Region*, specify the *Key Date* **02.02.2000**.

c) Save and execute the query again.

d) In the executed report, the region *Bavaria (09)* is now, due to the *Key Date*, assigned to the *Regional Manager 1* within the Time Dependent Hierarchy Structure *GR## Customer Hier.*.

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Lesson Summary

You should now be able to:

- Define your own hierarchies in SAP BI
- Create time-dependent hierarchy structures
- Use link nodes in the hierarchy definition

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Unit Summary

You should now be able to:

- Describe the various properties of characteristics and their use in adjusting reports to your requirements
- Demonstrate the benefit of using display attributes to describe characteristics in more detail
- Describe the difference between using display attributes and navigation attributes
- Display characteristics and key figures in a hierarchy
- Include external hierarchies in your reports
- Define how the hierarchy is displayed in the report
- Combine hierarchies and structures
- Restrict characteristics to hierarchy nodes
- Define your own hierarchies in SAP BI
- Create time-dependent hierarchy structures
- Use link nodes in the hierarchy definition

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Unit 6

Variables

Unit Overview

This lesson identifies the different types of variables and their various processing types. The lesson also describes how to create variables using the variable Wizard. Examples of variables that are delivered with Business Content are presented.

Unit Objectives

After completing this unit, you will be able to:

- Describe how variables can be used for defining more flexible reports
- Describe the different types of variables
- Create different types of variables using the Variable Dialog
- Use variables that are delivered with Business Content in your query definition
- Use a Pre-Query to deliver values for variables in a Result-Query

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Lesson: Variables

Lesson Overview

This lesson deals with the different types of variables and their various processing types.

It describes how to create variables using the Variable Wizard.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe how variables can be used for defining more flexible reports
- Describe the different types of variables
- Create different types of variables using the Variable Dialog
- Use variables that are delivered with Business Content in your query definition
- Use a Pre-Query to deliver values for variables in a Result-Query

Business Example

You want to use flexible reports in your company with free selection of characteristic values. In order to do this, you have to define variables using the Variable Wizard. By including text variables that are filled using the replacement path, you receive detailed information in your reports.

Using Variables

Variables are query parameters that you define in the Query Designer and that are filled with values only when you execute the query or Web application.

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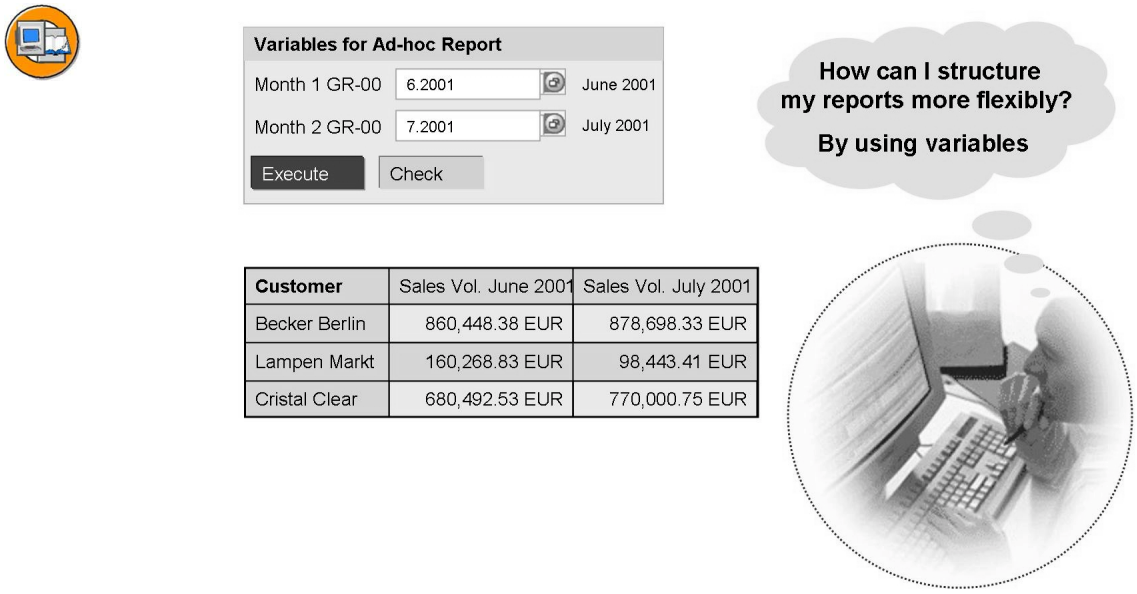

Figure 53: Creating Queries with Variables

Variables act as placeholders for:

- Characteristic values
- Hierarchies
- Hierarchy nodes
- Texts
- Formula elements

Variables are **reusable objects**.

The variables defined in the Query Designer are available in all InfoProviders for use in query definition. Variables do not depend on the InfoProvider, but rather on the InfoObject for which they were created.

Variables enable you to set queries more flexibly (query parameterization). When using variables in the Query Designer, you do not choose fixed characteristic values, hierarchies, hierarchy nodes, texts, or formula elements, but rather you set variables as placeholders. These placeholders are then filled with values at query runtime (when you insert the query into a workbook, when you refresh a workbook or when you launch the query on the Web). If you use variables, a query definition can then serve as the basis for many different queries.

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Processing Type:	Variable Type: Characteristic Value Variables	Hierarchy Node Variables	Text Variables	Formula Variables	Hierarchy Variables
Manual Entry / Default Value	X	X	X	X	X
Replacement Path	(X)*		X	X	
Customer Exit	X	X	X	X	X
SAP Exit	X	X	X	X	X
Authorization	X	X			

* Only in conjunction with the replacement path 'Query Result'

Figure 54: Processing Types for the Different Types of Variables

Variable Types

There are different variable types, depending on the object (for example, characteristic, formula) for which the variable is defined as a placeholder.

Characteristic Value Variables

When selecting characteristic values in the query definition, you can select variables instead of fixed values. These variables, which act as placeholders, are filled with values when you execute the query. You can use variables to select single values and value ranges.

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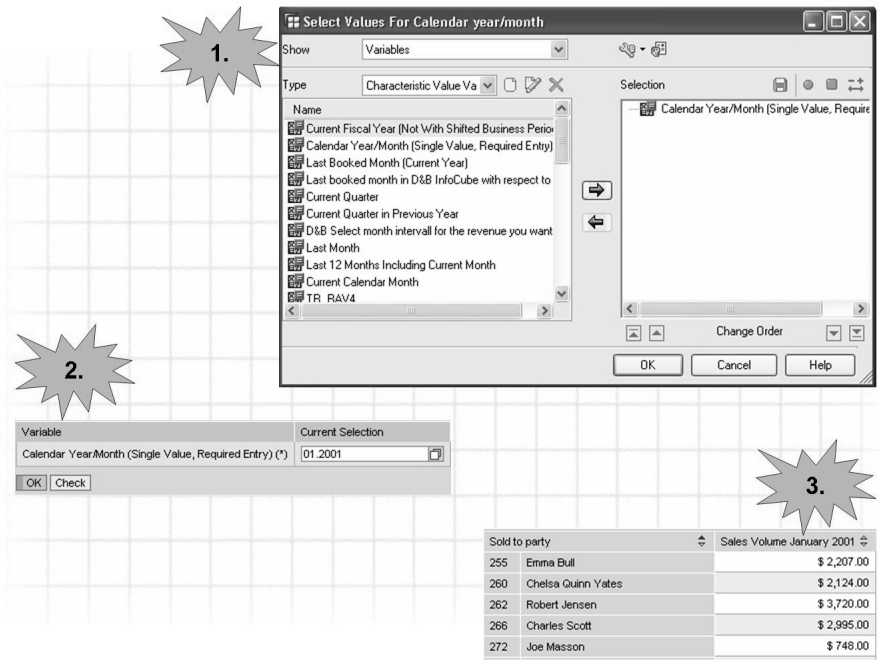

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Figure 55: Characteristic Value Variable

1. **Selecting Single Value Variables**

   From the context menu of the characteristic, choose *Restrict*. The dialog box for selecting characteristic values appears.

   Select the *Variables*option from the *Show*drop down list and then transfer the required variables using Drag&Drop or the *Arrow* button.

2. **Selecting Single Value Variables as Variable Value Range Limits**

   In the dialog box for selecting characteristic values, in the *Show* drop down list, choose *Value Ranges* and set the required operator (Between, Less than, Greater than, etc.). Press the select values button and then select *Variables* from the *Show* drop down list. Choose the variable for the 'from' operator. Repeat this process for the 'to' operator.

   When using the *Between* operator, you can restrict both limits using single value variables or choose a single value variable for one of the interval limits and transfer a fixed value for the other interval limit on the *Fixed Values* tab page.

   When using the operators *Greater than or equal to*, *Less than or equal to, Greater than, or Less than* from the list of available variables in the left window, highlight a variable and move this using Drag&Drop or the *Arrow* button into the right *Selection* window.

   Hint: Swapping Interval Limits

   If you are using variables when making interval selections, you can swap the limits by highlighting the relevant variable in the right *Selection* window, and choosing *Swap Interval Limits* from the context menu.

3. **Selecting Variables with Several Single Values or Value Ranges**

   Depending on how they have been defined, you can not only select single values for variables, but also several single values, intervals, or selection options. Under *Single Values*, select the relevant variable from the variables window and specify the values or interval limits when you execute the query.

Text Variables

Text variables represent a text. You can use text variables in query descriptions, calculated key figures, and structural components.

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To include an existing text variable, choose the 'Select Text Variable' icon and search for the required text variable in the list of existing text variables. This appears with its technical name, enclosed by ampersands (&), in the description.

Formula Variables

Formula variables represent numerical values. You can use formula variables in formulas.

Numerical values are also used for calculating exceptions and conditions. You can also use formula variables here.

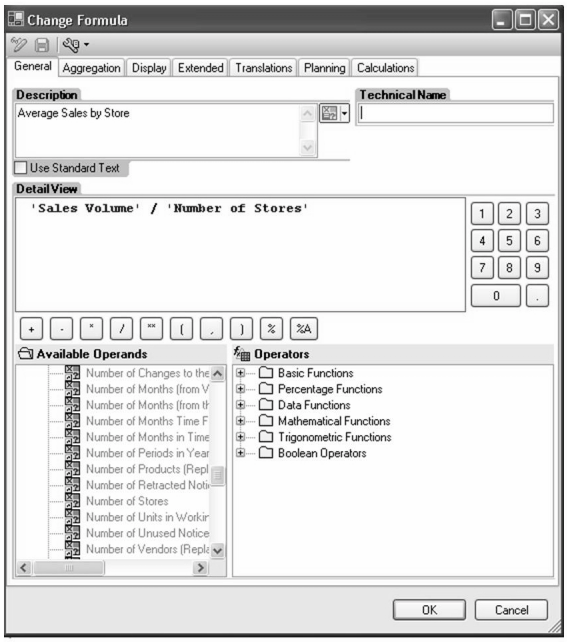

Figure 56: Variables for Formulas

Example:

To calculate the average sales by store, use a formula variable to provide the number of stores to the calculation. This values could be read from a master table, supplied by a user at run time, it could even be an attribute of an organisation.

Hierarchy Variables

Hierarchy variables represent hierarchies. You can use them wherever hierarchies can be selected.

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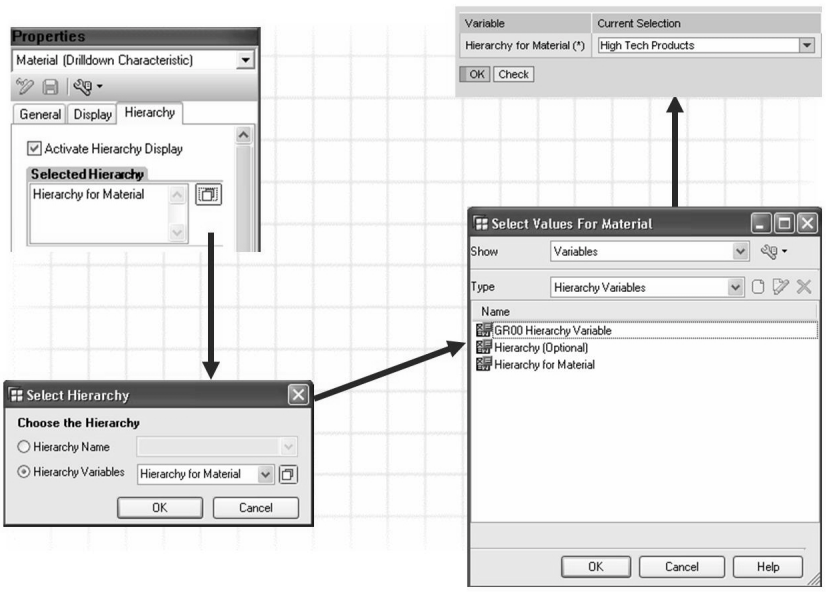

Figure 57: Hierarchy Variables

To select a hierarchy as a variable, in the *Properties* pane select the choose hierarchy button from the *Hierarchy*tab. Then choose the radio button for hierarchy variables and then select the required variable from either the drop down or via the select button.

Hierarchy Node Variables

Hierarchy node variables represent a node in a hierarchy. You can use them as an alternative to hierarchy nodes as fixed values for restricting a characteristic.

If you use a hierarchy node variable, you can make selections by hierarchy node when you use the query.

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There are two possible combinations of hierarchies and nodes:

- **Variable hierarchy node with a fixed hierarchy**

  For example, a report about any department (variable hierarchy node) for the hierarchy valid for 2002 (fixed hierarchy).

  1. To restrict a characteristic to a variable hierarchy node, use the context menu of the characteristic to call the dialog box for restricting characteristic values.
  2. Change to *Show* selection to *Variables* option, then in the *Type* drop down list select *Hierarchy Node Variables.*
  3. From the list of variables in the left window, select the required variable. Use Drag&Drop (or the arrow pointing to the right) to move these into the right *Selection* window.

- **Variable hierarchy node with a variable hierarchy**

  For example, a report about any department (variable hierarchy node) for the hierarchy valid for the current calendar year (variable hierarchy).

  1. To restrict a characteristic with a variable hierarchy to a variable hierarchy node, follow the same steps as above.
  2. In the*Properties* pane make sure the *Hierarchy*tab is open and press the select hierarchy button. Then change the radio button to *Hierarchy Variables*and select the required variable for the hierarchy selection.

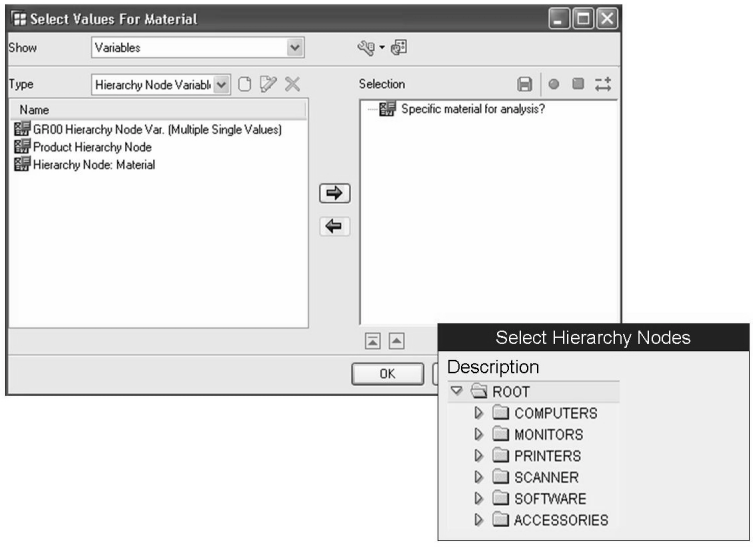

Figure 58: Variables for Hierarchy Nodes

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To be able to enter a value for the hierarchy node variable at runtime, set the cursor on the greyed-out input field and, using input help or the corresponding icon, select the required hierarchy node.

Note: If your are using a hierarchy variable at the same time, you first have to select the hierarchy.

Variable Processing Types

The following processing types are available:

User Entry/Default Value

Replacement Path

Authorization

Customer Exit

SAP Exit

- **User Entry / Default Value**

  If you choose *User Entry/Default Value* as the processing type for a variable, you can manually enter the required value for the variable in a dialog box when you execute the query.

  You enter a default value when you create the variable. This default value is then displayed for input-enabled variables in the input field of the variable screen. For fields that are not input-enabled, the default value is used as the variable value.

- **Replacement Path**

  The processing type *Replacement Path* enables you to specify the value that automatically replaces the variable when the query or Web application is executed.

  For example, when you enter a variable as a characteristic value, you do not need to determine the text for the characteristic value straight away, but can let it be filled dynamically to match the characteristic that is used when the query is executed for the variable.

  1. **Text variables and formula variables with the replacement path processing type** are replaced by the corresponding characteristic value. The Variable Wizard automatically takes you through the *Characteristic* dialog step. This is where you select the reference for the replacement value.
  2. **Characteristic value variables with the replacement path processing type** are replaced by a query result.

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In the *Replacement Path* dialog box, you select the query containing the results that you want to use as a variable. You can now use the data result of the selected query as a variable in a different query.

- **Authorization**

  The *Authorization* processing type enables you to fill the variables automatically with the values from the authorization of a user.

  If you choose the *Authorization* processing type when you create a variable, the variable fills automatically with the values in the user's authorization.

  When the user opens a query, the data selection is automatically carried out according to his or her authorizations.

- **Customer exit**

  If necessary, you have the option of using a customer exit to set up a processing type for variables that is tailored specifically to your needs.

  The *Customer Exit* processing type for variables enables you to determine values for variables by means of a function module exit. The function module used is **EXIT_SAPLRRS0_001**.

  You create a project in transaction *CMOD* by selecting the SAP enhancement *RSR00001* and assigning this to the enhancement project. Activate the project.

  Note: For more information about working with the SAP enhancement for global variables in reporting, see the SAP enhancement help. Call the transaction *SMOD*. Enter the name of the enhancement *(RSR00001)*, choose *Documentation* and then *EditDisplay/Change*. For general information about working with *Customer Exits*, see the *Application Help* in transaction *CMOD*.

- **SAP Exit**

  The SAP exit processing type is contained in variables that are delivered with SAP BW Business Content.

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Overview of Variable Types and Processing Types

Variable Type/Processing Type	User Entry / Default Value	Replacement Path	Customer Exit	Authorization
Characteristic Variable	x	x	x	x
Text Variable	x	x	x	
Hierarchy Variable	x		x	
Hierarchy Node Variable	x		x	x
Formula Variable	x	x	x	

Defining New Variables

New variables are defined in the dialogs where they are used. The settings are made on a series of tabs.

General

Replacement Path

Details

Default Values

Currencies and Units

The fields on each tab will only appear if they are relevant to the context in which you are defining the variable.

General Information Tab

In this tab you enter the name of the variable and choose the Global Settings. Depending on the context you can also choose the method of populating the variables:

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Manual Input/default value
Replacement Path
Customer Exit
Authorization

Figure 59: New Variable: General Information

Replacement Path Tab

This tab is used for characteristic value variables, formula variables, and text variables with the replacement path processing type.

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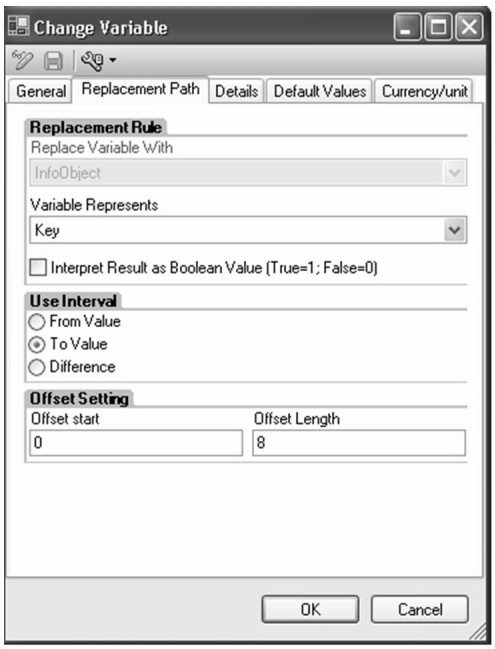

Figure 60: New Variable : Replacement Path

There are different options for the replacement path, according to the type of variable used:

- **Text variables and formula variables with the *Replacement Path* processing type** are replaced by the corresponding characteristic value. The value for a formula variable has to be a number. The value for a text variable has to be a text.

  1. Under *Replace Variable With*, you have the following options:

     Key (Internal Value)

     External Characteristic Value of the Key

     Label (Text)

     Attribute Value

     Hierarchy Attribute

  2. Using the setting *Use Interval*, you determine whether the *From-Value*, the *To-Value*, or the *Difference* is used as the value when the value to be replaced is an interval.
  3. The setting *Offset Start and Offset Length* enables you to determine the start and the length of the text output. For example, if the only the first 10 characters of the text are to be used, the Offset Start value would be 0 and the Offset Length value would be 10.

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4. The *Evaluate as Boolean* function (value 0 or 1)

   This function is only available for formula variables.

   If you select this setting, the formula variable is not replaced by a value (for example, key value), but rather it specifies whether a non-zero or non-blank value exists.

   - The value of the variable is 0 if the value to be replaced is a string with only blank characters or a zero.
   - The value of the variable is 1 if the value to be replaced is a string with characters that are not blank or a number that is not zero.

- **Characteristic value variables with the *Replacement Path* processing type** are replaced by a query result.

  You can now use the data result of the selected query in a different query using the variable.

  Example: You want to insert the result of the query *Top 5 Products* into another query *Sales Volume - Calendar Year/Month* variably.

  1. Highlight the characteristic, for example, *Product*, and create a new variable.
  2. Enter a name and a description for the variable and choose the *Replacement Path* processing type.
  3. You reach the *Replacement Path* tab now from the *Replace Variable Value with*drop down list you must choose *Query.*Now enter the name of the query which will supply the variable values (i.e. the query **`Top 5 Products`**) where that query uses a condition to select the top 5 products for the month.
  4. You can now insert the variable into the query (*Sales Volume - Calendar Year/Month*) to determine how the sales volume of the 5 products with the highest sales volumes has developed on a month-by-month basis.

  Note: Each time that the query *Sales Volume - Calendar Year/Month* is executed, the pre-query (*Top 5 Products*) is executed beforehand. This can lead to long runtimes. If you do not absolutely need to execute a pre-query (for example, you do not have to calculate the top 5 products every time since these change only monthly), SAP recommends that you use a variable that represents a precalculated value set, where the variable values are stored persistently.

Details Tab

The Details tab allows you to enter settings for all types of variables except for variables with the replacement path processing type.

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The details tab present only those options that are possible and useful.

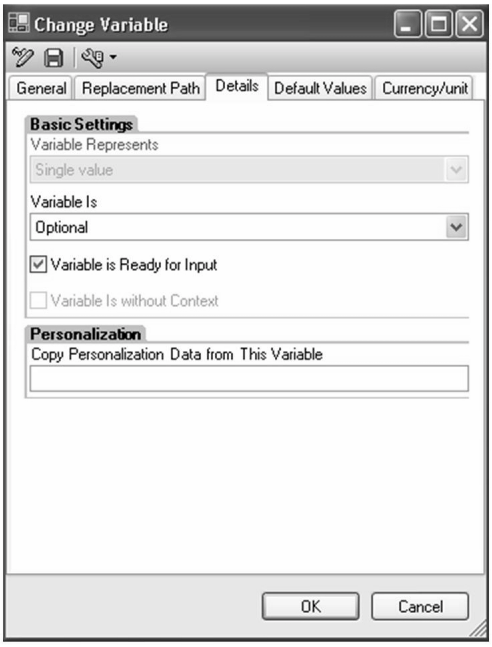

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Figure 61: New Variable : Details

1. Under *Variable Represents*, select the display area that the variable is to represent. You can choose from:

   - *Single Value*

     The variable represents one value only.

   - *Multiple Single Values*

     The variable represents a range of single values.

     You can use this setting with hierarchy nodes, for example, to enable the user to enter several single nodes.

   - *Interval*

     The variable represents a from-value and a to-value.

   - *Selection Option*

     The variable represents a combination of single values and intervals of your choice.

   - *Precalculated Value Set*

     The variable represents a number of values that are stored in a database table by the Reporting Agent.

2. Under *Variable is*, specify whether the variable input is *Optional, Mandatory*, or *Mandatory, Initial Value not Allowed*.
3. Under *Variable is Ready for input* you can determine whether the variable is input-enabled when the query or Web application is executed. If the ready-for-input option is active (= default setting), the variables screen is offered when you execute the query or Web application. You can then enter the required values, confirm the default values, or change the default values.
4. The option *Can be changed in query navigation* enables you not only to select from values that you entered in the variables screen after you have executed the query, but also use other values as dynamic filters in the query.
5. *Copy personalization data from variable*: You can personalize variable values for input-enabled variables for each user. These personal values are saved for each variable and each user.

Default Values Tab

When you define a variable, you enter one or more default values. These then appear in the variables screen when you execute the query or Web application.

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Currencies and Units Tab

These settings are used with formula variables.

You can select from the following dimensions:

Amount

Quantity

Price (= currency/unit)

Number (= default setting)

Date

Changing Variables in the Variable Editor

The Variable Editor uses a dialog box to give all of the selection options available for changing an existing variable.

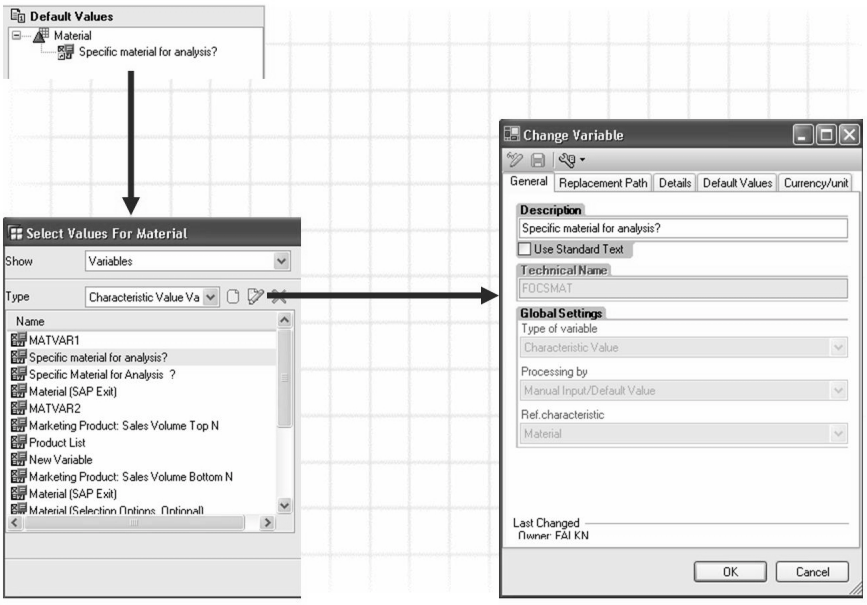

Figure 62: Editing a Variable

The individual fields of the dialog box reflect the dialog steps in the Variable Wizard and show the current settings of the variable. The dialog box is context sensitive, which means that only the fields and options that are relevant for the variable display, depending on the type of variable and the processing type.

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Using the Variable Offset

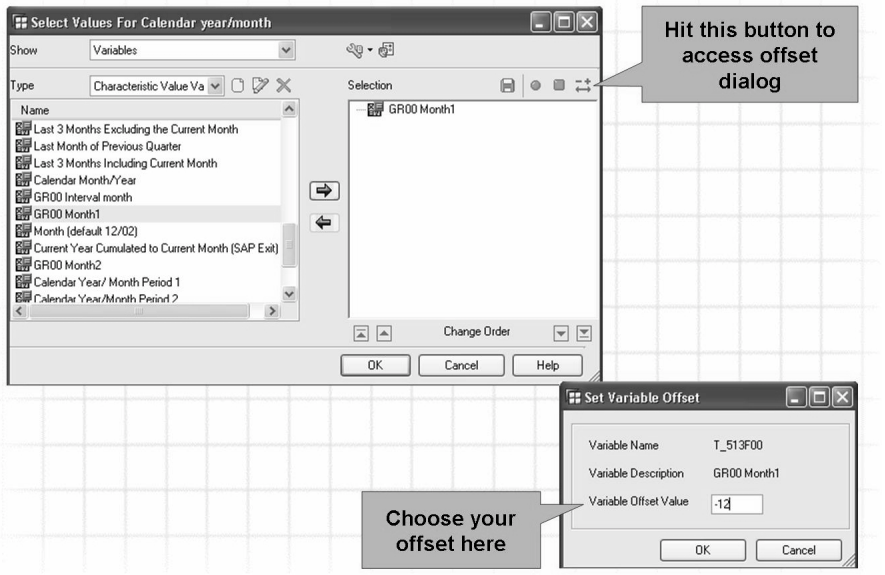

Figure 63: Variable Offset

To analyze key figures that have a fixed time- relationship to one another, you can use the variable offset. For example, you want to compare the sales volume from the current time period with that of the same time period in the previous year. In your report definition, you can use the same variable several times to restrict the key figures and determine a difference from the input value.

You can also use the variable offset to select an interval as a restriction relative to either the upper or lower value of a range, this can be achieved using only one variable.

1. To do this, use the *Value Range*option then select a variable as the upper value.
2. Then select the **same** variable for the lower value.
3. Now specify variable offset for either the upper or lower limit.

Business Content Variables

Business Content variables are delivered for all types of variables. You have to activate the variables delivered before you can use them.

Variables that are delivered with **Business Content** from *SAP BW* often have the SAP exit processing type. This enables you to create complex queries quickly and easily.

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For time characteristics, a range of variables are delivered that replace frequently-used time periods or specific times, for example, the current month or the comparable month of the previous year.

Additional Objects

Specify Additional Data:		
Object Type:	**Name**	**Technical Name**
Variables	Current calendar month	0CMONTH
	Current month from previous year	0CMCMLY
	Last 12 months excluding the current month	0CML12LM
	Last 12 months including the current month	0CML12CM
	Last month	0CMLMON
	Current quarter from previous year	0CMAQULY
	Current quarter	0CMCQUAR
	Last month posted (current year)	0CYMONTH
	Cal. year/month (single value, mandatory entry)	0PCALMON
	Text variable for month	0T_CMONT
	Cal. year/month time period 1	0I_CALZ1

Figure 64: Business Content Variables for 0CALMONTH

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Exercise 11: Different Types of Variables

Exercise Objectives

After completing this exercise, you will be able to:

- Define characteristic value variables and include them in your query definition
- Define text variables with the replacement path processing type in order to describe key figures restricted by characteristic variables in more detail
- Define hierarchy and hierarchy node variables and include combinations of these in your report
- Create formula variables as placeholders for different amounts
- Create a characteristic value variable with the replacement path to use the result of a Pre-Query

Business Example

You want to use flexible reports in your company with restricted key figures. In order to do this, you have to define characteristic value variables. By including text variables that are filled using the replacement path, you get the relevant information for your restricted key figures in the report.

You want to be able to choose flexibly between the hierarchies available and the current hierarchy nodes in your report and therefore, use hierarchy variables and hierarchy node variables.

You want to make calculated key figures more flexible by using formula variables.

And you should use existing variables that are delivered with Business Content.

Finally use a Pre-Query to deliver values for variables in a Result-Query.

Task 1:

In order to structure your reports flexibly, you want to use variables instead of fixed values to restrict your key figures. You want to list the sales volume for each of your materials for a particular month and for a time interval. You want to display the chosen time or time period in the Column header of the sales volumes.

1. Create a new query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   Place the characteristic *Material (0MATERIAL)* into the Rows.

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Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns, restricted to the characteristic *Cal. Year/Month (0CALMONTH)*. Restrict *Cal. Year/month* using a variable representing a **single month** which has to be entered at runtime and is defaulted by the value 6.2001.

Use the following description for the variable:

Description: **GR## Month 1**

Variable name: **BW513F##**

2. Define a new text variable that you include in the description of the key figure so that you can list the month, to which the sales volume is restricted at runtime, as a text (for example, *Sales Volume June 2001*). Ensure that the text variable relates to the from-value of the characteristic variable.

   Use the following description for the text variable:

   Description: **GR## Text Var. Month(from)**

   Variable name: **BW513G##**

3. Drag the *Sales Volume EUR (T_INVCD_V)* key figure into the Columns again and restrict this using a variable so that the user has to select a **month interval** at runtime to which the sales volume is restricted.

   Use the following description for the variable:

   Description: **GR## Month Interval**

   Variable name: **BW513K##**

   Default values: 01.2001 - 12.2001

4. In order to specify the selected interval in the Column header, you need a to-value text variable in addition to the from-value text variable. Create the to-value text variable and use both variables in the key figure description.

   Enter the following as the text variable description:

   Description: **GR## Text Var. Month (to)**

   Variable name: **BW513L##**

5. Save the query in your role under:

   Unit: Variables→ Lesson: Variables in the *Exercise* folder.

   Description: **GR## BW305 Variables 1**

   Technical name: **BW30513M##**

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Execute the query.

Task 2:

You now want to display the materials as a hierarchy in your report and select the hierarchy at runtime.

By using a hierarchy node variable, you can be flexible in selecting individual hierarchy nodes.

1. In the query definition of *GR## BW305 Variables 1*, restrict the material to a hierarchy node variable, which you create as a new variable. Define the hierarchy node variable to allow the entry of multiple single values.

   Enter the following description:

   Description: **GR## Hierarchy Node Var.**

   Technical name: **BW513N##**

   Once you have created the hierarchy node variable, stay in the selection dialog box for *Material* to define the hierarchy variable in the second step.

2. You also want to be able to select the hierarchy flexibly at runtime. To do this, define a hierarchy variable and include this in the query.

   Description: **GR## Hierarchy Var.**

   Technical name: **BW513P##**

3. Save the query and then execute it. Select a hierarchy and two hierarchy nodes.

   Set other hierarchy nodes in the report as a filter for the material.

Task 3:

You want to display the sales volume of your customers for a time period that is selected by the user. You also want to display the number of selected months in the interval and the average sales volume per month.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting → Sales and Distribution* InfoArea.

   Transfer the *Sold-to Party (T_SOLD_TO) characteristic* into the Rows.

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Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns, restricted to the characteristic *Cal. year/Month (0CALMONTH)*. Restrict *Cal. year/Month* by the characteristic variable that you created (*GR## Month Interval (BW513K##)*). For the description use the textvariables *GR## Text Var. Month (from)* and *GR## Text Var. Month (to)*.

2. To list the number of months in the interval in the report, define a new calculated key figure on query level named **`Number of Month`** using a new formula variable with the following description:

   Description: **`GR## Number of Months`**

   Variable name: **`BW513Q##`**

   This uses the replacement path to calculate the difference between the interval limits of the variable *GR## Month Interval (BW513K##)* for *Cal. Year/Month*.

3. Use the *GR## Number of Months* formula variable to create a further formula **`Average Sales Volume per Month`** that calculates the average sales volume per month in the selected time period.

   Save the query in your Training BW305 Reporting role under:

   Unit: Variables → Lesson: Variables in the *Exercise* folder.

   Description: **`GR## BW305 Variables 2`**

   Technical name: **`BW30513R##`**

   Now execute the query.

Task 4:

To display the sales volume in the current year for chosen materials, use variables that are delivered with Business Content.

1. Create a new query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   Place the *Material (0MATERIAL)* characteristic into the Rows.

   Restrict this using the content variable *Material (Selection Options, Optional) (0S_MAT)*.

2. Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns, restricted to the characteristic *Cal. Year/Month (0CALMONTH)*. Restrict *Cal. Year/Month* using the Content variable

   Current Year Cumulated to Current Month (SAP Exit) (0I_CMY01).

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For the description of the restricted key figure use *Text Variable Month (0T_CMONT)* and *Text Variable Month (0T_CMOTT)* and in between the word **to**.

Hint: Be sure to activate the display of *Technical Names* before searching for the text variables.

3. Copy the restricted key figure *Sales Volumes EUR &0T_CMONT& to &0T_CMOTT&* and enter **-48** months as the variable offset so that the comparative time period displays as 4 years earlier.
4. Save the query in your Training Bw305 Reporting role under:

   Unit: Variables → Lesson: Variables in the *Exercise* folder.

   Description: **GR## BW305 Content Variables**

   Technical name: **BW30513S##**

   Now execute the query.

Task 5:

Optional

Create a Pre-Query to deliver values for a characteristic value variable with the replacement path used in a Result-Query.

1. Create a new query as Pre-Query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting → Sales and Distribution* InfoArea.

   Place the characteristic *Material (0MATERIAL)* into the Rows.

   Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns.

   Restrict the query using *Cal. Year/Month (0CALMONTH)* from **01.2001** to **12.2001**.

   Define a condition to evaluate the **Top 5 Materials**.

   Save the query in your Training Bw305 Reporting role under:

   Unit: Variables → Lesson: Variables in the *Exercise* folder.

   Description: **GR## BW305 Pre-Query**

   Technical name: **BW30513U##**

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2. Create a second query as a Result Query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting→ Sales and Distribution* InfoArea. This query uses the results from the Pre-Query.

   Place the characteristic *Material (0MATERIAL)* into the Characteristic Restriction area on the *Filter* tab.

   Restrict the characteristic *Material (0MATERIAL)* to the values found out by the Pre-Query using a characteristic value variable with replacement path.

   Description for the variable: **GR## Top 5 Materials**

   Variable name: **BW513T##**

   Include the characteristic *Cal. Year/Month (0CALMONTH)* in the columns and restrict it to **01.2001 - 03.2001** .

   Include the basic key figure *Invoice Quantity (0INVCD_QTY)* in the Columns.

   From the *Organization* dimension, select *Sales Organization* and place it in the rows. On the *Filter* tab, in the *Default Values* window, restrict *Sales Organization* to the value **Germany Frankfurt (1000)**.

   Place *0MATERIAL* in the Free Characteristics area.

   Save the query in your Training BW305 Reporting role under:

   Unit: Variables→ Lesson: Variables in the *Exercise* folder.

   Description: **GR## BW305 Result-Query**

   Technical name: **BW30513V##**

   Execute the query and drill down by Material. How many materials are shown?

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Solution 11: Different Types of Variables

Task 1:

In order to structure your reports flexibly, you want to use variables instead of fixed values to restrict your key figures. You want to list the sales volume for each of your materials for a particular month and for a time interval. You want to display the chosen time or time period in the Column header of the sales volumes.

1. Create a new query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting→ Sales and Distribution* InfoArea.

   Place the characteristic *Material (0MATERIAL)* into the Rows.

   Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns, restricted to the characteristic *Cal. Year/Month (0CALMONTH)*. Restrict *Cal. Year/month* using a variable representing a **single month** which has to be entered at runtime and is defaulted by the value 6.2001.

   Use the following description for the variable:

   Description: **`GR## Month 1`**

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Variable name: **BW513F##**

a) To define a new query, open the Query Designer and choose *InfoAreas→ BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → OK*.

b) Use Drag&Drop to transfer *Material* from the *Material* dimension into the *Rows*.

c) Use Drag&Drop to include the basic key figure *Sales Volume EUR (T_INVCD_V)* into the Columns.

d) From the context menu for *Sales Volume EUR*, choose *Edit → Dimensions → Time*. Transfer *Cal. Year/Month* into the right window using Drag&Drop.

e) From the context menu for *Cal. Year/Month*, choose *Restrict → Show: Variables → Type: Characteristic Value Variable* and press the button *Create New Variable*.

f) On the *General* tab page, enter:

Description: **GR## Month 1**

Variable name: **BW513F##**

Processing by: **Manual Input/Default Value**

g) On the *Details* page, choose the following settings:

Variable Represents: **Single Value**

Variable is: **Mandatory**

Variable is ready for Input: **Set the flag to active**

h) On the *Default Values* tab page, select:

Default Value: **6.2001**

i) Choose *OK*.

j) Transfer the variable that you have defined into the selection window and choose *OK*.

The window closes and you return to the *Change Selection* dialog box.

2. Define a new text variable that you include in the description of the key figure so that you can list the month, to which the sales volume is restricted at runtime, as a text (for example, *Sales Volume June 2001*). Ensure that the text variable relates to the from-value of the characteristic variable.

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Use the following description for the text variable:

Description: **GR## Text Var. Month(from)**

Variable name: **BW513G##**

a) In the *Change Selection* dialog box, position the cursor at the end of the key figure description and select *Enter* to position the cursor on the next line.

Choose the *Text Variables* icon. .

Choose *Create New Variable*.

b) On the *General* tab page, enter:

Description: **GR## Text Var. Month (from)**

Variable name: **BW513G##**

Processing by: **Replacement Path**

Ref. Characteristic: **Cal. year / month**

c) On the *Replacement Path* tab page, select:

Replace Variable With: **InfoObject**

Variable Represents: **Label**

Use Interval: **From Value**

d) Choose *OK*.

e) The text variable that you have defined appears in the description with its technical name enclosed with *&* characters.

3. Drag the *Sales Volume EUR (T_INVCD_V)* key figure into the Columns again and restrict this using a variable so that the user has to select a **month interval** at runtime to which the sales volume is restricted.

Use the following description for the variable:

Description: **GR## Month Interval**

Variable name: **BW513K##**

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Default values: 01.2001 - 12.2001

a) Use Drag&Drop to include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns.

b) From the context menu for *Sales Volume EUR*, choose *Edit → Dimensions → Time*. Transfer *Cal. Year/Month* into the right window using Drag&Drop.

c) From the context menu for *Cal. Year/Month*, choose *Restrict → Show: Variables → Type: Characteristic Value Variable* and press the button *Create New Variable*.

d) On the *General* tab page, enter:

Description: **GR## Month Interval**

Variable name: **BW513K##**

Processing by: **Manual Input/Default Value**

e) On the *Details* page, choose the following settings:

Variable Represents: **Interval**

Variable is: **Mandatory**

Variable is ready for Input: **Set the flag to active**

f) On the *Default Values* tab page, select *Change Standard Values → Show: Value Ranges → Between*. .

Default Value: **01.2001**

To Default Value: **12.2001**

g) Choose *OK*.

h) Transfer the variable that you have defined into the selection window and choose *OK*.

i) The window is closed and you return to the *Change Selection* dialog box.

4. In order to specify the selected interval in the Column header, you need a to-value text variable in addition to the from-value text variable. Create the to-value text variable and use both variables in the key figure description.

Enter the following as the text variable description:

Description: **GR## Text Var. Month (to)**

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Variable name: **BW513L##**

a) In the *Change Selection* dialog box, position the cursor at the end of the key figure description and choose *Return* to get into the second row.

Choose the *Text Variables* icon. .

b) Then select the text variable *GR## Text Var. Month (from) (BW513G##)* that you created.

c) After the text variable, add the word **to**.

d) Choose the *Text Variables* icon again. .

Choose *Create New Variable*.

e) On the *General* tab page, enter:

Description: **GR## Text Var. Month(to)**

Variable name: **BW513L##**

Processing by: **Replacement Path**

Ref. Characteristic: **Cal. year / month**

f) On the *Replacement Path* tab page, select:

Replace Variable With: **InfoObject**

Variable Represents: **Label**

Use Interval: **To Value**

g) Choose *OK*.

h) The text variable that you have defined appears in the description with its technical name enclosed in *&*.

5. Save the query in your role under:

Unit: Variables→ Lesson: Variables in the *Exercise* folder.

Description: **GR## BW305 Variables 1**

Technical name: **BW30513M##**

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Execute the query.

a) To save the query, choose *Save Query*.

b) In the Roles window, choose *Unit: Variables → Lesson: Variable* and the *Exercise* folder.

Enter:

Description: **GR## BW305 Variables 1**

Technical name: **BW30513M##**

c) Execute the query.

Task 2:

You now want to display the materials as a hierarchy in your report and select the hierarchy at runtime.

By using a hierarchy node variable, you can be flexible in selecting individual hierarchy nodes.

1. In the query definition of *GR## BW305 Variables 1*, restrict the material to a hierarchy node variable, which you create as a new variable. Define the hierarchy node variable to allow the entry of multiple single values.

   Enter the following description:

   Description: **GR## Hierarchy Node Var.**

   Technical name: **BW513N##**

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Once you have created the hierarchy node variable, stay in the selection dialog box for *Material* to define the hierarchy variable in the second step.

a) Open the global query definition for *GR## BW305 Variables 1 (BW30512M##).*

b) In the *Default Values* area, from the context menu for *Material*, choose the *Restrict → Show: Variables → Type: Hierarchy Node Variables* and press the button *Create New Variable*.

c) On the *General* tab page, enter:

Description: **GR## Hierarchy Node Var.**

Variable name: **BW513N##**

Processing by: **Manual Input/Default Value**

d) On the *Details* tab page, choose the following settings:

Variable Represents: **Multiple Single Values**

Variable is: **Optional**

Variable is ready for Input: **Set the flag to active**

e) Choose *OK*.

f) **Do not leave the *Select Values for Material* dialog box yet.**

2. You also want to be able to select the hierarchy flexibly at runtime. To do this, define a hierarchy variable and include this in the query.

Description: **GR## Hierarchy Var.**

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Technical name: **BW513P##**

a) Highlight your newly created hierarchy node variable and go to the bottom of the *Selection for Material* dialog box and choose the *Variable Hierarchy* button.

b) In the upcoming *Select Hierarchy* window, choose *Hierarchy Variables*. Select the button at the end of the entry field. Another window, *Select Values for Material*, opens. There choose *Create New Variable*.

c) On the *General* tab page, enter:

Description: **GR## Hierarchy Var.**

Variable name: **BW513P##**

Processing by: **Manual Input/Default Value**

d) On the *Details* tab page, choose the following settings:

Variable Represents: **Single Value**

Variable is: **Optional**

Variable is ready for Input: **Set the flag to active**

e) Choose *OK* 4 times until you return to the *Select Values for Material* screen.

f) Back on the *Select Values for Material* window, transfer your hierarchy node variable into the selection window. You see now that the **GR## Hierarchy Var.** is now assigned to the **GR## Hierarchy Node Var.**

g) Close the *Select Values for Material* window by choosing *OK*.

h) Finally, check to make sure that the new *GR## Hierarchy Var.* is selected for the characteristic *Material (0MATERIAL)*. Enter the *Properties* area, choose the *Hierarchy* tab page and select the *GR## Hierarchy Var.*, if necessary. Leave the other settings as they are.

3. Save the query and then execute it. Select a hierarchy and two hierarchy nodes.

Set other hierarchy nodes in the report as a filter for the material.

a) Save the query and then execute it.

b) Set other hierarchy nodes in the query as a filter for the material.

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Task 3:

You want to display the sales volume of your customers for a time period that is selected by the user. You also want to display the number of selected months in the interval and the average sales volume per month.

1. Create a new query based on the *Billing (T_SDC03)* InfoProvider in the *BW305 Reporting → Sales and Distribution* InfoArea.

   Transfer the *Sold-to Party (T_SOLD_TO) characteristic* into the Rows.

   Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns, restricted to the characteristic *Cal. year/Month (0CALMONTH)*. Restrict *Cal. year/Month* by the characteristic variable that you created (*GR## Month Interval (BW513K##)*). For the description use the textvariables *GR## Text Var. Month (from)* and *GR## Text Var. Month (to)*.

   a) To define a new query, open the Query Designer and choose *InfoAreas→ BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → OK*..

   b) Use Drag&Drop to transfer *Sold-to Party* from the *Sold-to Party (T_SOLD_TO)* dimension into the Rows.

   c) Use Drag&Drop to include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns.

   d) From the context menu for *Sales Volume EUR*, choose *Edit → Dimensions → Time*. Transfer *Cal. Year/Month* to the right window using Drag&Drop.

   e) From the context menu for *Cal. Year/Month*, choose *Restrict → Show: Variables → Type: Characteristic Value Variable* and select your variable *GR## Month Interval (BW513K##)*.

   f) Insert both of the text variables that you defined into the second line of the *Description* field. The second line should appear as follows: *GR## Text Var. Month (from)* to *GR## Text Var. Month (to)* .

2. To list the number of months in the interval in the report, define a new calculated key figure on query level named **`Number of Month`** using a new formula variable with the following description:

   Description: **`GR## Number of Months`**

   Variable name: **`BW513Q##`**

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This uses the replacement path to calculate the difference between the interval limits of the variable *GR## Month Interval (BW513K##)* for *Cal. Year/Month*.

a) From the context menu for the *Key Figure* structure, choose *New Formula*. Then choose *Edit* from the context menu of the new formula. Enter the description **Number of Month**.

b) In the *Available Operands* field, from the context menu for *Formula Variables*, choose *New Variable*. Then choose *Edit* from the context menu of the new variable.

c) On the *General* tab page, enter:

Description: **GR## Number of Months**

Variable name: **BW513Q##**

Processing by: **Replacement Path**

Ref. Characteristic: **Cal. year/month**

d) On the *Replacement Path* tab page, select:

Replace Variable With: **InfoObject**

Variable Represents: **Key**

Use Interval: **Difference**

e) On the *Currency/Unit* tab page, the Dimension is set as **Number**.

f) Choose *OK*.

g) From the formula variables directory, transfer the new formula variable *GR## Number of Months* into the *Detail View* field.

Choose *OK*.

3. Use the *GR## Number of Months* formula variable to create a further formula **Average Sales Volume per Month** that calculates the average sales volume per month in the selected time period.

Save the query in your Training BW305 Reporting role under:

Unit: Variables → Lesson: Variables in the *Exercise* folder.

Description: **GR## BW305 Variables 2**

Technical name: **BW30513R##**

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Now execute the query.

a) To create the new formula, choose *New Formula* from the context menu for the key figure structure. Then choose *Edit* from the context menu of the new formula. Enter the description **`Average Sales Volume per Month`**.

b) Transfer *Sales Volume EUR* into the *Detail View* field.

Choose *Divided by "/"* .

Then transfer the formula variable *GR## Number of Months*.

Choose *OK*.

c) To save the query, choose *Save Query*

d) From the Training BW305 Reporting role, choose *Unit: Variables* → *Lesson: Variables* and the *Exercise* folder.

Enter:

Description: **`GR## BW305 Variables 2`**

Technical name: **`BW30513R##`**

e) Execute the query.

Task 4:

To display the sales volume in the current year for chosen materials, use variables that are delivered with Business Content.

1. Create a new query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting*→ *Sales and Distribution* InfoArea.

   Place the *Material (0MATERIAL)* characteristic into the Rows.

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Restrict this using the content variable *Material (Selection Options, Optional) (0S_MAT)*.

a) To define a new query, open the *Query Designer*.

b) Choose *InfoAreas→ BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → OK.*

c) Use Drag&Drop to transfer *Material* from the *Material* dimension into the Rows.

d) From the context menu for *Material*, choose *Restrict → Show: Variables → Type: Characteristic Value Variable* and select the variable *Material (Selection Options, Optional) (0S_MAT)*.

e) Choose *OK*.

2. Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns, restricted to the characteristic *Cal. Year/Month (0CALMONTH)*. Restrict *Cal. Year/Month* using the Content variable

Current Year Cumulated to Current Month (SAP Exit) (0I_CMY01).

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For the description of the restricted key figure use *Text Variable Month (0T_CMONT)* and *Text Variable Month (0T_CMOTT)* and in between the word **to**.

Hint: Be sure to activate the display of *Technical Names* before searching for the text variables.

a) Use Drag&Drop to include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns.

b) From the context menu for *Sales Volume EUR*, choose *Edit* → *Dimensions* → *Time*. Transfer *Cal. Year/Month* to the right window using Drag&Drop.

c) From the context menu for *Cal. Year/Month*, choose *Restrict* → *Show: Variables* → *Type: Characteristic Value Variable* and select the variable *Current Year cumulated to current month (SAP Exit) (0I_CMY01)*.

d) Then include the text variables *Text Variable Month (0T_CMONT)* and *Text Variable Month (0T_CMOTT)* and in between the word **to** in the second row of the *Description* field.

Hint: Be sure to activate the display of *Technical Names* before searching for the text variables in the next step.

e) Choose *OK*.

3. Copy the restricted key figure *Sales Volumes EUR &0T_CMONT& to &0T_CMOTT&* and enter **-48** months as the variable offset so that the comparative time period displays as 4 years earlier.

a) Use *Copy* and *Paste* to copy the key figure *Sales Volumes EUR &0T_CMONT& to &0T_CMOTT&* in the key figure structure.

b) From the context menu for the copied key figure, chose *Edit*.

c) From the context menu for the restricting variable *Current year cumulated to current month (SAP Exit) (0I_CMY01)*, choose *Restrict.*

d) In the *Selection* window choose the button *Set offset for variable* and enter **-48**. Choose *OK* three time.

4. Save the query in your Training Bw305 Reporting role under:

Unit: Variables → *Lesson: Variables* in the *Exercise* folder.

Description: **GR## BW305 Content Variables**

Continued on next page

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Technical name: **BW30513S##**

Now execute the query.

a) To save the query, choose *Save Query*.

b) In the Training BW305 Reporting role, choose *Unit: Variables → Lesson: Variables → Exercise*.

c) Enter:

Description: **GR## BW305 Content Variables**

Technical name: **BW30513S##**

d) Execute the query.

Task 5:

Optional

Create a Pre-Query to deliver values for a characteristic value variable with the replacement path used in a Result-Query.

1. Create a new query as Pre-Query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting → Sales and Distribution* InfoArea.

   Place the characteristic *Material (0MATERIAL)* into the Rows.

   Include the basic key figure *Sales Volume EUR (T_INVCD_V)* in the Columns.

   Restrict the query using *Cal. Year/Month (0CALMONTH)* from **01.2001** to **12.2001**.

   Define a condition to evaluate the **Top 5 Materials**.

   Save the query in your Training Bw305 Reporting role under:

   Unit: Variables → Lesson: Variables in the *Exercise* folder.

   Description: **GR## BW305 Pre-Query**

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Technical name: **BW30513U##**

a) To define a new query, open the Query Designer and choose *InfoAreas→ BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → OK*.

b) Use Drag&Drop to transfer *Material* from the *Material* dimension into the *Rows*.

c) Use Drag&Drop to include the basic key figure *Sales Volume EUR (T_INVCD_V)* into the Columns.

d) Restrict the key figure using *Cal. year/Month (0CALMONTH)* restricted to values from 01.2001 to 12.2001.

e) Now define the condition. Press the *Conditions* button in the BEx Query Designer toolbar. The *Conditions* area opens. Right click within this area, and then choose *New Condition*. Double-click or *Right mouse click → Edit* on the new *Condition x*.

f) ***General*** tab page:

Description: **Top 5 Materials**.

Condition is Active box has to be checked.

Fill in the *Condition parameters:* by pressing the *New* button.

Key Figures	Operator	Values
Sales Volume EUR(T_INVCD_V)	Top N	5

Characteristic Assignment tab page:

All Characteristics in the Drilldown Independently

Confirm with *OK*.

g) Save the query in your Training BW305 Reporting role under:

Unit: Variables → Lesson: Variables in the *Exercise* folder.

Description: **GR## BW305 Pre-Query**

Technical name: **BW30513U##**

2. Create a second query as a Result Query based on the *Billing (T_SDC03)* InfoCube in the *BW305 Reporting→ Sales and Distribution* InfoArea. This query uses the results from the Pre-Query.

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Place the characteristic *Material (0MATERIAL)* into the Characteristic Restriction area on the *Filter* tab.

Restrict the characteristic *Material (0MATERIAL)* to the values found out by the Pre-Query using a characteristic value variable with replacement path.

Description for the variable: **GR## Top 5 Materials**

Variable name: **BW513T##**

Include the characteristic *Cal. Year/Month (0CALMONTH)* in the columns and restrict it to **01.2001 - 03.2001** .

Include the basic key figure *Invoice Quantity (0INVCD_QTY)* in the Columns.

From the *Organization* dimension, select *Sales Organization* and place it in the rows. On the *Filter* tab, in the *Default Values* window, restrict *Sales Organization* to the value **Germany Frankfurt (1000)**.

Place *0MATERIAL* in the Free Characteristics area.

Save the query in your Training BW305 Reporting role under:

Unit: Variables→ Lesson: Variables in the *Exercise* folder.

Description: **GR## BW305 Result-Query**

Technical name: **BW30513V##**

Execute the query and drill down by Material. How many materials are shown?

a) To define a new query, open the Query Designer and choose *InfoAreas→ BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03) → OK*.

b) Use Drag&Drop to transfer *Material* from the *Material* dimension into the *Rows*.

c) On the *Default Values* window, rom the context menu for *Material*, choose *Restrict → Show: Variables → Type: Characteristic Value Variable* and press the button *Create New Variable*.

d) On the *General* tab page, enter:

   Description: **GR## Top 5 Materials**

   Variable technical name: **BW513T##**

   Processing by: **Replacement Path**

   Ref. Characteristic: **0Material**

Continued on next page

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On the *Replacement Path* tab page, select:

Replace Variable With: **Query**

Query: **BW30513U##**

Choose *OK*.

Find and select your variable and then choose *OK*.

e) Use Drag&Drop to include the basic key figure *Invoice Quantity (0INVCD_QTY)* into the Columns.

f) Use Drag&Drop to transfer *Cal. Year/Month* from the *Time* dimension into the Columns and restrict it to **01.2001 - 03.2001**.

g) Use Drag&Drop to transfer *Sales Organization* from the *Organization* dimension into the Rows and then restrict it to **Germany Frankfurt (1000)**.

h) Use Drag&Drop to transfer *Material* from the *Material* dimension into the Free Characteristics.

i) Save the query in your Training BW305 Reporting role under:

Unit: Variables→ Lesson: Variables in the *Exercise* folder.

Description: **GR## BW305 Result Query**

Technical name: **BW30513V##**

Execute the query. Drill down by Material. How many materials are shown? Five materials are shown based on the output of the Pre-Query that selected the top five materials.

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Lesson Summary

You should now be able to:

- Describe how variables can be used for defining more flexible reports
- Describe the different types of variables
- Create different types of variables using the Variable Dialog
- Use variables that are delivered with Business Content in your query definition
- Use a Pre-Query to deliver values for variables in a Result-Query

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Unit Summary

You should now be able to:

- Describe how variables can be used for defining more flexible reports
- Describe the different types of variables
- Create different types of variables using the Variable Dialog
- Use variables that are delivered with Business Content in your query definition
- Use a Pre-Query to deliver values for variables in a Result-Query

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Unit 7

Exceptions and Conditions

Unit Overview

This unit deals with including exceptions and conditions to further analyze a report. Exceptions allow you to highlight deviations. Conditions allow you to reduce report options to what is really necessary.

Unit Objectives

After completing this unit, you will be able to:

- Explain the purpose of exceptions
- Use exceptions in a query definition
- Activate and deactivate exceptions within a report
- Use the Exception Wizard to create exceptions in the query results
- Explain the purpose of conditions
- Use conditions in a query definition
- Structure a variable condition
- Focus reports on fundamental data using conditions
- Activate and deactivate conditions within a report
- Change, enhance, and delete conditions
- Define a condition using the Condition Wizard

Unit Contents

Lesson: Exceptions 270
Exercise 12: Exceptions 287
Lesson: Conditions 296
Exercise 13: Conditions 307

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Lesson: Exceptions

Lesson Overview

This lesson deals with exception reporting and the definition of exceptions in the *Query Designer* and interactively using the *Exception Wizard*.

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the purpose of exceptions
- Use exceptions in a query definition
- Activate and deactivate exceptions within a report
- Use the Exception Wizard to create exceptions in the query results

Business Example

In order to make quick, responsible decisions, a company's data must be prepared and presented so that values that deviate from expected values are noticed by users at a glance. The management of your organization wants to use a warning system within a report and has therefore asked you to define threshold values with different colors in an *Exception* on a query level.

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Defining Exceptions in the Query Designer

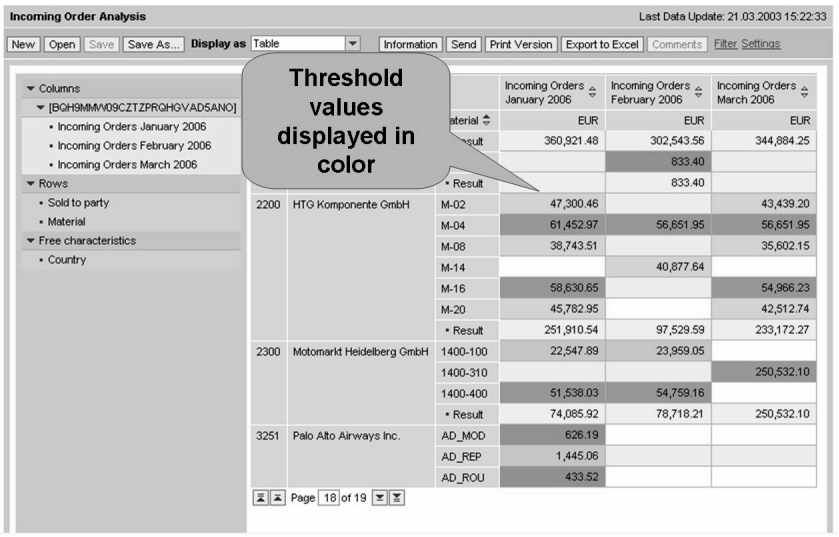

Figure 65: Active Exception in a Web Analysis

The functions in exception reporting enable you to select and highlight unusual deviations of key figure values in a query. You can see deviations from predefined threshold values or intervals in the query result displayed in different colors if the exception is active. Early spotting of these deviations provides the basis for timely and effective reactions.

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Creating Exceptions

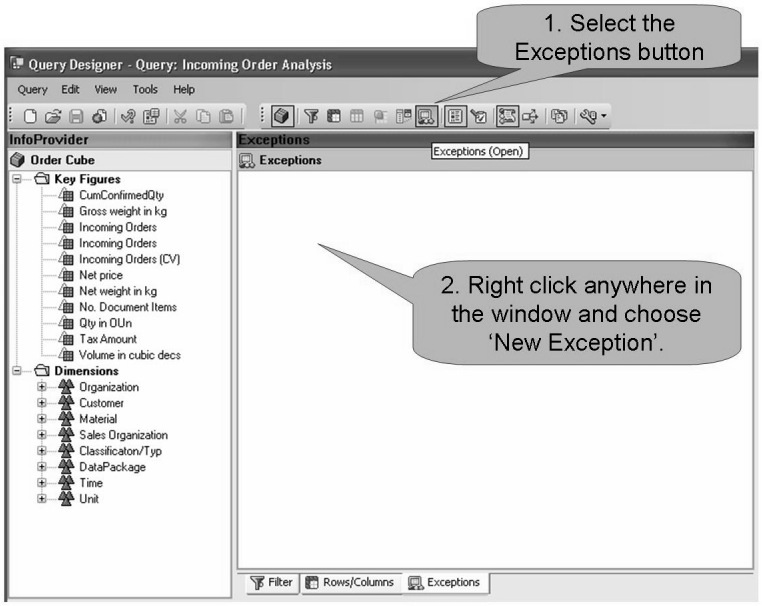

Figure 66: Creating a New Exception in the Query Designer

You create an exception in the *Query Designer* by selecting the icon from the *Query Designer* toolbar to open the *Exception* window. Right click anywhere in the window and choose *New Exception* to create the new exception object. It will be displayed in the *Exception* window as *Exception n* (where 'n' is a sequentially assigned number starting with 1). Right click on this exception object and choose *Edit* to begin creating the exception definition.

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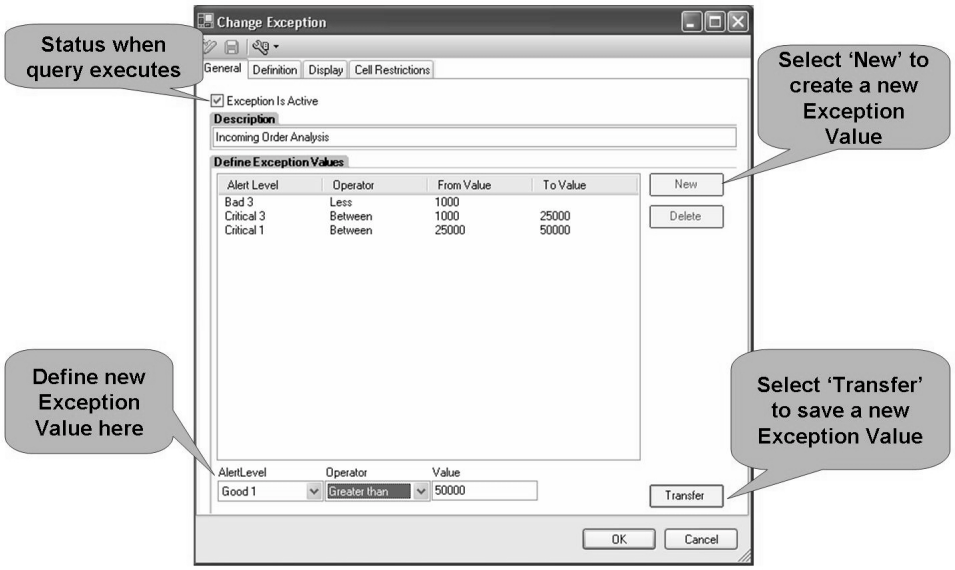

Figure 67: General Tab of the Exception Definition

On the *General* tab, you can set the default status, description and one or more exception values. The default status is set via the *Exception is Active* checkbox. If the checkbox is filled, the exception is applied as soon as you execute the query. If you do not set the active flag, you can activate the exception interactively in the Web Analyzer by choosing *Settings → (select the exception) → Toggle State*. In the BEx Analyzer, from the BEx toolbar choose, *Insert List of Exceptions*. There you have the option of activating or deactivating the exception from there. There is a web item for web applications that you can integrate into your template for the same purpose.

You can use exceptions to evaluate one or all key figures (structure elements) in your query definition. If you want to use exceptions selectively on specific key figures in your query definition, you have to define an exception for each key figure accordingly.

Exception Values

On the *Exception Values* section of the *General* tab page, you enter your values by first choosing *New*. An alert level row is activated at the bottom of the screen consisting of the fields *Alert Level, Operator* and one or more *Value* fields, depending on the operator chosen. You choose *Transfer* to add your entries to the list of exception values.

You can set the alert levels to the colors red (Bad 1, 2 and 3), yellow (Critical 1, 2 and 3), and green (Good 1, 2 and 3), each in three shades, as required. These nine alert levels are internally numbered and ranked as follows:

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Alert Level Name	Alert Level Rank
Good 1	1
Good 2	2
Good 3	3
Critical 1	4
Critical 2	5
Critical 3	6
Bad 1	7
Bad 2	8
Bad 3	9

The colors relate to the color characteristic values of the format templates delivered by SAP and symbolize traffic light colors.

Hint: If you want to assign your own alert level colors, in the BEx toolbar in the *BEx Analyzer* choose *Format → Patterns*. So that these changes are kept in the query, you have to save them in a workbook. For Web applications, the formats are stored in the *MIME Repository* under the stylesheet used for the web template, such as *BWReports.css*. You can modify them there.

You can include all values or specific intervals (for example, only those falling below the threshold value in the red area) in the threshold value catalog. You can enter fixed point or floating point numbers for the values you are defining.

With key figures values on the border between two alert levels, the highest alert level rank is used. For example, take the scenario where there is an alert level of 'Between 0 and 1000' using 'Bad 3' and another alert level defined as 'Between 1000 and 5000' using 'Critical 3', and the key figure being evaluated has a value of exactly 1000. The key figure value of 1000 is the common point between the two alert level ranges. In this case, the value will be assigned the color used for 'Bad 3' since it has a higher alert level rank as shown in the table above.

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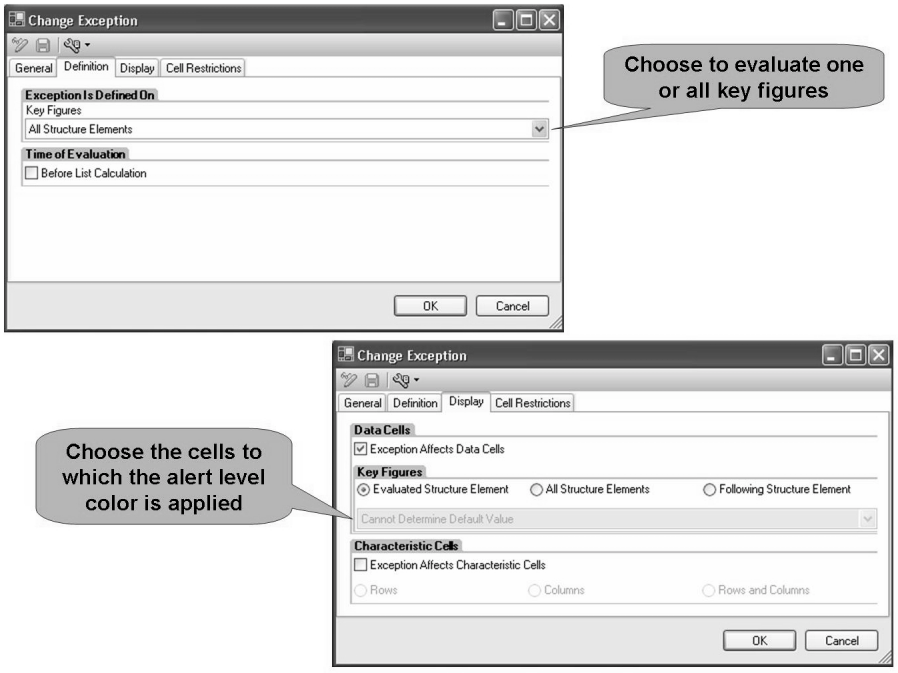

Figure 68: Definition and Display Tabs of the Exception Definition

Definition Tab

On the *Definition* tab of the exception definition, you can select to evaluate the exception against one or all of the key figure elements of the structure. There is also a setting for determining whether the exception is evaluated before or after any local calculation within the query.

Display Tab

On the *Display* tab of the exception definition you have control over which cells of an analysis receive the color for the determined alert level. If you select the checkbox for *Exception Affects Data Cells*, then the following choices can be made:

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Key Figure Choice	Result
Evaluated Structure Element	The structure element chosen on the *Definition* tab will be the one to receive the color assigned to the alert level.
All Structure Elements	Regardless of which structure element is being evaluated in the exception, all structure elements will receive the color assigned to the alert level.
Following Structure Element	With this setting, you can evaluate one structure element, but then apply the color of the alert level to a different structure element.

If the checkbox for *Exception Affects Characteristic Cells* is selected, then you can select from the following options:

Characteristic Cell Choice	Result
Rows	The color of the alert level determined by the exception is applied to the characteristic values in the row where the exception occurs.
Columns	The color of the alert level determined by the exception is applied to the characteristic value in the column where the exception occurs.
Rows and Columns	The color of the alert level determined by the exception is applied to the characteristic value in both the column and row where the exception occurs.

Cell Restrictions

On the *Cell Restrictions* tag page, you can specify whether the exception applies to both detail and result (total) values or to only the result values. This setting is used for any characteristic that is **not** used in the *Define Cell Restrictions* area in the lower part of the screen.

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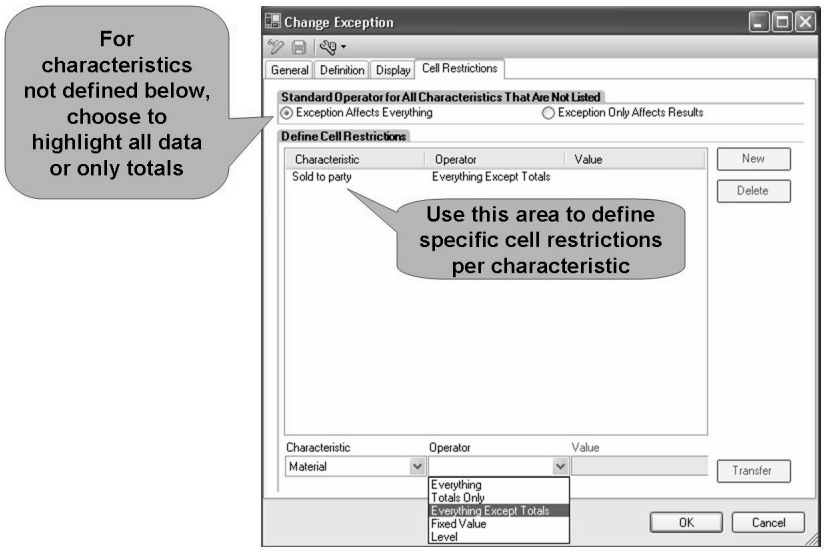

Figure 69: Cell Restrictions Tab of the Exception Definition

In the *Define Cell Restrictions* window, you can choose *New* to define an operator for each characteristic in the query definition, and a value for each operator. You also choose *Transfer* to add your restrictions to the list.

You have the following selection options for the operators:

Everything

The cell context is not restricted. The exception applies for every drilldown state of the characteristic.

Totals Only

The exception affects only the aggregated values of the characteristic.

Everything Except Totals

The exception affects all values except for the aggregated values of the characteristic.

Fixed Value

The exception applies only to a specific characteristic value of the characteristic, which you can determine in the search help in the *Value* field. You can also use a characteristic value variable here. To do this, select *Variables Entry*. You are then given the option of using or changing an existing characteristic value variable, or of creating a new one.

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Level

The exception applies only to specific hierarchy levels of the characteristic. You enter the required hierarchy level in the *Value* field here.

Hint: You have to use all characteristics that you specified in the *Define Cell Restrictions* area in the drilldown of the report since only then will the exception take effect. If there is a characteristic in the drilldown that is not recorded in the *Define Cell Restrictions* area, the effect that the exception has depends on whether you selected *Exception Affects Everything* or *Exception Only Affects Results* on the *Cell Restrictions* tab page. If you selected *Exception Affects Everything*, it does not matter where you integrate the characteristic in the drilldown; the exception is applied accordingly. However, if you selected *Exception Only Affects Results*, you have to place this characteristic at the end of the drilldown, otherwise the exception does not take effect.

Changing and Deleting Exceptions

You can change exceptions in the *Query Designer* by choosing *Edit* from the context menu of the exception definition.

If you want to delete an exception, choose *Remove* from the context menu of the exception definition.

Hint: If you execute your report using your own web template, you can create, change, activate, and deactivate exceptions using the *List of Exceptions* Web item. You can delete an exception using the context menu only if you created the exception in the web application itself.

Exception Wizard

Within the *Web Analyzer*, users can create exceptions on an as-needed basis using the *Exception Wizard*.

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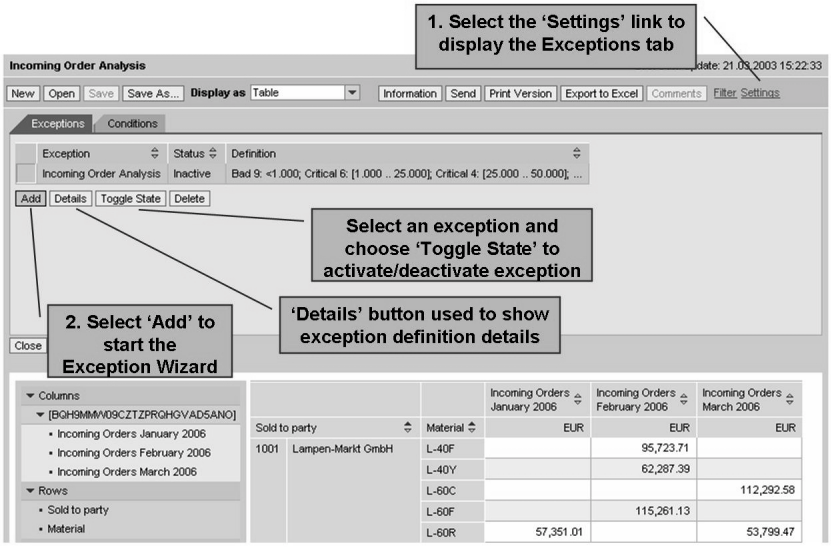

Figure 70: Accessing Exceptions in the Web Analyzer

In the *Web Analyzer*, selecting the *Settings* link provides access to exceptions that are part of the query definition as well as to the Exception Wizard. In the graphic above you can see an existing exception, *Incoming Order Analysis*, at the top of the screen. By selecting the exception, the user can activate/deactivate the exception with the *Toggle State* button. The parameters of the exception can be changed by selecting the *Details* button. Neither the status nor the definition of the exception can be changed permanently using these buttons.

To create a new exception, the user can select the *Add* button. This action starts the Exception Wizard described below.

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Step 1: Set Exception Type

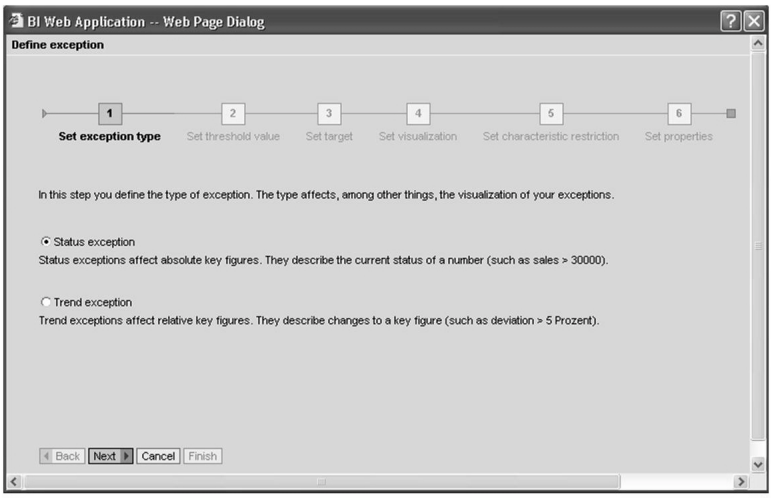

Figure 71: Exception Wizard: Set Exception Type

In this first step of the Exception Wizard, the choice is made between using a *Status Exception* or a *Trend Exception*. A status exception operates on absolute key figures. For example, a status exception might be stated as “Sales > 30000”. This is consistent with the definition of exceptions in the 3.x releases of SAP BW. New in BI are trend exceptions. A trend exception operates on relative key figures. For example, a key figure might be considered an exception if the deviation of the key figure is greater than +5% over time. When the exception type is chosen, the subsequent wizard screens adapt to that choice.

To proceed to the next screen, the user selects the *Next* button.

Step 2: Set Threshold Value

In the second step, the actual exception values are defined as well as other settings.

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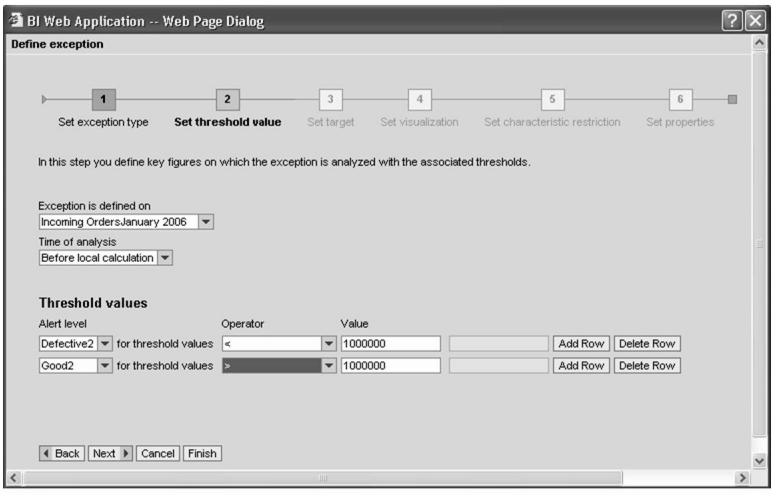

Figure 72: Exception Wizard: Set Threshold Value

On the top part of the screen, you choose to evaluate one or all of the key figures in the key figure structure. You also make the choice of whether the exception evaluation takes place before (default) or after any local calculations within the query.

Defining the exception values is done in the same way as in the *Query Designer* by choosing an alert level, operator and then either one or two values (depending on the operator chosen). The operators are the normal boolean operators such as less than, equal to or between. The operators *Top N, Bottom N, Top %, Bottom %, Top Sum and Bottom Sum* are not available in the Exception Wizard since the filtering of the data supplied to the query has already been done. Those operators are only available when defining exceptions in the *Query Designer*.

Step 3: Set Target

In step three of the Exception Wizard the user chooses which cells are to be affected by the exception.

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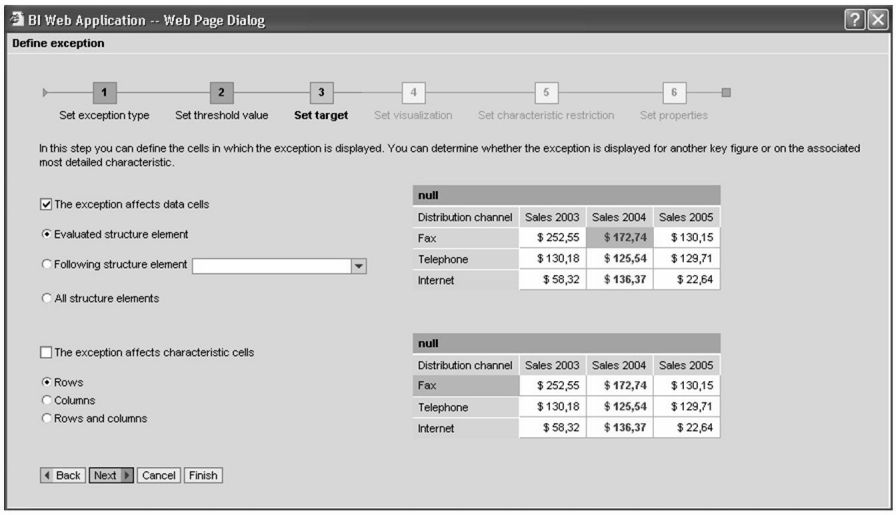

Figure 73: Exception Wizard: Set Target

The exception can be made to apply color to either the values of the key figures and/or the characteristic values in the query result. For the key figure cells, you have a choice to apply the specific alert level color to the key figure being evaluated, all key figures, or some key figure other than the one being evaluated.

For characteristic values in the query result, you can choose to apply the specific alert level color to either the rows, the columns or both, based on where the key figure value appears.

Step 4: Set Visualization

The fourth step in the exception wizard consists of choosing between using background color or symbols to denote the exception.

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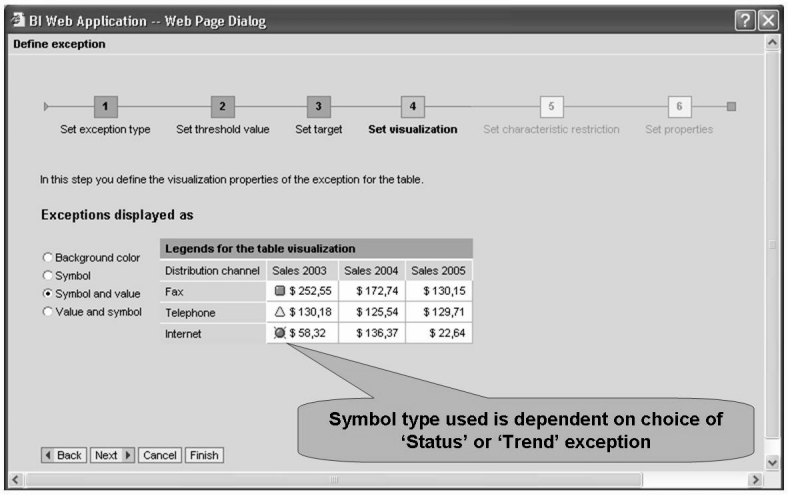

Figure 74: Command Wizard: Set Visualization

The default value is to have the exception rendered as background color within a cell. This corresponds directly to how exceptions were always rendered in BW 3.x. Now, depending on whether you chose *Status Exception* or *Trend Exception*, you can also have the result rendered as a symbol such as a traffic light (red, yellow or green) or an arrow showing the direction of a trend (up, down or flat). Choices are available for symbols to show only the symbol in place of the value or along with the value either before or after it.

Step 5: Set Characteristic Restriction

In this fifth step of the exception wizard you select if the exception is applied to only the results or if certain characteristics are required in the report drilldown before the exception will be evaluated and applied.

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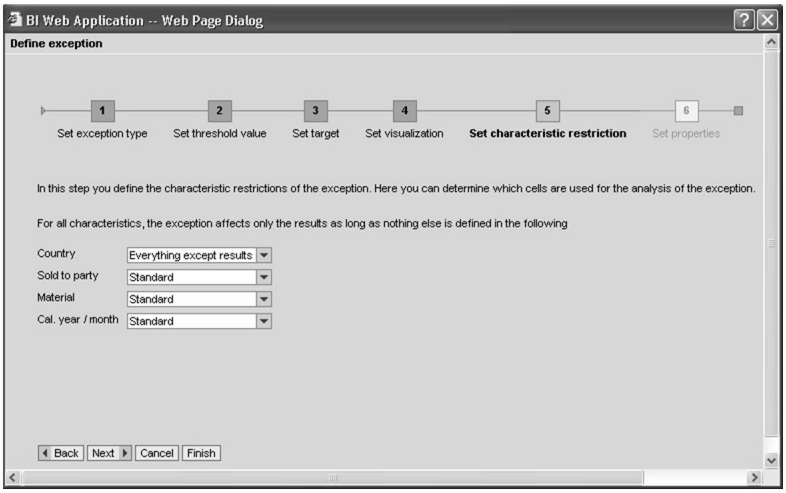

Figure 75: Exception Wizard: Set Characteristic Restriction

Just as when defining exceptions in the *Query Designer*, it is important to note how the exception will operate given certain combinations of characteristics in the report.

Hint: In order for the exception to take effect, all characteristics with a value on this screen other than *Standard* must be in the drilldown of the report. If there is a characteristic in the report drilldown that has *Standard* as the assigned value on this screen, you have to place this characteristic at the end of the drilldown, otherwise the exception will not take effect.

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Step 6: Set Properties

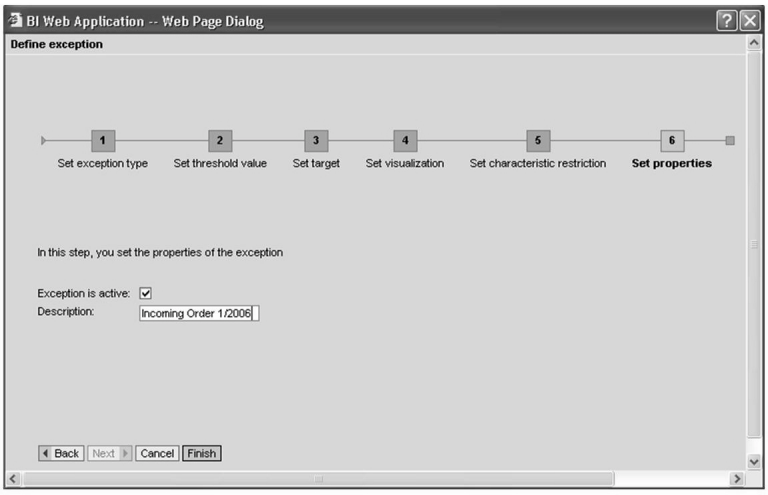

Figure 76: Exception Wizard: Set Properties

In this final step of the exception wizard, the user makes the determination of whether the exception is automatically active in the query results or whether is must be activated by the user in a separate step.

Also, a description is provided for the exception in this step. The description should be one that conveys a clear meaning about what the exception is intended to show the user.

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Exception Wizard: Result

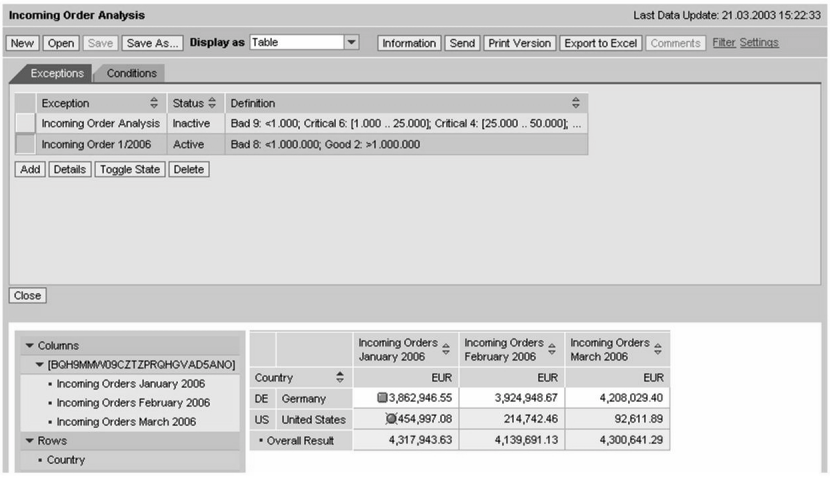

Figure 77: Active Exception Using Symbols

Shown above is the result of the sample exception created with the exception wizard. Note that the exception is rendered using a symbol and the key figure value and that the exception only is applied to one key figure when the characteristic *Country* is in the drilldown.

Frequently Asked Questions

Can you define several exceptions in one query and if yes, what is the correlation between the two?

You can define several exceptions in a query for different value assignment areas or for different versions. If the threshold value areas overlap when you activate several exceptions, the worst (highest) alert level counts.

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Exercise 12: Exceptions

Exercise Objectives

After completing this exercise, you will be able to:

- Define exceptions in the BEx Query Designer and display the exceptions in a report

Business Example

In order to highlight values that exceed or fall short of specified thresholds in a report, you have to define these threshold values in a query definition. You have the task of determining intervals for threshold values that you defined with your superiors, and integrating these so that they can be accessed at any time. The management of your organization also wants to have the flexibility of defining threshold values in order to use and analyze reports taking market conditions into consideration.

Task 1:

You need to define a query to use with exceptions. You want to test out the use of both absolute values and variable default values for the exceptions.

1. Create a new query using the cube *Billing (T_SDC03)* within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Place the characteristic *Sold-to Party (T_SOLD_TO)* from the *Customer* dimension, the characteristic *Material (0MATERIAL)* from the *Material* dimension, and the characteristic *Cal.year / month (0CALMONTH)* from the *Time* dimension in the Rows. Restrict *Cal.year / month (0CALMONTH)* to January 2001 - March 2001.

   In the Columns, include the *Sales Volume EUR (0T_INVCD_V)* key figure.

   Place the characteristic *Sales Organization (0SALESORG)* from the *Sales Area* dimension restricted to *Germany Frankfurt (1000)* in the *Characteristic Restriction* area.

2. Define the following exception: *Description*: **`Exception Absolute Values`** and put a check in the *Exception is Active* checkbox. Exception Values:

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Alert Level	Operator	Value	Value
Bad 3	*Less than*	10,000	
Critical 2	*between*	10,000	50,000
Good 1	*Greater than*	50,000	

In the first step, no more settings are necessary, so confirm your exception by choosing *OK*.

3. Now save the query definition in the under *Roles → Training BW305 Reporting → Unit: Exceptions and Conditions→ Lesson: Exceptions → Exercise* with the following description:

   Description: **GR## BW305 Exceptions**

   Technical name: **BW30517A##**.

   Execute the query in the Web or the BEx Analyzer.

4. You now see that all values of the *Sales Volume EUR (0T_INVCD_V)* column are in color. What happens in the report if you check the button *Exception Only Affects Results* on the *Cell Restrictions* tab page in the exception definition?

5. Which further settings do you have to implement to evaluate only the results of the characteristic *Cal.year / month (0CALMONTH)* by the exception?

6. In the executed report, remove the characteristic *Cal. year / month* from the drilldown. Does the exception still work?

7. Stay in the executed report, insert the characteristic *Cal. year / month* back into the drilldown, but now, remove the characteristic *Sold-to Party* from the drilldown. What do you notice now?

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Task 2:

Optional:

In the second step, you need to create an additional exception based on your **`GR## BW305 Exceptions`** query, in which the threshold values are variable. The variables have already been created for you. You need only define your exception and then define the threshold values in a variable request before executing your query.

1. Define the additional exception as an active one with the description **`Exception Flexible Values`**. The single values of the key figure *Sales Volume EUR (0T_INVCD_V)*, but not the interim results and the final results shall be shaded. Define the following *Exception Values*.

Alert Level	Operator	Value	Value
Bad 3	*Less than*	*Alert level neg. 9 / neg. 7*	
Bad 1	*between*	*Alert level neg. 9 / neg. 7*	*Alert level neg. 7/ middle 5*
Critical 2	*between*	*Alert level neg. 7/ middle 5*	*Alert level middle 5/ good 3*
Good 3	*between*	*Alert level middle 5/ good 3*	*Alert level good 3 / good 1*
Good 1	*Greater than*	*Alert level good 3 / good 1*	

Set the first exception ***Exception Absolute Values*** to **inactive**.

Execute the query. A variable request for your threshold values appears. Since you defined your variables with default values, confirm these values.

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Solution 12: Exceptions

Task 1:

You need to define a query to use with exceptions. You want to test out the use of both absolute values and variable default values for the exceptions.

1. Create a new query using the cube *Billing (T_SDC03)* within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Place the characteristic *Sold-to Party (T_SOLD_TO)* from the *Customer* dimension, the characteristic *Material (0MATERIAL)* from the *Material* dimension, and the characteristic *Cal.year / month (0CALMONTH)* from the *Time* dimension in the Rows. Restrict *Cal.year / month (0CALMONTH)* to January 2001 - March 2001.

   In the Columns, include the *Sales Volume EUR (0T_INVCD_V)* key figure.

   Place the characteristic *Sales Organization (0SALESORG)* from the *Sales Area* dimension restricted to *Germany Frankfurt (1000)* in the *Characteristic Restriction* area.

   a) In the *BEx Query Designer* choose *New Query* and select *InfoAreas*, *BW Training → BW Customer Training → BW 305 Reporting → Sales and Distribution → Billing (T_SDC03)* and choose *Open*.

   b) Place *Sold-to party (T_SOLD_TO)* from the *Customer* dimension, *Material (0MATERIAL)* from the *Material* dimension, and *Cal.year / month (0CALMONTH)* from the *Time* dimension in the Rows.

   c) Place the key figure *Sales Volume EUR (0T_INVCD_V)* in the Columns.

   d) On the *Filter* tab page in the area *Default Values* enter the context menu for *Cal. Year/Month (0CALMONTH)*, choose *Restrict* and select *Single Values* and then the months January 2001, February 2001, and March 2001. Transfer them to the right selection window and confirm with *OK*.

   e) Include *Sales Organization (SALESORG)* from the *Sales Area* dimension in the *Characteristic Restriction* area and restrict it to *Germany Frankfurt (1000)*.

2. Define the following exception: *Description*: **`Exception Absolute Values`** and put a check in the *Exception is Active* checkbox. Exception Values:

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Alert Level	Operator	Value	Value
Bad 3	*Less than*	10,000	
Critical 2	*between*	10,000	50,000
Good 1	*Greater than*	50,000	

In the first step, no more settings are necessary, so confirm your exception by choosing *OK*.

a) In the BEx Query Designer toolbar, choose the *Exceptions* button. *Right mouse click* in the *Exceptions* area, then *New Exception*. Enter the context menu of the new *Exception x* and choose *Edit*.

b) On the *General* tab page, enter the description **`Exception Absolute Values`** and ensure that *Exception Is Active* is checked.

c) Under *Define Exception Values*, enter the different alert levels listed in the table above by using the buttons *New* and *Transfer*.

d) Do not make any changes on the other tab pages and save your exception by choosing *OK*.

3. Now save the query definition in the under *Roles → Training BW305 Reporting → Unit: Exceptions and Conditions→ Lesson: Exceptions → Exercise* with the following description:

   Description: **`GR## BW305 Exceptions`**

   Technical name: **`BW30517A##`**.

   Execute the query in the Web or the BEx Analyzer.

   a) In the BEx Query Designer, choose the *Save Query* button. Then, choose *Exit and use the query* or *Execute*.

4. You now see that all values of the *Sales Volume EUR (0T_INVCD_V)* column are in color. What happens in the report if you check the button *Exception Only Affects Results* on the *Cell Restrictions* tab page in the exception definition?

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a) In the BEx Query Designer, go to the *Exceptions* tab page, in the context menu of the *Exception Absolute Values*, choose *Edit*. On the *Cell Restrictions* tab page, check the button ***Exception Only Affects Results***, press *OK*. Alternatively you can change the settings of the exceptions by using the *Properties* tab page directly in the Query Designer.

b) Save the query and execute it again. The result in the report is that **only the overall result of the *Sales Volume EUR (0T_INVCD_V)* key figure is in color**.

5. Which further settings do you have to implement to evaluate only the results of the characteristic *Cal.year / month (0CALMONTH)* by the exception?

a) You have to go to the *Exceptions* area, enter the exception *Exceptions Absolute Values*, open the *Cell Restrictions* tab page and assign the following operators to the different characteristics used in the query definition by using the *New* button and the *Transfer* button:

Sold-to party —> Everything Except Totals

Material —> Everything Except Totals

Cal. year / month —> Totals only.

To define these settings there's not the opportunity to use the *Properties* tab page directly in the Query Designer.

b) Save the query and execute it again and check the effect of changing the settings of the exception.

6. In the executed report, remove the characteristic *Cal. year / month* from the drilldown. Does the exception still work?

---

a) In the BEx Analyzer, remove by clicking with the right mouse button and choosing *Remove Drilldown*. If you are using a Web report, remove the characteristic from the navigation block or the table by clicking with the right mouse button and choosing *Remove Drilldown*. **Now you don't see the key figure's single values for the characteristic *Cal. year / month* any more, but it's results, so the exception still works and the coloring is still there.**

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7. Stay in the executed report, insert the characteristic *Cal. year / month* back into the drilldown, but now, remove the characteristic *Sold-to Party* from the drilldown. What do you notice now?

---

a) You can see that the key figure values are no longer shaded by the exception. **This is because you now see the results of the characteristic *Sold-to Party* in the report, and the results of this characteristic are not affected by the exception since the cell restriction is "Everything Except Totals".**

Task 2:

Optional:

In the second step, you need to create an additional exception based on your **`GR## BW305 Exceptions`** query, in which the threshold values are variable. The variables have already been created for you. You need only define your exception and then define the threshold values in a variable request before executing your query.

1. Define the additional exception as an active one with the description **`Exception Flexible Values`**. The single values of the key figure *Sales Volume EUR (0T_INVCD_V)*, but not the interim results and the final results shall be shaded. Define the following *Exception Values*.

Alert Level	Operator	Value	Value
Bad 3	*Less than*	*Alert level neg. 9 / neg. 7*	
Bad 1	*between*	*Alert level neg. 9 / neg. 7*	*Alert level neg. 7/ middle 5*
Critical 2	*between*	*Alert level neg. 7/ middle 5*	*Alert level middle 5/ good 3*
Good 3	*between*	*Alert level middle 5/ good 3*	*Alert level good 3 / good 1*
Good 1	*Greater than*	*Alert level good 3 / good 1*	

Set the first exception ***Exception Absolute Values*** to **inactive**.

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Execute the query. A variable request for your threshold values appears. Since you defined your variables with default values, confirm these values.

a) In the BEx Query Designer, choose the *Exceptions* tab page. *Right mouse click* in the *Exceptions* area, then *New Exception*. Enter the context menu of the new *Exception x* and choose *Edit*.

b) On the *General* tab page, enter the description **`Exception Flexible Values`** and ensure that *Exception Is Active* is checked.

c) Under *Define Exception Values*, enter the different alert levels listed in the table above by using the buttons *New* and *Transfer*.

d) On the *Cell Restrictions* tab page, assign the following operators to the different characteristics used in the query definition by using the *New* button and the *Transfer* button:

Sold-to party —> Everything Except Totals

Material —> Everything Except Totals

Cal. year / month —> Everything Except Totals.

e) Confirm the exception with *OK*.

f) In the exception ***Exception Absolute Values*** remove the check from the *Exception Is Active* field, then choose *OK*.

g) *Execute* the query.

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Lesson Summary

You should now be able to:

- Explain the purpose of exceptions
- Use exceptions in a query definition
- Activate and deactivate exceptions within a report
- Use the Exception Wizard to create exceptions in the query results

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Lesson: Conditions

Lesson Overview

This lesson deals with defining threshold values and ranked lists in the Query Designer and also interactively using the Conditions Wizard.

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the purpose of conditions
- Use conditions in a query definition
- Structure a variable condition
- Focus reports on fundamental data using conditions
- Activate and deactivate conditions within a report
- Change, enhance, and delete conditions
- Define a condition using the Condition Wizard

Business Example

The sales department wants the flexibility to restrict a report so that only the most important information displays. This should enable a more efficient analysis of data when large amounts of data are analyzed. You now have the task of using conditions within a query definition in order to meet the aims of the sales department.

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Defining Conditions

Sold-to Party		Sales Volume EUR
3500	Royal Brit. Rail	28,456,900.00 EUR
2500	Electro Engines	15,760,300.00 EUR
3010	Hever Industrial Inc.	11,009,567.00 EUR
2120	COMPU Tech	8,780,300.00 EUR
1660	Booktree Inc.	6,430,780.00 EUR
2000	Becker Berlin	2,670,987.00 EUR
3390	Nobil North Ltd.	800,587.00 EUR
5510		798,971.00 EUR
		234,400.00 EUR
		202,650.00 EUR

By defining a condition, you can restrict your query to a specific ranked list, for example.

Figure 78: Focusing Data Using Conditions

By defining a condition, you have the option of analyzing the query results in more detail. You can analyze combinations of characteristics using ranked lists, thereby displaying your ten best customers by sales revenue, for example. By defining value limits, you can display all key figure values above or below a certain value. The data is restricted accordingly in the results area of the query so that you only see the area that interests you. You can define multiple conditions for a query, and then activate or deactivate them in the report itself to create different views of the data.

You can make restrictions in the Query Designer, using the toolbar button *Condition* . As a prerequisite, you have to have created a query definition for which one or more conditions can be defined.

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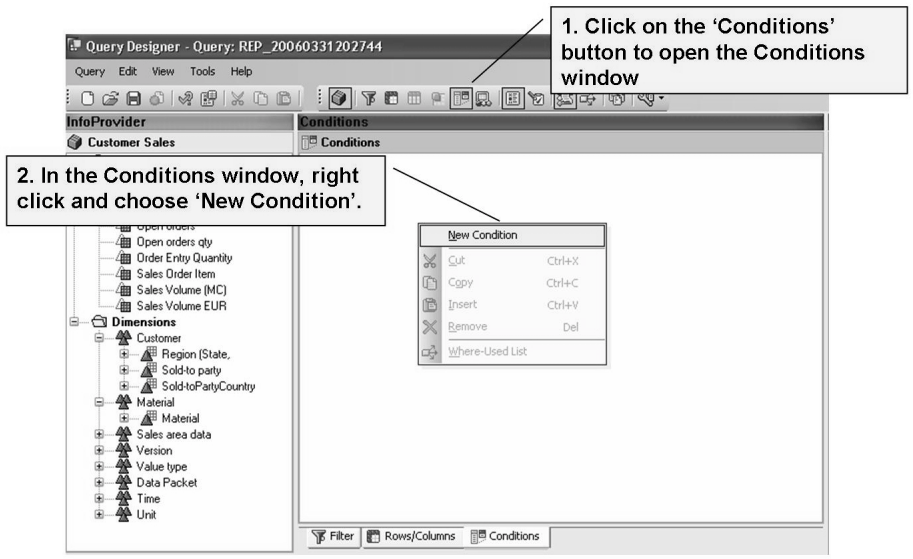

Figure 79: Defining a New Condition in the Query Designer (1)

Within the conditions pane that appears right click and chose the menu option *New Condition*. A new condition is created with a temporary name. You must double click on this new object (or select it first then use the menu option *Edit*) to define the settings for the condition.

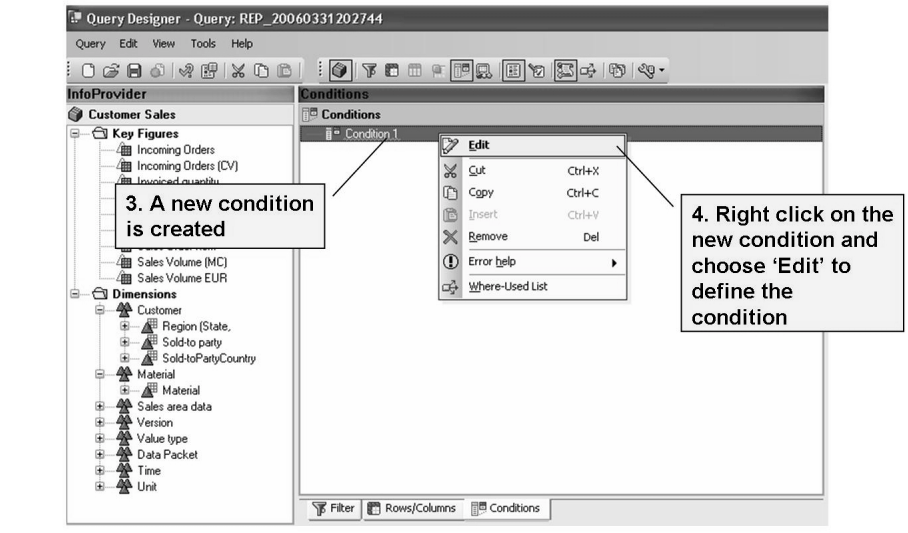

Figure 80: Defining a New Condition in the Query Designer (2)

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The General Tab appear first. Here enter a *Description* and set the condition to *Active*. If the condition has the status *Active*, that condition is used in the report as soon as you execute the query. If you do not set the active flag, the condition can be activated in the report itself.

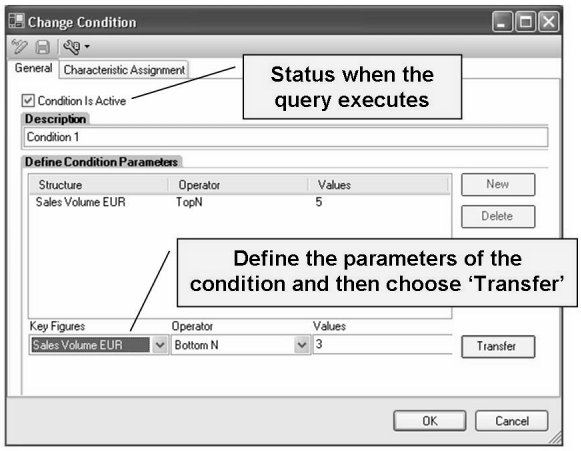

Figure 81: Conditions : General Tab

Features

In *Define Condition Parameters*, choose *New* to select a *Key Figure* for which a condition is to be used. In the second field, you can see the operators for specifying value definitions. You choose *Transfer* to add your entries to the list of conditions and choose *New* to define more conditions. You save your conditions by choosing *OK*; you can then display your report in the BEx Analyzer or in the web.

Hint: A condition row consists of a key figure, an operator, and a value for the operator. In query definitions that contain two structures, there is an additional field for defining a structural component.

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You can use the following operators for threshold value conditions:

- *Equal to*

  Example: Invoiced quantity equals 1000

- *Not Equal to*

  Example: Line item not equal to 5

- *Less than*

  Example: Sales revenue less than 100,000 EUR

- *Greater than*

  Example: Incoming orders greater than 1,000,000 EUR

- *Less than or equal to*

  Example: Sales revenue less than or equal to 100,000 EUR

- *Greater than or equal to*

  Example: Incoming orders greater than or equal to 1,000,000 EUR

- *Between*

  Example: Sales from/to, with the option of defining these values using a variable request

- Not Between

  Example: Sales from/to excluded from display, with the option of defining these values flexibly at runtime.

Hint: In the variable definition, select *Variable Entry*. You are then given the option of choosing an existing variable from the drop-down list, changing the variable or creating a *New Variable*.

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You can use the following operators for ranked list functions:

- *Top N*

  Example: Display the sales revenue of the top 5 customers

- *Bottom N*

  Example: Display the bottom 3 (lowest) incoming orders

- *Top %*

  Example: Restriction to 20% of the best revenue, in order

- *Bottom %*

  Example: List of 15% of the customers with the lowest sales revenue, in order

- *Top Sum*

  Example: You get a list of the products with the highest sales revenues where the total sales revenue makes up 20,000 EUR. All sales revenues are sorted in descending order and then the sum is calculated until the threshold value of 20,000 EUR is exceeded. All products, including the product that takes the sales volume over the 20,000 EUR mark, are listed.

- *Bottom Sum*

  Example: Same as the *Top Sum* but here, a ranked list is sorted in ascending order of products with the weakest sales revenue until a sum greater than or equal to 20,000 EUR is reached. All products, including the product that takes the sum over the 20,000 EUR mark are also listed here.

Caution: When you execute a report with an active condition, you always see the **unconditional** query result in the *Overall Result* row (overall result without filter). If you want to see the filtered (conditional) query result, from the context menu in the BEx Analyzer, you can choose *Properties* → *Calculations* → *Calculate Result As* → *Summation*. If you are using the web browser, you can call the context menu and then choose *Attributes* → *Data Cell*→ *Result Calculations* → *Sum* .

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On the characteristic assignments tab you define how the condition will work in conjunction with the characteristics in your query . If the query contains many drill-down characteristics it is very easy for the condition to be out of context and produce invalid results. You can decide between the following options:

- All characteristics in the drill-down independently

  The condition is always valid for all characteristic combinations.

- Most detailed characteristic along the rows

  The condition is valid only when all characteristics in the query have been used in the drill down along the rows.

- Most detailed characteristic along the rows

  The condition is valid only when all characteristics in the query have been used in the drill down along the rows.

- Individual Characteristic and Characteristic combinations

  For this setting you define precisely which characteristics must be in the drill down before the condition is valid. Check the boxes to include them.

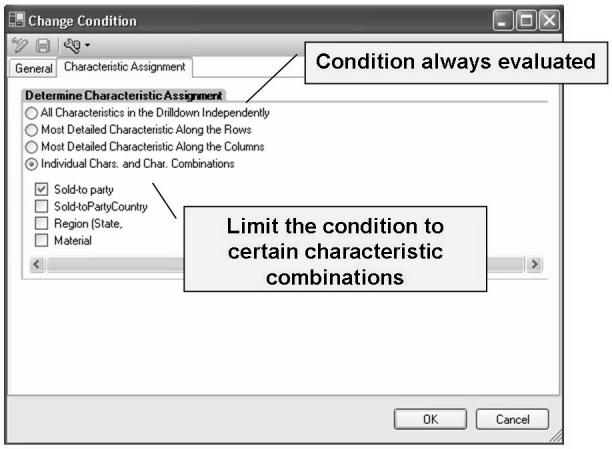

Figure 82: Conditions : Characteristic Assignment Tab

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Using Several Conditions in a Report

If you are using several conditions in one report, conflicts can arise that lead to automatic deactivation. The following status descriptions appear in the display:

- **Variant**

  Reason:

  The condition relates to a characteristic or characteristic combination that is not included in the drilldown.

- **Not Used**

  Reason:

  The condition relates to a characteristic that is drilled down using an active display hierarchy.

  The condition relates to a characteristic that is included through the activation of another condition, leading to a collision, and is therefore deactivated (however, you can reactivate this condition and automatically deactivate the last condition activated).

Caution: If you activate a condition for a combination of characteristics, the results row no longer displays.

Changing and Deleting Conditions

Conditions Wizard

Within the *Web Analyzer*, users can create conditions on an as-needed basis using the *Conditions Wizard*.

In the *Web Analyzer* selecting the *Settings* link provides access to existing conditions that are part of the query definition as well as to the Condition Wizard. By selecting an existing condition, the user can activate/deactivate the condition with the *Toggle State* button. The parameters of the existing condition can be changed by selecting the *Details* button. Neither the status nor the definition of the condition can be changed permanently using these buttons.

To create a new condition, the user can select the *Add* button. This action starts the Condition Wizard described below.

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Step 1: Set Condition Type

The Condition Wizard starts with the choice of condition type.

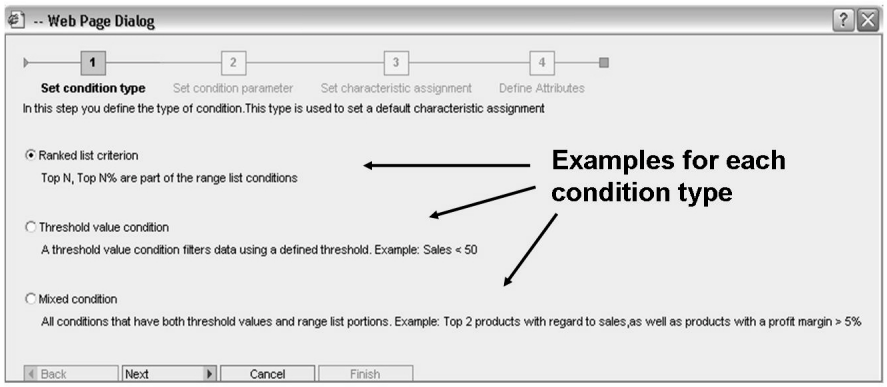

Figure 83: Step 1: Set Condition Type

In this first step of the Conditions Wizard, the choice is made between using a *Ranked List* or a *Threshold value* or a *Mixed* condition type. A ranked list uses ranking criteria such as top n, or bottom 5%. .A threshold value test the absolute value of the key figure, such as >, <, between, equal to etc. A mixed condition uses a combination of both threshold and ranking criteria, such as top 5 salespeople plus products selling greater than 1000 EUR.

To proceed to the next screen, the user selects the *Next* button.

Step 2: Set Condition Parameters

In the second step, the actual condition criteria is defined as well as other settings.

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Enter the parameters based on the condition chosen.

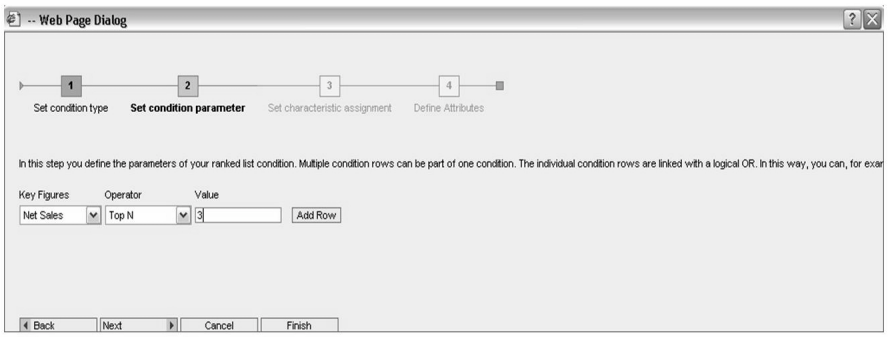

Figure 84: Step 2: Set Condition Parameters

Defining the condition criteria is done in the same way as in the *Query Designer* by choosing an key figure, operator and then a value for the operator to work on.

Step 3: Set Characteristic Assignment

In step three of the Condition Wizard the user chooses characteristics are valid for the condition.

Characteristic assignment is done in the third step of the wizard.

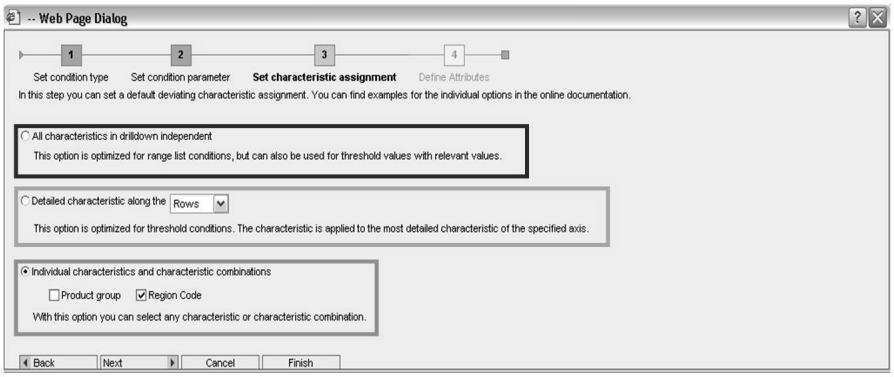

Figure 85: Step 3: Set Characteristic Assignment

Just as in the Query Designer it is important to define the relevance of the condition to the characteristics in order to avoid invalid results.

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Step 4: Define Attributes

The fourth step in the condition wizard consists of entering a name for the condition and deciding if the condition should be active or inactive when the query is executed.

Set the activity status and description to finish the condition.

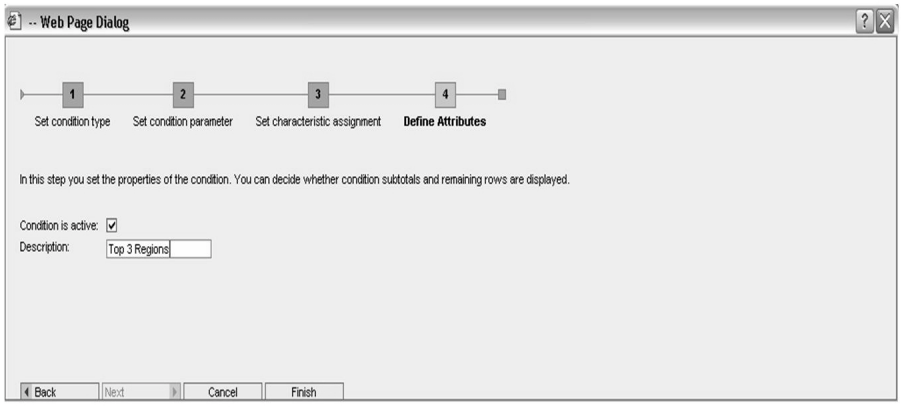

Figure 86: Step 4: Define Attributes

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Exercise 13: Conditions

Exercise Objectives

After completing this exercise, you will be able to:

- Define conditions in the BEx Query Designer and display them in a report.

Business Example

You can define conditions to considerably reduce the volume of data in a report.

Task:

Structure your query based on the *Billing* InfoCube and include several conditions so that they can be activated as required in the report. To ensure a certain amount of flexibility, you want to use variables in one of the conditions.

1. Create a new query using the *Billing (T_SDC03)* InfoProvider within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Move the characteristics *Division (0DIVISION)* and *Material (0MATERIAL)* into the free characteristics area. For *Material*, under *Properties* define the *Product Hierarchy for Material MARA (PRDHA)* as inactive.

   Move the characteristic *Sold-to Party (T_SOLD_TO)* into the Rows and the key figure *Sales Volume EUR (T_INVCD_V)* into the Columns. Specify *Total* for the result calculation for the key figure.

2. Define the first condition with the *Description* **`Top 5 and Bottom 3 All Char.`** . Ensure that the condition applies for the key figure *Sales Volume EUR* and for *All Characteristics in the Drilldown Independently*. The condition is to be activated as required in the executed report first, and not yet in the query definition.

3. Now create a second, not active condition with the *Description* **`< 1000 Comb. Sold-to Party, Division`** restricted to characteristics *Sold-to Party* and *Division* and applied for the *Sales Volume EUR* key figure.

4. Define the third, not active condition with the *Description* **`From 1 Mil. to 10 Mil. Variable All Char.`**. Specify that the condition applies for *All Characteristics in the Drilldown Independently* and for the key figure *Sales Volume EUR*, use the operator *Between* and the variable values *From Value (T_VONW00)* and *Till Value (T_BIS00)*. The variables already contain the default values 1,000,000 and 10,000,000.

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5. Define the fourth and final, not active condition with the *Description* **Bottom Sum 1000 Material** restricted to the single characteristic *Material* and applied to the *Sales Volume EUR* key figure.

6. Now save the query definition under *Roles* → *Training BW305 Reporting* → *Unit: Exceptions and Conditions*→ *Lesson: Conditions* → *Exercise* with the following description:

   Description: **GR## BW305 Conditions**

   Technical name: **BW30518A##**

   Execute the query in the Web and see the function of each of the conditions by activating and deactivating them.

7. From the Web toolbar in the default template, you can choose *Settings* → *Conditions* to access and activate/deactivate *(Toggle State)* all existing conditions. Furthermore you can view the *Details* of each condition and create *New* conditions here.

   Activate and deactivate the different conditions and extend the results area or your table using the free characteristics available.

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Solution 13: Conditions

Task:

Structure your query based on the *Billing* InfoCube and include several conditions so that they can be activated as required in the report. To ensure a certain amount of flexibility, you want to use variables in one of the conditions.

1. Create a new query using the *Billing (T_SDC03)* InfoProvider within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Move the characteristics *Division (0DIVISION)* and *Material (0MATERIAL)* into the free characteristics area. For *Material*, under *Properties* define the *Product Hierarchy for Material MARA (PRDHA)* as inactive.

   Move the characteristic *Sold-to Party (T_SOLD_TO)* into the Rows and the key figure *Sales Volume EUR (T_INVCD_V)* into the Columns. Specify *Total* for the result calculation for the key figure.

   a) In the *BEx Query Designer* choose *New Query* and select *InfoAreas*, *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing (T_SDC03)* and choose *Open*.

   b) From the *Sales Area* dimension, move *Division* to the *Free characteristics* area.

   c) From the *Material* dimension, move *Material* to the *Free characteristics* area.

   d) In the *Properties* of *Material*, select the hierarchy *Product Hierarchy for Material MARA (PRDHA)*. Remove the check mark in the *Activate Hierarchy Display* box.

   e) Move the characteristic *Sold-to Party (T_SOLD_TO)* into the Rows.

   f) Move the key figure *Sales Volume EUR (T_INVCD_V)* into the Columns. In order to specify the appropriate result calculation go to *Properties → Calculations → Calculate Result As* and select *Total*.

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2. Define the first condition with the *Description* **`Top 5 and Bottom 3 All Char.`** . Ensure that the condition applies for the key figure *Sales Volume EUR* and for *All Characteristics in the Drilldown Independently*. The condition is to be activated as required in the executed report first, and not yet in the query definition.

   a) Press the *Conditions* button in the BEx Query Designer toolbar. The *Conditions* area opens. Right-mouse-click within this area, and then *New Condition*. Double-click or *Right-mouse-click* → *Edit* on the new *Condition x*.

   b) ***General*** tab page:

   Description: **`Top 5 and Bottom 3 All Char.`**

   Remove the check from the *Condition is Active* box.

   Fill in the *Condition parameters* by pressing the *New* button.

Key Figures	Operator	Values
Sales Volume EUR(T_INVCD_V)	Top N	5
Sales Volume EUR(T_INVCD_V)	Bottom N	3

   Select *Transfer* after each one to add it to the condition.

   Characteristic Assignment tab page:

   All Characteristics in the Drilldown Independently

   Confirm with *OK*.

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3. Now create a second, not active condition with the *Description* **< 1000 Comb. Sold-to Party, Division** restricted to characteristics *Sold-to Party* and *Division* and applied for the *Sales Volume EUR* key figure.

   a) Right-mouse-click within the *Conditions* area, and then *New Condition*. Double-click or *Right-mouse-click* → *Edit* on the new *condition x*.

   .

   b) ***General*** tab page:

   Description: **< 1000 Comb. Sold-to Party, Division**

   Remove the check from the *Condition is Active* box.

   Condition parameters:

Key Figures	Operator	Values
Sales Volume EUR(T_INVCD_V)	Less than	1000

   Characteristic Assignment tab page:

   Individual Chars. and Char. Combinations.

   Select the characteristics *Sold-to Party* and *Division*.

4. Define the third, not active condition with the *Description* **From 1 Mil. to 10 Mil. Variable All Char.**. Specify that the condition applies for *All Characteristics in the Drilldown Independently* and for the key figure

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Sales Volume EUR, use the operator *Between* and the variable values *From Value (T_VONW00)* and *Till Value (T_BIS00)*. The variables already contain the default values 1,000,000 and 10,000,000.

a) ***General*** tab page:

Description: **`From 1 Mil. to 10 Mil. Variable All Char.`**

Remove the check from the *Condition is Active* box.

Condition parameters:

Key Figures	Operator	From Value	To Value
Sales Volume EUR(T_IN-VCD_V)	Between	Variable: From value (T_VONW00)	Variable: Till Value (T_BIS00)

Characteristic Assignment tab page:

All Characteristics in the Drilldown Independently

5. Define the fourth and final, not active condition with the *Description* **`Bottom Sum 1000 Material`** restricted to the single characteristic *Material* and applied to the *Sales Volume EUR* key figure.

a) ***General*** tab page:

Description: **`Bottom Sum 1000 Material`**

Remove the check from the *Condition is Active* box.

Condition parameters:

Key Figures	Operator	Values
Sales Volume EUR(T_INVCD_V)	Bottom Total	1000

Characteristic Assignment tab page:

Individual Chars. and Char. Combinations.

Select the characteristic *Material*.

6. Now save the query definition under *Roles → Training BW305 Reporting → Unit: Exceptions and Conditions→ Lesson: Conditions → Exercise* with the following description:

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Description: **GR## BW305 Conditions**

Technical name: **BW30518A##**

Execute the query in the Web and see the function of each of the conditions by activating and deactivating them.

a) In the BEx Query Designer, choose the *Save Query* button. Then, choose *Execute*.

7. From the Web toolbar in the default template, you can choose *Settings* → *Conditions* to access and activate/deactivate *(Toggle State)* all existing conditions. Furthermore you can view the *Details* of each condition and create *New* conditions here.

   Activate and deactivate the different conditions and extend the results area or your table using the free characteristics available.

   a) Proceed as described in exercise step above.

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Lesson Summary

You should now be able to:

- Explain the purpose of conditions
- Use conditions in a query definition
- Structure a variable condition
- Focus reports on fundamental data using conditions
- Activate and deactivate conditions within a report
- Change, enhance, and delete conditions
- Define a condition using the Condition Wizard

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Unit Summary

You should now be able to:

- Explain the purpose of exceptions
- Use exceptions in a query definition
- Activate and deactivate exceptions within a report
- Use the Exception Wizard to create exceptions in the query results
- Explain the purpose of conditions
- Use conditions in a query definition
- Structure a variable condition
- Focus reports on fundamental data using conditions
- Activate and deactivate conditions within a report
- Change, enhance, and delete conditions
- Define a condition using the Condition Wizard

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Unit 8

BEx Analyzer

Unit Overview

This unit describes the functions that you can call from the *SAP BI* BEx Toolbar in the BEX Analyzer.

The Unit explains, among other things, how to create your own templates for embedding reports, how to move and copy areas in the query, how to add more queries to a worksheet, and how to create a snapshot. The Unit also describes how to activate the log book, for example, to trace database access.

Unit Objectives

After completing this unit, you will be able to:

- Describe the role of the BEx workbook
- Use the functions of the BEx Analysis Toolbox
- Define Workbook Settings within the BEx Design Toolbox

Unit Contents

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Exercise 14: BEx Analysis Toolbox 335

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Lesson: BEx Analyzer

Lesson Overview

This lesson covers the functions of the BEx Analyzer. You will learn how to embed a query in a workbook and define the settings which influence the behavior of the result in the workbook.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the role of the BEx workbook
- Use the functions of the BEx Analysis Toolbox
- Define Workbook Settings within the BEx Design Toolbox

Business Example

The SAP BI users use BEx Analyzer as an analytical, reporting, and design tool embedded in Microsoft Excel to easily access InfoProvider data, Queries, Query Views, and workbooks and to analyze the data by navigating interactively. They can configure global settings and specific settings for workbooks, create new workbooks and trigger the distribution of them. In order to define new query definitions they also can launch the BEx Query Designer.

General Features

When you first launch the BEx Analyzer two toolboxes appear. The **analysis** toolbox contains all the functions used when the user is working with the query results in the workbook. The **design** toolbox contain the functions used when developing the workbook.

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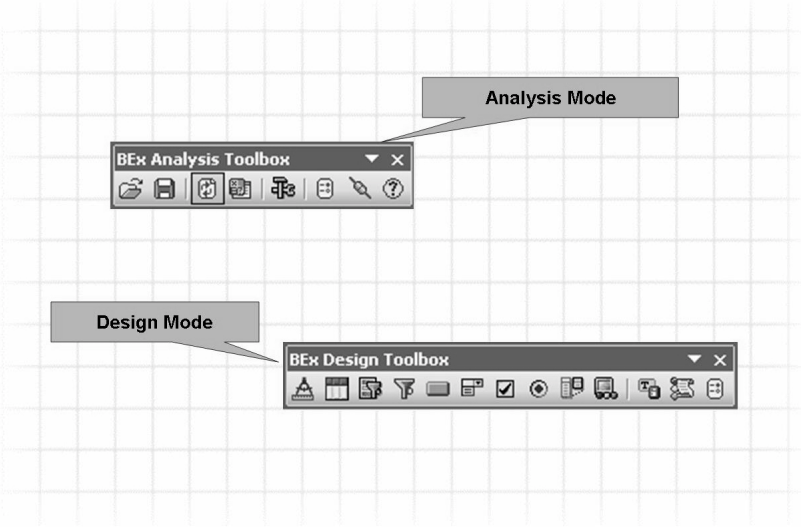

Figure 87: Analysis versus Design Mode

Open Dialogue

First you need to decide precisely what do you want to open ? There are two choices:

- Previously saved workbook.

  This is a workbook which contains one or more queries and may also contain specific filters, graphics and formatting. The workbook may also be made up of many worksheets.

- New workbook based on existing query.

  When you choose this option you will reach the query dialog box and you will need to choose an existing query to embed in the new workbook. The workbook will appear with standard BEx formatting.

It is also possible to open the Query Designer directly from the BEx Analyzer. This means you can either create a new query or open an existing query in maintenance mode in order to view it or modify it before using it in the BEx Analyzer.

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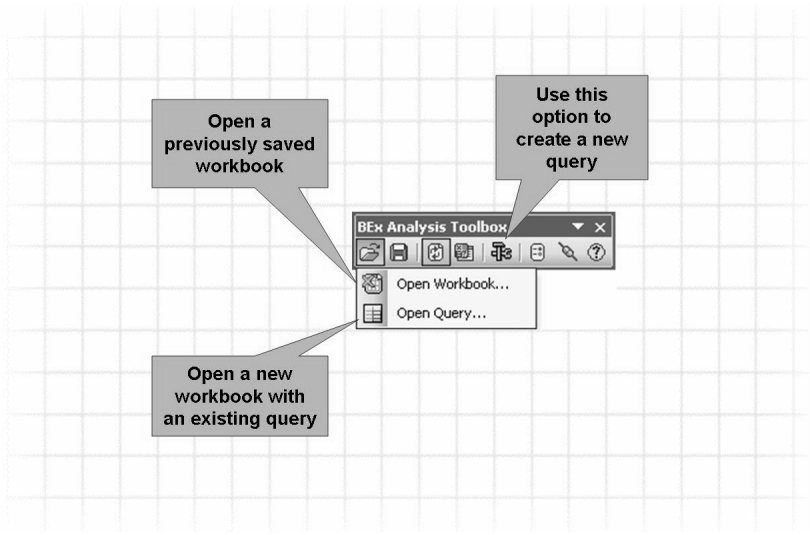

Figure 88: BEx Analyzer Open Options

Open Workbook

The open workbook dialog is used to locate an existing workbook. There are four button to the left of the dialog to help you find your workbook.

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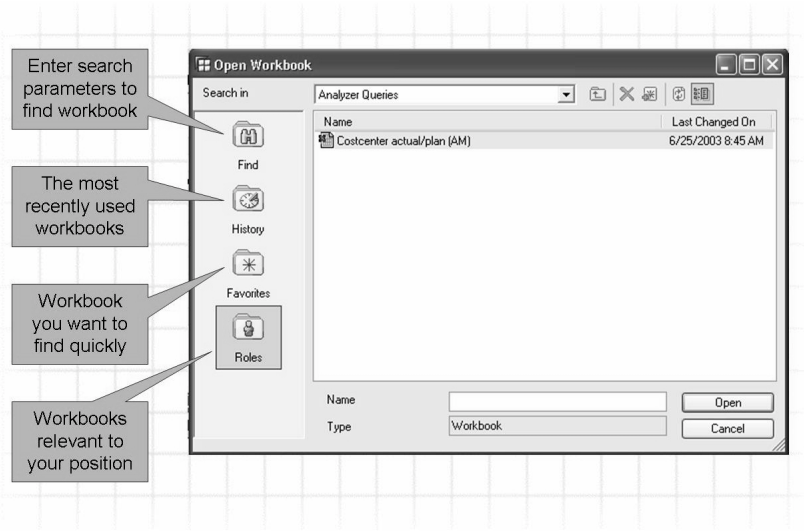

Figure 89: Open Workbook Dialog

- Find

  Use this option to supply partial information which will help track down a workbook

- History

  This option will display the last 15 workbooks you have worked with.

- Favorites

  This option will display any workbook which you have added to your favorites. If you spot a workbook which you know you want to work with frequently you can use the 'Add to Favorites' option so it will appear under this button thereafter.

- Roles

  A user may be assigned to one or more roles by the system administrator. The workbooks may be stored against roles. If the user presses this button they will see the roles to which they have been assigned and against these roles the assigned workbooks will appear.

Open Query

The open query dialog is used to locate an existing query so that it can be embedded with a new workbook. There are five buttons to the left of the dialog to help you find your query. It is worth remembering that you do not have to select a BEx Query,

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you could simply select any InfoProvider. This means that all the data from the InfoProvider will appear inthe result unconstrained. The user would then use the navigation options in the workbook to filter the data as required.

Caution: A BEx Query is designed to reduce the amount of data extracted from the InfoProvider. The option of selecting the InfoProvider directly in the open dialog could cause long run times as all data is extracted.

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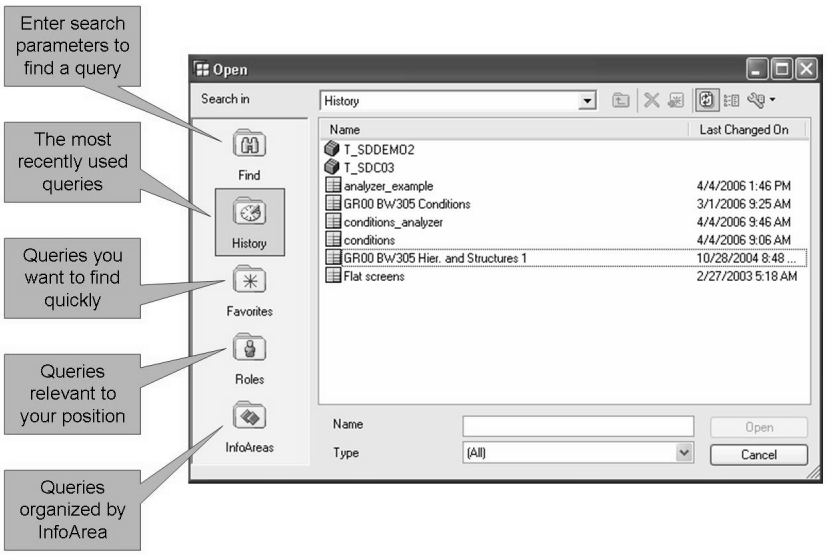

Figure 90: Open Query Dialog

- Find

  Use this option to supply partial information which will help track down a query.

- History

  This option will display the last 15 queries you have worked with.

- Favorites

  This option will display any query which you have added to your favorites. If you spot a query which you know you want to work with frequently you can use the 'Add to Favorites' option so it will appear under this button thereafter.

- Roles

  A user may be assigned to one or more roles by the system administrator. The queries may be stored against roles. If the user presses this button they will see the roles to which they have been assigned and against these roles the assigned queries will appear.

- InfoAreas

  A query is assigned to an InfoProvider such as an Infocube or Infoset. All InfoProviders are organized into InfoAreas. So if you know which InfoProvider your query has been assigned to it may be easier to locate the query by drilling down to the InfoProvider via the InfoAreas.

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Save Workbook Dialogue

A workbook can contain the results of one or more queries, the queries can appear on multiple worksheets or one a single worksheet. A workbook can be formatted to the user's requirements (logos, fonts, styles etc.) and can contain Excel native formatting and other Excel features such as pivot tables, filters. When a workbook is saved the current navigation state is also saved. This means that when the user reaches a useful navigation state they can choose to save the workbook so that next time the workbook opens at the same position. The user can also choose whether to refresh the data automatically when the workbook next opens or to open the workbook with the old (frozen) data first, the user cold then choose to manually refresh the data.

The Save dialog box offers two places where the workbook could be saved.

- Favorites

  A workbook saved here could only be opened by the user who saved it there. This is regarded as a personal set of workbooks. A user can add other workbooks to this area by using the menu options 'Add to Favorites' in the open dialog box.

- Roles

  A workbook saved here can be opened by others who share the same role. Potentially it could be possible for one person to open the workbook, make some changes to the results (i.e. change filters) or change formatting, then re-save the workbook affecting all users who use the same workbook. So it is important to consider BEx Analysis Authorizations when workbooks are shared via roles so changes can be controlled.

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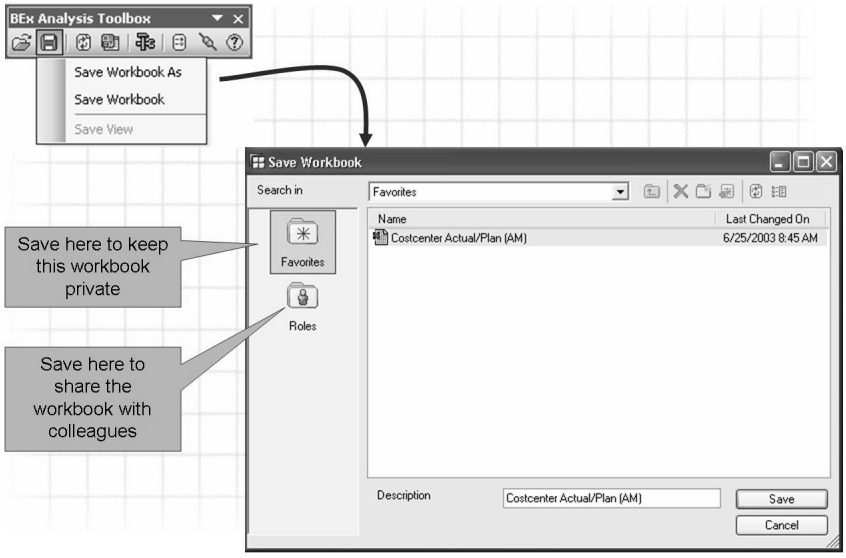

Figure 91: Save Workbook Dialog

Refresh / Pause Automatic Refresh

The default action following any change to the navigation state of the result set in a workbook is that an automatic refresh of the query is performed. If a user wishes to enter a series of filters then it would be inefficient for the query to automatically refresh each time a filter was entered, especially if the refresh took a while to complete. It is possible to halt the auto refresh from executing and instead switch to a manual refresh mode which means that the user can enter a series of filters and when they are ready they simply press the fresh button in the toolbox to trigger the refresh. This means the OLAP processor can process all the filters in one step. The refresh icon appears slightly differently depending on whether the workbook is in automatic refresh mode or manual refresh mode. To switch between the automatic refresh and manual refresh modes simply press the *refresh* button in the analysis toolbox.

When a workbook is saved the reporting data can also be saved with the workbook. This means that when the workbook is reopened the user will immediately see the old reporting data, they would have to press the *refresh* button in order to refresh the data. You have to consider whether this is the required behavior for the users, they may prefer to have the workbook automatically refresh on opening. If the latter is the case then switch the default check box setting to *Refresh workbook on opening*.

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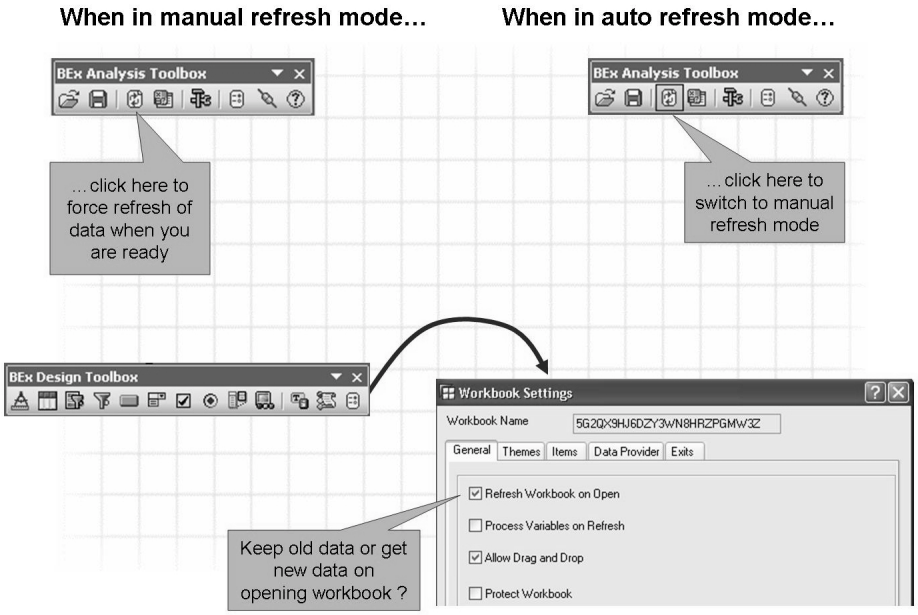

Figure 92: Workbook Refresh Options

Changing Variable Value

When a workbook is opened which contains one or more variables, these variables will need to be populated. There are a number of choices related to processing of variables in workbooks.

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The default settings of the workbook will cause the variables dialog to appear so that the user can enter the required values. The dialog contains features that are designed to assist the user in selecting the values.

- Variants

  A variant is a collection of variable values which have been previously saved so that they can easily be recalled. A variant can be useful when common collections of variable values are needed, this saves the user from having the enter the values each time, they simply select from the *Available variants*drop down list to choose an appropriate variant. To save a new variant select the button *save variant* and supply a name for the variant.

- Personalize Variables

  A user can choose to save the values of variables in a personal list. This means that instead of being presented with a huge number of irrelevant variable values, the user simply sees the values which they use frequently, this should save time when choosing the values. To save values to the personal list press the *Personalize Variables*button, the values currently entered in the variables selection fields will be added to the list for the user. To recall the personal list simply press the button *personalized variables*.

- Start With These Values Next Time

  If this box is checked then the next time the workbook opens using the variables values in the dialog box.

It is also possible to open the workbook without the variables dialog box appearing. The variables values last entered will be used. If the user decides to change the values of the variables they simply press the *change variables* button in the analysis toolbox. The default action is that the variables dialog will not appear on workbook opening however if you decide you would like to see the variables dialog when the workbook opens you need to access the *Settings* button in the design toolbox, then check the box marked *Process variables on workbook opening*.

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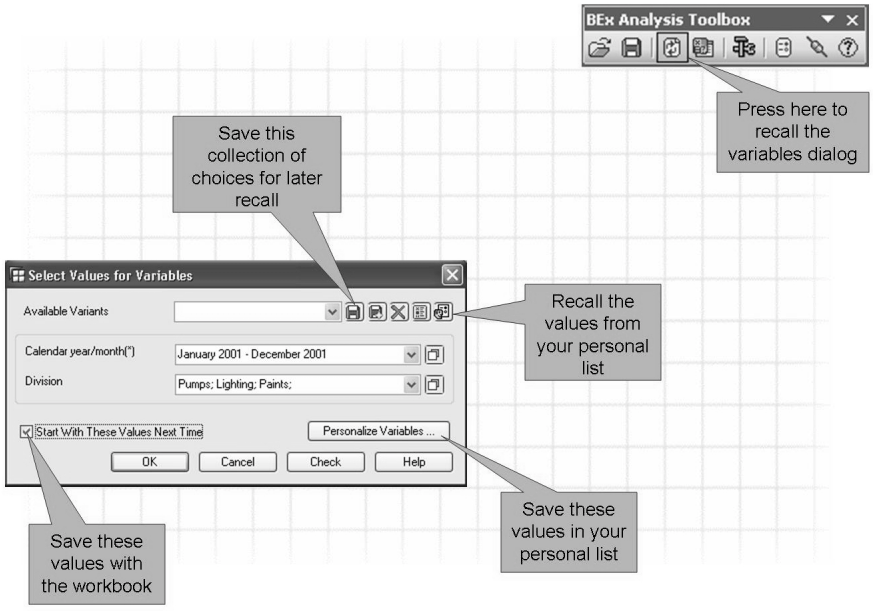

Figure 93: Changing Variables Values

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Tools

The *Tools*button can be found on the analysis toolbox and provides access to a number of useful tools.

- Query Designer

  You can open the query designer in 'create' mode if you need to build a new query. However you can also open the definition of the current query (the query must first he selected in the workbook by selecting any result cell of the required query).

- Broadcaster

  The Broadcaster allows you to send the workbook results to other users either immediately or at predefined timepoint. This link will open up the broadcaster dialog so that you are able to make the settings.

- Planning Modeler

  This link opens the Planning Modeler. Here you can design planning applications that are fully integrated with the BEx environment.

- Report Designer

  The Report Designer allows you to create reports based on BEx Queries which require a high level of formatting. This link takes you to this tool.

- Web Analyzer

  The Web Analyzer is a web based tool which allows a user to open queries, query views from SAP and non SAP data sources for flexible analysis. This link takes you to this tool.

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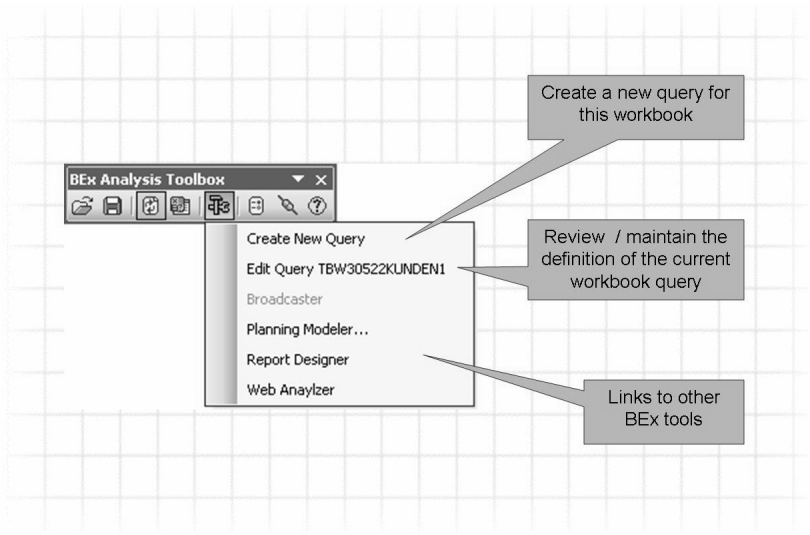

Figure 94: Tools

Global Settings

The global settings allow you to define the environment in which all workbooks will be processed. The settings are organized via tabs as follows:

Behavior

- Display System Name in Local History

  Sometimes it is helpful to identify the source of the report (and therefore the data) before opening.

- Log On with Attached GUI

  If the user is already logged on to the SAP BI, this setting means that the same user id will be used to launch the BEx Analyzer. If you prefer to enter the logon details each time the Analyzer is launched then do not check this box.

- Launch Legacy Version from RRMX

  RRMX is the transaction code used to launch the BEx Analyzer from the SAP GUI. The BEx is supplied with a BW 3.x version of the tools as well as the current Netweaver BI 2004s version. You can choose to launch the older BW 3.x version of the BEx Analyzer from RRMX by checking this box.

- Launch Analyzer whenever Excel starts

  You can choose to launch the BEx Analyzer functions whenever you start Excel.

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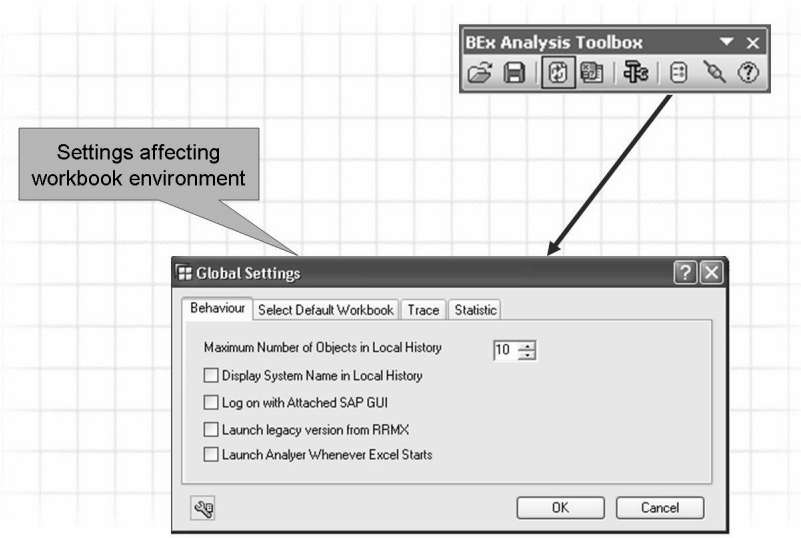

Figure 95: Global Settings

Connect and System Information

If you want to remind yourself of some key system information including how you are currently logged on then press the *System Information* button in the analysis toolbox.

Here you also have an opportunity to log off and log on again. Look carefully at the toolbar icon graphic, when you are logged on the 'plug' icon appears connected, when you are not logged on the 'plug' remains unconnected !

Hint: This can be a useful feature when you are testing or developing authorizations in the Analyzer and need to switch between users without leaving the Analyzer.

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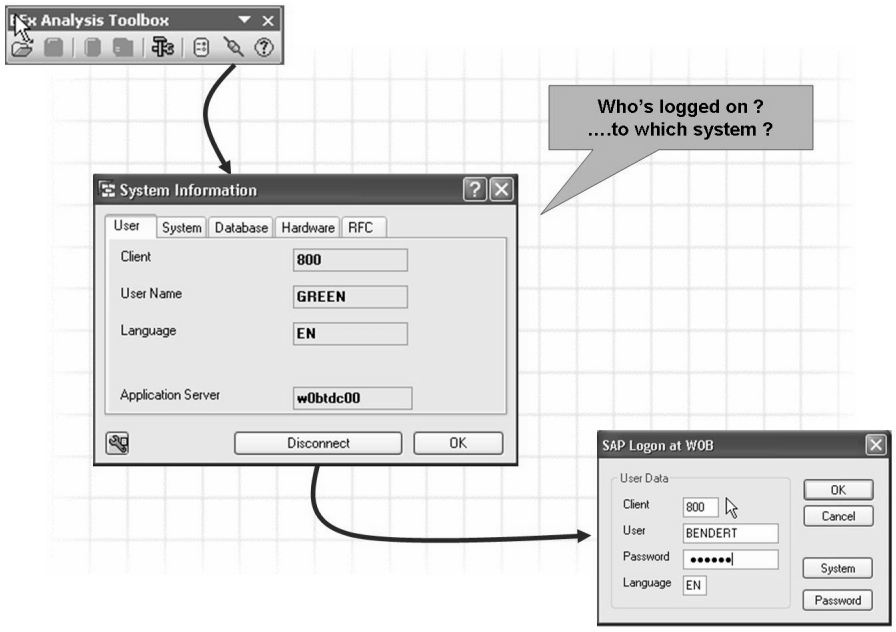

Figure 96: Connect and System Information

Workbook Settings: General Tab

The design toolbox contains a range of tools which help a developer to create a flexible and potentially sophisticated workbook. The toolbox contains options to add new analysis features such as navigation controls (radio buttons, drop down lists) and text elements to the workbook. The button *Workbook Settings* is found in the design toolbox and offers the developer a number of settings which affect the behavior and presentation of the workbook.

In this class we take a look at the *Workbook Settings* button and specifically the settings on the *General* tab. These settings are important for any workbook from the most complex to the most simple.

Note: The design mode of the workbook and all the tools available in this mode are covered in detail in the BW306 class. This is a 5 day class which looks at advanced BI report development.

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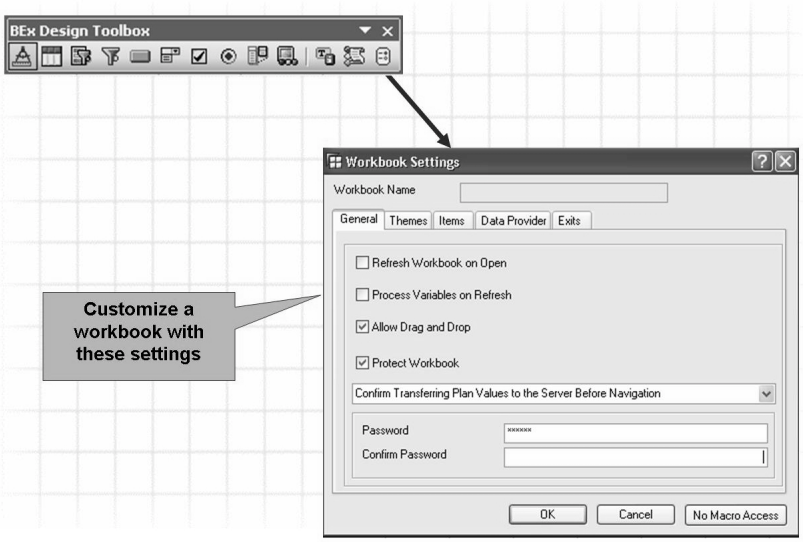

Figure 97: Workbook Settings : General Tab

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The settings available under the General Tab include:

- Refresh Workbook on Open

  Causes the workbook to automatically refresh all query results on opening to retrieve the latest data fro the InfoProvider.

- Refresh Workbook on Open

  Causes the workbook to automatically refresh all query results on opening to retrieve the latest data fro the InfoProvider.

- Allow Drag and Drop

  If you want the prevent the users from using the drag and drop features then check this box. A workbook may be intentionally developed with minimal or no opportunity for navigation, switching off the drag and drop feature ensures that the user cannot change the navigational state of the result using this method.

  Hint: Don't forget to uncheck the *Allow Navigation* boxes in the design items such an analysis grid and filters, otherwise navigation can still be carried out using the menu options.

- Protect Workbook

  If you want to protect your workbook from unauthorized changes to the design aspects, i.e. changing cell formatting or using any of the design mode options then simply check this box and supply (and repeat) a password. Whenever a design toolbox button is pressed the user will be prompted for a password (of course only a developer would need to work in design mode). Entering the correct password will put the workbook into unprotected mode. It does **not** uncheck the *Protect Workbook* box.

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Exercise 14: BEx Analysis Toolbox

Exercise Objectives

After completing this exercise, you will be able to:

- Understand how to create a basic analysis workbook using the BEx Analyzer.

Business Example

Workbooks are a key presentation vehicle for the BEx query results. Your business users are familiar with the Excel environment and require the query results to be saved in this format. The users would like to ensure the workbooks are always up to date when opening and that they are not required to re-enter the variables selection each time the workbook is opened.

Task:

In this exercise you will start the BEx Analyzer and use the **Open** dialog to find an existing query. You will then execute this query to display the results. You will test the automatic refresh feature and then you will ensure that the workbook is always refreshed on opening. You will also ensure that the workbook settings cannot be change by users. You will save your new workbook and then you will re-open your workbook to confirm that the variables are being re-used and that the workbook is automatically refreshing.

1. Start the BEx Analyzer from the Windows menu and then open the query GR00 BW305 Variables 1 (T_BW30513M00) using the InfoAreas button. The query can be found under the path *BW Training → BW Customer Training → Reporting → Sales and Distribution → Billing.* When the variables dialog box appears enter the values:

   GR00 Month 1 : **01.2001**

   GR00 Month Interval : **01.2001 - 12.2001**

2. Pause the automatic refresh function in the workbook, then test this is working by selecting the filter values for materials range **1400-100 to 1400-750**. When you are ready, force the query to refresh the results with your new filter values.

3. Now change the variable values as follows :

   GR## Month 1 : **06.2001**

   GR## Month Interval : **06.2001 - 12.2001**

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4. Make the appropriate workbook settings to ensure that each time the workbook is opened the data is refreshed automatically. Also protect the workbook so that this setting cannot be changed, use a password of your choice.
5. Save your workbook to your *Favorites* using the description **Sales Results Workbook GR##** then close the workbook. (it is not necessary to close the BEx Analyzer).
6. Re-open your workbook and confirm that even though the workbook was refreshed on opening (look in the heading for the *Last Updated* time), the variables dialog did not appear since the variable values were saved with the workbook and thus were re-used.

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Solution 14: BEx Analysis Toolbox

Task:

In this exercise you will start the BEx Analyzer and use the **Open** dialog to find an existing query. You will then execute this query to display the results. You will test the automatic refresh feature and then you will ensure that the workbook is always refreshed on opening. You will also ensure that the workbook settings cannot be change by users. You will save your new workbook and then you will re-open your workbook to confirm that the variables are being re-used and that the workbook is automatically refreshing.

1. Start the BEx Analyzer from the Windows menu and then open the query GR00 BW305 Variables 1 (T_BW30513M00) using the InfoAreas button. The query can be found under the path *BW Training → BW Customer Training → Reporting → Sales and Distribution → Billing.* When the variables dialog box appears enter the values:

   GR00 Month 1 : **01.2001**

   GR00 Month Interval : **01.2001 - 12.2001**

   a) Follow the path *Start → Programs → Business Explorer → Analyzer* to start the BEx Analyzer. Enable the macros, if prompted.

   b) From Analysis Toolbox click on the *Open* icon then select the *Open Query* menu option.

   c) Logon using the details given by your instructor.

   d) Click on the InfoAreas button and follow the menu path *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Billing* to find the query GR00 BW305 Variables 1 (T_BW30513M00). Click on the *Open* button to execute the query.

   e) In the variable dialog box enter the values shown above (you may have to use the selection buttons to access the selections), then press the *OK* button to display the query results.

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2. Pause the automatic refresh function in the workbook, then test this is working by selecting the filter values for materials range **1400-100 to 1400-750**. When you are ready, force the query to refresh the results with your new filter values.

   a) From the Analysis Toolbox press the *Pause Automatic Refresh* button (watch carefully as the button changes appearance).

   b) Select the filter values for materials **1400-100 to 1400-750** (notice the results do not immediately change even though you have chosen some filters!)

   c) Press the *Refresh* button and watch as the query is now refreshed using the filter values you previously selected.

3. Now change the variable values as follows :

   GR## Month 1 : **06.2001**

   GR## Month Interval : **06.2001 - 12.2001**

   a) In the Analysis Toolbox press the button *Change Variables Values* and enter the values above, then press OK to execute the query.

4. Make the appropriate workbook settings to ensure that each time the workbook is opened the data is refreshed automatically. Also protect the workbook so that this setting cannot be changed, use a password of your choice.

   a) From the Design Toolbox press the *Workbook Settings* button to reach the settings dialog. Under the *General* tab check the box marked *Refresh Workbook on Open*. Then check the box marked *Protect Workbook* and enter a password in the *Password* field then repeat this same password in the *Confirm Password* field. Choose any password. Press OK when done and then you must press the *Exit Design Mode* button to return the Analysis Mode.

5. Save your workbook to your *Favorites* using the description **Sales Results Workbook GR##** then close the workbook. (it is not necessary to close the BEx Analyzer).

   a) From the Analysis Toolbox press the *Save* button then choose the menu option *Save Workbook As.*

   b) Enter the workbook name **Sales Results Workbook GR##** in the *Description* field then press *Save* button.

   c) Close the workbook using the Excel menu option *File → Close*. (If you are prompted to save your changes, select the *No* button)

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6. Re-open your workbook and confirm that even though the workbook was refreshed on opening (look in the heading for the *Last Updated* time), the variables dialog did not appear since the variable values were saved with the workbook and thus were re-used.

   a) From the Analysis Toolbox press the *Open* button and then choose the menu option *Open Workbook*. Your workbook should now be displayed under the *History* area. Highlight the required workbook and press the *Open* button to display the workbook results. To check the refresh time of the workbook, look in the heading for the *Last Updated* time.

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Lesson Summary

You should now be able to:

- Describe the role of the BEx workbook
- Use the functions of the BEx Analysis Toolbox
- Define Workbook Settings within the BEx Design Toolbox

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Unit Summary

You should now be able to:

- Describe the role of the BEx workbook
- Use the functions of the BEx Analysis Toolbox
- Define Workbook Settings within the BEx Design Toolbox

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Unit 9

BEx Web Analyzer

Unit Overview

This unit teaches you about the BEx Web Analyzer. You will open queries and change the navigation status.

Unit Objectives

After completing this unit, you will be able to:

- explain how the new BEx Web Analyzer fits into the overall architecture of the BI capabilities of NetWeaver 2004s
- describe the sources of data used for analysis in the Web Analyzer
- perform various analyses of data using the functions of the Web Analyzer

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Lesson: BEx Web Analyzer

Lesson Overview

In this lesson you get an overview of the BEx Web Analyzer. You will see the features and how to implement the *BEx Web Analyzer*.

Lesson Objectives

After completing this lesson, you will be able to:

- explain how the new BEx Web Analyzer fits into the overall architecture of the BI capabilities of NetWeaver 2004s
- describe the sources of data used for analysis in the Web Analyzer
- perform various analyses of data using the functions of the Web Analyzer

Business Example

SAP BI users should use the BEx Web Analyzer to perform ad hoc analysis on top of various BI data providers (InfoProviders, BEx Queries and BEx Query Views) as well as 3rd party BI data providers. Users can save the results of the ad hoc analysis in the Enterprise Portal or as a new BEx Query View. The results of the ad hoc analysis can also be printed or can be sent to Information Broadcasting for distribution.

BEx Web Analyzer

The *BEx Web Analyzer* is one of several BEx Web tools provided as part of the *Business Explorer Suite*. The analytical options provided by the Web Analyzer are optimized for business experts. For example, navigation in an analysis is easy and intuitive using drag and drop operations to quickly change the structure of the analysis. Additionally, the user can quickly create exceptions and conditions with the help of built-in wizards.

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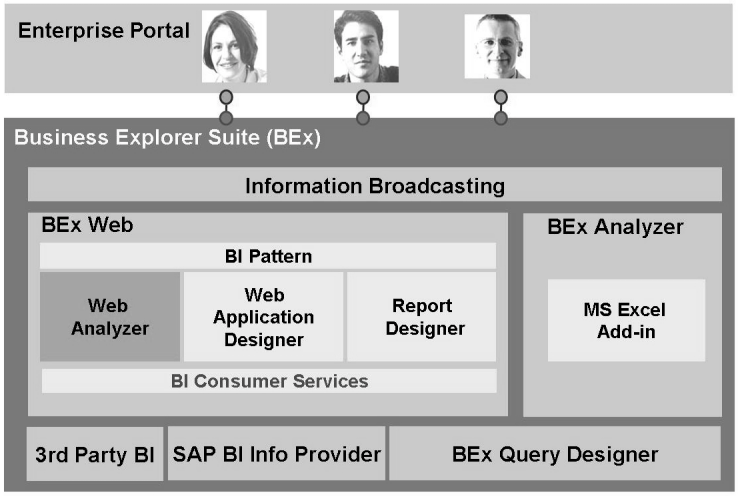

Figure 98: Web Analyzer in the Business Explorer Suite

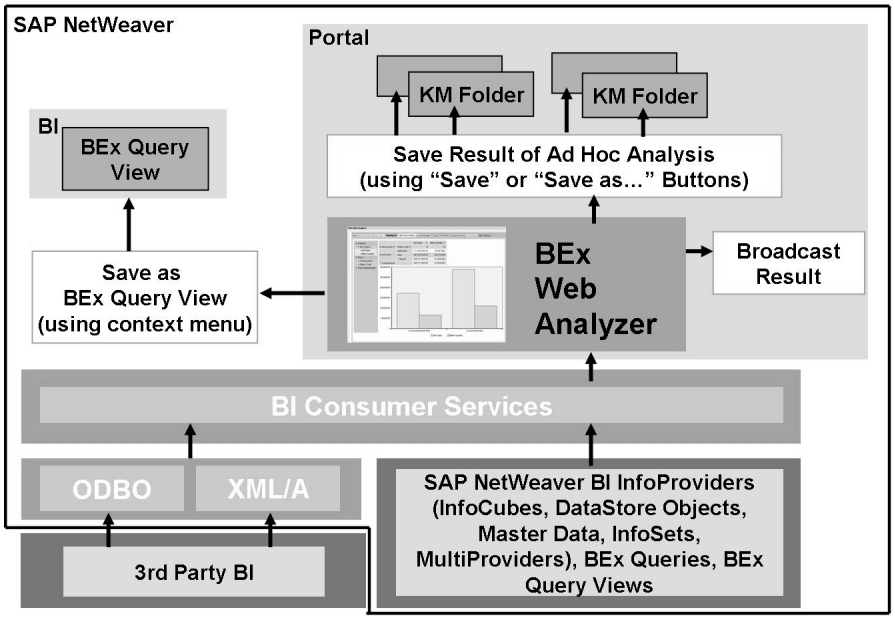

Figure 99: Detailed Overview: BEx Web Analyzer

With SAP NetWeaver 2004s Business Intelligence, a new version of the BEx Web Analyzer is available. The BEx Web Analyzer is integrated into the SAP NetWeaver Portal and allows you to perform ad hoc analyses on top of various BI data

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providers. These data providers can be either third-party BI sources or NetWeaver BI InfoProviders, queries or query views. Analyses run with the Web Analyzer can be broadcast or saved for future use.

With the new BEx Web Analyzer, users have two options for saving the results of their ad hoc analyses. The first option, as shown in the graphic above, permits users to leverage the integration of BI with the NetWeaver Portal to save their results with the *Save* button in either the BEx Portfolio or the Favorites portion of the Knowledge Management area. When using this option, the complete layout of the ad hoc analysis (whether a chart, table or both) is saved. Results saved to the portal can be readily accessed using the *Open* button from the Web Analyzer. Using the *Save As* button, users can store various versions of their analysis in KM folders on the portal.

With the second option, users can save their ad hoc analysis result as a *BEx Query View* via the context menu. These BEx Query Views can then be used as data providers for BEx Web Applications or BEx Reports. The BEx Query View contains the navigation status of the analysis, but does not contain information about the layout (e.g. chart layout). This is saved in the BI metadata repository. This procedure allows you to use query views based on third-party BI data, as well as SAP NetWeaver BI data, as data providers for BEx Web Applications or BEx Reports.

The Web Analyzer is able to access data from both SAP BI InfoProviders and third party BI sources. This extends the range of options available to the user to improve the quality of analysis.

Both SAP BI and third-party data providers can be used in the Web Analyzer.

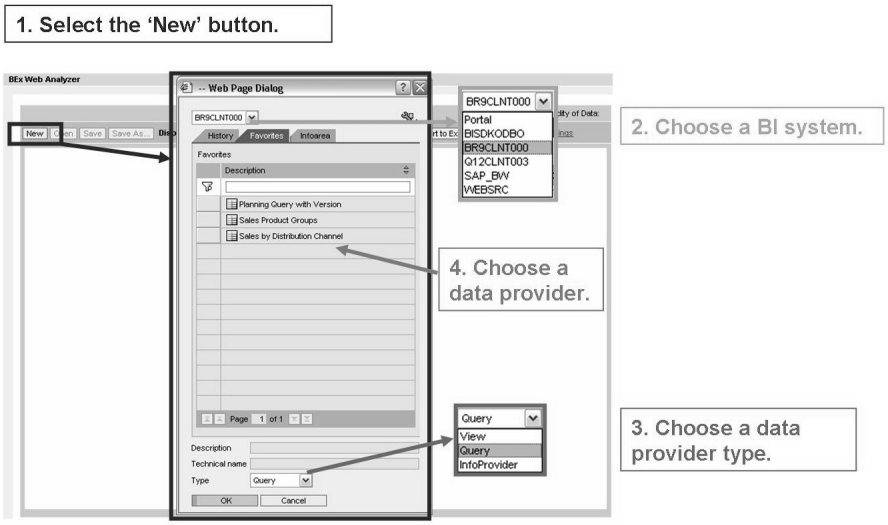

Figure 100: BI Data Provider Access in the Web Analyzer

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To access any BI data provider within the Web Analyzer, begin by clicking on the *New* button. From the resulting dialog box, the user can first select any system that has been maintained in the portal system landscape. These can be either SAP NetWeaver BI systems or third-party BI systems. Once a source system is selected, then the user can choose the data provider type from the drop-down box. The set of data providers meeting the selection criteria is then displayed for selection.

Drag and Drop Navigation and Filtering

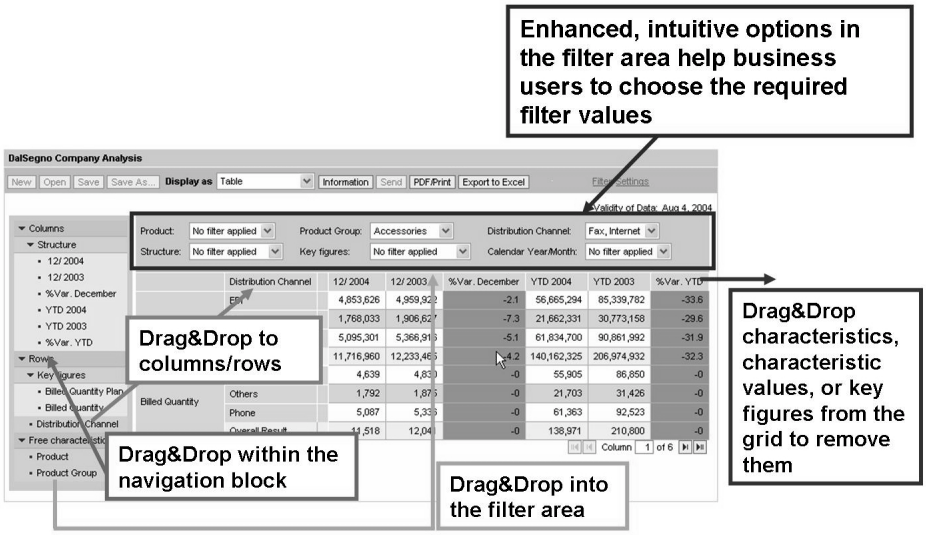

Figure 101: Ad Hoc Analysis using Drag & Drop and Enhanced Filter Area

In the Web Analyzer, the user can now perform various ad hoc navigation steps easily using drag and drop operations. Shown above is an example using several forms of drag and drop navigation. A user can:

- Drag items from one section of the navigation block to another; i.e. from the rows to the columns, to immediately alter the structure of the analysis.
- Drag items from the navigation block directly to the rows or columns of the analysis results.
- Drag characteristics to the filter area to immediately perform the corresponding filtering of the results.
- Drag Items out of the analysis grid to remove them from the analysis.

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In the filter area, it is now very easy to see exactly what filtering actions are being applied to the analysis. This is due to the use of pull-down boxes for each of the characteristics showing what, if any, filters have been applied to each characteristic. Changes can be made easily with the effects seen immediately in the body of the analysis.

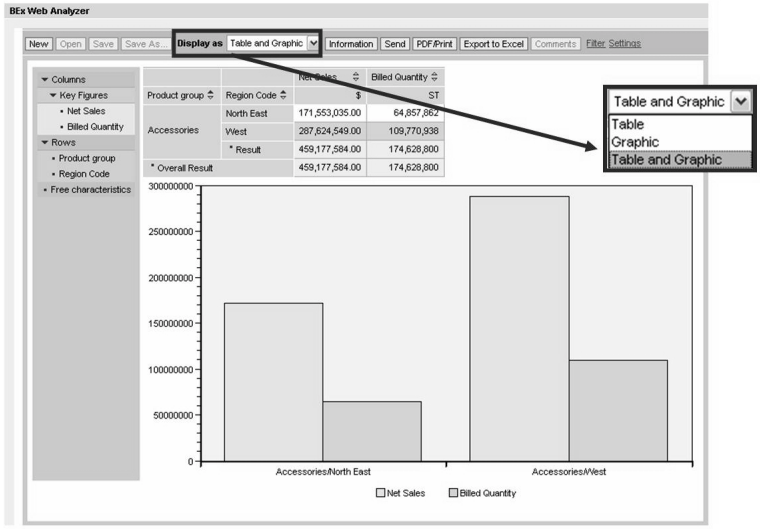

Figure 102: Table View and Graphic View

Users can easily switch between table view, graphic view, or a combination of both using a dropdown box. The combination view is a new feature of the Web Analyzer. When the analysis is saved in the portal, the view is saved intact. Any drag and drop navigation performed on the table view also applies directly to the chart view. In the settings area, users can choose various display options for both the table view and graphic view via selections organized on tab pages.

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Exception and Condition Wizards

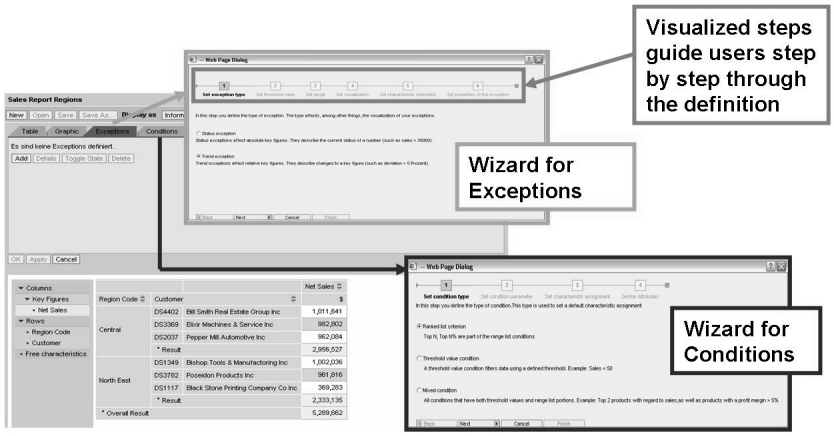

Figure 103: Wizards for Defining Exceptions and Conditions

The new BEx Web Analyzer provides business users with wizard-based definition of exceptions and conditions. Exceptions are used to highlight data values in different colors to draw attention to important trends or variances. Conditions are used to filter the data on the analysis to only values that meet specific conditions. For example, the top five regions based on achievement of revenue targets.

These wizards can be launched from the associated tab pages in the ‘Settings’ area. Both wizards lead the user through the different steps using guided procedures.

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Creating an Exception

Start the Exception Wizard or the Condition Wizard from the Settings area of the Web Analyzer.

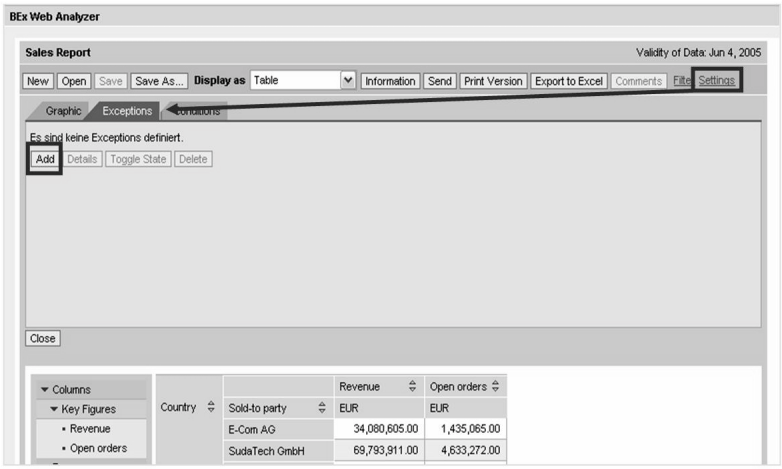

Figure 104: Creating a New Exception

To create an exception in the Web Analyzer, first choose the *Settings* link in the toolbar. From there, select the *Exceptions* tab and the choose the *Add* button. This starts the exception wizard. The user is then guided through the process in a series of five screens.

Hint: The result of an ad hoc analysis containing exceptions created in this way can be saved in a KM folder in the portal or broadcast to other parties. However, the exception created with the exception wizard in the Web Analyzer does not become part of either the query or query view definition. In order to make an exception a permanent part of the query or query view definition, the exception must be defined using the Exception Editor in the BEx Query Designer.

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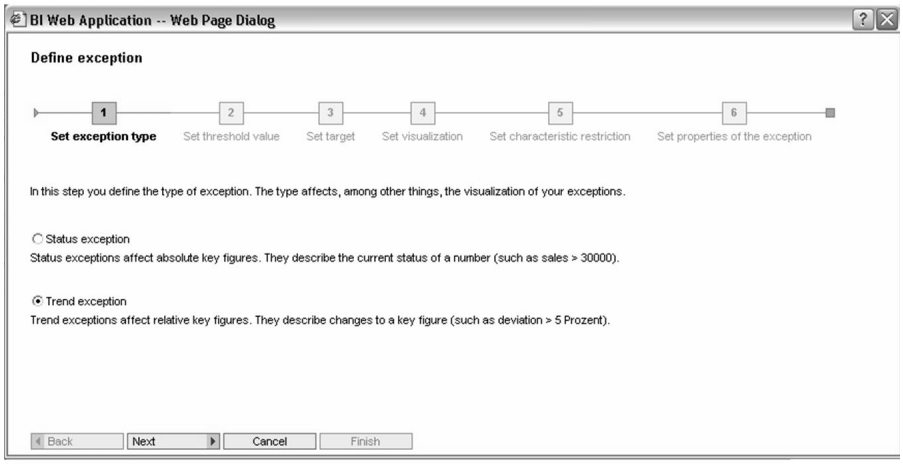

Figure 105: Exception Wizard Step 1: Set Exception Type

In the first step of the wizard, set the *exception type*. You can choose between *status* exception and *trend* exception. A status exception operates on absolute key figures. For example, a status exception might be stated as "Sales > 30000". This is consistent with the definition of exceptions in the 3.x releases of SAP BW. New in BI are trend exceptions. A trend exception operates on relative key figures. For example, a key figure might be considered an exception if the deviation of the key figure is greater than +5% over time. When the exception type is chosen, the subsequent wizard screens adapt to that choice. For example, on the fourth step of the wizard, *Set Visualization*, the choice for a status exception is a traffic light icon while the choice for a trend exception is an arrow icon.

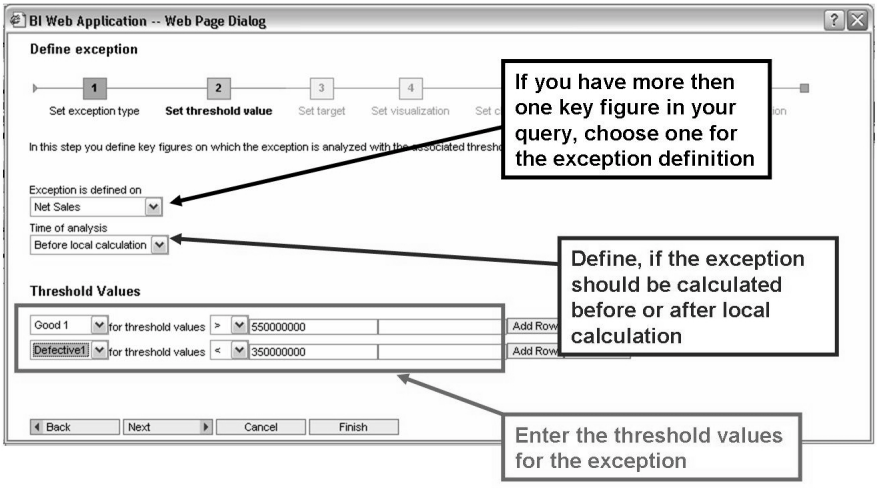

Figure 106: Exception Wizard Step 2: Set Threshold Values

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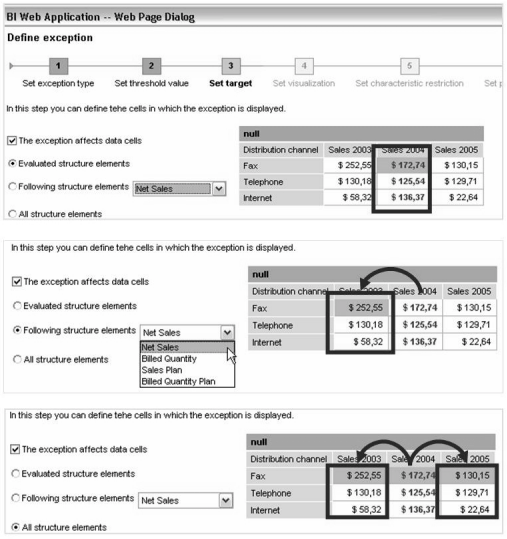
In the second step of the Exception Wizard, the user makes the settings for the key figure threshold values. A key figure is chosen for the exception definition. Additionally, the timing of the exception evaluation can either be before or after any local calculations such as formulas in the query. For each alert level used in the exception definition, a boolean operator and the appropriate threshold value(s) are chosen. Depending on the operator chosen, the user supplies one or two values for each exception.

You can choose from nine different alert levels:

- Good 1-3, rendered as three shades of green in the standard palette
- Critical 1-3, rendered as three shades of yellow in the standard palette
- Defective 1-3, rendered as three shades of red in the standard palette

The color palette used for the alert levels can be changed in the style sheet assigned to the analysis.



The exception affects the data cells only for the evaluated structure element chosen in step 2 of the wizard.

The exception will be determined from the structure element chosen in step 2 but affects the data cells of another key figure (e.g. the exception will be determined from a deviation but applied for the absolute key figure “Revenue”).

The exception will be applied to the data cells for all available key figures.

Figure 107: Exception Wizard Step 3a: Effect on Data Cells

In step three of the Exception Wizard, the user can choose if they want to have the result of the exception applied to the data cells of an analysis. If this choice is made, the user can make a subsequent choice of which data cells are affected.

The choices are:

- Evaluated structure elements
- Following structure elements
- All structure elements

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The *evaluated structure element* refers to the key figure chosen for a specific exception in the prior step of the wizard. This is the most common setting. The *following structure element* choice allows you to evaluate one key figure, but apply the color highlighting to a different key figure. The setting for *all structure elements* applies the color highlighting from an exception to all key figures in the analysis.

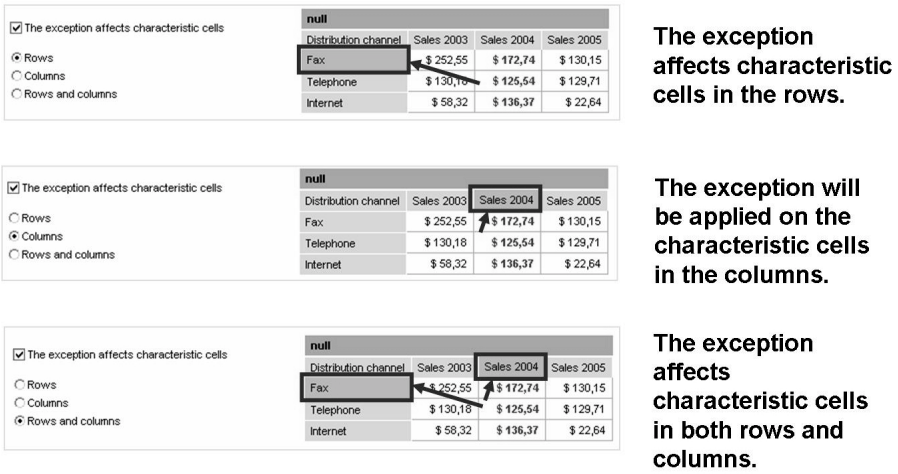

Figure 108: Exception Wizard Step 3b: Effect on Characteristic Cells

Also in step 3 of the Exception Wizard, the user can choose how or if the exception affects certain characteristic cells in an analysis. The choices for this option are:

- Rows
- Columns
- Rows and columns

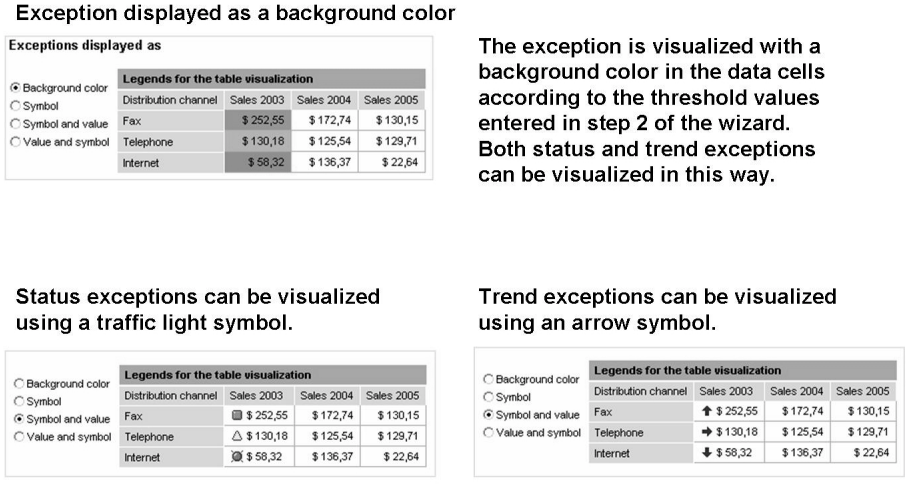

Figure 109: Exception Wizard Step 4: Set Visualization

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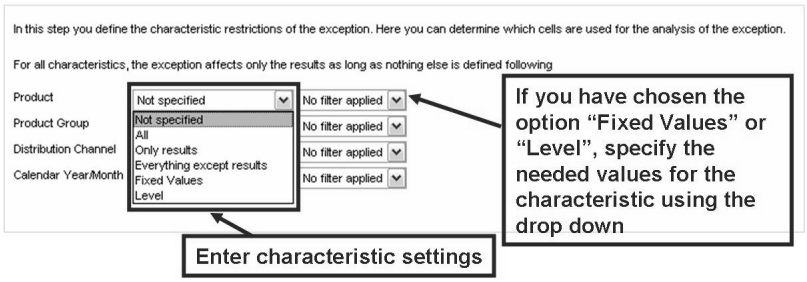
In step 4 of the Exception Wizard, the user makes choices about how the exception will be visualized or rendered in the analysis. For both status and trend exceptions, the exception cells can be rendered using a background color based on the alert level assigned to the threshold values chosen in step 2 of the Exception Wizard. This corresponds to how exceptions functioned in the BW 3.x releases. For *status* exceptions, if any of the choices containing *symbols* are selected, the symbol will be rendered as a traffic light based on the alert level assigned to the threshold values. For example, all the *Good* alert levels will be rendered as a green traffic light. For *trend* exceptions, if any of the choices containing *symbols* are selected, the symbol will be rendered as an arrow showing the direction of the trend.



These settings determine the relevance of the exception based on which characteristic values are present in the analysis.

Figure 110: Exception Wizard Step 5: Enter Characteristic Restrictions

In step 5 of the Exception Wizard, the user chooses whether to restrict how the exception is evaluated for each of the characteristics in the analysis. For each characteristic, you can choose whether the exception affects:

- All values
- Only the results
- Everything except the results
- A fixed value
- A fixed hierarchy level.

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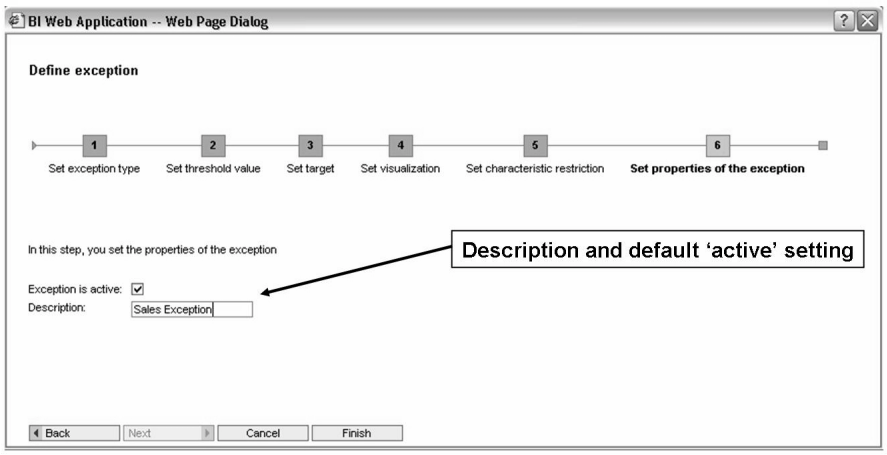

Figure 111: Exception Wizard Step 6: Exception Properties

In the sixth and final step of the Exception Wizard, the user chooses whether the exception is active by default, or must be activated within the analysis. Also, the description of the exception is entered here. The exception description is important to provide users of the analysis a good indication of what the exception is measuring.

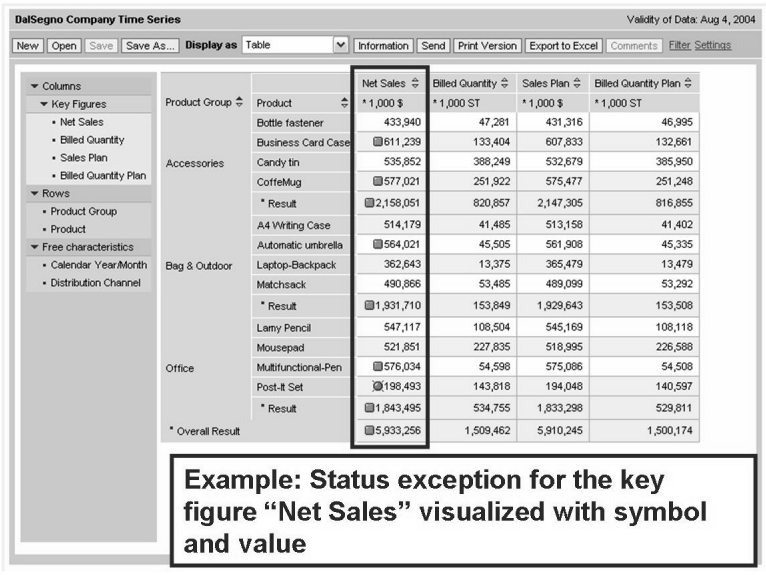

Figure 112: Sample Exception in an Ad Hoc Analysis

Shown here is an example of an analysis result with a status exception active. The status exception has been defined to render the exception as a symbol followed by the value of the key figure. The symbol used for status exceptions is a traffic light.

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Creating a Condition

The Condition Wizard starts with the choice of condition type.

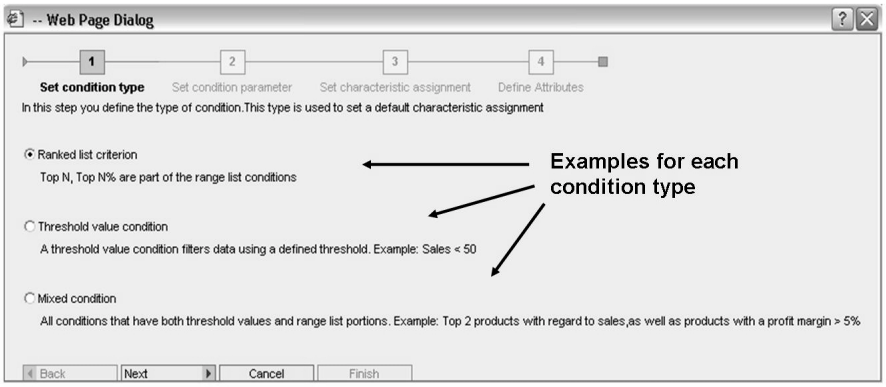

Figure 113: Condition Wizard Step 1: Set Condition Type

In the first step of the condition wizard, the *condition type* can be set (ranked list criterion, threshold value condition, or mixed condition). Each option is explained with an example to help business users find the best option for their analysis. Depending on the chosen option, the appropriate parameters will be offered in the next step of the wizard.

Enter the parameters based on the condition chosen.

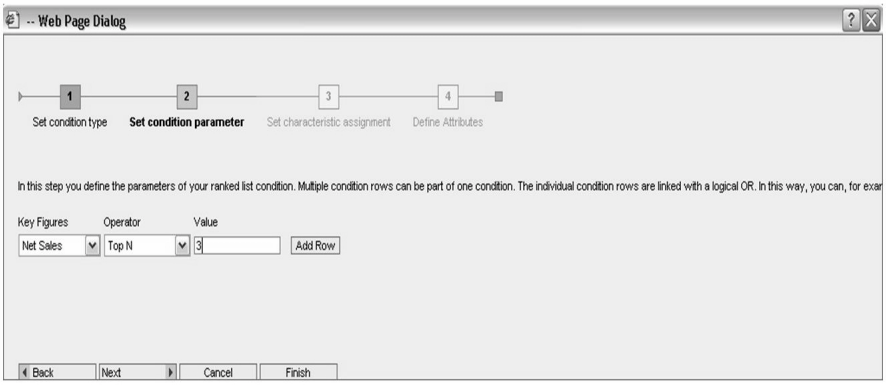

Figure 114: Condition Wizard Step 2: Enter Condition Parameters

In the second step of the condition wizard, the *parameters* for the conditions can be defined according to the condition type. The offered operators are dependent on the condition type chosen in the first step.

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Characteristic assignment is done in the third step of the wizard.

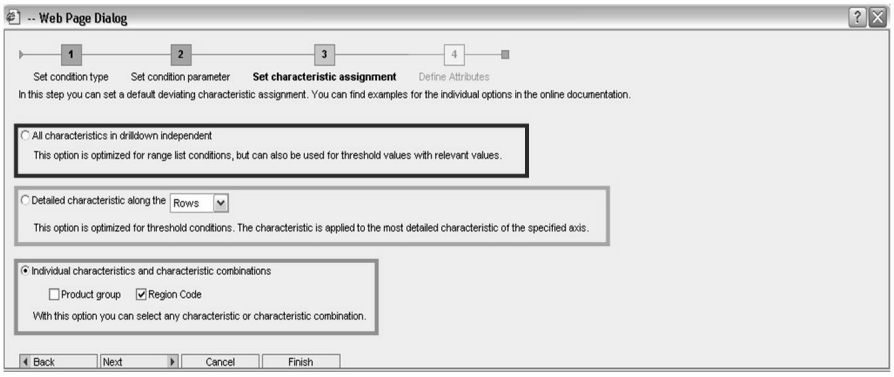

Figure 115: Condition Wizard Step 3: Characteristic Assignment

The *characteristic assignment* takes place in the third step of the condition wizard. You can choose to apply the condition to:

- all characteristics in the drilldown independently
- the most detailed characteristic along the rows or columns
- an individual characteristic or a combination of characteristics.

Set the activity status and description to finish the condition.

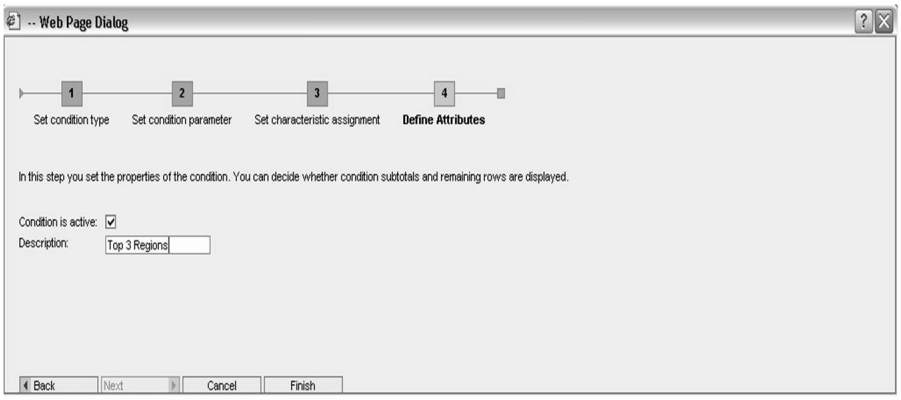

Figure 116: Condition Wizard Step 4: Enter Description

In the final condition wizard step, the *activity status* of the condition can be set and a *description* can be entered. The description should provide a clear indication of the use of the condition. Once all settings are complete, choose the *Finish* button to save the condition definition.

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Printing and Broadcasting the Analysis

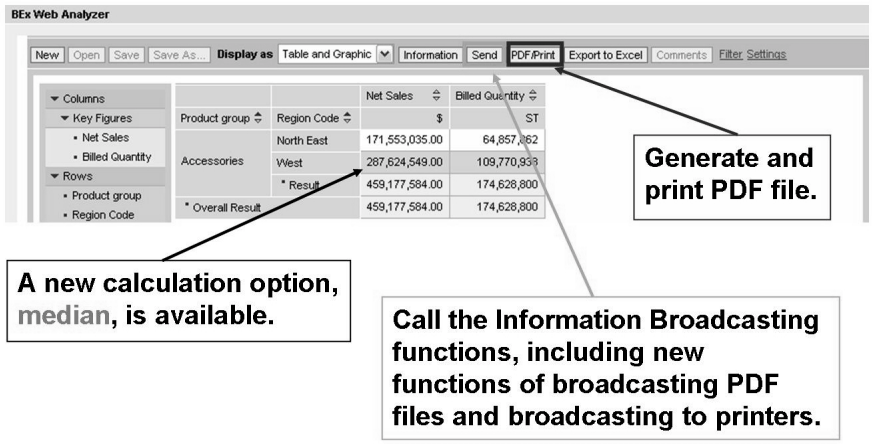

Figure 117: Additional Web Analyzer Features

Using the “PDF/Print” button, users can generate a PDF file from the ad hoc analysis result and print it.

Clicking on the “Send” button, users can access the functions of Information Broadcasting. With SAP NetWeaver 2004s, Information Broadcasting is extensively enhanced. In addition to the previous broadcasting functions, it allows for the distribution of PDF files as well as sending the analysis directly to a printer. Please refer to the lesson on *Information Broadcasting* for more details.

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Exercise 15: BEX Web Analyzer

Exercise Objectives

After completing this exercise, you will be able to:

- Use the BEx Web Analyzer to create an ad hoc analysis and save it to the Portal.

Business Example

Your company decides to use the *BEx Web Analyzer* to enable their employees to perform ad-hoc analysis.

Task:

You will open the *BEx Web Analyzer* from the Portal and then create a new ad hoc analysis based on an existing query. You will perform various navigation activities and then create a new exception to highlight interesting sales results. Finally you will save the analysis to the BEx Portfolio in the Portal.

1. To access the BEx Web Analyzer, logon to the attached Portal by either executing transaction code ZPORTAL from your assigned BI system or opening your web browser and entering the URL http://portal-(SID).wdf.sap.corp:50100/irj where (SID) is to be replaced by your assigned BI system ID. Enter the user ID and password provided by your instructor. Go to the Business Intelligence tab page and choose BEx Web Analyzer.

2. Launch query DalSegno Company Time Series (PM_WEB_ANALYZER_DALSEGNO) in the Web Analyzer. To find the query, choose the New Analysis button in the Web Analyzer. Then choose the Type Query from the drop down box. Select the InfoArea tab page. Use the following path to reach the query:

   SAP Demo → SAP Demo Scenario - DalSegno Company → SAP Demo: DalSegno Company Reporting Cube → DalSegno Company Time Series query.

   Choose *OK* to launch the query in the Web Analyzer.

3. You can now use drag and drop navigation in the query display. You would like to drilldown by Product within each Calendar Year/Month. Drag the characteristic Product from the Free characteristics to the right side of the Calendar Year/Month heading to add that drilldown.

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4. Drilldown by Product Group between the Calendar Year/Month and Product characteristics. You can either insert the Product Group after the Calendar Year/Month or before the Product. In this case, drag the Product Group characteristic from the Free characteristics and insert it to the left side of the Product heading.
5. Replace Calendar Year/Month with Distribution Channel in your query results using drag and drop. Calendar Year/Month will become a free characteristic of the query. Drag Distribution Channel from the Free characteristics and drop it on top of the Calendar Year/Month heading in the query results area.
6. Remove the key figure Billed Quantity Plan by dragging it out of the query results to the right of window. Then do the same thing for the key figure Billed Quantity.
7. Move the remaining key figures from the Columns to the Rows using drag and drop. In the navigation area of the Web Analyzer, drag the heading Key Figures in the Columns section and drop it on the Rows header.
8. After reviewing this alternative, you determine that you prefer having the Net Sales and Sales Plan information displayed in the columns as in the original query. Reverse the previous navigation and place the Key Figures heading back in the Columns.
9. Using the context menu, remove the drilldown on Distribution Channel from your query results. Right click on Distribution Channel and navigate within the context menu via *Change Drilldown* to the *Remove Drilldown* option.
10. Add a Filter menu to your query results using the *Filter* hyperlink to facilitate changes to the filter settings for the query view
11. Using the *Filter* dropdown box for Distribution Channel, limit your query results to only the Internet distribution channel.
12. Remove the filter on Key Figures so that all four key figures are displayed in the columns. Do this by selecting *Clear* from the Key Figures drop-down box.
13. In addition to a tabular display, you have the option to display the data as a chart or to include both a table and a chart. Choose *Graphic* from the Display as drop-down box to view your query in graphical display. After that, return to a tabular view of the query to perform further analysis.
14. Clear the Internet filter for Distribution Channel so that the query will show results for all distribution channels. Select *Clear* from the Distribution Channel drop-down box.

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15. In the next step of your analysis, you will create and use an exception. Before creating the exception, remove Product Group from the drill-down by dragging it out of the query results.

    Also note the scaling factors shown at the top of the query view. Net Sales, for example, is shown in thousands of dollars. Therefore, an individual value such as 2,056,717 for the A4 Writing Case is actually $2,056,717,000. This information is important for creating your exceptions correctly.

    Select the Settings link and choose the *Exceptions* tab page. There, click on Add.

16. After you chose the Add button, a wizard opens to guide you through defining an exception. In the first step, you define the type of exception. You can choose Status Exception for absolute key figures, such as "Net Sales". Or you can choose Trend Exception for relative key figures, such as current net sales versus the prior year net sales. In this case, select the radio button for exception type Status Exception and then choose *Next* to continue.

17. The next step is to define the settings for the threshold value(s). Here you will first choose the key figure structure element(s) for which the exception is defined. You will be defining exceptions based on Net Sales. Select Net Sales from the *Exception is defined on* drop-down box.

    The next setting required on this screen is the threshold value or values that will generate an exception. To define the threshold value, you select an exception level (Good 1 to 3, Critical 1 to 3, and Defective 1 to 3) and an operator. Leave the first exception row set to Good 1 and select ">" as the operator from the dropdown box. You have determined that you would like all values over $2,000,000,000 to be highlighted as "Good 1". Enter 2000000000 in the field to the right of the “>” symbol.

    Add a second threshold value row for the next exercise step.

18. Create a second threshold value for Net Sales that are unacceptably low. You will categorize these as **Defective 1** for reporting purposes. Select **Defective 1** from the exception level dropdown list. **Net Sales** less than **$1,000,000,000** are unacceptably low and need to be highlighted on your query view. Select "<" from the Operator dropdown list. Complete this setting by entering **1000000000** as your lower threshold. Move to the next step of the Exception Wizard by choosing *Next*.

19. The next screen allows you to determine which data and characteristic cells are affected by the exception. The default setting is for the exception to affect data cells only, and specifically the "evaluated structure element', in other words,

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the elements on which the exception was defined. In this case, that element is **Net Sales**. Select the "Evaluated structure element" radio button. Click *Next* to continue.

20. The next step in defining an exception is to set the visualization, or whether the exception will be indicated by a background color or by a symbol. Highlight the exception with a background color. Then select *Next* to proceed.

21. Highlight all products that meet the thresholds that you previously established, as well as any totals on the query. To do this, select “All” in the dropdown box next to the **Product** characteristic. Choose *Next* to proceed to the final screen of the exception definition

22. On the final Exception Wizard screen, enter the description **GR## Exception**. Select Finish. The system automatically closes the Exception Wizard and returns to the BEx Web Analyzer. You may now view the analysis result with your exception.

23. After reviewing your results, save the result of your ad-hoc analysis in the BEx Portfolio. Click on *Save as*, and choose the *BEx Portfolio* as the target. Enter **GR## Ad Hoc Analysis** as the description for your analysis. Finish by choosing *OK*.

24. In the Web Analyzer, use the *Open* button to check if your ad-hoc analysis result was stored correctly in the BEx Portfolio.

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Solution 15: BEX Web Analyzer

Task:

You will open the *BEx Web Analyzer* from the Portal and then create a new ad hoc analysis based on an existing query. You will perform various navigation activities and then create a new exception to highlight interesting sales results. Finally you will save the analysis to the BEx Portfolio in the Portal.

1. To access the BEx Web Analyzer, logon to the attached Portal by either executing transaction code ZPORTAL from your assigned BI system or opening your web browser and entering the URL http://portal-(SID).wdf.sap.corp:50100/irj where (SID) is to be replaced by your assigned BI system ID. Enter the user ID and password provided by your instructor. Go to the Business Intelligence tab page and choose BEx Web Analyzer.

   a) From your Citrix desktop, choose Start → Programs → Internet Explorer

   b) From the browser window, enter the URL of http://portal-(SID).wdf.sap.corp:50100/irj where (SID) is the system ID of your assigned BI system. Press Enter.

   c) On the Portal logon screen, enter your assigned user ID and password, and then click on the Log on button.

   d) In the Portal, choose the Business Intelligence tab, and then choose BEx Web Analyzer.

2. Launch query DalSegno Company Time Series (PM_WEB_ANALYZER_DALSEGNO) in the Web Analyzer. To find the query, choose the New Analysis button in the Web Analyzer. Then choose the Type Query from the drop down box. Select the InfoArea tab page. Use the following path to reach the query:

   SAP Demo → SAP Demo Scenario - DalSegno Company → SAP Demo: DalSegno Company Reporting Cube → DalSegno Company Time Series query.

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Choose *OK* to launch the query in the Web Analyzer.

a) In the Web Analyzer, choose the *New Analysis* button.

b) In the dialog window that opens, choose Type **Query** from the drop down box at the bottom of the window.

c) Select the InfoArea tab.

d) Use the path *SAP Demo → SAP Demo Scenario - DalSegno Company → SAP Demo: DalSegno Company Reporting Cube* to reach the query *DalSegno Company Time Series (*PM_WEB_ANALYZER_DALSEGNO).

e) Select the query and choose *OK* to execute the query in the Web Analyzer.

3. You can now use drag and drop navigation in the query display. You would like to drilldown by Product within each Calendar Year/Month. Drag the characteristic Product from the Free characteristics to the right side of the Calendar Year/Month heading to add that drilldown.

   a) In the query results, drag Product from the Free characteristics section of the navigation area and drop it on the right side of the Calendar Year/Month heading.

4. Drilldown by Product Group between the Calendar Year/Month and Product characteristics. You can either insert the Product Group after the Calendar Year/Month or before the Product. In this case, drag the Product Group characteristic from the Free characteristics and insert it to the left side of the Product heading.

   a) In the query results, drag Product Group from the Free characteristics section of the navigation area and drop it on the left side of the Product heading.

5. Replace Calendar Year/Month with Distribution Channel in your query results using drag and drop. Calendar Year/Month will become a free characteristic of the query. Drag Distribution Channel from the Free characteristics and drop it on top of the Calendar Year/Month heading in the query results area.

   a) In the query results, drag Distribution Channel from the Free characteristics portion of the navigation area and drop it on top of the Calendar Year/Month heading in the query results area.

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6. Remove the key figure Billed Quantity Plan by dragging it out of the query results to the right of window. Then do the same thing for the key figure Billed Quantity.

   a) In the query results, drag Billed Quantity Plan out of the query to remove it.

   b) In the query results, drag Billed Quantity out of the query to remove it.

7. Move the remaining key figures from the Columns to the Rows using drag and drop. In the navigation area of the Web Analyzer, drag the heading Key Figures in the Columns section and drop it on the Rows header.

   a) Under the Columns heading, drag Key Figures and drop it on top of the Rows heading.

8. After reviewing this alternative, you determine that you prefer having the Net Sales and Sales Plan information displayed in the columns as in the original query. Reverse the previous navigation and place the Key Figures heading back in the Columns.

   a) Under the Rows heading, drag Key Figures and drop it on top of the Columns heading.

9. Using the context menu, remove the drilldown on Distribution Channel from your query results. Right click on Distribution Channel and navigate within the context menu via *Change Drilldown* to the *Remove Drilldown* option.

   a) Right click on Distribution Channel in your query results and choose *Change Drilldown → Remove Drilldown.*

10. Add a Filter menu to your query results using the *Filter* hyperlink to facilitate changes to the filter settings for the query view

    a) On the right side of the toolbar above the query results, choose the *Filter* link.

11. Using the *Filter* dropdown box for Distribution Channel, limit your query results to only the Internet distribution channel.

    a) From the dropdown box for Distribution Channel, choose *Edit*.

    b) In the resulting selection screen, choose Internet as the selected distribution channel and press the *Add* button to select it.

    c) Select *OK* when finished.

12. Remove the filter on Key Figures so that all four key figures are displayed in the columns. Do this by selecting *Clear* from the Key Figures drop-down box.

    a) From the drop-down box for Key Figures, choose *Clear*.

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13. In addition to a tabular display, you have the option to display the data as a chart or to include both a table and a chart. Choose *Graphic* from the Display as drop-down box to view your query in graphical display. After that, return to a tabular view of the query to perform further analysis.

    a) From the drop-down box for Display as, choose *Graphic*.

    b) To return to the original table, choose *Table* from the Display as drop-down box.

14. Clear the Internet filter for Distribution Channel so that the query will show results for all distribution channels. Select *Clear* from the Distribution Channel drop-down box.

    a) From the drop-down box for Distribution Channel, choose *Clear*.

15. In the next step of your analysis, you will create and use an exception. Before creating the exception, remove Product Group from the drill-down by dragging it out of the query results.

    Also note the scaling factors shown at the top of the query view. Net Sales, for example, is shown in thousands of dollars. Therefore, an individual value such as 2,056,717 for the A4 Writing Case is actually $2,056,717,000. This information is important for creating your exceptions correctly.

    Select the Settings link and choose the *Exceptions* tab page. There, click on Add.

    a) In the query result area, remove Product Group from the drill-down by dragging it out of the query result area to the right.

    b) Note the scaling factor listed in the heading for each key figure column. The scaling factor for Net Sales is *1000 $

    c) Select the *Settings* hyperlink on the right side of the toolbar above the query results.

    d) In the *Settings* dialog, choose the *Exceptions* tab. Once there, choose Add.

16. After you chose the Add button, a wizard opens to guide you through defining an exception. In the first step, you define the type of exception. You can choose Status Exception for absolute key figures, such as "Net Sales". Or you can choose Trend Exception for relative key figures, such as current net sales versus the prior year net sales. In this case, select the radio button for exception type Status Exception and then choose *Next* to continue.

    a) Select the radio button for Status Exception

    b) Select *Next* in the Exception Wizard to continue

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17. The next step is to define the settings for the threshold value(s). Here you will first choose the key figure structure element(s) for which the exception is defined. You will be defining exceptions based on Net Sales. Select Net Sales from the *Exception is defined on* drop-down box.

    The next setting required on this screen is the threshold value or values that will generate an exception. To define the threshold value, you select an exception level (Good 1 to 3, Critical 1 to 3, and Defective 1 to 3) and an operator. Leave the first exception row set to Good 1 and select ">" as the operator from the dropdown box. You have determined that you would like all values over $2,000,000,000 to be highlighted as "Good 1". Enter 2000000000 in the field to the right of the “>” symbol.

    Add a second threshold value row for the next exercise step.

    a) From the *Exception is defined on* dropdown box, choose Net Sales.

    b) Ensure that the first dropdown box for the threshold value has a value of Good 1.

    c) From the dropdown box to the right of for threshold values, choose “>”.

    d) Enter 2000000000 in the field to the right of the “>” symbol.

    e) If necessary, select *Add Row* to add a second threshold value row for the next step

18. Create a second threshold value for Net Sales that are unacceptably low. You will categorize these as **Defective 1** for reporting purposes. Select **Defective 1** from the exception level dropdown list. **Net Sales** less than **$1,000,000,000** are unacceptably low and need to be highlighted on your query view. Select "<" from the Operator dropdown list. Complete this setting by entering **1000000000** as your lower threshold. Move to the next step of the Exception Wizard by choosing *Next*.

    a) Ensure that the first dropdown box for the threshold value has a value of **Defective 1**.

    b) From the dropdown box to the right of for threshold values, choose “<”.

    c) Enter **1000000000** in the field to the right of the “<” symbol.

    d) Select *Next* to proceed to the next step of the Exception Wizard

19. The next screen allows you to determine which data and characteristic cells are affected by the exception. The default setting is for the exception to affect data cells only, and specifically the "evaluated structure element', in other words,

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the elements on which the exception was defined. In this case, that element is **Net Sales**. Select the "Evaluated structure element" radio button. Click *Next* to continue.

a) Select the Evaluated structure element radio button

b) Select *Next* to proceed to the next step of the Exception Wizard.

20. The next step in defining an exception is to set the visualization, or whether the exception will be indicated by a background color or by a symbol. Highlight the exception with a background color. Then select *Next* to proceed.

    a) Select the Background color radio button

    b) Select *Next* to proceed to the next step of the Exception Wizard

21. Highlight all products that meet the thresholds that you previously established, as well as any totals on the query. To do this, select “All” in the dropdown box next to the **Product** characteristic. Choose *Next* to proceed to the final screen of the exception definition

    a) From the dropdown box next to **Product**, choose **All**.

    b) Select *Next* to proceed to the next step of the Exception Wizard

22. On the final Exception Wizard screen, enter the description **GR## Exception**. Select Finish. The system automatically closes the Exception Wizard and returns to the BEx Web Analyzer. You may now view the analysis result with your exception.

    a) Enter **GR## Exception** as the description of your exception.

    b) Select the *Finish* button to exit the wizard and return to the Web Analyzer. Your results should now be displayed as specified in your exception

23. After reviewing your results, save the result of your ad-hoc analysis in the BEx Portfolio. Click on *Save as*, and choose the *BEx Portfolio* as the target. Enter **GR## Ad Hoc Analysis** as the description for your analysis. Finish by choosing *OK*.

    a) On the left side of the toolbar above the query results, select *Save as*.

    b) Choose the *BEx Portfolio* tab.

    c) Enter **GR## Ad Hoc Analysis** as the description.

    d) Select *OK* to save the analysis in the *BEx Portfolio* .

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24. In the Web Analyzer, use the *Open* button to check if your ad-hoc analysis result was stored correctly in the BEx Portfolio.

    a) In the Web Analyzer, use the *Open* button to check if your ad-hoc analysis is stored in the BEx Portfolio. It should be listed and accessible on the BEx Portfolio page

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Lesson Summary

You should now be able to:

- explain how the new BEx Web Analyzer fits into the overall architecture of the BI capabilities of NetWeaver 2004s
- describe the sources of data used for analysis in the Web Analyzer
- perform various analyses of data using the functions of the Web Analyzer

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Unit Summary

You should now be able to:

- explain how the new BEx Web Analyzer fits into the overall architecture of the BI capabilities of NetWeaver 2004s
- describe the sources of data used for analysis in the Web Analyzer
- perform various analyses of data using the functions of the Web Analyzer

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Unit 10

Information Broadcasting

Unit Overview

Unit Objectives

After completing this unit, you will be able to:

- Understand the purpose and key features of Information Broadcasting
- Identify scenarios for Information Broadcasting
- broadcast via Email
- use different formats (MHTML, HTML, Online Link)
- execute ad hoc and scheduled in background processing
- Install the Workbook Pre-Calculation Service
- Start the set-up program
- Evaluate possible error messages

Unit Contents

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Exercise 16: BEx Broadcaster 389
Lesson: Workbook Precalculation 396

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Lesson: Information Broadcasting Overview

Lesson Overview

This lesson will introduce participants to the concepts of a broadcast and outline the BEx Broadcaster's key capabilities and functions.

Lesson Objectives

After completing this lesson, you will be able to:

- Understand the purpose and key features of Information Broadcasting
- Identify scenarios for Information Broadcasting

Business Example

Your project team is interested in the key features of the BEx Broadcaster, the scenarios in which it can be used and the integration points to other BW components as well as the Enterprise Portal. The target is to find some easy ways to distribute reports to different audiences.

Presentation of the key features, the different scenarios and the integration with the Enterprise Portal

Information Broadcasting is a flexible function of the Business Explorer which provides to facility to distribute reporting results out to various audiences whether they are regular SAP BI users or not. Broadcasting is not restricted to one method. You can choose the source of the data, the format of the data, the target audience, the broadcast channel and of course the timing of the broadcast. You can even use a combination of these for a single broadcast. There is also a Wizard to help you work through the settings if you are an occasional user. Broadcasts can be defined as a one time distribution or they can be set to distribute result data on a regular basis at predetermined times. The data can be either precalculated or the broadcast can send a link to the online data. Users may decide if they want to subscribe to broadcasts, (or perhaps even unsubscribe).

The diagram below illustrates the positioning of the Information Broadcaster within NetWeaver BI.

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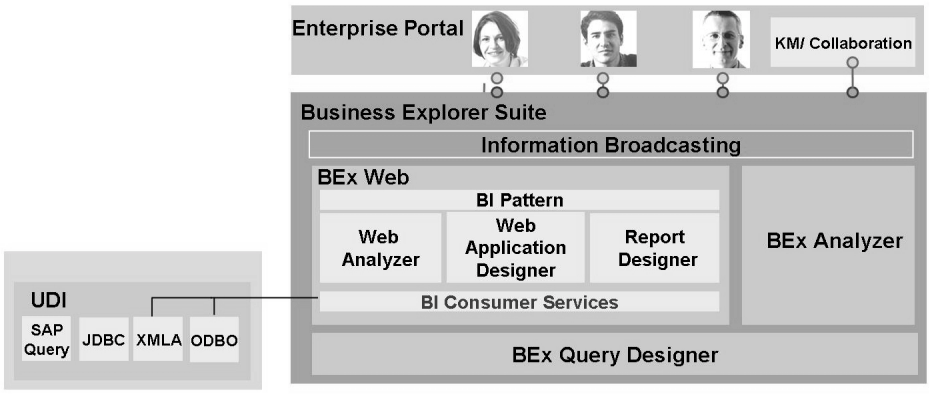

Figure 118: Information Broadcasting Architecture

There are many scenarios in which the Broadcaster can play a key role. Broadcasting can be executed as a one time event, regular scheduled event, or even used just to alert personnel of any critical situation which needs attention. The Broadcaster can also be used to improved the performance of the BEx environment by using the tools to precalculate reports, fill the query cache

I need my team to see these low sales figures *immediately* with my suggestions for improvements

I would like all my weekly KPI reports to be updated and available in the Collaboration Rooms of the Portal *every* Friday morning ready for my team meeting

I would like to be alerted *only* if any of my top customers have experienced long wait times for deliveries

Figure 119: Broadcasting Scenarios

Broadcasting runs across the entire BEx Suite and uses a consistent interface for the creation of broadcast settings regardless of the tool in which the broadcast is being defined. Broadcast data can come from any SAP BI data source, but also non-SAP

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data sources can be used in a broadcast. Source data can be read in real time at the time of the broadcast, the data does not need to reside in BI to be accessible by the Broadcaster.

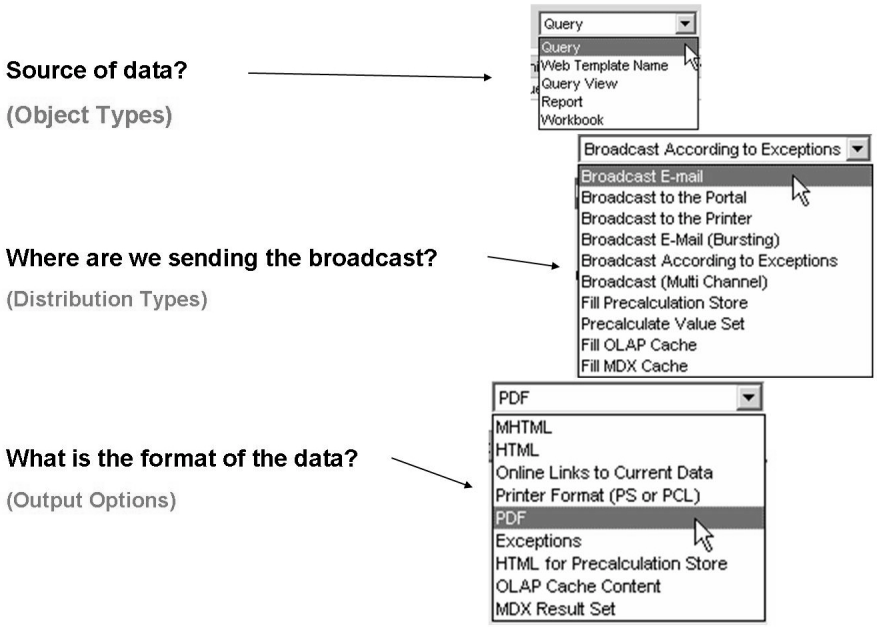

Figure 120: Flexible Broadcasting Options

A key feature of the Broadcaster is the tight integration with the NetWeaver Portal. Broadcasts can be sent to the portal where users can take advantage of a range of Knowledge Management tools such as:

- Feedback
- Discussion
- Rating
- Subscription
- Search
- Subscription
- Download
- Collaboration

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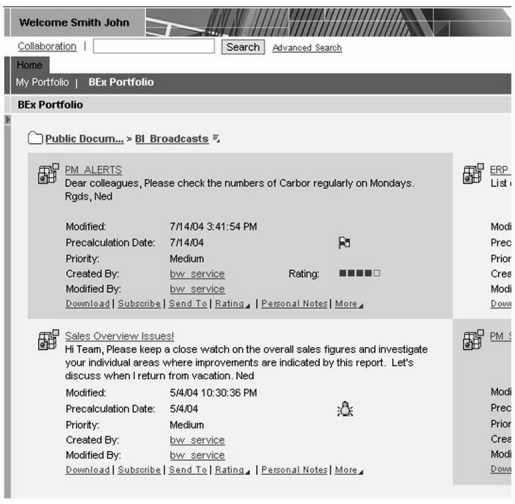

KM Services enabled on top of any broadcasted BI data as well as on any document attached to BI data

Use KM Services for:

- **Subscription**
- **Feedback**
- **Discussion**
- **Collaboration**
- **Rating**
- **TREX search**
- **Notes**
- **Download**

Figure 121: Portal Integration

A role is delivered with NetWeaver BI which provides easy access to Broadcasts via the Portal. Any portal user who is assigned to this role will be able to access their broadcasts easily via the Portal.

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Lesson Summary

You should now be able to:

- Understand the purpose and key features of Information Broadcasting
- Identify scenarios for Information Broadcasting

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Lesson: BEx Broadcaster

Lesson Overview

This lessons deals with the detailed settings of the BEx Broadcaster

Lesson Objectives

After completing this lesson, you will be able to:

- broadcast via Email
- use different formats (MHTML, HTML, Online Link)
- execute ad hoc and scheduled in background processing

Business Example

Your project team is interested in the ability to distribute reports quickly via email on an ad hoc basis as well as on a routine basis

BEx Broadcaster

The BEx Information Broadcaster can be accessed from various BEx reporting tools. The broadcaster can also be accessed via the Portal through the delivered BI Role. Broadcast settings can be created and inserted into BI reports by the report developer during the development phase. The report user can also create broadcast settings during the run time as the need arises.

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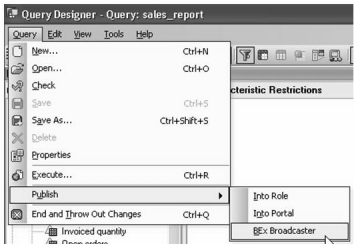
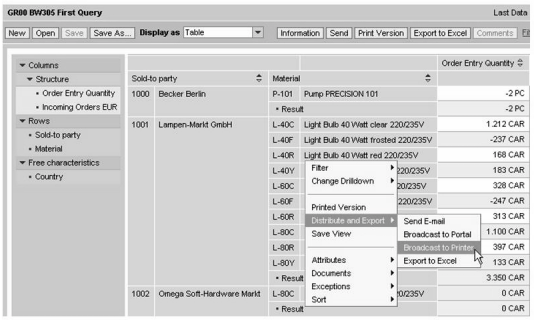
- BEx Query Designer
- BEx Analyzer
- BEx Web Analyzer
- BEx Report Designer
- Portal





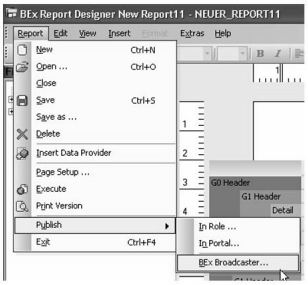


Figure 122: Accessing the Broadcaster

When to Broadcaster settings dialog appears you are able to select the type of reporting object. Choose from the following options:

- Query
- Query View
- Report
- Workbook
- Web Template Name

Press the *Open* button

and you will be able to select the reporting object from the usual places, i.e. Roles, Infoareas, History or Favorites. When you have chosen you reporting object and pressed the *Transfer* button you will now see the broadcast setting for that object (if any have been created already). you may now use the context menu to perform various maintenance activities.

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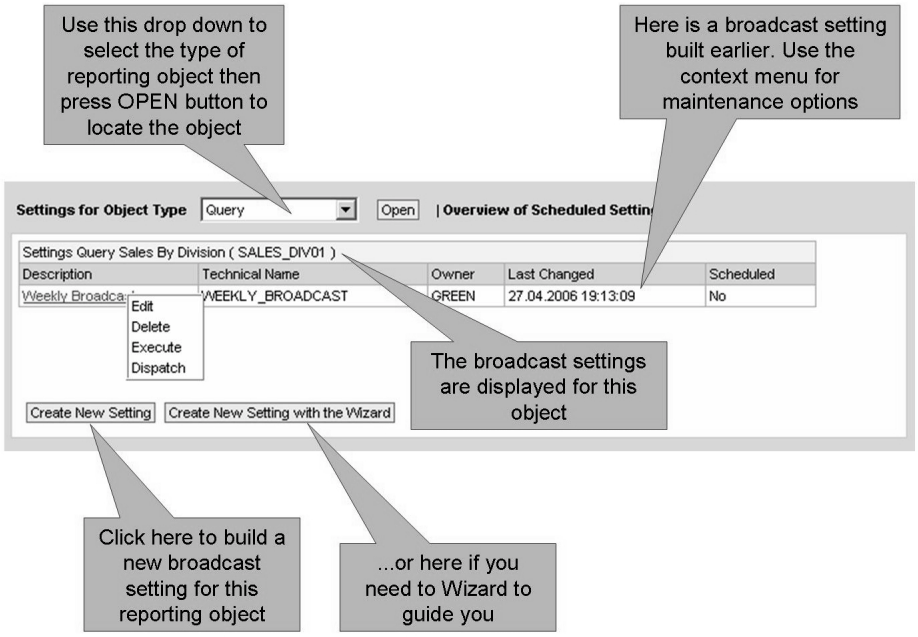

Figure 123: Broadcast Settings Dialog

The context menu (right mouse click) on each setting allows you to *Execute* the Broadcast immediately but *Dispatch* allows you to schedule the run. You can also use the *Edit* option to review of change the settings of the broadcast. The *Delete* option will allow you to remove the broadcast if it is no longer required.

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When you create a new broadcast you are immediately prompted for the *Distribution Type*. Choose from the following options :

- Broadcast Email

  Broadcast the results of a report to email addresses or simply broadcast a link to the on-line report.

- Broadcast to the Portal

  Broadcast the results of a report to the Portal so these become easily accessible by group of people who may also use the collaboration features of the Knowledge Warehouse.

- Broadcast to the Printer

  Broadcast the results of a report to a printer so that hard copies can be made.

- Broadcast Email (Bursting)

  The broadcaster retrieves the emails of the recipients from the master data attributes of a reporting characteristic. ie. the email address of the cost center manager could be an attribute of the characteristic 'Cost Center'.

- Broadcast According to Exceptions

  Broadcast the results of a report only when the exceptions defined in the query have been triggered.

- Broadcast (Multi Channel)

  Use this option when you need a combination of the above methods.

- Precalculate Value Set

  This option will allow you to schedule a collection of filter values for a characteristic by running a control query. These collected filter values can then be used by a subsequent query as input parameters, thus dramatically improving online query performance.

- Fill OLAP cache

  Use this type to setup a broadcast to warm up the OLAP cache so that online query performance will improve.

- Fill MDX cache

  Use this type to setup a broadcast to warm up the MDX cache so that online query performance will improve when using reporting tools (possibly 3rd party) which use this extraction method.

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Options for *Output Format* are dependant on the selection you have made for *Distribution Type*. The example in the graphic show we have selected *Broadcast Email* as the distribution type and so only the relevant output format options are shown.

HTML. Use this option whenever you want to send the report results as a separate file in an email. This could then be saved separately by the user.

MHTML (multipart HTML). Multipart HTML combines all the objects required for the report together in one single file. Use this option when you want to embed the BEx report within the body of the email (rather than as a separate file)

OnLine Links to Current Data. The "Online Link" E-Mails the url for the query which can then be conveniently launched and navigated on as usual.

PDF. Use this option to create a PDF file containing the report results. Tis will be attached to the email.

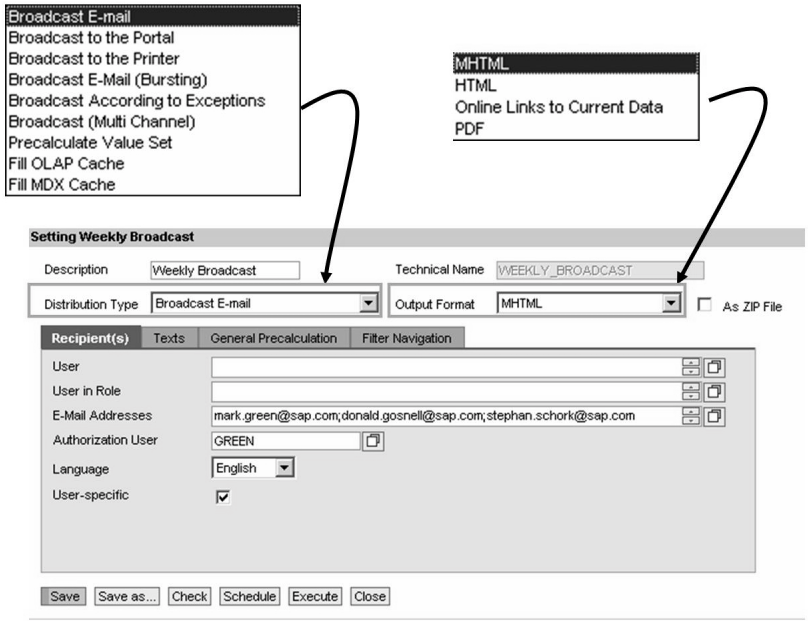

Figure 124: Detailed Settings

Recipients Tab

There are three options to determine who receives e-mails: On the recipients tab, one or more SAP users separated by semi-colons can be selected. Or, "User in Role" sends files to the SAP users associated with the role or roles selected. Or, E-Mail addresses can be entered directly.

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For SAP users and “Users in Roles”, their E-Mail addresses and the communication type “E-Mail” are required in SU01 if you would like to use external email addresses. Otherwise the broadcast is made to the user's SAP Office Inbox.

For background processing, the “Authorization User” setting can be used to assess date format and OLAP authorizations. Leave the field “Authorization Users” empty if the user name is irrelevant to the generation of the document. In this case, the system uses the current user and their authorizations in the execution of the settings.

If the document is created in the foreground, the logon language is used unless you specify differently. If background processing is used, the language in the setting is used.

User Specific: Select this setting if you want to generate the document to be user specific. The system generates the document for each of the specified recipients with their personal settings (date format, language) and data authorizations. Recipients that are only specified with E-Mail addresses are excluded from this.

Note: There is quick text help for each of the settings which is available when you “hover” the mouse over the setting.

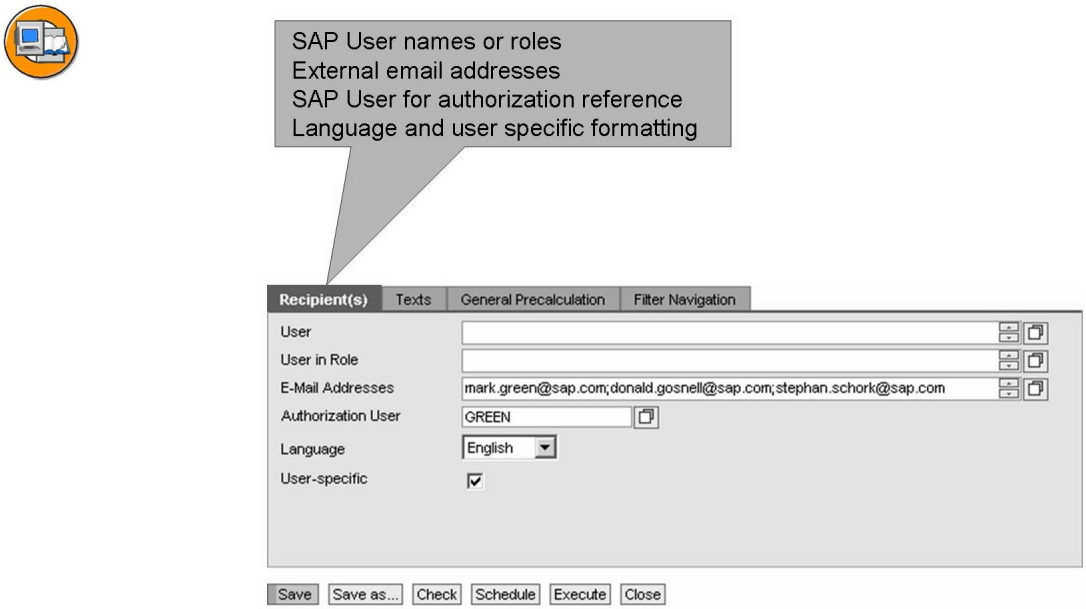

Figure 125: Recipient Tab

Text Tab

Subject: Enter a subject line for the e-mail manually or use a text variable from “Attach Text Variable”. The text can be up to 50 characters long.

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Importance: Select the desired importance of the e-mail (low, medium, high).

Contents: Enter text for the contents of the e-mail manually or use a text variable from Attach Text Variable. When sending online links, the system automatically adds a link to the text of the e-mail if it is not part of the text via the variable PR_ONLINE_LINK.

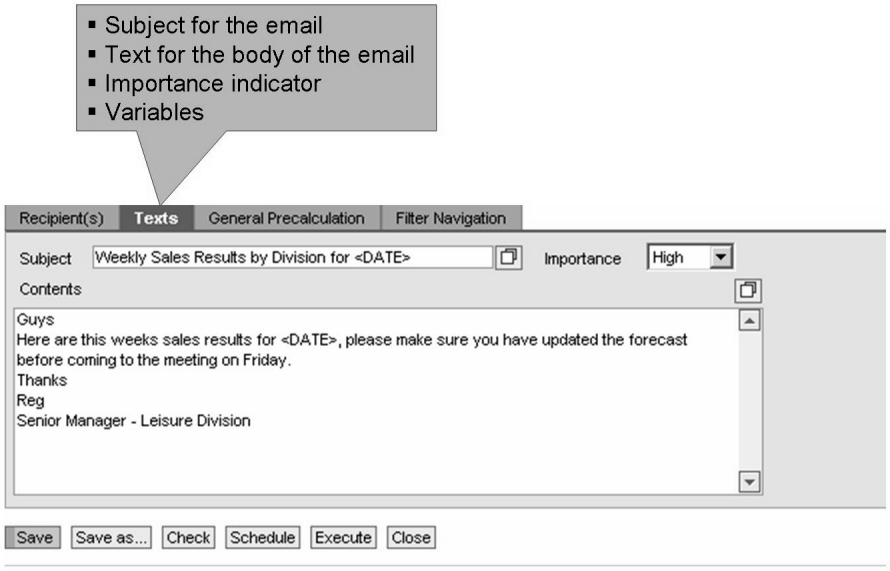

Figure 126: Text Tab

General Precalculation Tab

For broadcasting via email there are only two option under this tab. The theme drop down allows you to choose a preferred 'look' for the report results. If you check the box 'Only Upon Data Change' then the broadcast will only be sent if the data has changed since the last broadcast sent with this setting. An important prerequisite is that this broadcast setting has not been modified since the first broadcast. This feature is useful as is means you can avoid resending the same broadcast data to individuals.

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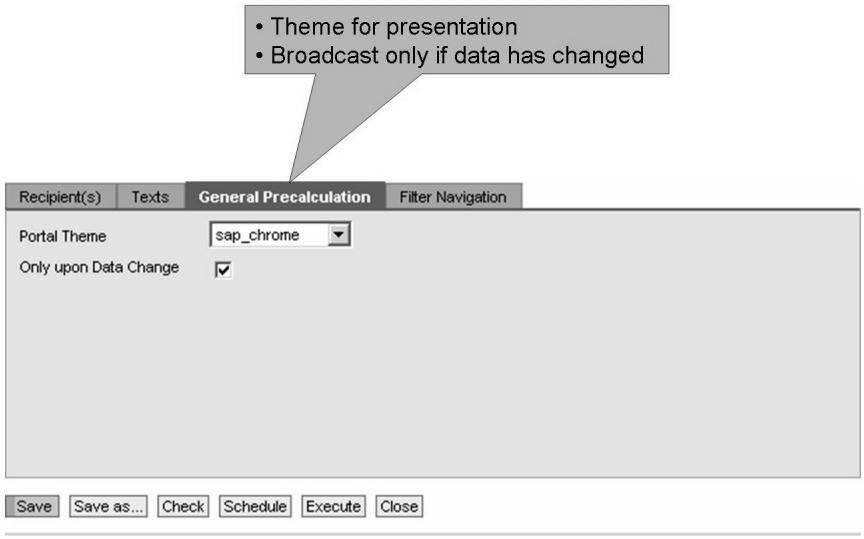

Figure 127: General Precalculation

Filter Navigation Tab

For workbooks there is no filtering option.

The only “Output Format” which supports filtering is “HTML” and you **must** use the Zip option. Filtering a query which has sales for six different Divisions for example, would result in six separate files by Division within the zipped file.

Any characteristics in the query but not in the filter can be “filtered on”.

If “Add Unfiltered View” is selected, a view will be pre-calculated which does contain the selected characteristic.

Characteristics are either filtered individually or with a control query. For each characteristic combination that occurs in the control query, a filtered document is calculated.

Caution: You should evaluate the number of possible combination the control query may generate as this could cause a very large number of views to be created.

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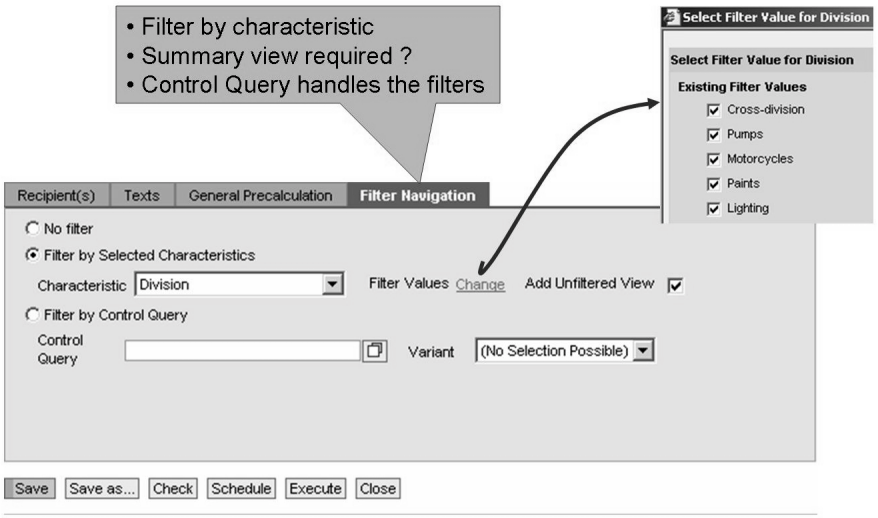

Figure 128: Filter Navigation Tab

Scheduling a Broadcast

There are four main option which determine when a broadcast will be sent.

- Immediately

  Simply use the *Execute* button to send the broadcast off immediately. Immediate execution works for settings which were saved and also for settings which were not saved (an ad-hoc broadcast).

- Execution with Data Change in the InfoProvider

  If you want to send broadcast only when there has been a changeof data in the InfoProvider which supplies the broadcast data then choose this option.

- Execution at Pre-Defined Time

  A broadcast setting can be assigned to a time point so that the results are sent at predefined times. The system administrator should setup the timepoints in advance so that they show up in the dialog box.

- Direct Scheduling in the Background Processing

  Here you can specify your own time points and also determine how many broadcasts should be sent (i.e. I am monitoring a new store for the next 8 weeks only)

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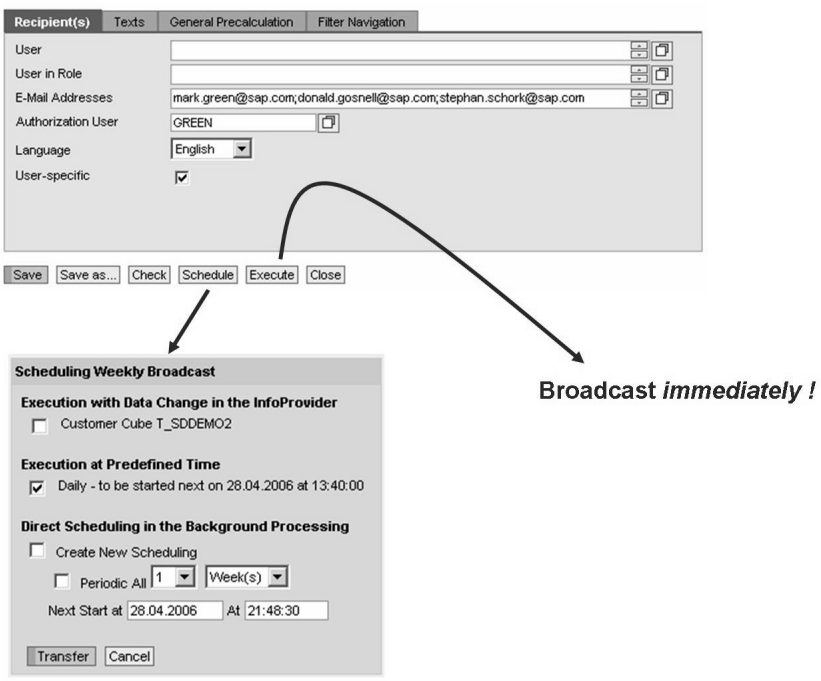

Figure 129: Scheduling Broadcast

Broadcast Wizard

As well as report developers defining the broadcast settings as design time, users can also create their own broadcast settings at run time. To help the user, particularly the casual user, the Broadcast Wizard is available. The Broadcast Wizard takes you through a series of prompts where you supply the key information required to develop a broadcast. At any time you can leave the Wizard and use the standard settings dialogs which offer more settings.

Settings created with the Wizard can be maintained with the Broadcaster.

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Exercise 16: BEx Broadcaster

Exercise Objectives

After completing this exercise, you will be able to:

- Using the BEx Broadcaster to distribute a query

Business Example

In order to enable the precalculation and the distribution of a certain query, the BEx Broadcaster can be used in an adhoc or scheduled way. Possible addresses can be actual persons or the portal.

Task:

You need to create and a new query and distribute it to your own BI-user ID (BW305-##), to the BI-user ID of your neighbor.

1. Create a new query using the *Billing (T_SDC03)* InfoCube within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Place the navigation attribute *Country (T_SOLD_TO__0COUNTRY)* in the *Free Characteristics* and the characteristic *Sold-to Party (T_SOLD_TO)* in the *Rows*.

   In the *Columns*, include the *Sales Volume EUR (0T_INVCD_V)* key figure.

   Save the query definition in the under *Roles → Training BW305 Reporting → Unit: Information Broadcasting→ Lesson: BEx Broadcaster → Exercise* with the following description:

   Description: **`GR## BW305 Broadcast Query`**

   Technical name: **`BW30520A##`**.

2. Distribute, via the BEx Broadcaster, the new query **immediately** to your own BI-user (BW305-##) and to the BI-user of your neighbor.

   Create a new Broadcast-setting by using the following values:

   Recipient(s) tab page:

Field	Value
Description	GR## BW305 Broadcast-Email
Distribution Type	Broadcast E-Mail

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Output Format	MHTML File, as Zip File
User	BW305-##, BW305-of-your-neighbor
Authorization User	BW305-##
Language	English

Texts tab page:

Field	**Value**
Subject	GR## BW305 Broadcast-Email
Importance	High

Finally, execute the setting. For the immediate execution you do not have to save it first. Check the inbox of your SAP Business Workplace and/or the inbox of your email-account for mails with the generated report as attachment.

3. In order to precalculate and distribute the report **regularly**, the broadcast-settings can be scheduled. Starting today and then once every week the report has to be sent. As time choose current time plus one minute. In the *Subject* field enter **`once a week`** after the existing text.

   Before scheduling the broadcast-setting, you have to save it. Take the existing *Description* **`GR## BW305 Broadcast-Email`** and the *Technical Name* **`BW305BC_EMAIL##`**.

   Hint: It may last a few minutes until the scheduled email arrives.

4. As an additional step you want to make available the precalculated report to portal users, using the *Public Documents* folder in the *BEx Portfolio*. To do so, create a new broadcast-setting using the following values:

Field	**Value**
Description	GR## BW305 Broadcast-Portal
Distribution Type	Broadcast to the Portal
Output Format	MHTML File, as Zip File

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Export Document to Other Folder	Browse: *CM Repository View* → *Public Documents* → *Transfer*
Authorization User	BW305-##
Language	English

Save the setting: take the existing *Description* **`GR## BW305 Broadcast-Portal`** and the *Technical Name* **`BW305BCPORTAL##`**.

Schedule the setting: once a week, starting today in one minute.

5. Launch the portal, go to *Business Intelligence* → *BEx Portfolio* → *Public Documents* and check if your report was stored correctly.

   Portal Address: http://portal-(SID).wdf.sap.corp:50100/irj where (SID) is to be replaced by your assigned BI system ID.

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Solution 16: BEx Broadcaster

Task:

You need to create and a new query and distribute it to your own BI-user ID (BW305-##), to the BI-user ID of your neighbor.

1. Create a new query using the *Billing (T_SDC03)* InfoCube within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Place the navigation attribute *Country (T_SOLD_TO__0COUNTRY)* in the *Free Characteristics* and the characteristic *Sold-to Party (T_SOLD_TO)* in the *Rows*.

   In the *Columns*, include the *Sales Volume EUR (0T_INVCD_V)* key figure.

   Save the query definition in the under *Roles → Training BW305 Reporting → Unit: Information Broadcasting→ Lesson: BEx Broadcaster → Exercise* with the following description:

   Description: **`GR## BW305 Broadcast Query`**

   Technical name: **`BW30520A##`**.

   a) Create and save the query definition as described above.

2. Distribute, via the BEx Broadcaster, the new query **immediately** to your own BI-user (BW305-##) and to the BI-user of your neighbor.

   Create a new Broadcast-setting by using the following values:

   Recipient(s) tab page:

Field	Value
Description	GR## BW305 Broadcast-Email
Distribution Type	Broadcast E-Mail
Output Format	MHTML File, as Zip File
User	BW305-##, BW305-of-your-neighbor
Authorization User	BW305-##
Language	English

   Texts tab page:

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Field	Value
Subject	GR## BW305 Broadcast-Email
Importance	High

Finally, execute the setting. For the immediate execution you do not have to save it first. Check the inbox of your SAP Business Workplace and/or the inbox of your email-account for mails with the generated report as attachment.

a) In the toolbar of the BEx Query Designer: *Query* → *Publish* → *BEx Broadcaster*.

b) Choose *Create New Setting* and complete the fields as described above.

c) Finally, *Execute* the setting.

d) You reach the inbox of your SAP Business Workplace via *SAP Menu* → *Office* → *Folders* → *Inbox* → *Workplace* → *Inbox* → *Unread Documents*.

3. In order to precalculate and distribute the report **regularly**, the broadcast-settings can be scheduled. Starting today and then once every week the report has to be sent. As time choose current time plus one minute. In the *Subject* field enter **`once a week`** after the existing text.

   Before scheduling the broadcast-setting, you have to save it. Take the existing *Description* **`GR## BW305 Broadcast-Email`** and the *Technical Name* **`BW305BC_EMAIL##`**.

   Hint: It may last a few minutes until the scheduled email arrives.

   a) *Save* the broadcast-setting.

   b) Then press the *Schedule* button, and under *Direct Scheduling in the Background Processing*, check the boxes *Create New Scheduling*, *Periodic all 1 Week*, and enter the current date and the current time plus one minute.

   Finally, choose *Transfer*.

4. As an additional step you want to make available the precalculated report to portal users, using the *Public Documents* folder in the *BEx Portfolio*. To do so, create a new broadcast-setting using the following values:

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Field	Value
Description	GR## BW305 Broadcast-Portal
Distribution Type	Broadcast to the Portal
Output Format	MHTML File, as Zip File
Export Document to Other Folder	Browse: *CM Repository View* → *Public Documents* → *Transfer*
Authorization User	BW305-##
Language	English

Save the setting: take the existing *Description* **`GR## BW305 Broadcast-Portal`** and the *Technical Name* **`BW305BCPORTAL##`**.

Schedule the setting: once a week, starting today in one minute.

a) Choose *Create New Setting* and complete the fields as described above. Finally, choose *Save*.

b) Schedule the setting as described in exercise step 3.

5. Launch the portal, go to *Business Intelligence* → *BEx Portfolio* → *Public Documents* and check if your report was stored correctly.

Portal Address: http://portal-(SID).wdf.sap.corp:50100/irj where (SID) is to be replaced by your assigned BI system ID.

a) Proceed as described above.

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Lesson Summary

You should now be able to:

- broadcast via Email
- use different formats (MHTML, HTML, Online Link)
- execute ad hoc and scheduled in background processing

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Lesson: Workbook Precalculation

Lesson Overview

In this lesson you will learn how to perform workbook precalculation using the Broadcasting functionality.

Lesson Objectives

After completing this lesson, you will be able to:

- Install the Workbook Pre-Calculation Service
- Start the set-up program
- Evaluate possible error messages

Business Example

Some of your users want to publish from Workbooks so your project team has requested a review of the required set-up.

Workbook Precalculation

You can precalculate workbooks and distribute them via E-mail or publish them in the Enterprise Portal. Before you can broadcast workbook results you must first setup the workbook precalculation service. The basic steps are listed below.

- Install Microsoft .Net Framework (installed with SAP Frontend)
- Install SAP GUI 6.40
- Install SAP Netweaver BI Frontend 2004s (BI Add-On).
- Install Microsoft Excel 2000 or higher

Several administrative activities are necessary in the BW system for pre-calculation and distribution of workbooks

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Here are the main steps for setup:

1. Install the pre-calculation software that is part of BI Add On.
2. After Finishing the installation go to the Services Window of your operating system
3. Search for Service called SAP BW PRECALCULATION SERVICE 7.0. Double click on the service
4. Enable Automatic as Startup type
5. In the logon tab mark the checkbox 'Allow service to interact with desktop'
6. Log on to the BW system from the pc where you created the settings above, and enter transaction RSPRECADMIN in order to Create Precalculation Server.
7. Enter the technical name of the server (max. 10 characters) and a description. The description is language dependent and appears in the BEx Broadcaster during selection of a special precalculation server. The precalculation server, which from a technical viewpoint is an RFC server, appears in the list.
8. Start the Windows service SAP BW Precalculation Service. The precalculation server is ready and the status display of the precalculation server shows a green light. You can now see the server in the broadcaster setting dialog for a workbook precalculation distribution type.

There is a log available to do trouble shooting. From Customizing (transaction SPRO): SAP Reference IMG > SAP NetWeaver > SAP Business Information Warehouse > Reporting-relevant Settings > General Reporting Settings in Business Explorer > Administer Precalculation Server > Select the ‘Documentation for the Server’ icon > Display the Front End Log.

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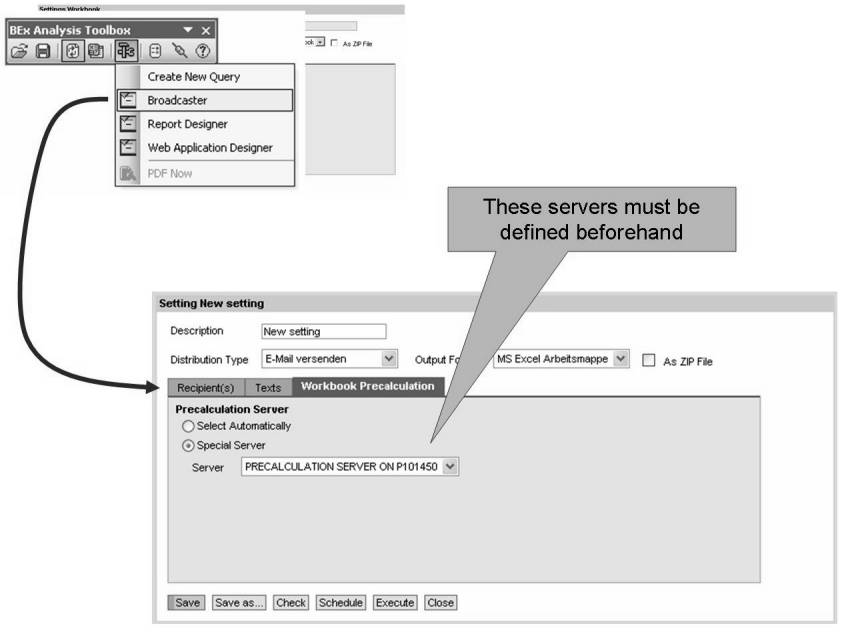

Figure 130: Workbook Precalculation

A broadcast setting is created from a saved workbook (i.e. Not a temporary workbook) from the Tools option in the menu bar.

This button will launch the Broadcaster. Then, the user selects a workbook and creates a new setting. Choose whether you want to send the precalculated workbook as an email or whether it should be published in the Enterprise Portal. If you wish to distribute the workbook as a ZIP file, select *ZIP file.*

Select the *Workbook pre-calculation* tab page.

If the workbook contains variables, you can enter the desired variant, the data of which is used to precalculate the workbook, in the *Variants* field.

Specify which pre-calculation server should be used. If the system should use the first available pre-calculation server from the pre-calculation servers set in Customizing, then highlight *Select Automatically*.

If the system should use a special pre-calculation server, then highlight *Special Server* and specify the server.

If this special server is not available, then the system terminates.

If requried, check your settings using the *Check* button and choose *Save*. Enter a technical name for the broadcast setting and select *Transfer*. The new setting appears in the overview in the upper area of the BEx Broadcaster.

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If you would like to immediately distribute the broadcast setting for the workbook, select *Execute*. A new browser window appears that displays the processing status of the broadcast setting. If you would like to close the window, choose *Cancel.* If you would like to distribute the broadcast setting for the workbook at a specific time or with data change, select *Schedule*.

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Lesson Summary

You should now be able to:

- Install the Workbook Pre-Calculation Service
- Start the set-up program
- Evaluate possible error messages

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Unit Summary

You should now be able to:

- Understand the purpose and key features of Information Broadcasting
- Identify scenarios for Information Broadcasting
- broadcast via Email
- use different formats (MHTML, HTML, Online Link)
- execute ad hoc and scheduled in background processing
- Install the Workbook Pre-Calculation Service
- Start the set-up program
- Evaluate possible error messages

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Unit 11

Enterprise Portal Integration

Unit Overview

Unit Objectives

After completing this unit, you will be able to:

- Understand the BI Portal integration in general
- Understand how to integrate a BI Web Application into the SAP Enterprise Portal as an iView
- Understand the use of the Role Upload of existing BI roles.
- Understand the Drag & Relate function

Unit Contents

Lesson: SAP BI Portal Integration 404

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Lesson: SAP BI Portal Integration

Lesson Overview

This lesson deals with the integration of SAP BI content into the SAP Enterprise Portal.

Lesson Objectives

After completing this lesson, you will be able to:

- Understand the BI Portal integration in general
- Understand how to integrate a BI Web Application into the SAP Enterprise Portal as an iView
- Understand the use of the Role Upload of existing BI roles.
- Understand the Drag & Relate function

Business Example

Your enterprise wants to integrate content from *SAP BI* into the *SAP EP* (Enterprise Portal). Therefore you need more information about the types of BI Objects and the tools for integrating these BI Objects.

Integration into the SAP Enterprise Portal

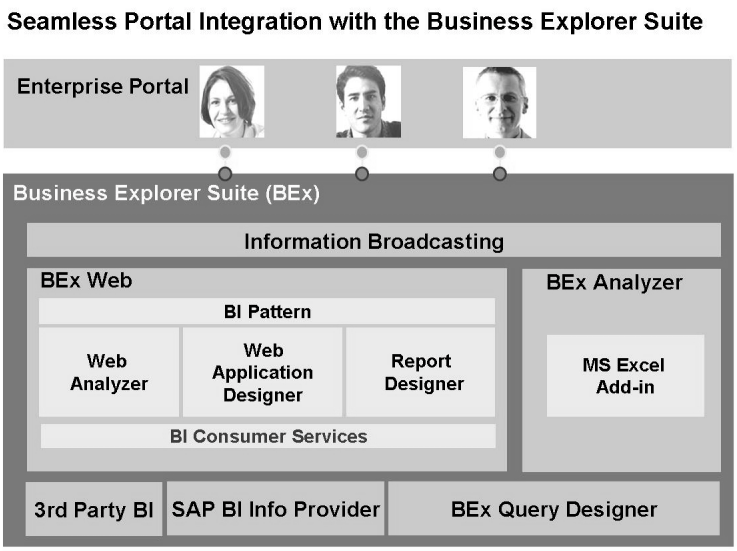

Figure 131: SAP BI Portal Integration

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You can integrate business-relevant content from *SAP Business Intelligence* seamlessly into a *SAP Enterprise Portal*. The *SAP Enterprise Portal* enables you to access applications from other systems and sources, such as the Internet or Intranet. Using one entry point, you can reach both structured and unstructured information. In addition to content from *Knowledge Management*, business data from data analysis is available to you from the Internet and from the Intranet.

The preparation of information is based on user roles in the company. Since *SAP Business Intelligence* uses the role concept, integrating *SAP BI* contents into the *SAP Enterprise Portal* is easy. *SAP BI* users see their *SAP BI* role in the *SAP Enterprise Portal* with the same content.

Furthermore, you can also use the *iView* concept to integrate *SAP BI* applications and bring individual Web applications from *SAP BI* as an *iView* into the *SAP Enterprise Portal*. You can then display and use them from a page in the portal, together with other *iViews* from the *SAP BI* system or from other systems.

The unification concept for the *SAP Enterprise Portal* enables you to directly set contents from the *SAP BI* system with contents from other systems or from the Internet in relation to one another. With the function *Drag & Relate*, you can link data together across system boundaries in order to obtain additional information.

The Portal Desktop

The portal desktop refers to the entire portal screen, including content and layout. As is shown in the following graphic, the portal desktop is divided into three main areas: header area, navigation panel and content area.

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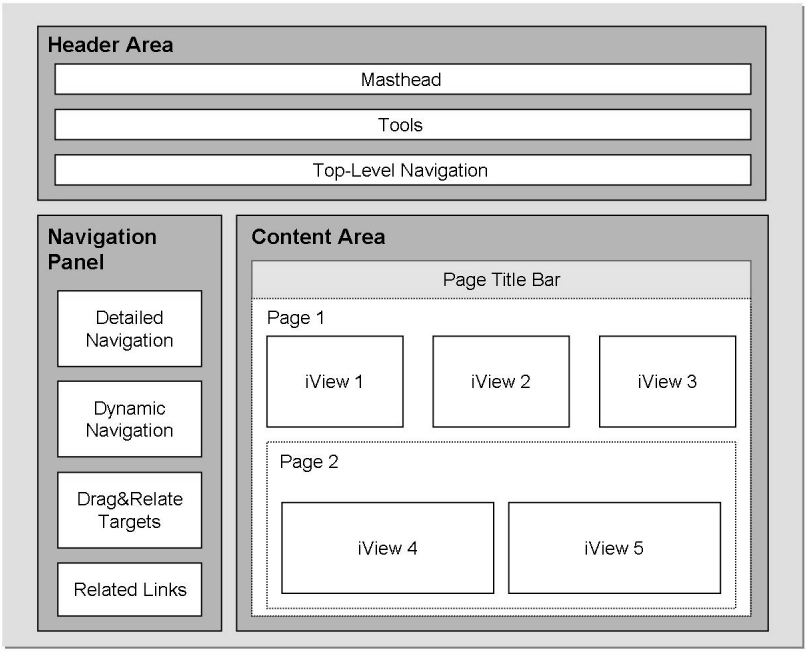

Figure 132: Portal Desktop 1

The integration of *SAP BI* and *SAP EP* is especially concentrated on the content area.

Short Introduction of Portal-Desktop

The SAP Enterprise Portal out-of-the-box interface provides all the tools necessary for working in the portal. The default interface can be changed through customizing and personalization.

The interface consists of the following elements:

- Portal Desktop

  The entire portal screen including any content and layout. The out-of-the-box portal desktop consists of the header area, page title bar, navigation panel, and content area.

- Header Area

  The part of the portal layout that contains the masthead, tools area, and top-level navigation bar.

- Masthead

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Contains branding elements, user identification, and the appropriate (based on the portal configuration) function links from among Help, Personalize, New Session, Log Off and Log On.

- Tools

  A persistent area that provides ready access to such key applications as real-time collaboration, or to a search component.

- Top-Level Navigation

  Your entry point for navigating the content available to your role on your portal.

- Page Title Bar

  An iView below the header area containing items related to the currently displayed content page.

- Navigation Panel

  The left-hand pane just below the top-level navigation bar, dedicated to navigating content. You can reduce, enlarge, collapse, and expand the navigation panel by clicking the appropriate arrow icons.

- Navigation iViews

  The areas in the navigation panel related to portal navigation, all of which change contextually according to the content displayed in the content area.

  Detailed Navigation

  This iView contains links to all the content that is assigned to you, displayed in a tree format.

  Dynamic Navigation

  This area contains iViews whose user interface controls, such as drop-down lists and links, access databases and retrieve data related to the content displayed in the content area.

  Drag&Relate Targets

  This iView contains a list of links pointing to iViews that have been configured with drag-on capability, according to user permissions. When you drag data items from content iViews onto these links, you receive related information.

  Related Links Area

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This iView contains a list of links whose target topics are relevant to the iView or portal page with which you are currently working. The links are predefined on the iView and the page levels (Portal Content Studio). Clicking an object in the Related Links iView opens its content in a new browser window that can be customized.

Hint: The Portal Content Studio provides a central environment for developing and managing different types of portal content such as iViews, pages, layouts, roles... For more information, see under help.sap.com: Portal Content Studio.

Portal Favorites iView

This iView contains user-compiled links that provide direct access to Knowledge Management (KM) elements, such as folders and documents, and portal navigation objects such as pages, or iViews that run as full-page applications.

- Content Area

  The area of the portal desktop for performing tasks, and in which administrative tools, navigation results, and portal pages with iView content are displayed.

- Page

  Portal Pages (Services) consists of iViews and are integrated into Portal via Portal roles

- iView

  SAP Enterprise Portal lets you retrieve data from information sources in your company and on the Internet through the use of mini programs called *iViews* (integrated views). *iViews* can access documents, e-mail, Web sites, intranets, and data in enterprise applications. *iViews* assemble for you a personalized picture of all that is pertinent to your business functions. The work and content areas that make up your portal desktop are all *iViews*, as are the top-level navigation bar, and the areas you see in the navigation panel.

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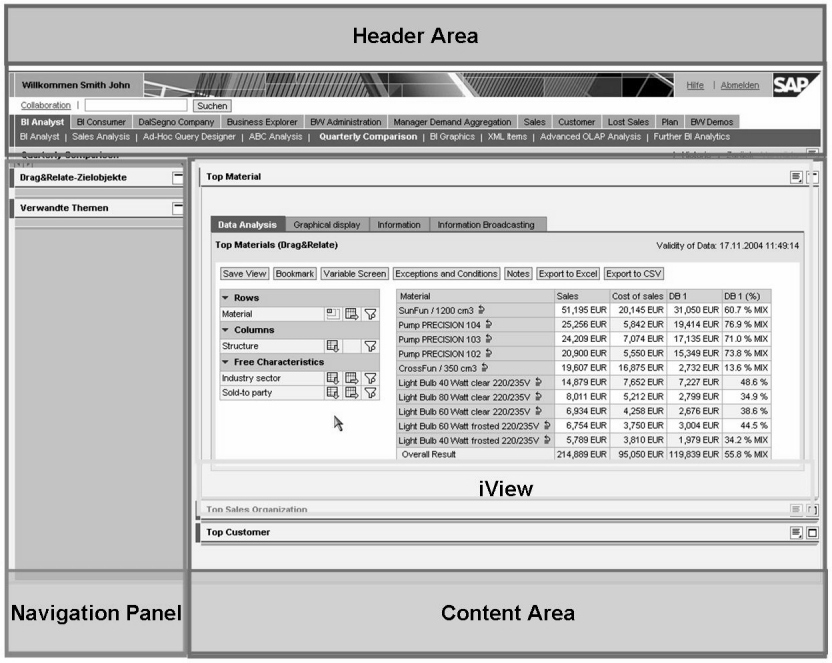

Figure 133: Portal Desktop 2

Integration and Display Types of BI Content in the Portal

You are able to integrate content from *SAP BI* into the *SAP EP* using various tools. Depending on the type of integration, you create various objects with various displays in the portal. You have various options for displaying the BI objects in the *SAP Enterprise Portal*.

The following table provides a summary of the various display types.

Overview: Display Types of BI Objects in the Enterprise Portal

Display Type	Description
BEx Web Application as iView	Web-based BI application that is displayed as an iView in the Enterprise Portal. BEx Web applications are BI Web templates executed in the Web that are created using the BEx Web Application Designer.
BEx Web Application as a Document in Knowledge Management	In a document stored in a KM folder with historic data of a Web-based BI application.

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BEx Web Application as Online Link in Knowledge Management	Link to a Web-based BI application with current data in a KM folder. The display requires the Repository-Manager for BI Metadata.
BI Workbook as iView	MS Excel workbook with one or more embedded queries that are displayed in a separate browser window as an iView in the Enterprise Portal.
BI Workbook as a Document in Knowledge Management	MS Excel workbook with one or more embedded queries that is stored as a document with historic data in a KM folder.
BI Query as iView	Query that is displayed as a Web-based BI application in a standard view (Standard Web Template for Ad-hoc Analysis) as an iView in the Enterprise Portal. It is a special form of a BEx Web application.
BEx Query as Online Link in Knowledge Management	A link to a query with current data stored in a KM folder that is displayed with the Standard Web Template for Ad-hoc Analysis. The display requires the Repository Manager for BI Metadata.
BI Query as a Document in Knowledge Management	A document with historic data for a query stored in a KM folder that is displayed with the Standard Web Template for Ad-hoc Analysis.
Individual BI Document as a Document in Knowledge Management as iView	A single document generated in SAP BI (such as documentation for metadata) that is displayed as in iView in the Enterprise Portal. The document of the link can either be available through the Repository Manager for BI Document and BI Metadata in Knowledge Management or a precalculated BEx Web Application in Knowledge Management.

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Multiple BI Documents in Knowledge Management as iView	Multiple documents and/or links from a folder in Knowledge Management are displayed with a KM Navigation iView. The documents and/or links in Knowledge Management can come from SAP BI and other sources. The layout of a KM Navigation iView can be adapted using layout sets.
Web-Interface as iView	Web-capable planning application of BI BPS that is displayed in the Enterprise Portal as an iView.
Components from SAP BI	Different applications and tools from SAP BI, such as the Administrator Workbench, the BEx Query Designer, the BEx Web Application Designer or the BEx Analyzer.

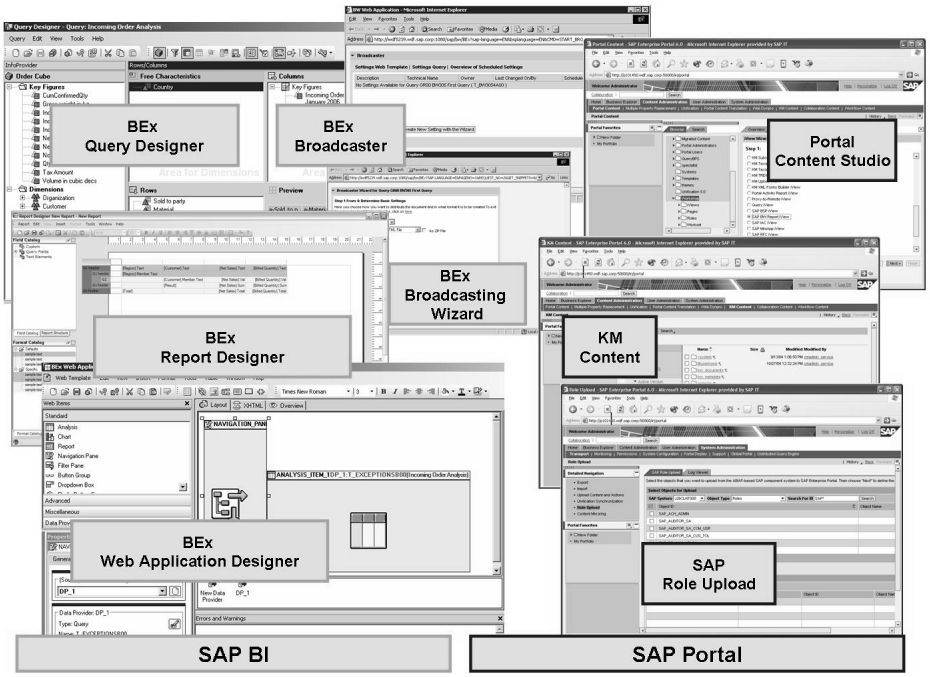

Figure 134: Tools for Integrating BI Objects into the Portal

To distribute or integrate content from *SAP BI* to the *SAP Enterprise Portal* you can use the following tools:

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Tools for Integrating BI Objects into the Enterprise Portal

BEx Broadcasting Wizard	An assistant that supports you in precalculating and distributing queries, Web templates or workbooks with step-by-step instructions.
BEx Broadcaster	Tool for precalculation and distribution of queries, Web templates and workbooks. The BEx Broadcaster offers more extensive options than the BEx Broadcasting Wizard.
BEx Web Application Designer	A desktop application for creating Web pages using BI content.
BEx Query Designer	Tool for defining queries that are based on a selection of characteristics and key figures (InfoObjects) or on reusable structures of an InfoProvider.

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Portal Content Studio	Central environment for the creation and management of Portal Content in the Enterprise Portal.
KM Content	Central environment for the creation and management of documents and links in Knowledge Management.
SAP Role Upload	Tool for uploading role definitions and the associated objects from backend systems (for example a BI system) into the Enterprise Portal.

Hint: Portal Content Studio

The Portal Content Studio is the central environment in the Enterprise Portal for creating and managing portal content. You can use it to edit the following types of portal content: iViews, Portal Pages, layouts of Portal Pages, Portal Roles, Worksets.

Note: Workset

Worksets let you bundle iViews and pages in folder hierarchies, like for roles. Worksets represent generic, re-usable structures. A workset may be used in any number of roles, and a role may consist of a number of different worksets. You may not assign worksets to users. A workset that is to be added to a portal therefore is always part of a role.

The following table provides an overview of the integration tools and their use. If there is a combination in the table labeled with X, it means that this display type of BI content is possible with the corresponding tool.

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Display Type \ Tool	BEx Broadcasting Wizard	BEx Broadcaster	BEx Web App Designer	BEx Query Designer	Portal Content Studio	KM Content	SAP Role Upload
BEx Web Apps iView			X		X		X
BEx Web App as KM Document	X	X					
BEx Web App as KM Online Link	X	X	X		X	X	
BI Workbook as iView					X		X
BI Workbook as KM Document	X	X					
BI Query as iView				X	X		X
BI Query as KM Document	X	X					
BI Query as KM Online Link	X	X		X		X	
BI Document as KM Document						X	
Multiple KM Documents as iView						X	
Web-Interface (from Planning) as iView						X	
Components from SAP BI						X	

Figure 135: Overview of the Integration Tools and their Use

A broad spectrum of users has the option of publishing BI content to the Enterprise Portal.

The tools are customized for various groups of users:

Overview of User Groups – Tools

User Groups	Tools
Information Consumer	Broadcasting Wizard
Knowledge Worker	BEx Broadcaster
Authors and analysts	BEx Query Designer BEx Web Application Designer BEx Broadcaster
Administrators	Portal Content Studio KM-Content SAP Role Upload

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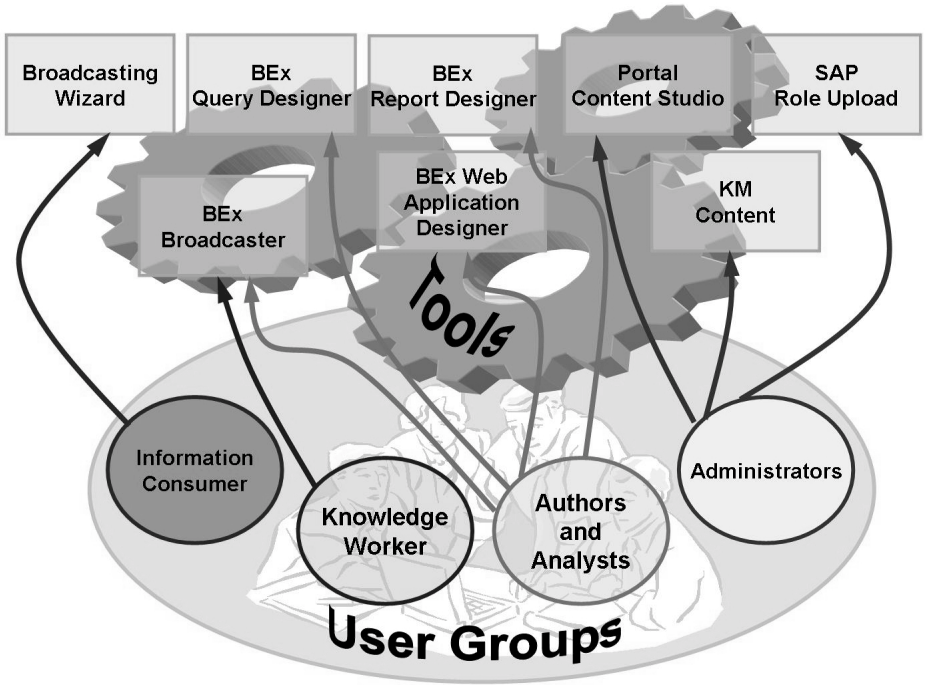

Figure 136: User Groups / Tools

Generating Content from SAP BI for the Enterprise Portal

The following sections will explain which tools support you with the integration of SAP BI and SAP EP.

As an author, you generate BI reports within SAP BI with the help of tools from the BI Business Explorer (BEx):

- Queries that are created with the BEx Query Designer.
- BEx Web Applications are created with the BEx Web Application Designer.
- The BEx Analyzer is the platform for creating and editing BI Workbooks.
- Formatted reports are created with the BEx Report Designer.
- Precalculated documents and links to BEx Web Applications or queries in Knowledge Management are generated with the BEx Broadcaster.

The integration of Queries and Web Applications will be explained in this lesson. The integration of precalculated documents and links to BEx Web Applications or Queries will be shown in the lesson of the BEx Broadcaster. For more information with regard to the integration of BI Workbooks we like to refer to our documentation under help.sap.com, as you need detailed information about the Portal Content Studio.

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The Portal Content Studio is a tool within the portal that enables manual inclusion of content from SAP BI, i.e. generation of iViews with BI workbooks is not directly supported from within the BEx Analyzer.

Integration Functions in the BEx Query Designer

In the BEx Query Designer, you can use the menu path *Query* → *Publish*l to publish queries to BI Roles, to the SAP Enterprise Portal and with the BEx Broadcaster.

You are able to publish queries that you have edited and saved in the BEx Query Designer so that they are available to other users.

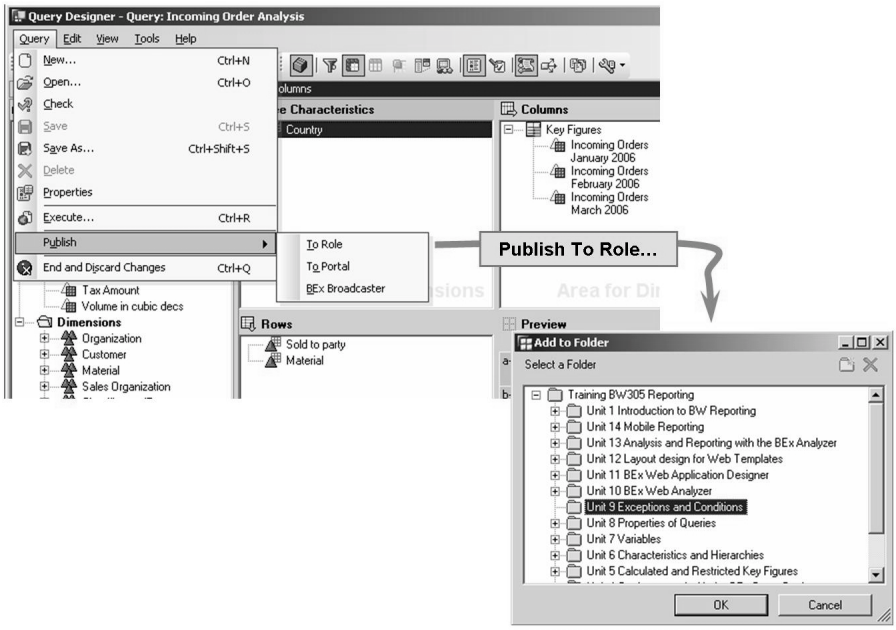

Figure 137: Publish Queries in Roles

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In the menu path, you can select from the following options:

- Publish in Roles

  The save dialog appears and you can select a role in which you want to publish the query. The system saves a link to the current query in the selected role. This role can later be integrated into the SAP Enterprise Portal with the function Role Upload.

- Publish to Portal

  The save dialog appears and you can publish the query to the Enterprise Portal.

  Here you can select from several options.

- BEx Broadcaster

  The BEx Broadcaster, which is a Web application for precalculating and distributing queries, Web templates and Workbooks, appears. You can find additional information under lesson of the BEx Broadcaster.

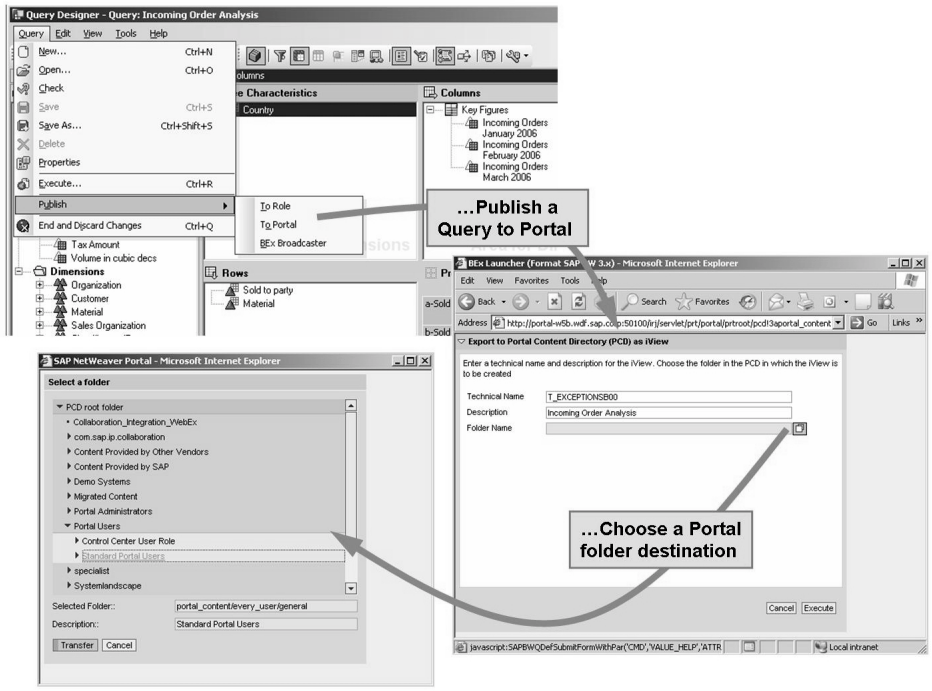

Figure 138: Publish Queries to the Portal

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Integration Functions in the BEx Web Application Designer

In the BEx Web Application Designer, select the menu entry *Publish* to publish Templates in BI Roles, to the SAP Enterprise Portal, with the BEx Broadcaster and you can choose *Copy URL to the Clipboard*.

You are able to publish Templates that you have edited and saved in the BEx Web Application Designer so that they are available to other users.

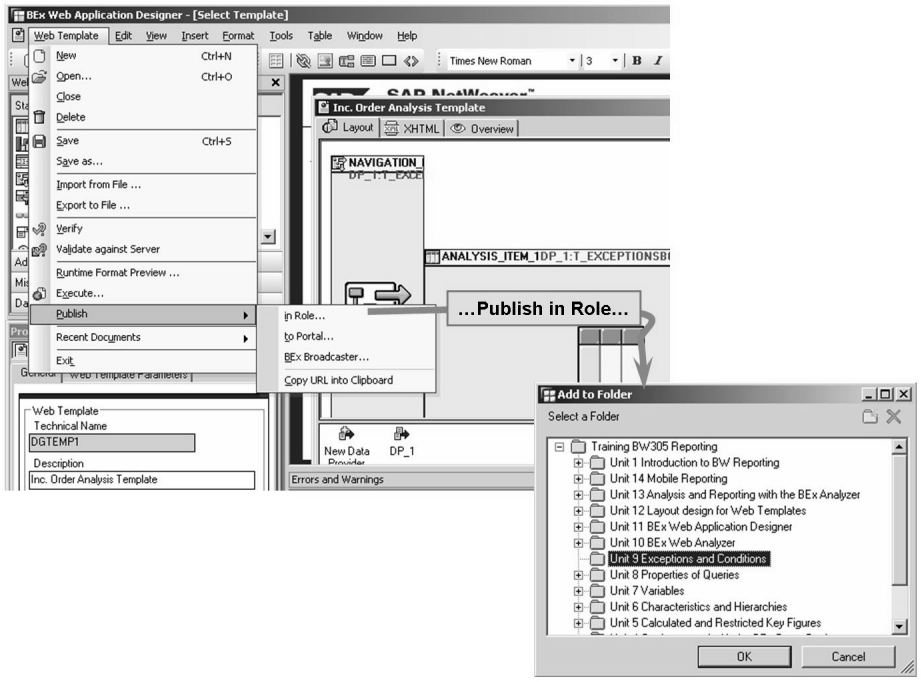

Figure 139: Publish Web Applications to a Role

Publish to the SAP Portal

The save dialog, which contains various views of the portal that can be stored in a Web template, appears. Depending on view, the system generates either iViews in the portal or links in Knowledge Management.

Hint: The options described below are available to you in the BEx Web Application Designer via the menu entry *Template* → *Publish*.

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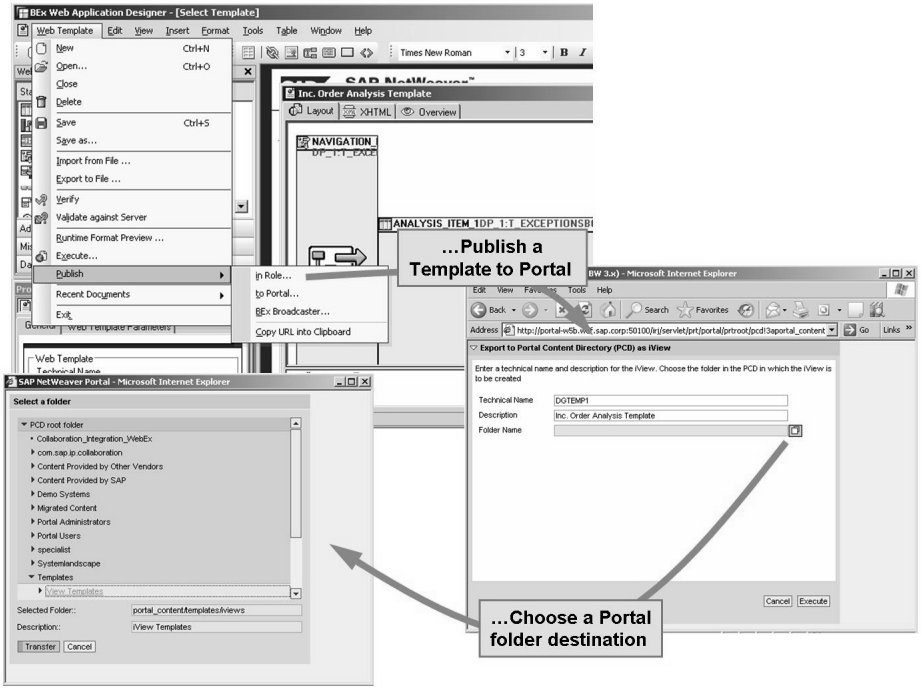

Figure 140: Publish Web Applications to the Portal

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The following views are available for selection in the save dialog:

- Portal Roles

  The Portal Roles view displays the portal roles assigned to the user. This view combines the storage of iViews in the Portal Content Directory (PCD) and assignment of iViews to a portal role or portal page. The iViews are always appended to the folders of the portal role or to the portal page from below.

  Note: Portal Content Directory (PCD)

  The PCD is the central storage mechanism of the portal. It stores data from portal content objects such as roles, pages, system landscape, worksets and many more.

  Hint: You can also generate links in Knowledge Management in the Portal Roles view.

  The system shows all iViews with BEx Web applications from the BEx system that you logged onto with the BEx Web Application Designer.

  The content of KM navigation iViews that are included in the portal roles or portal pages is seamlessly integrated into the hierarchy of the portal roles.

  The generated iView receives all the same properties described under the Portal Content view.

  Hint: If you select a folder below KM navigation iView, this folder becomes a folder in Knowledge Management and the system generates a link in Knowledge Management.

  Hint: Portal system administrators (users with the portal role super_admin_role) are able to see the contents of the view Portal Roles in the portal under *Content Administration → Portal Content*. To see the contents of the individual portal roles you need to open the portal roles for editing.

Integration Using Role Upload

You are able to integrate content from SAP BI into the Enterprise Portal using SAP role upload.

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Role upload is a function that you can use for the following scenarios:

- You want to continue to use existing role definitions for a BI system in the Enterprise Portal.
- You want to use objects from a BI system (for example, Web applications) as content objects to build your roles in the portal. This means these objects have to be available in the portal.
- Initially, you upload all relevant roles and objects from the BI system into the Enterprise Portal. In the future you want to create and maintain your content objects only in the portal.
- You upload newly created role definitions from the back end system into the portal at regular intervals. You mainly do this when you use the BI system as the leading system. In this case, you continue to create your roles in the BI system and only use the portal as a medium for display and navigation.

Before you can upload objects from SAP BI into SAP EP, you must carry out the following steps:

- Import the plug-in

  You have to import the SAP Basis Plug-In into every BI system from which you want to do an upload. Only then will the functions need for the upload be completely available.

- Authorizations in the BI System

  You need the authorization **S_RFC** in the BI system for the function group PWP2.

- Configuring the system landscape in the portal

  You need to create a system in the portal within the portal system landscape for every BI system from which you upload objects.

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The uploaded objects are converted into portal objects. The role upload includes among other the following functions:

- Upload roles (single roles and composite roles), or Transactions from the SAP backend system to the portal.
- Upload the services and attributes contained in the roles.

  Uploaded services that depend on the role are created in the PCD (Portal Content Directory) .
- Single roles are created as either portal roles or worksets with the corresponding menu hierarchy in the PCD, the same as the attributes of the contained services (such as transactions).
- Composite roles are created as either portal roles or worksets with their corresponding menu hierarchy in the PCD.
- When objects are uploaded again, you can define whether or not existing objects should be overwritten.
- User assignments can also be uploaded to the portal.

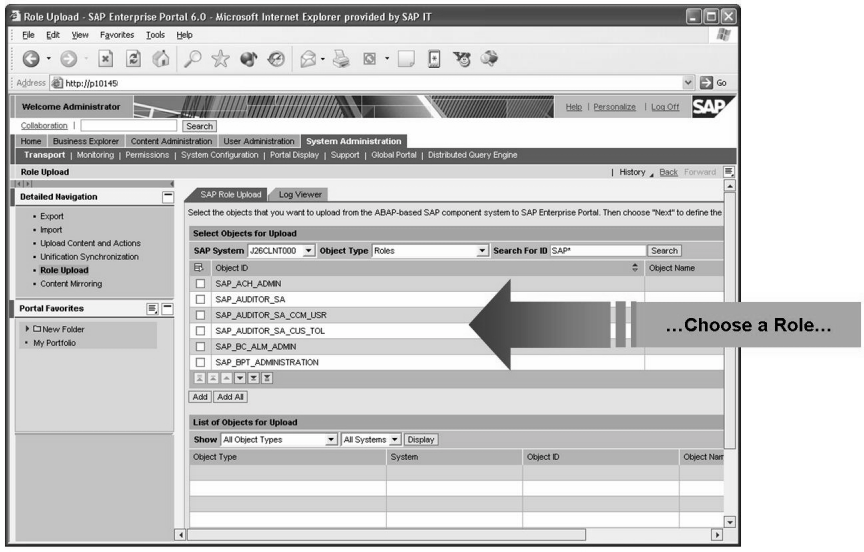

Figure 141: SAP Role Upload in the Portal

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To upload objects from ABAP-based systems you have to perform the following steps:

1. Choose *System Administration → Transport → Role Upload*.
2. Under SAP System select the system from which you want to perform the upload.
3. Select the Object Type you want to upload, for example:

   Roles

   Transactions
4. Enter an ID for the search. You can perform a generic object search. Choose *Search*. The objects found are displayed in a list. In the list you can select the objects that should actually be uploaded.
5. Select either single objects and choose *Add*. Or select *Add All* to select all objects for the upload. The selected objects are included in the list of objects to be uploaded. You can check this list again and remove certain objects or all objects. In this way you can also include objects from different component systems in the list for uploading, and upload them all together. You should make sure that the upload packages are divided into clear and meaningful units. SAP therefore recommends that you only upload objects from one system in a given package.

The object list for the upload process is finished. The next step is to define the settings for the upload.

You can make some settings for the upload in order to define more precisely what is uploaded and what should happen with the uploaded objects for example: Upload User Mapping (an uploaded role is automatically assigned to a portal user, a prerequisite for this is that these users have a corresponding user in the ABAP-based system); Upload included services (when roles are uploaded, the services included in the roles, such as transactions, are also uploaded and created as separate objects in the PCD); Overwrite existing content; Migrate First Folder Level as Entry Point, etc.

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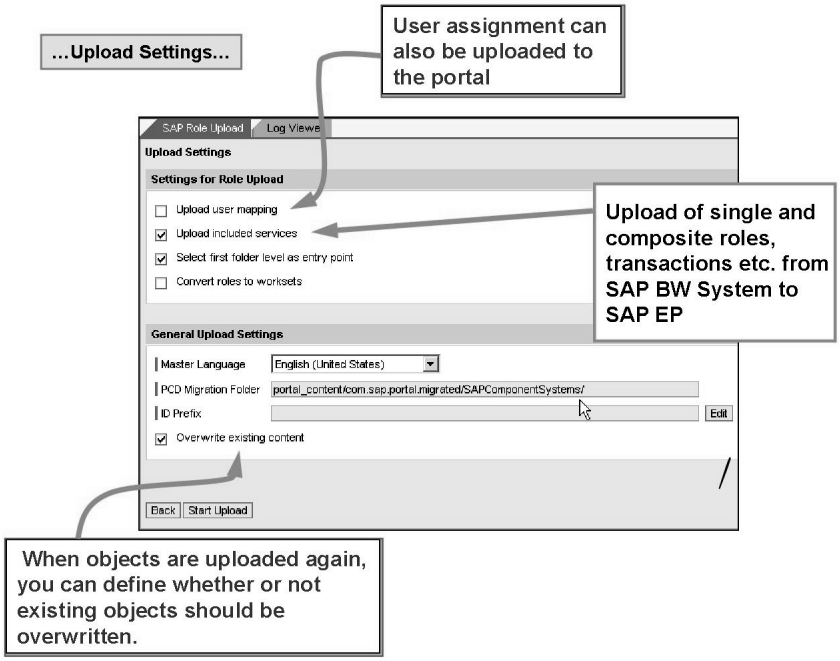

Figure 142: Upload Settings

Once you have defined the settings for the upload, you can start the upload process.

1. After defining the Upload Settings, choose *Start Upload*. A new screen is displayed in which you can see the status of the upload process. The status is updated automatically. You can also cancel the upload by choosing Request Interrupt.
2. Once the uploaded has been completed, you can use the log to check if the objects were created correctly in the PCD. The log shows whether each object was uploaded without errors. It also displays error messages and warnings if the upload did not run correctly.
3. You can also download the log. You can find the download function next to the dropdown list for selecting the type of message.

Once the objects have been uploaded from the ABAP-based systems, they can be found in the Portal Catalog in the relevant folders.

In the Portal Catalog, choose *Portal Content* → *Migrated Content* → *SAPComponentSystems*. You will find further sub-folders in this folder. The objects uploaded from the backend systems are stored there, sorted by the portal object type to which they were converted and the logical system from which they were uploaded.

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Uploaded objects from ABAP-based systems are converted into portal objects (for example. Portal Role, iViews). You can use these objects in the portal without making any technical adjustments.

Hint: The objects from ABAP-based systems do not need any post-processing in the portal. They are converted to portal objects when they are uploaded.

Drag & Relate with BI Contents in the Enterprise Portal

The function Drag & Relate enables you to execute BI applications or other transactions with BI contents (as filter values) across system boundaries by connecting data from one application with data in another application.

Within the BEx Query Designer you can choose the symbol *Query Properties* and activate the setting *Display Drag & Relate links* or you can activate the setting within the report with the help of the context menu choosing *Query Properties*, the symbol

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appears alongside the Drag & Relate-enabled InfoObjects in a Web application. This setting is necessary for you to be able to recognize Drag & Relate InfoObjects in an Enterprise Portal and to use the Drag & Relate function.

Hint: If you are publishing iViews in the enterprise portal using the BEx Web Application Designer or the BEx Query Designer, these iViews are Drag & Relate target objects by default and can therefore be selected as targets in other iViews.

You can use the Drag & Relate function with Drag & Relate-enabled characteristics in tables and charts (possible components of a BEx Web application as an iView in the SAP Portal. In charts you are able to use Drag & Relate from legends, as long as the legend only contains one characteristic and this characteristic is enabled for Drag & Relate

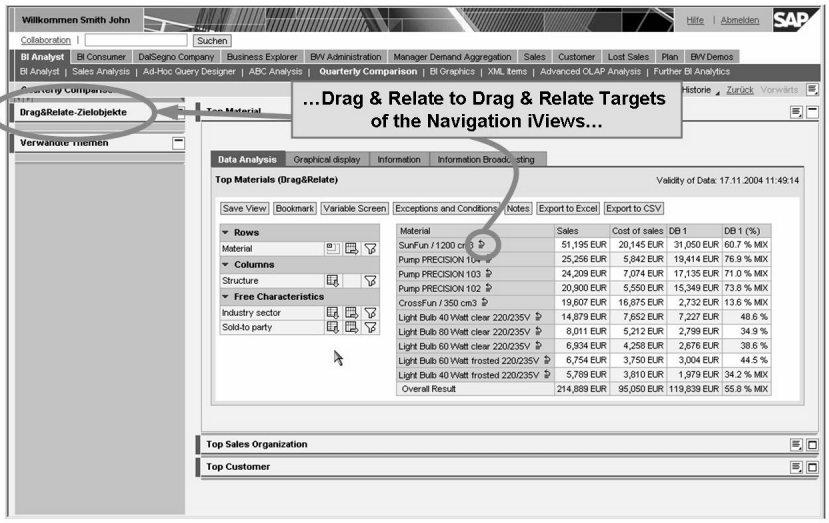

Figure 143: Drag and Relate in the Portal

In the SAP Portal you select a business object showing the Drag and Relate symbol (for example order) by clicking on it and dragging it into another object (for example, a link to an external Web site) in the navigation panel in the Drag & Relate Target Objects iView. The system executes the action (for example, displays the delivery status of the order).

Hint: Note that the Drag & Relate function does not replace the *Report-Report Interface*(RRI) function. The two functions complement each other.

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Possible Drag & Relate Scenarios

Drag&Relate Source	Drag&Relate Target
BEx Web application	BEx Web application
BEx Web application	R/3 transaction
R/3 transaction	BEx Web application
BEx Web application	External (for example, Web Site)

Hint: For more information, see the SAP Service Marketplace under *SAP Business Intelligence → Services & Implementation → HOW TO ... Guides → How to enable Drag & Relate between BI characteristics and EP Web Components*.

Drag & Relate-enabled characteristics are characteristics delivered with Business Content that have Business Object Repository (BOR) object types assigned. By default you are only able to use the Drag & Relate function for InfoObjects with the BOR object type assigned, where the key is exactly the same. Not all characteristics of the Business Content are assigned. Any correlation that you want to establish between BI InfoObjects and R/3 objects Unifier has to be defined manually with the so called *Relationship Editor*. The *Relationship Editor* is a user interface of the *SAP NetWeaver Portal* by which relations between business objects can be mapped, viewed, and modified.

Hint: If you do want to use InfoObjects that are not listed for Drag&Relate scenarios, first check whether you are able to build the scenarios using the report-report interface.

The following characteristics are Drag & Relate enabled:

Basic Characteristic	Description
0ABCPROCESS	*Business process number*
0APPLICANT	*Applicant*
0APPR_REQU	*Appropriation request*
0ASSET	*Asset subnumber*
0BPARTNER	*Business partner*
0COORDER	*Order number*

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0COSTCENTER	*Cost center*
0CS_ORDER	*Service order*
0CUSTOMER	*Customer number*
0DOC_NUMBER	*Sales document*
0EMPLOYEE	*Employee*
0EQUIPMENT	*Equipment number*
0FUNCT_LOC	*Functional location*
0INSP_LOT	*Inspection lot number*
0MATERIAL	*Material*
0PLANT	*Plant*
0WORKCENTER	*Work center/ resources*

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Lesson Summary

You should now be able to:

- Understand the BI Portal integration in general
- Understand how to integrate a BI Web Application into the SAP Enterprise Portal as an iView
- Understand the use of the Role Upload of existing BI roles.
- Understand the Drag & Relate function

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Unit Summary

You should now be able to:

- Understand the BI Portal integration in general
- Understand how to integrate a BI Web Application into the SAP Enterprise Portal as an iView
- Understand the use of the Role Upload of existing BI roles.
- Understand the Drag & Relate function

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Unit 12

Document Integration

Unit Overview

Unit Objectives

After completing this unit, you will be able to:

- Describe the different document classes for metadata, master data, and transaction data
- Define documents for these document classes
- Assign and upload documents
- Explain the integration between Enterprise Portal KM services and BI

Unit Contents

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Procedure: Metadata Document Integration 441
Procedure: Master Data Document Integration 444
Procedure: InfoProvider Data Document Integration 447
Exercise 17: Document Integration 451

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Lesson: Document Integration

Lesson Overview

This lesson describes how to define and retrieve documents for metadata, master data and InfoProvider data. In addition, the architecture of document integration between BI and the KM services of the portal is examined.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the different document classes for metadata, master data, and transaction data
- Define documents for these document classes
- Assign and upload documents
- Explain the integration between Enterprise Portal KM services and BI

Business Example

In view of the meaningful value of analytical reports, it is of an enormous advantage to be able to access additional documentation within a report. Additional information about the query, individual characteristic values, as well as combinations of characteristic values is extremely useful. When defining characteristic values, it is often desirable to link technical drawings, detailed pictures or other files as documentation.

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Using the Document Browser

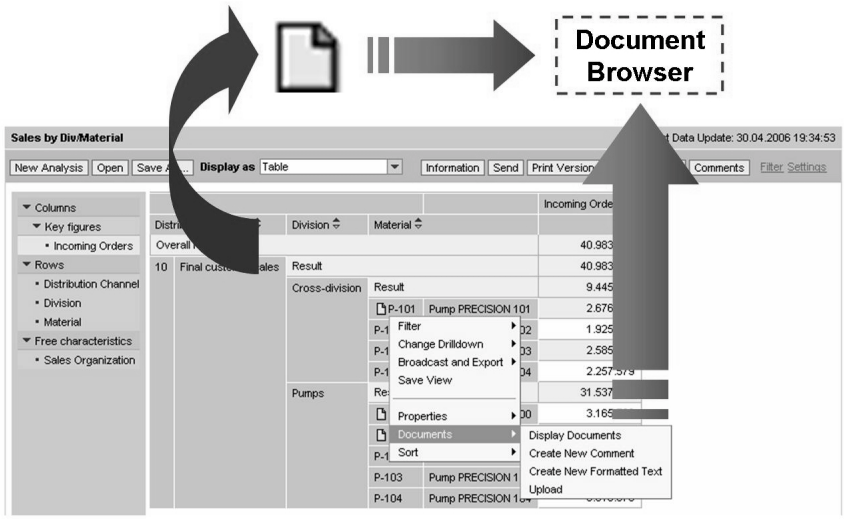

Figure 144: Accessing the Document Browser

In NetWeaver 2004s BI, the concept of document integration has been upgraded significantly over prior versions. Because of the close integration of BI and Knowledge Management (KM), users have more choices of where and how documents can be accessed. Enterprise Knowledge Management provides central and role-based access to the information in your company and creates a connection between structured business data and unstructured documents. The Document Browser used in the past has also undergone changes to provide several new services to the user. Now, documents of all types can be created and edited from the Document Browser. In addition, all the common services provided by KM can be assigned to these documents. This can enhance the degree of collaboration around important documents in your organization.

From a report displayed on the web, it is a simple task to create a new document by uploading an existing file. From the context menu of the web report, choose *Documents* → *Upload* to start the dialog to name and upload the file. Once the files has been uploaded to the CM Repository on the portal, a confirmation message will be issued.

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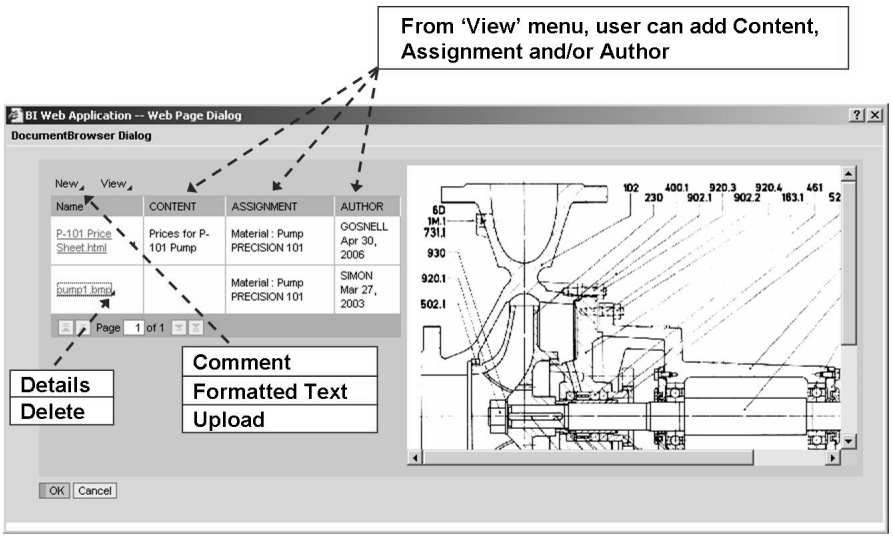

Figure 145: Document Browser Web Dialog

In the new Document Browser and in the *List of Documents* web item, you can display the columns "Name", "Content", "Assignment (to the BI Data)" and "Author/Change Date". The columns can be switched on and off online or in the configuration. This means it is possible to display the contents of the documents in the list of documents only. The latter is especially useful for comments.

If configured, the user can edit the document directly in the Document Browser. The user can also:

- Upload new documents
- Add Links to documents (only for documents in the CM Repository)
- Add Comments about the documents

These comments are not embedded in the document but simply are references to the document.

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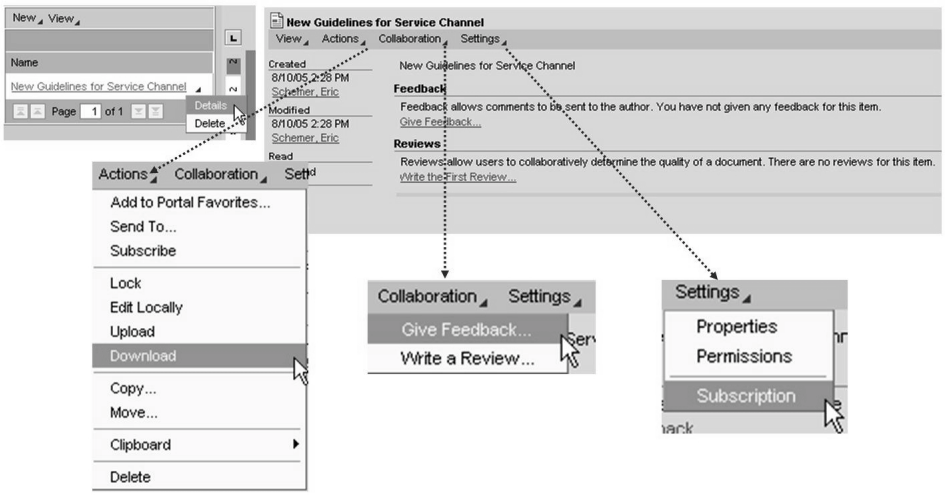

Figure 146: KM and Collaboration Services

KM integration makes all of the KM services available for BI documents (for example, text search, text mining, subscription, rating, personal documents, discussions). These services allow efficient collaboration in your corporate portal and allows individual users and teams to communicate within their business processes and access shared data in virtual rooms.

This collaboration provides the following benefits:

- Increases user productivity by enabling more efficient project work for teams
- Encourages innovation by optimizing collaboration in teams
- Reduces costs by shortening the collaboration cycle
- Optimizes decisions by increasing the quantity of information that the decisions are based on
- Accelerates problem solving processes.

Within SAP NetWeaver, you can integrate third-party services, for example, e-mail and calendar functions from Microsoft Exchange or Lotus Domino and WebEx for online sessions. You can integrate SAP NetWeaver applications (for example, BI analyses) and third-party applications in rooms. Users can use the Collaboration Launch Pad in the portal and the member list in rooms to launch collaboration services.

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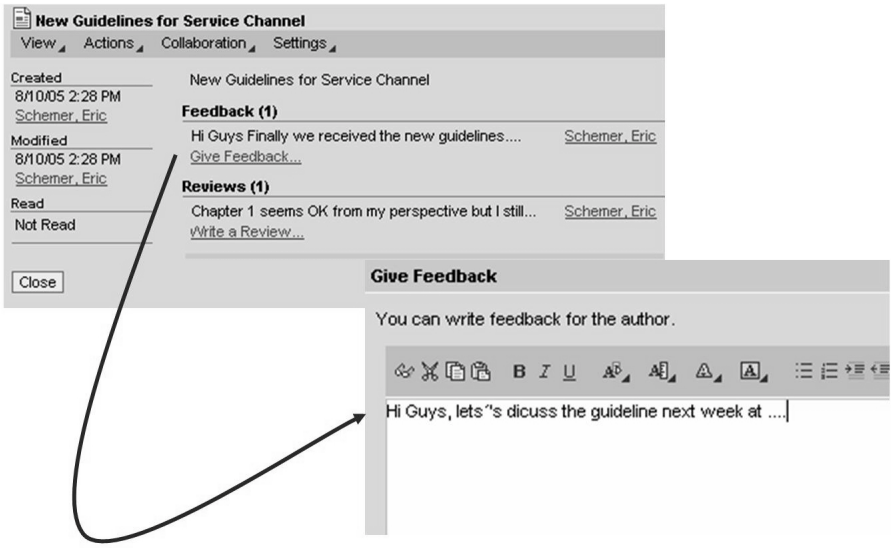

Figure 147: Example: Feedback Service

For each document shown in the Document Browser, you can configure the *feedback* service to be available to the user. This allows for the quick entry and distribution of feedback from the user back to the author of the document.

Document Integration

For metadata, master data and transaction data, you can define and even link one or more documents in various formats, versions and languages.

SAP distinguishes between logical documents, which are linked to BI objects using attributes (for example, object type and object name), and physical documents which belong to a specific logical document as individual characteristic values (versions) and which present meta-descriptions for individual files using their attributes (for example, language and format). You can store the individual files either on an SAP database or on an external content server using an HTTP interface.

In the *Administrator Workbench*, you choose *Documents* to reach the navigation window for the three document classes *Metadata*, *Master Data*, and *InfoProvider Data*.

Hint: To link one document from any document class to another document, without actually linking to this document physically, you have to save both documents in a format that supports hyperlinks: such as HTML, Microsoft WORD or Microsoft EXCEL.

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Metadata Document Class

You can define documents for metadata for the following BW objects:

- InfoObject
- InfoCube
- InfoSet
- ODS Object
- Query

You can define additional explanations for individual structural components, for changes that have been made and the reasons for the changes, for historical developments and so on here.

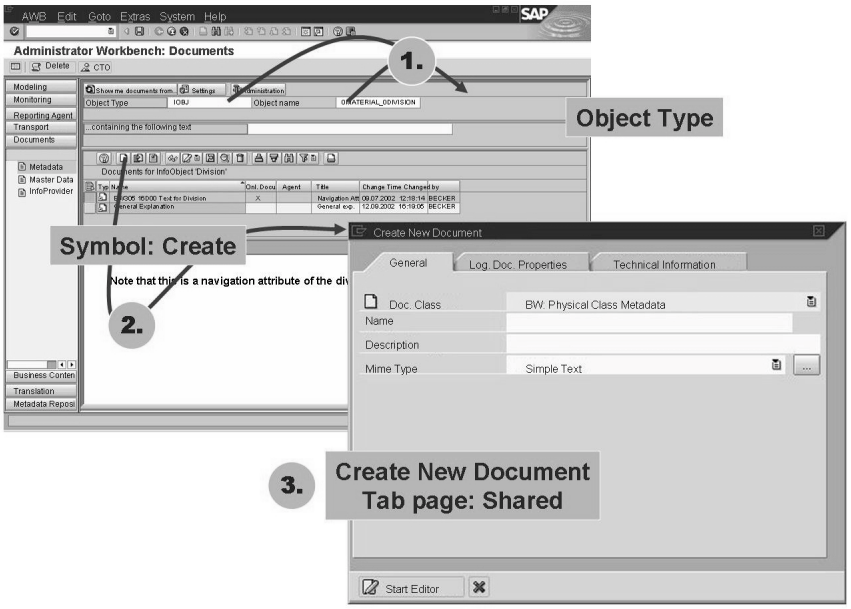

Figure 148: Metadata Document Integration I.

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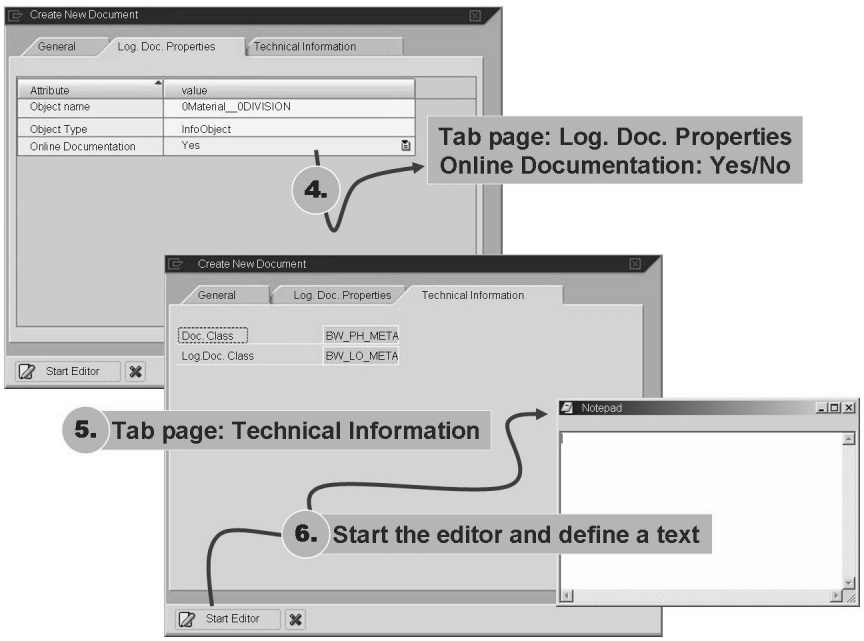

Figure 149: Metadata Document Integration II.

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Metadata Document Integration

1. From the *SAP Menu*, choose *Modeling → Data Warehousing Workbench: Modeling → Documents → Metadata*.
2. Define the technical name of the object type (for example, *Query Element* with the technical name ELEM) and the object name (for example, Query: GR00 BW305 Document Integration with the technical name: T_BW30516A00) in the upper window.
3. Use the *Create* symbol in the middle window to reach the *Create New Document* dialog box. Alternatively, you can use the *Import...* symbol to integrate a document for the characteristic value.
4. On the *Shared* tab page, the document class is automatically given; therefore, you only need to define a *Name* and *Description* and select the *MIME Type* that you want to use to create your document.

Caution:

- The name has to be unique among all documents in a document class.
- The description appears later as a hyperlink text in the access browser window.

Hint: Multipurpose Internet Mail Extensions: MIME is an enhancement of the original Internet Email Protocol, which enables different types of data to be exchanged on the Internet. It contains, among other things, audio, video, graphical, and application programs as well as ASCII files (originally only ASCII files).

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5. On the *Log. Doc. Properties* tab page, you can decide whether the document is created as *Online Documentation*.

Hint: Online Documentation

The logical document properties for metadata include *Object Name*, *Object Type*, and *Online Documentation* (yes/no). If you define several documents for a metadata object with the property *Online Documentation*, only the last created document displays as an online link, all previous documents display as link references. The *Online Documentation* displays by default as F1 help for the object to which it is assigned.

6. Choose *Start Editor* to reach an application that corresponds to the MIME type that you selected. You can define a text there.
7. Save your entries and close the application.

Hint: Alternatives

- Alternatively, you can reach the document definition for your query in the *Query Designer*, from the menu path *View → Documents*.
- For InfoObjects, in the *Data Warehouse Workbench → Modeling → InfoObjects*, you can select an object and define a document using *Goto → Documents*.
- Use transaction code RSD1 to reach the *Edit InfoObjects: Start* dialog window and select *Goto → Documents* here in order to reach the document maintenance.

8. You can then display the documents you defined from the report itself by choosing the document link, or from the context menu, *Documents → Display Documents* or in the *Metadata Repository* for the relevant BW object.

Master Data Document Class

You can define documents for single characteristic values for master data.

Here, you can define pictures for personnel numbers, descriptions, and technical specifications of materials, original documents and so on.

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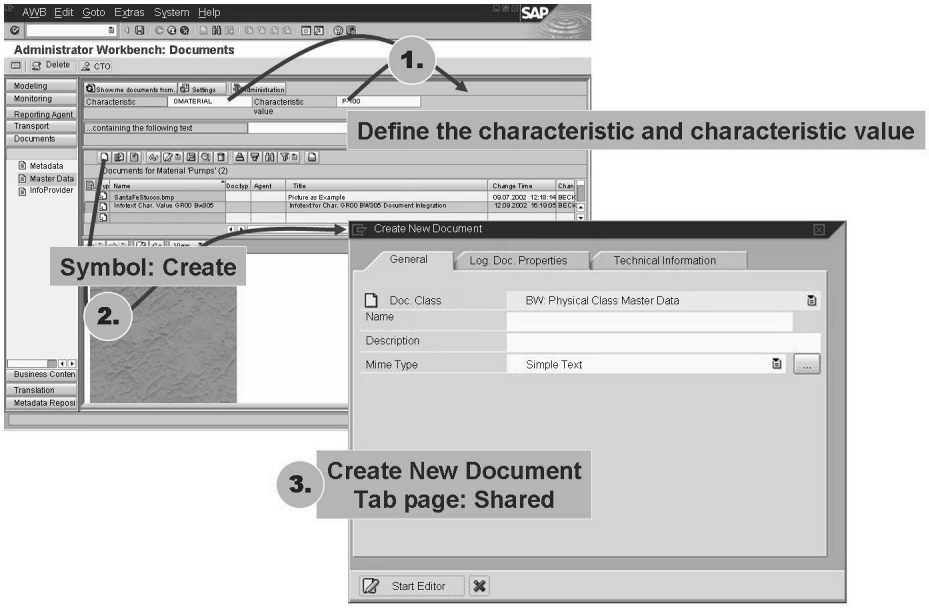

Figure 150: Master Data Document Integration I.

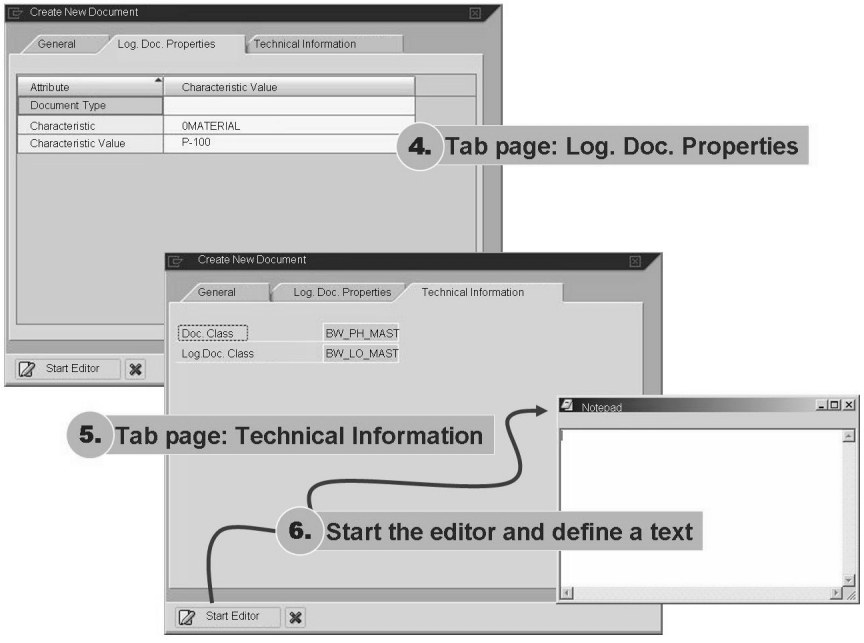

Figure 151: Master Data Document Integration II.

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Master Data Document Integration

1. From the *SAP Menu*, choose *Modeling* → *Data Warehousing Workbench: Modeling* → *Documents* → *Master Data*.
2. Define a characteristic (for example, *Material* with the technical name: 0MATERIAL) and a characteristic value (for example, pump with the technical name: P-100) in the upper right window.
3. Use the *Create* symbol in the lower right window to reach the *Create New Document* dialog box. Alternatively, you can use the *Import...* symbol to integrate a document for the characteristic value.
4. On the *Shared* tab page, the document class is automatically given; therefore, you only need to define a *Name* and *Description* and select the *MIME Type* that you want to use to create your document.
5. Choose *Start Editor* to reach the application that corresponds to the MIME type that you selected. You can define a text there.
6. Save your entries and close the application.

Hint: Alternatives

- For master data, you can select an object from *Data Warehousing Workbench: Modeling* → → *InfoObjects* and, using the context menu, *Maintain Master Data* → *Selection* → then *Execute*, you reach the *Maintain Master Data: List* dialog box. You can select a characteristic value here and choose *Goto* → *Documents* to define a document.

7. You can display the documents you defined from the report itself using the document link in the browser window that opens when you choose the document icon, or from the context menu *Documents* → *Display Documents*.

Hint: You can also use the context menu *Documents* → *Comment* or *Documents* → *Formatted text* to create a new document.

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InfoProvider Data Document Class

You can assign one or more documents to the transaction data of an InfoProvider (a query, for example). You also have the option of assigning any number of documents to a combination of characteristic values and key figures. The documents are then displayed in the report in a context-sensitive fashion, which means that access to the documents adjusts according to the navigational state of the report.

Hint: Characteristic is permitted as an attribute of documents.

In characteristic InfoObject maintenance on the *General* tab page, you determine whether the characteristic is permitted as a document attribute. You can annotate transaction data with relation to a characteristic in *SAP BI* in this way. Example: You define the following as a text document for the sales key figure, the month January 2002 and the country US: **The sales for the US in January 2002 were extremely low due to a weak exchange rate**. The characteristics *month* and *country* must have these properties activated.

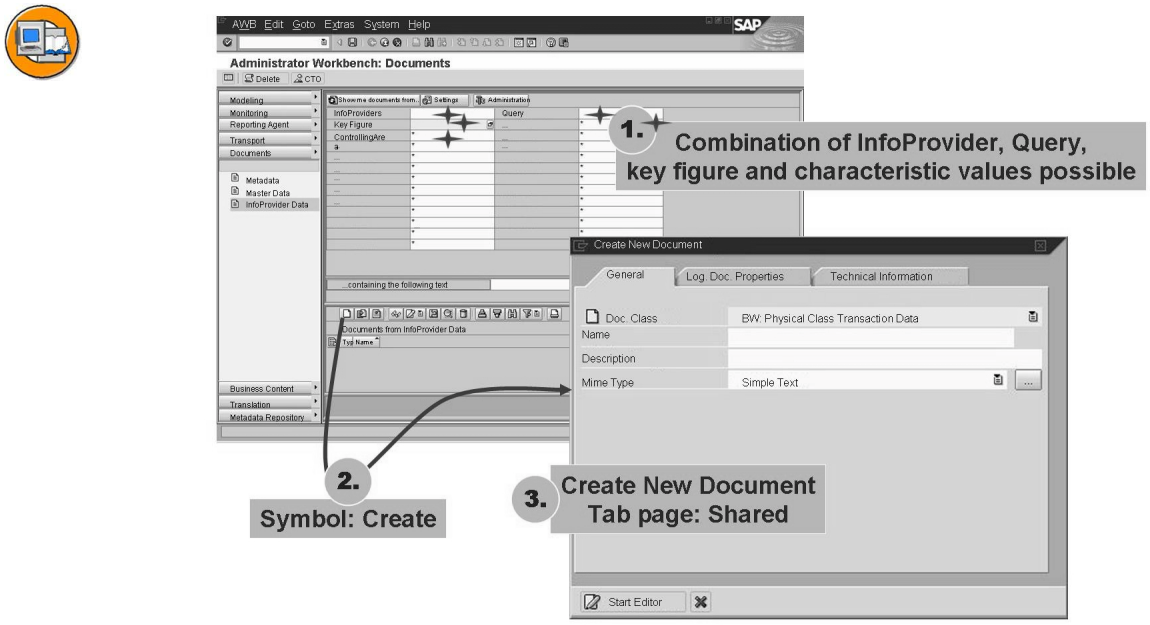

Figure 152: InfoProvider Data Document Integration I.

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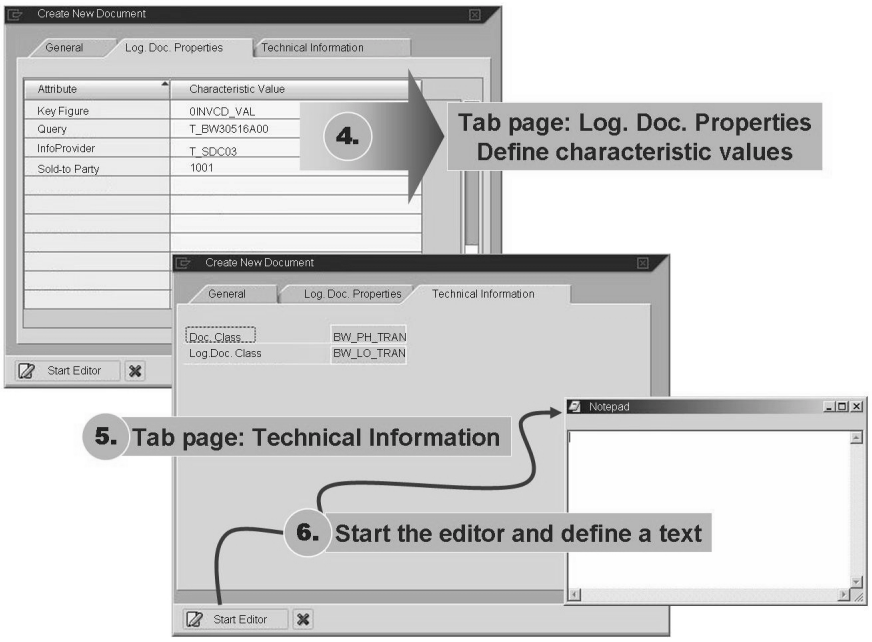

Figure 153: InfoProvider Data Document Integration II.

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InfoProvider Data Document Integration

1. From the *SAP Menu*, choose *Modeling → Data Warehousing Workbench: Modeling → Documents → InfoProvider Data*.
2. Either define a combination of *InfoProvider*, *Query*, *Key Figure*, and characteristic values in the upper window, **OR**
3. Use *Create* icon on the toolbar in the middle window to define a name and a description (document class is given, as is the MIME type) on the *Shared* tab page. Then, on the *Log. Doc. Properties* tab page for the current attributes, define a *Characteristic Value* to create a document using the objects listed above.
4. Choose *Start Editor* to reach the application that corresponds to the MIME type that you selected. You can define a text there.
5. Save your entries and close the application.
6. You can display the documents defined from the report itself using the context menu, *Documents → Display Documents*.

Hint: General

Generally, you can use the context menu in the report and then *Documents → Display Documents* to reach the Document Browser window and create a new document using *New → Comment (or Formatted text or Upload*.

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BI and KM Document Integration Architecture

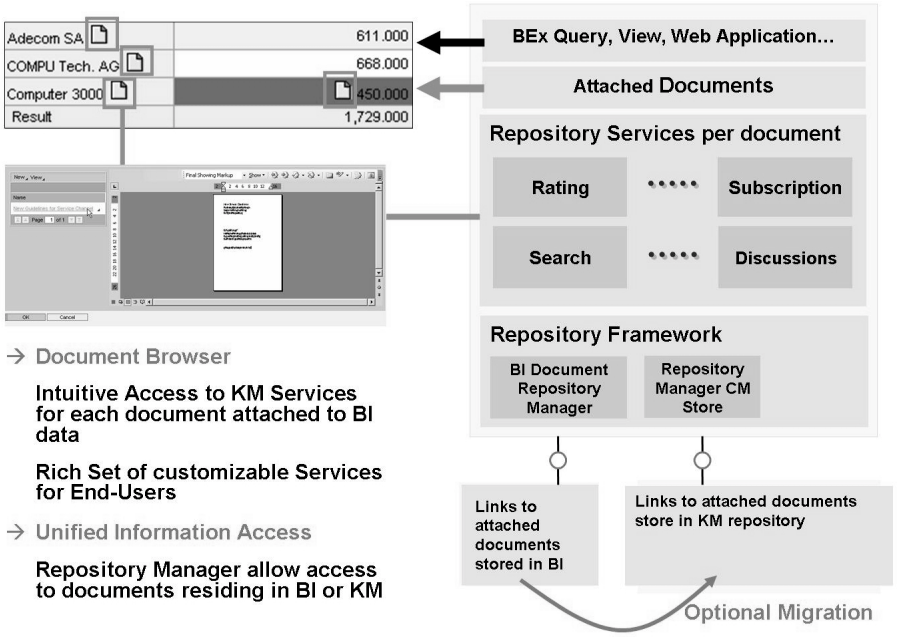

Figure 154: BI and KM Document Integration Architecture

The graphic above shows the relationships of the various components used in document integration. Users in any BEx query, view or web application can access the Document Browser. The Document Browser can also be invoked via the icons for the documents attached to the query, view or web application.

The BEx Portfolio or any KM iView that gives access to BI metadata, master data, and transactional documents can also be used to call up the new Document Browser. Within the Document Browser, a number of different services can be used, depending on which ones have been made available to the user through configuration activities.

The Repository Framework includes repository managers for documents stored on BI and in the Content Management (CM) repository on the portal. This allows the user access to documents stored on either system.

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The BI documents for Metadata, Master Data and InfoProvider Data can be integrated into the portal-based KM in different ways:

- With the Repository Manager for BI Documents. In this case the documents are physically stored on the BI server in the SKWF framework. The Repository Manager for BI Documents is available in the portal as of Release SAP NetWeaver '04.
- With a migration of documents into a CM repository. In this case, the documents are physically stored in the portal. The CM Repository Manager gives access to these documents. This allows the documents for master data and InfoProvider data to be assigned on the hierarchy node level as well (in addition to the characteristic values).
- With the Repository Manager for BI Metadata. In contrast to manually created documentation for metadata, the HTML-based documentation for the BI metadata will continue to be generated automatically from the metadata repository as needed. The Repository Manager for BI Metadata is available in the portal as of Release SAP NetWeaver 2004 (with SAP BW 3.5).

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Exercise 17: Document Integration

Exercise Objectives

After completing this exercise, you will be able to:

- Define different documents for metadata, master data and InfoProvider data

Business Example

So that users can assess analyses in a report more effectively, you have been asked to provide access to documents in the report. Moreover, you are expected to get in touch wih the relevant departments so that you can create images, construction diagrams, provide explanations and so on for individual characteristic values through document access. You also have to define your own comments for some individual InfoObjects (for example, Division and Material) and provide access to the *Metadata Repository* data.

Task 1:

As the basis for your task, you need to create a query definition that allows analysis of sales volume for the Pump division. This query needs to allow for document access by the users.

1. Create a new query using the *Billing* (T_SDC03) InfoProvider within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Include the navigation attribute *Division (0MATERIAL_0DIVISION)* from the *Material* dimension and the characteristic *Material (0MATERIAL)* in the Rows. Restrict *Division (0MATERIAL_0DIVISION)* to *Pumps*. Select *Sales Volume (0INVCD_VAL)* and the characteristic *Currency/Unit (1CUDIM)* for the Columns area.

2. For *Material* , set the properties to display the **Key** values. For both *Division* and *Currency/Unit*, display their values as the **Text**. In the properties for the query, set all the 3 flag for *Document Links* .

3. Now save the query definition under *Roles → Training BW305 Reporting → Unit: Document Integration → Lesson: Document Integration → Exercise* with the following description:

   Description: **`GR## BW305 Document Integration`**

   Technical name: **`BW30516A##`**

   Execute the query in the Web or the BEx Analyzer.

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4. You see a new symbol in the report *Display Documents* for some BW objects. Access the *DocumentBrowser Dialog* to view the documents and evaluate the further possibilities within the *DocumentBrowser Dialog* by clicking *New* and *View*.

Task 2:

In the second step, you want to define documents for a characteristic value (Master Data Document) and an InfoObject (Metadata Document).

1. To define a text for a characteristic value, go to the *SAP Menu → Modeling → Data Warehousing Workbench: Modeling → Documents → Master Data*. For the *Material* value **P-100** define a new text document as follows:

   Name: **BW30516B##**

   Description: **GR## BW305 Text for Pump**

   Open the editor and define the following text:

   Note: This pump is a discontinued model.

   Model color: Santa Fe Stucco

   Save your entries and close the editor. A document link displays in the middle right window for further access. Using the *Details* icon, you can view the document in the lower right window.

2. Now define an image document for the same characteristic. To do this, you have to choose *SAP Menu → Office → Folders → Shared Folders → BW305 Graphical Material* and find the *Santa Fe Stucco* bitmap file.

   Export the attachment to the *My Documents* folder of your disk drive using *Export* and *Save* under the *File Name:* **SantaFeStucco##.bmp**.

   Return to the document maintenance in the *Administrator Workbench* and the *Master Data*, in order to define the picture for the characteristic **0material** and the characteristic value *P-100*.

   In the middle right window, choose *Import...*. The *Open* dialog box appears. From the *My Documents* folder, choose *SantaFeStucco##.bmp*, and choose *Open*. In the *Create New Document* dialog box, enter the description **GR## Santa Fe Stucco** and save your entries.

   Using the *Display* icon or the *Details* icon, you can view the image in the lower right window.

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3. Return to your report in the *BEx Analyzer* or on the Web and display the documents you defined above for characteristic value ***P-100***.

4. Finally define a general text for Material (0MATERIAL) InfoObject directly in the *DocumentBrowser Dialog*.

   Name of the text: **`BW30516D##`**

   Description: **`GR## Text for Material`**

   Text: **`The term Material is equivalent to Part.`**

   Return to your report.

   In the next step, open the *Administrator Workbench → Documents → Metadata* to call up the documents for this specific InfoObject using *Show me documents from...*. This allows you to see that documents can be created in both ways: directly within the report *(DocumentBrowser Dialog)* and in the Administrator Workbench.

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Solution 17: Document Integration

Task 1:

As the basis for your task, you need to create a query definition that allows analysis of sales volume for the Pump division. This query needs to allow for document access by the users.

1. Create a new query using the *Billing* (T_SDC03) InfoProvider within the *BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution* InfoArea. Include the navigation attribute *Division (0MATERIAL_0DIVISION)* from the *Material* dimension and the characteristic *Material (0MATERIAL)* in the Rows. Restrict *Division (0MATERIAL_0DIVISION)* to *Pumps*. Select *Sales Volume (0INVCD_VAL)* and the characteristic *Currency/Unit (1CUDIM)* for the Columns area.

   a) In the *BEx Query Designer* choose *New Query* and select *InfoAreas → BW Training → BW Customer Training → BW 305 Reporting → Sales and Distribution → Billing (T_SDC03)* and choose *Open*.

   b) From the *Material* dimension, select *Division (0MATERIAL__0DIVISION)* and *Material (0MATERIAL)* and transfer them to the Rows.

   c) Restrict *Division* to the single value of **Pumps**.

   d) Transfer key figure *Sales Volume (0INVCD_VAL)* into the Columns and, from the *Units* dimension, move *Currency/Unit (1CUDIM)* to the Columns.

2. For *Material* , set the properties to display the **Key** values. For both *Division* and *Currency/Unit*, display their values as the **Text**. In the properties for the query, set all the 3 flag for *Document Links* .

   a) Choose *Material → Properties → Display → Display As → Key*.

   b) For both *Division* and *Currency/Unit*, choose *Properties → Display → Display As → Text*.

   c) For the query, choose *Properties → Display → Document Links* and check all the boxes.

3. Now save the query definition under *Roles → Training BW305 Reporting → Unit: Document Integration → Lesson: Document Integration → Exercise* with the following description:

   Description: **`GR## BW305 Document Integration`**

   Technical name: **`BW30516A##`**

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Execute the query in the Web or the BEx Analyzer.

a) Save the query definition as described above.

b) Execute the query in the presentation tool of your choice.

4. You see a new symbol in the report *Display Documents* for some BW objects. Access the *DocumentBrowser Dialog* to view the documents and evaluate the further possibilities within the *DocumentBrowser Dialog* by clicking *New* and *View*.

   a) BEx Analyzer: choose *Context Menu* → *Goto* → *Documents* to access the *DocumentBrowser Dialog*.

      Web: choose *Context Menu* → *Documents* → *Display Documents*.

      Hint: From the Web-Report you can also access directly the *Create New Documents*, *Create New Formatted Text*, and *Upload* functions.

Task 2:

In the second step, you want to define documents for a characteristic value (Master Data Document) and an InfoObject (Metadata Document).

1. To define a text for a characteristic value, go to the *SAP Menu* → *Modeling* → *Data Warehousing Workbench: Modeling* → *Documents* → *Master Data*. For the *Material* value **`P-100`** define a new text document as follows:

   Name: **`BW30516B##`**

   Description: **`GR## BW305 Text for Pump`**

   Open the editor and define the following text:

   `Note: This pump is a discontinued model.`

   `Model color: Santa Fe Stucco`

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Save your entries and close the editor. A document link displays in the middle right window for further access. Using the *Details* icon, you can view the document in the lower right window.

a) Choose *SAP Menu → Modeling → Data Warehousing Workbench: Modeling → Documents → Master Data*.

b) In the upper right window, enter characteristic **`0material`** and characteristic value **`P-100`**.

c) From the middle right window, choose *Create → Shared tab page* and define the name and description given above.

d) Choose *Start Editor* and enter the text given above.

e) To save your work and leave the editor, choose *File → Save → File → Exit*.

f) Choose the *Display* icon or the *Details* icon to view the created document.

2. Now define an image document for the same characteristic. To do this, you have to choose *SAP Menu → Office → Folders → Shared Folders → BW305 Graphical Material* and find the *Santa Fe Stucco* bitmap file.

   Export the attachment to the *My Documents* folder of your disk drive using *Export* and *Save* under the *File Name:* **`SantaFeStucco##.bmp`**.

   Return to the document maintenance in the *Administrator Workbench* and the *Master Data*, in order to define the picture for the characteristic **`0material`** and the characteristic value *P-100*.

   In the middle right window, choose *Import...*. The *Open* dialog box appears. From the *My Documents* folder, choose *SantaFeStucco##.bmp*, and choose *Open*. In the *Create New Document* dialog box, enter the description **`GR## Santa Fe Stucco`** and save your entries.

   Using the *Display* icon or the *Details* icon, you can view the image in the lower right window.

   a) Fulfill the steps as described above.

3. Return to your report in the *BEx Analyzer* or on the Web and display the documents you defined above for characteristic value ***P-100***.

   a) BEx Analyzer: choose *Context Menu → Goto → Documents* to access the *DocumentBrowser Dialog*.

      Web: choose *Context Menu → Documents → Display Documents*.

4. Finally define a general text for Material (0MATERIAL) InfoObject directly in the *DocumentBrowser Dialog*.

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Name of the text: **BW30516D##**

Description: **GR## Text for Material**

Text: **The term Material is equivalent to Part.**

Return to your report.

In the next step, open the *Administrator Workbench → Documents → Metadata* to call up the documents for this specific InfoObject using *Show me documents from...*. This allows you to see that documents can be created in both ways: directly within the report *(DocumentBrowser Dialog)* and in the Administrator Workbench.

a) In the executed report, beside the *Material* InfoObject, choose *Context Menu → Goto → Documents* or *Context Menu → Documents → Display Documents*. Then choose *New → Comment* and create the text as described above.

   Return to your report.

b) *SAP Menu → Modeling → Data Warehousing Workbench: Modeling → Documents → Metadata*. Select *Object Type → InfoObject*, in the *Object Name* field, enter **0material**, and press *Show me documents from...* button. You now should see the metadata-document you just created in the list of documents.

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Lesson Summary

You should now be able to:

- Describe the different document classes for metadata, master data, and transaction data
- Define documents for these document classes
- Assign and upload documents
- Explain the integration between Enterprise Portal KM services and BI

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Unit Summary

You should now be able to:

- Describe the different document classes for metadata, master data, and transaction data
- Define documents for these document classes
- Assign and upload documents
- Explain the integration between Enterprise Portal KM services and BI

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Unit 13

Report-Report-Interface

Unit Overview

Unit Objectives

After completing this unit, you will be able to:

- Use the report/report interface (RRI) for navigating within SAP BI and for jumping into other attached systems
- Define a jump that feeds a parameter to a URL

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Lesson: Report-Report-Interface

Lesson Overview

In this lesson you will become acquainted with the functionality of the report/report interface (RRI). With the help of the RRI, the user can jump from a report into another report in order to drill down into more detail.

Lesson Objectives

After completing this lesson, you will be able to:

- Use the report/report interface (RRI) for navigating within SAP BI and for jumping into other attached systems
- Define a jump that feeds a parameter to a URL

Business Example

You would like to call further reports or transactions from a report, in order to get more detailed information out of SAP BI itself, out of other attached systems and even out of the internet.

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Report/Report Interface

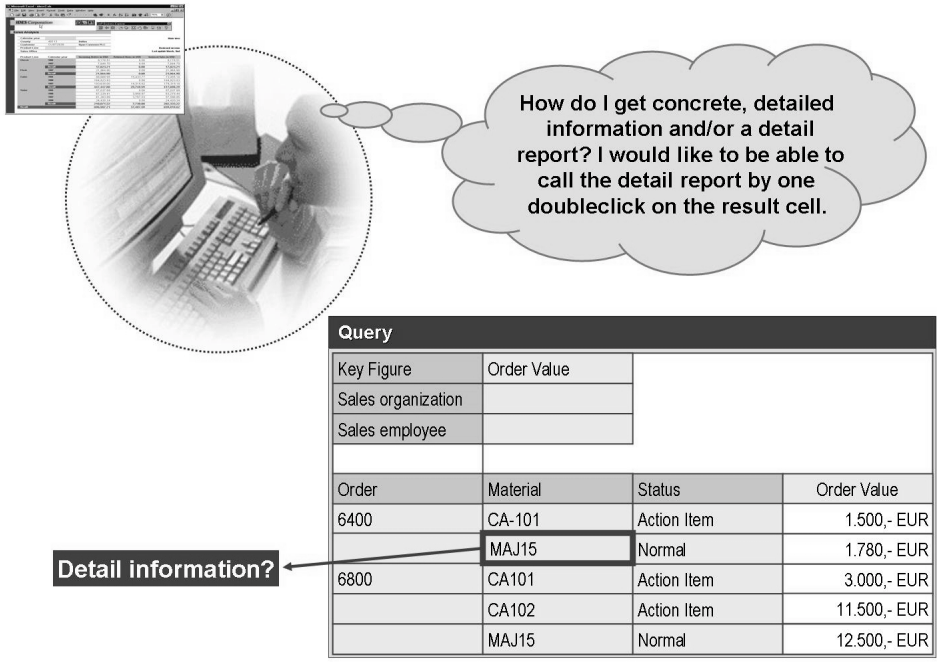

Figure 155: Report/Report Interface

The report/report interface (RRI) makes the parameterized call of programs possible from other programs. It gives the user the ability to jump from one report into another report that supplies further information. In SAP BI, you can arrive at branch destinations within and outside of the BI system.

With the report/report interface, you can create several individual reports, each with a limited number of characteristics. These can be linked one to another to make very flexible data evaluations possible online.

With the report/report Interface you can:

- Link reports containing different characteristics of an application; this makes it possible to report on more objects than you could with any individual report
- Connect reports that were created in different application classes

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Jump Targets

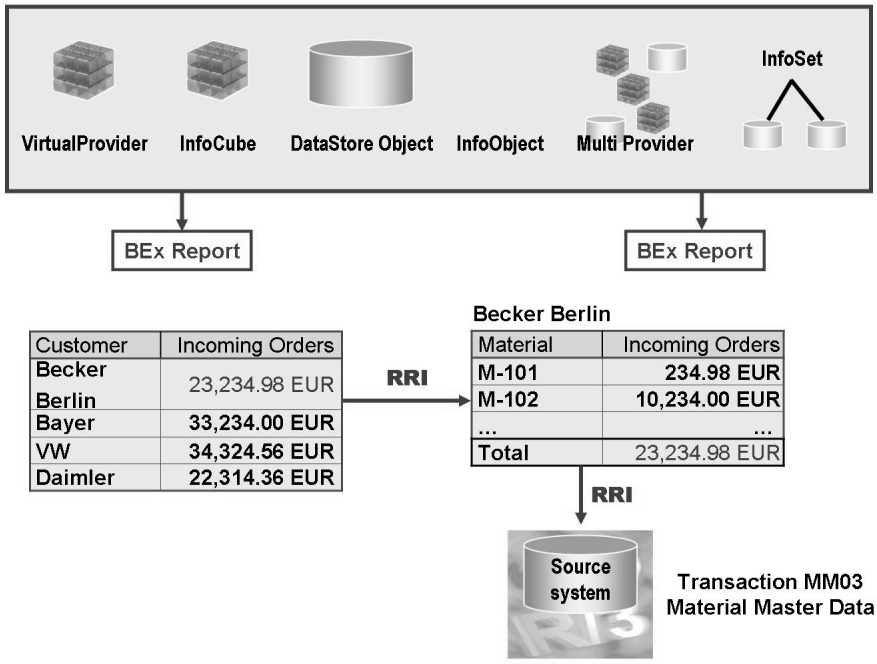

Figure 156: Jump Targets

From a query, the destination to which you branch is called a **Jump Target**. Depending on the report types you have selected for a query in the sender/receiver assignment, you can leave the query and:

- Start another query where the entry variants are filled by the selection conditions and element definitions of the selected cells of the sender query
- Start reports, functions, and transactions inside and outside of SAP BI

Hint: You need to have defined the sender/receiver assignment for the system to be able to offer jump targets.

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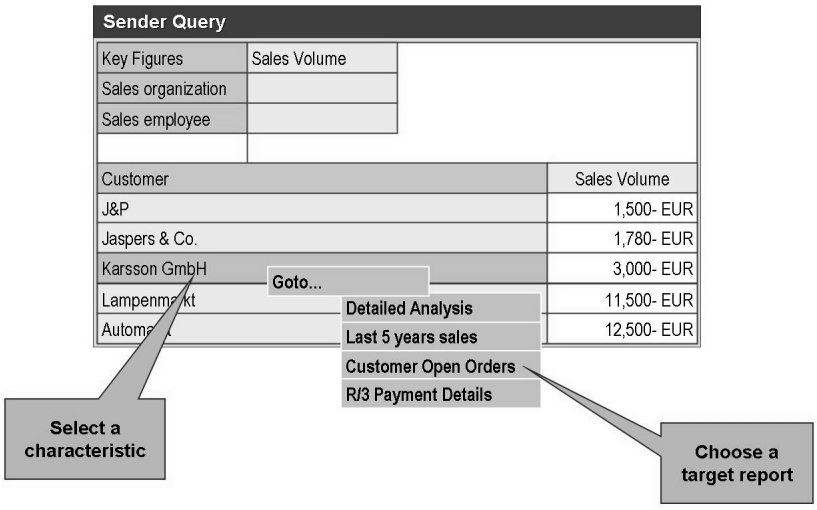

Figure 157: Jumping Reports

In order to start a jump highlight a characteristic value and then use the context menu to launch the *Goto* option. The menu will open up to show the assigned jump targets. With a single click you can go to the desired jump target. The selections made in the query definition are transferred into the jump target, this means that you can continue you navigation where you left off. You can link a whole sequence of reports so that you can drill down deeper and deeper to reach more information.

When jumping to a jump target outside of SAP BI, you need to select a source system and log on if necessary. You only need to log on once for each Excel session, even if several workbooks are opened.

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Working with the RRI

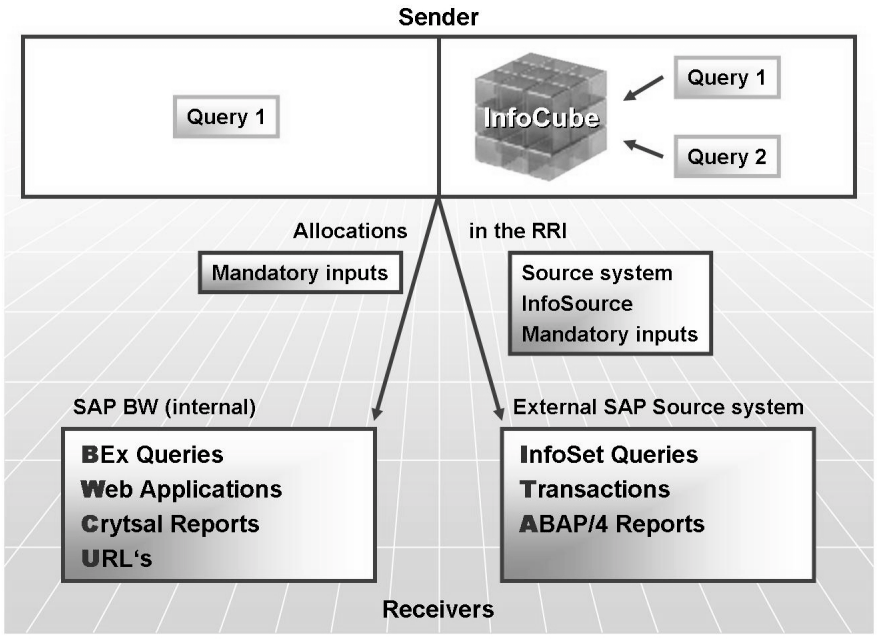

Figure 158: Working with the RRI

You use the sender/receiver assignment to make the necessary settings for connecting a SAP BI query to the report/report interface (RRI) in the BEx Analyzer. You can assign receiver reports to a sender report within SAP BI as well as in SAP ECC.

Creating Sender/Receiver Assignments

Tab Page	What You Should Know
Query	Specify the technical name of the sender query. You can also choose a query using input help.
InfoCube	If you want to assign the same jump target to all queries in an InfoCube, enter the technical name of the required InfoCube. You can also choose the InfoCube using input help (F4).

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After completing this initial information, you can select the type of report for the receiver report. The following types are available:

- BI BEx Query
- BI Web Application
- BI Crystal Report
- InfoSet Query
- SAP Transaction
- ABAP/4 Report
- Web Address

Then select the source system in which the query jump target lies:

- Local: The jump target is within SAP BI.
- Source system: The jump target is outside of SAP BI.
  - One source system as a target system:

    Specify the name of the source system. You can also choose the source system using F4 input help.
  - All source systems as target systems:

    Set the indicator in the *All Source Systems* checkbox. Specify the source system in which you first want to choose the required report.

For the receiver report you can also assign another name.

Hint: The name provides orientation for the final user. Pay attention to choosing a clear and informative designation.

Hint: If an InfoCube is filled from several InfoSources, you should specify which InfoSource the data is to be extracted from when allocating the receiver report. Select the desired InfoSource in the *InfoSource* column using the F4 help.

Caution: If, during the load process (*source system → BI*), fields are converted into this InfoSource, then you must create a conversion routine for the read process in the InfoSource.

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Example: Within an RRI, if the InfoObject *0FISCPER* (2002.003) is handed over as parameter to the source system, then this must be divided again into two individual fields (YEAR 2002 and PERIOD 003). The source system does not have a data field with the compound information and could not otherwise interpret the parameters transferred.

Sometimes it is desirable to maintain the field allocations individually for the parameter transfer of the transmitter to the receiver. For this, there are two exits.

- EXIT_SAPLRSBBS_001: Here the field allocation to the DataSource in the source system can be adapted.
- EXIT_SAPLRSBBS_002: This functional module is called before the jump in an ECC source system. You can find an example of its use in the "How To" papers under the heading *Drilldown to OLTP using User Exit mapping* on the SAP BW (2.0B) home page. Go to http://service.sap.com/bw

Caution: Calling up specific reports takes a long time if selections are missing. When jumping in SAP BI, you can stop a report from being started if it does not fill certain conditions that you determined previously as mandatory entries. In the following, the conditions you can set are described.

In BI, you can prevent a called report from starting when jumping if it does not fulfill certain conditions that you specify as mandatory input. The conditions can be entered via parameters. In the following table you see the possible settings that can be made.

1. Select the relevant target entry in the *Receiver* table.
2. Choose *Assignment Details*. The *Field Assignments* dialog box appears.
3. To make changes for the individual fields, choose the required settings from the drop-down list for the respective cell.

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Group Description	Default Setting	Alternative
Type	Generic	• V Variable • I InfoObject • 3 Table field • P URL Parameters • X Delete
Selection Type	*	• P Parameter • E Individual Values • I Interval • S Select option • H Hierarchy nodes
Mandatory entry	No (empty checkbox)	Yes (indicator set)

When the system calls up the receiver, the settings made in the *Field Assignments* dialog box are set. The system proposes all other field assignments generically.

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External URL as Jump Target

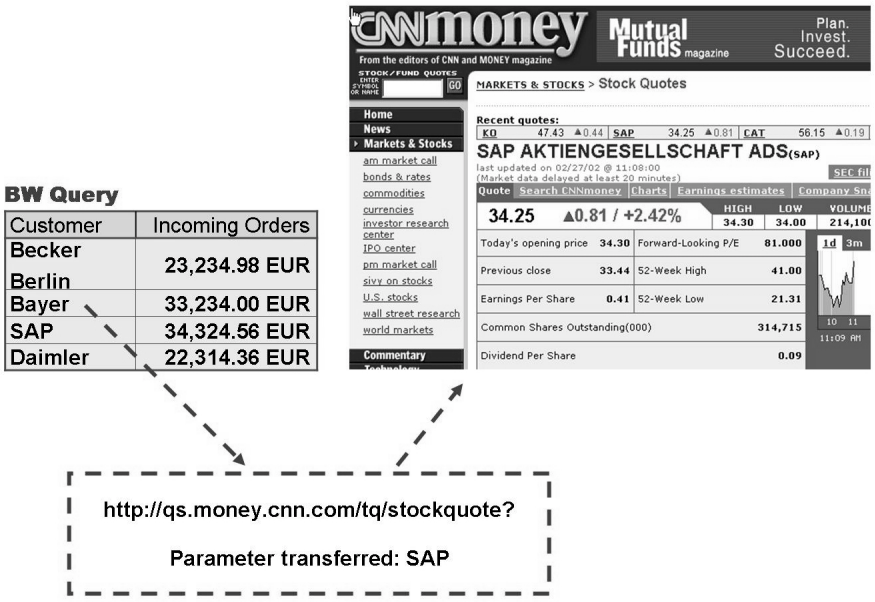

Figure 159: Using a URL as a Jump Target

You can indicate an URL address as a jump target as well. In the *Allocation Details* function in the *Query Jump Targets*, you define the parameter to be passed to the URL.

In order to determine the necessary parameter on the Internet side, extensive HTML knowledge is necessary. The Internet source code must be interpreted.

So, for example, the stock symbol of a customer can be passed to a receiver URL and the current share quotation can be returned.

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Exercise 18: Report-Report-Interface

Exercise Objectives

After completing this exercise, you will be able to:

- Use the Report-Report-Interface (RRI) for drilling through SAP BI and for jumping into other attached systems
- Define a jump to a URL with parameter transfer

Business Example

You would like to call other reports or transactions from a report, in order to access more detailed information for your analysis. Certain parameters, such as filter values, are to be passed to the jump targets.

Task:

Define two reports. The first report is based on the *Order Cube* and should show the incoming orders on the customer level. On the customer-level, you want to be able to display the associated order items.

Define a second report on the *Order Details* DSO object. This DSO stores the individual line items of the sales orders that are reported in the InfoCube. The material number is contained in the order items. Based on the order number, allow the user to branch to the original order in the source system using transaction **VA03**. Create for these connections the appropriate jump targets in the RRI.

Also, define for the first report a further jump target in order to pass the customer's location to the URL www.wetter.net to see the weather for their location.

1. Starting from the BEx Analyzer, create a query, based on the *Order Cube (T_SDC01)*. Select the *Sold-to party* and *City* as the characteristics and *Incoming orders* as the key figure. Use the calendar day as free characteristic and restrict it to the timeframe from 01.12.2001 to 28.12.2001.

   Save the query definition under *Roles → Training BW305 Reporting → Unit: Report-Report-Interface → Lesson: Report-Report-Interface → Exercise* with the following description:

   Description: **`GR## BW305 RRI Orders`**

   Technical name: **`BW30519C##`**

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2. Create another query using the *Order Details (T_SD01)* DSO. Include the sales document number, item and material number in the rows, as well as key figures for net weight in kg, net price, and net value in the columns. Include the customer number as free characteristic and restrict it with filter variable *T_SOLDTO*. Otherwise there is a danger that when executing the query separately, the entire DSO with all single items would be selected. Include calendar day in the free characteristics as well.

   Save the query definition under *Roles → Training BW305 Reporting → Unit: Report-Report-Interface→ Lesson: Report-Report-Interface → Exercise* with the following description:

   Description: **GR## BW305 RRI Order Details**

   Technical name: **BW30519D##**

3. Create an RRI setting to link the second query as a jump target for the first query. Test your settings when finished.

4.

   Create another RRI setting for the first query *GR## BW305 RRI Orders* in order to receive the Web site *www.wetter.net*, using *City* as the parameter to pass to the Web site. You often call German customers, and now it will be easy to know the local forecast, with which you can start the conversation.

5. Create another RRI, this time from the second query *GR## BW305 RRI Order Details* as a jump target to transaction **VA03** in the source system. With this transaction you can display the original order in the source system.

   With regards to the connection to the source system, you have to identify the *InfoSource* that is supplying the data to the DSO object. In the *InfoSource* field, enter **2LIS_11_VAITM**. You may enter the value directly into the field or use the F4 Help function.

   Test your settings when finished.

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Solution 18: Report-Report-Interface

Task:

Define two reports. The first report is based on the *Order Cube* and should show the incoming orders on the customer level. On the customer-level, you want to be able to display the associated order items.

Define a second report on the *Order Details* DSO object. This DSO stores the individual line items of the sales orders that are reported in the InfoCube. The material number is contained in the order items. Based on the order number, allow the user to branch to the original order in the source system using transaction **VA03**. Create for these connections the appropriate jump targets in the RRI.

Also, define for the first report a further jump target in order to pass the customer's location to the URL www.wetter.net to see the weather for their location.

1. Starting from the BEx Analyzer, create a query, based on the *Order Cube (T_SDC01)*. Select the *Sold-to party* and *City* as the characteristics and *Incoming orders* as the key figure. Use the calendar day as free characteristic and restrict it to the timeframe from 01.12.2001 to 28.12.2001.

   Save the query definition under *Roles → Training BW305 Reporting → Unit: Report-Report-Interface → Lesson: Report-Report-Interface → Exercise* with the following description:

   Description: **`GR## BW305 RRI Orders`**

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Technical name: **BW30519C##**

a) Start the BEx Analyzer and choose *Tools → Create New Query → New Query → InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Order Cube (T_SDC01) → Open*.

b) Place the key figure *Incoming Orders (T_INCORDV)* in the *Columns* area and the characteristics *Sold-to party T_SOLD_TO)* and *City (T_SOLD_TO__0CITY)* in the *Rows*.

c) In the *Free Characteristics* area, place the characteristic *Calendar day (0CALDAY)* from the *Time* dimension and restrict it to the interval *from 01.12.2001 to 28.12.2001*.

d) Save the query definition under *Roles → Training BW305 Reporting → Unit: Report-Report-Interface → Lesson: Report-Report-Interface → Exercise* with the following description:

Description: **GR## BW305 RRI Orders**

Technical name: **BW30519C##**

2. Create another query using the *Order Details (T_SD01)* DSO. Include the sales document number, item and material number in the rows, as well as key figures for net weight in kg, net price, and net value in the columns. Include the customer number as free characteristic and restrict it with filter variable *T_SOLDTO*. Otherwise there is a danger that when executing the query separately, the entire DSO with all single items would be selected. Include calendar day in the free characteristics as well.

Save the query definition under *Roles → Training BW305 Reporting → Unit: Report-Report-Interface→ Lesson: Report-Report-Interface → Exercise* with the following description:

Description: **GR## BW305 RRI Order Details**

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Technical name: **BW30519D##**

a) From the BEx Analyzer and choose *Tools → Create New Query → New Query → InfoAreas → BW Training → BW Customer Training → BW305 Reporting → Sales and Distribution → Order Details (T_SD01) → Open*.

b) Place the key figures *Net weight in kg*, *Net price*, and *Net value* in the *Columns* area.

c) Place the characteristics *Sales document*, *Item*, and *Material* from *Dimensions → Key Part* in the *Rows*.

d) In the *Free Characteristics* area, place the characteristic *Sold-to party (T_SOLD_TO)* and assign the variable *Sold-to Party (T_SOLDTO)*. This ensures that all single items of the DSO are not selected by mistake.

Caution: Always select a certain customer number or small range of customer numbers. Do not select all single items, in order to avoid query performance problems.

e) Finally, place the characteristic *Calendar day* in the *Free Characteristics* area. The value for this will be passed to the query by the sending query.

f) Save the query definition under *Roles → Training BW305 Reporting → Unit: Report-Report-Interface→ Lesson: Report-Report-Interface → Exercise* with the following description:

Description: **GR## BW305 RRI Order Details**

Technical name: **BW30519D##**

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3. Create an RRI setting to link the second query as a jump target for the first query. Test your settings when finished.

   a) In SAP BW, choose *SAP Menu → Business Explorer → Query → Maintain Sender-Recipients Mapping (RSBBS)* to access the settings for the RRI.

   b) On the *Query* tab, enter your sender query, **`GR## BW305 RRI Orders`**, in the *Sender* field using the F4 Help function to select your query from the list. Choose *Create*.

   c) Make the following settings:

Field	Value
Report Type	**`BW BEx Query`**
Target System	**`Local`**
Report	**`GR## BW305 RRI Order Details`** selected using F4 Help and the *Find* button.

   d) Choose *Transfer* and save your assignment settings.

   e) Test your settings by executing the *GR## BW305 RRI Orders* query, selecting a particular customer, then jumping to the *GR## BW305 RRI Order Details* query to see the details of the orders for that customer within the timeframe 01.12.2001 - 28.12.2001 (see filter values by pressing the *Filter* button).

4.

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Create another RRI setting for the first query *GR## BW305 RRI Orders* in order to receive the Web site *www.wetter.net*, using *City* as the parameter to pass to the Web site. You often call German customers, and now it will be easy to know the local forecast, with which you can start the conversation.

a) In SAP BW, choose again *SAP Menu* → *Business Explorer* → *Query* → *Maintain Sender-Recipients Mapping (RSBBS)* to access the settings for the RRI.

b) On the *Query* tab, enter your sender query, **`GR## BW305 RRI Orders`**, in the *Sender* field using the F4 Help function to select your query from the list. Choose *Create*.

c) Make the following settings:

Field	Value
Report Type	**`Web address`**
Target System	**`Local`**
Report	Using the F4 Help, enter **`http://www.wetter.net/cgi-bin/wetter-net/wetter_stadt.pl?`**

d) Choose *Transfer*.

e) Now you must make additional settings for the URL using the *Assignment Details* button. On the *Field Assignments* screen, select the InfoObject T_SOLD_TO__0CITY. Enter the field name of **`NAME`**. The field name is the input field on the Internet side. The field name was determined by looking at the source code of the Web page and must be entered using capital letters. Choose *Close*.

f) Save your settings.

g) Test your settings by executing the *GR## BW305 RRI Orders* query, selecting a customer based in Germany and jumping to the URL jump target.

Ignore any warnings you may receive.

Note: This web site only provides weather for German cities.

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5. Create another RRI, this time from the second query *GR## BW305 RRI Order Details* as a jump target to transaction **VA03** in the source system. With this transaction you can display the original order in the source system.

   With regards to the connection to the source system, you have to identify the *InfoSource* that is supplying the data to the DSO object. In the *InfoSource* field, enter **`2LIS_11_VAITM`**. You may enter the value directly into the field or use the F4 Help function.

   Test your settings when finished.

   a) In SAP BW, choose *SAP Menu → Business Explorer → Query → Maintain Sender-Recipients Mapping (RSBBS)* to access the settings for the RRI.

   b) On the *Query* tab, enter your sender query, **`GR## BW305 RRI Order Details`**, in the *Sender* field using the F4 Help function to select your query from the list. Choose*Create*.

   c) On the *Query* tab, enter your Sender Query *GR## BW305 RRI Order Details* in the *Sender* field using the F4 Help function to select your query from the list. Choose *Create*.

   d) Make the following settings:

Field	Value
Report Type	**`Transaction`**
Target System	**`Source system, IDES R/3`**
Report	**`VA03`** selected using F4 Help.

   e) Choose *Transfer*.

   f) Regarding the connection to the source system, clearly identify the *InfoSource* that is supplying the data to the DSO object. In the *InfoSource* field, enter **`2LIS_11_VAITM`**. You may enter the value directly into the field or use the F4 Help function.

   g) Save your settings.

   h) Test your settings. From the query *GR## BW305 RRI Order Details*, select an order number, then jump to the display of the order from the source system.

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Lesson Summary

You should now be able to:

- Use the report/report interface (RRI) for navigating within SAP BI and for jumping into other attached systems
- Define a jump that feeds a parameter to a URL

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Unit Summary

You should now be able to:

- Use the report/report interface (RRI) for navigating within SAP BI and for jumping into other attached systems
- Define a jump that feeds a parameter to a URL

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Unit 14

Managing Query Objects

Unit Overview

Unit Objectives

After completing this unit, you will be able to:

- Display the workbooks or views in which a query definition is stored
- Explain how to delete query objects
- Explain how to copy queries between InfoCubes
- Explain how to support multi language of query objects
- Identify basic techniques to improve query performance.

Unit Contents

Lesson: Managing Query Objects 484
Procedure: Deleting Query Objects 487
Procedure: Copying Queries 489

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Lesson: Managing Query Objects

Lesson Overview

This lesson deals with the functions relating to the general housekeeping, language translation and performance of query objects.

Lesson Objectives

After completing this lesson, you will be able to:

- Display the workbooks or views in which a query definition is stored
- Explain how to delete query objects
- Explain how to copy queries between InfoCubes
- Explain how to support multi language of query objects
- Identify basic techniques to improve query performance.

Business Example

In order to manage a huge amount and diversity of query objects some useful functionality is available. Eventually the defined query objects have to be translated to support multi language. Furthermore some aspects concerning performance have to be considered within the query definition.

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Query Where-Used List

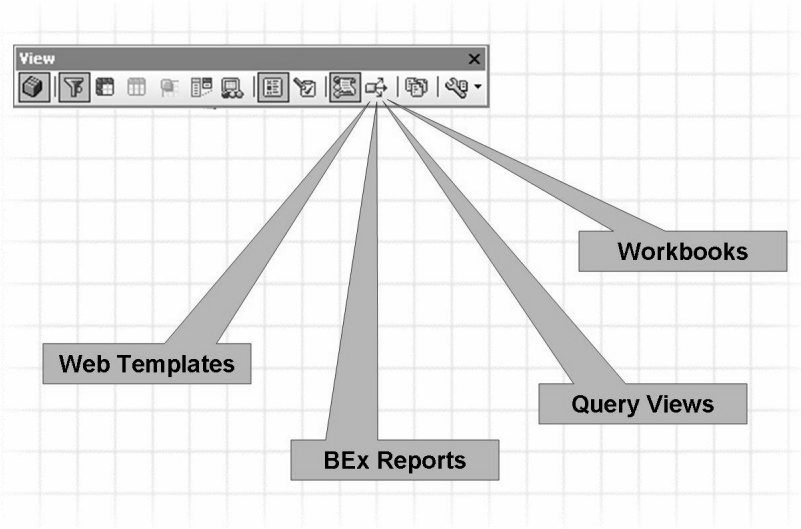

Figure 160: Where Used List

You have the option in the *Query Designer* of displaying a where-used list for the query definition in workbooks, views, web templates and formatted reports (created with the BEx Report Designer). To do this, choose the *Query Where-Used List* symbol from the Query Designer toolbar.

Deleting Query Objects

By choosing the menu option *Delete* within the Query Designer you can remove the query definition from SAP BEx. You can also delete the query definition and also various other global query objects such as restricted key figures, calculated key figures etc. by using the menu option found from the *SAP* menu, using the path *Business Explorer → Query → Delete Objects*.

Caution: In order to delete a query object, there must be at least one query, structure, restricted key figure, or calculated key figure.

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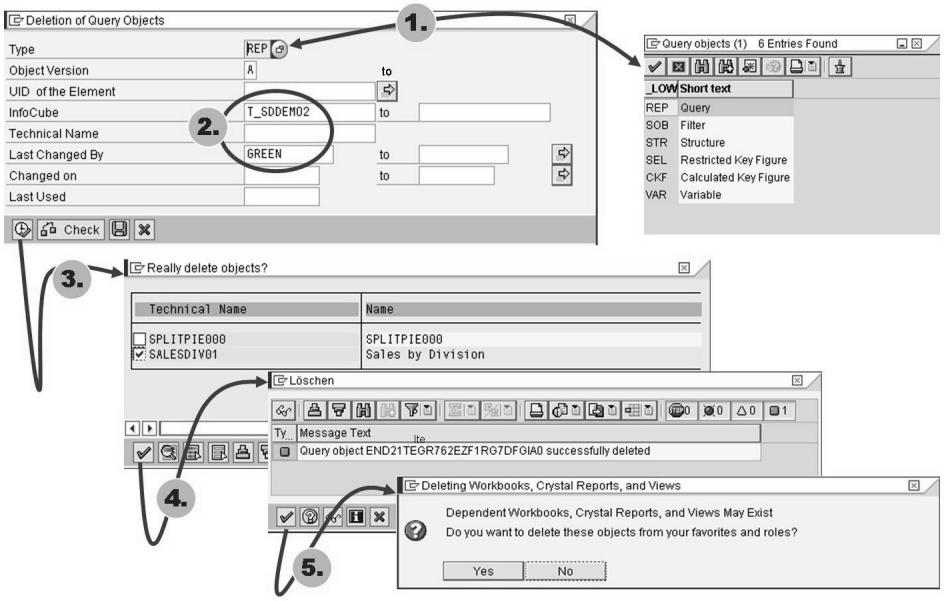

Figure 161: Deleting Query Objects

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Deleting Query Objects

1. Choose *SAP Menu → Business Explorer → Query → Delete Objects*. The *Deletion of Query Objects* dialog box appears.
2. Select the type of object that you want to delete (*Query, Structure, Restricted Key Figure, Calculated Key Figure, Variable, Filter*).
3. You can restrict your search further, if necessary, by specifying the InfoProvider area under *InfoCube* or using the options *Technical Name*, *Last Changed By*, *Last Changed On*,*Object Version*,*UID of the Element* or *Last Used* to obtain a list that matches these selection criteria.
4. Choose the *Execute* symbol. In the *Really delete objects?* dialog box, you can select the objects to be deleted by checking the relevant boxes.
5. Finally, choose the check symbol to delete the selected objects. If this was successful, the system displays a message stating that the objects were deleted successfully. If the system could not delete the selected object(s), the relevant message displays (for example, Query object ... is blocked. Deletion has been cancelled). If dependent workbooks, Crystal Reports, and views still exist for the objects, the system gives you the option of deleting the objects from the favorites and roles of all users.

Result

You can use selection options to find and delete specific query objects.

Copying Queries Between InfoProviders

In the *SAP* menu under *Business Explorer*, you find a *Copy* function that enables you to copy queries and their subobjects (structures, calculated key figures, restricted key figures) between different InfoProviders.

Caution: The target InfoProvider must contain all of the InfoObjects in the source InfoProvider.

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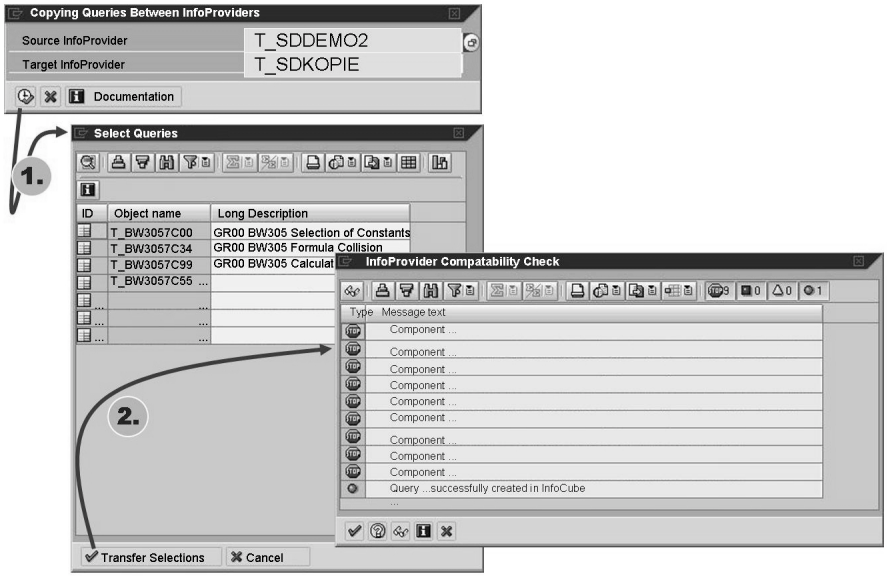

Figure 162: Copying Queries Between InfoCubes

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Copying Queries

1. Choose *SAP Menu → Business Explorer → Query → Copy*. The *Copying Queries Between InfoProviders* dialog box appears.
2. Specify a source InfoProvider that will be used by the query that you want to copy and specify a target InfoProvider. Choose *Execute*. The *Select Queries* dialog box appears.
3. Select the queries that you want to copy and choose *Transfer Selections*. The *InfoCube Compatibility Check* dialog box appears.

Hint: You have the following options for selecting multiple queries:

- Selecting several single queries from the list: Select the required queries by holding down the CTRL key and clicking with the mouse.
- Selecting several queries below one another in the list: Selecting a block by holding down the SHIFT key and selecting the first and last queries in the block.

4. The dialog box that follows confirms that the query has been successfully transferred into the selected InfoProvider . Choose *Continue* to end the process.

Hint: Note the following if you are using reusable sub-objects:

- Variables are InfoProvider-independent; no copies are created.
- No copies are created of global structures, calculated key figures, or restricted key figures on the InfoProvider level.

Result

The copied queries and sub-objects have a modified technical name that is a combination of the **technical name** of the original object and the added elements **_<number>** (for example, BW3058CAA_1).

Translating Query Objects

In the Translation function area in the Data Warehousing Workbench, you can translate short and long texts for BI objects, this includes**query objects**. Once a query is selected for translation the worklist automatically includes the **sub-objects** for translation, for example restricted key figures, variables. Also the worklist includes any **connected** objects such as workbooks.

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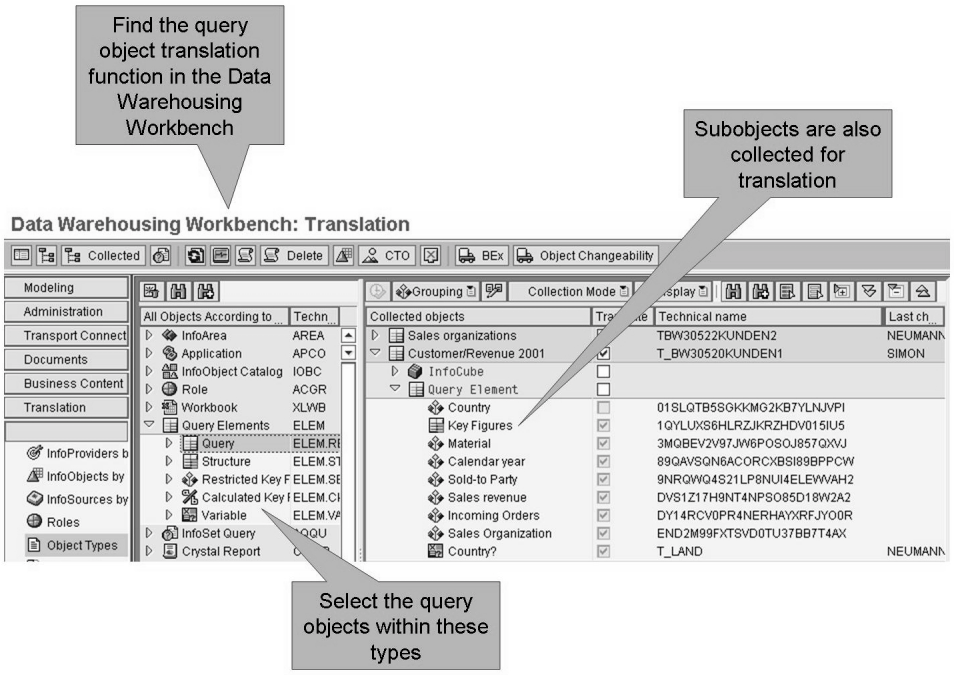

Figure 163: Translating Query Objects

Performance Aspects of Query Definition

Although the performance of your query is heavily dependant on the overall design and maintenance of your data model (i.e. thoughtful dimensioning of the Infocube, use of indexes, frequent compression), there are also a number of things you should bear in mind when designing and running a query which may help to avoid running into performance issues.

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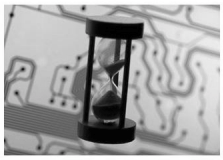
Common query design mistakes :

- Overlapping filters
- Too many drill down characteristics in initial view
- Over-use of exclude function



Have you considered…

- Design aggregates aligned to common filter requirements
- Make use of precalculated web templates
- Make use of value sets
- Switch BEx Analyzer workbook refresh mode to manual
- Use query performance monitoring tools
- Ensure the read mode of the query is set appropriately
- Warm up query cache via broadcaster
- Implement BI Accelerator

Figure 164: Performance Aspects of Query Definition

- Overlapping filters

  It is important to ensure you avoid this common query design error. For example, if your query contains the characteristic *Calendar month/year* filtered to the value **12.2006** (perhaps using a user input variable but the query also contains the characteristic *Calendar year* filtered to the fixed value **2006**, then you have a filter overlap for the year 2006. This means the OLAP processor is performing unneccessary steps to retrieve the data and this can harm performance.

- Too many drill-down characteristics in the initial view

  Keep the number of characteristics in the rows or columns to a minimum. Make use of the free characteristics. Too many characteristics in the rows or columns means the processor has to work hard to retrieve (and format) the extra data for all levels of drill down.

- Over-use of *exclude* function

  The exclude function (within characteristic filtering) is useful when you want to instruct the query to eliminate certain values from a range of values. However you should take care to use this function sparingly as too many exclusion instructions can start to slow down the query run time. Consider using inclusions wherever possible even if this means that the initial setup of the filters is more complex.

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- Design aggregates aligned to common filter requirements.

  Accessing pre-filled aggregates is one of the most significant ways of improving query performance. However aggregates are only efficient if you can safely predict the users common filtering requirements. The BW310 class has more on this subject.

- Make use of pre-calculated web templates

  It is possible to schedule the execution of the query at any desired time. The results are stored within a web template which means that web users have instant access to ready-made reports. However do bear in mind that the results are calculated at the time the query was run and this may mean the data is not always up to date. The BW306 class covers this function.

- Make use of value sets

  Value sets are containers which hold the results for a single characteristic which was generated from a scheduled query. For example you can schedule a query to run each night to calculate the top ten customers by profit. This list of customers can be stored persistently as a *value set*so that you can use this list as an ready made input for another query. This means you have a starting point for any query from a list of static filters which could help to improve the overall BEx reporting performance. The BW306 class covers this function.

- Switch BEx Analyzer workbook refresh mode to manual

  The default refresh mode for any workbook is **automatic** which means that whenever you select a filter value the query is immediately refreshed with a round trip to the InfoProvider. Refreshes can take some time if the result set is particularly large. If your users want to select a number of filter values at one time then switch the refresh mode to **manual** so that the user can choose the filter values first without the automatic refresh taking place. When the user is ready to refresh the query they simply press the *refresh* button in the BEx Analyzer toolbar so that the workbook 'catches up' with the filters set by the user. This means only one round trip to the InfoProvider is necessary to process all filters selected.

- Use query performance monitoring tools

  There are many tools available in Netweaver BI to assist in the detection of query perfomance problems. It is possible to analyze all aspect of the query run time and all levels of detail. The BW360 class covers these tools.

- Ensure the query read mode is set appropriately.

  The query read mode allows the query developer/administrator to determine the mode in which the OLAP process operates with regard to extracting reporting data. For example you may set the query to read all free characteristics or

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hierarchy node levels when the query first runs. This, of course, will mean the initial refresh of the query may be slower but the subsequent changes to the filters will be much quicker as all the data has already been read in memory. If you are looking for the initial execution of the query to be quick then consider setting the read mode so that the free characteristics are only processed when they are required by the user. This topic is covered in detail in the BW360 class.

- Warm up query cache via broadcaster

  The query cache stored recently used results sets in main memory. Whenever a query is refreshed the OLAP processor checks to see if the required results have already been collected in the query cache. If they have already been collected then this cached data is used instead of the processor having to read the results from the database. It is also possible, since NetWeaver BI 2004s, to schedule the filling of the query cache from the broadcaster so that the cache is 'warmed up' perhaps overnight ready for use the next day. This has a significant impact on query performance. The BW306 and BW360 class covers these topics.

- Implement BI Accelerator

  If you really want to ensure your queries run at the fastest possible speed then implement the BI Accelerator (BIA). BIA radically changes the way in which query data is retrieved using a sophisticated indexing concept in conjunction with modern hardware architecture. You can expect dramatic improvements with query performance once this feature is implemented. The topic is covered in detail in BW360.

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Lesson Summary

You should now be able to:

- Display the workbooks or views in which a query definition is stored
- Explain how to delete query objects
- Explain how to copy queries between InfoCubes
- Explain how to support multi language of query objects
- Identify basic techniques to improve query performance.

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Unit Summary

You should now be able to:

- Display the workbooks or views in which a query definition is stored
- Explain how to delete query objects
- Explain how to copy queries between InfoCubes
- Explain how to support multi language of query objects
- Identify basic techniques to improve query performance.

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Unit 15

Business Content

Unit Overview

This lesson deals with Business Content (BCT) and the metadata repository. The lesson gives you an overview of the role- and task-related information models in *SAP BW*. You can use the HTML-based BW Metadata Repository to access information on metadata, for example, links to other objects, centrally. You can activate a query in BCT and then go on to execute the query in the Query Designer.

Unit Objectives

After completing this unit, you will be able to:

- Understand and list the advantages of Business Content
- Use the Metadata Repository
- Use Business Content Browser to evaluate available and used content

Unit Contents

Lesson: Business Content.....498

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Lesson: Business Content

Lesson Overview

This lesson deals with the Business Content and the metadata repository. You obtain an overview of the delivered objects and the Business Content information models. In the metadata repository, you can display the definition of all active objects that are delivered in Business Content, as well as links to other objects. You can activate a query in Business Content and then go on to execute it in the Query Designer.

Lesson Objectives

After completing this lesson, you will be able to:

- Understand and list the advantages of Business Content
- Use the Metadata Repository
- Use Business Content Browser to evaluate available and used content

Business Example

A large number of reports are needed in your company. You can use the SAP BI system to check whether there are report definitions delivered by SAP in Business Content that meet, or partially meet, your requirements. You use the Metadata Repository and the Business Content Browser as an information source that allows you to obtain an overview of delivered and used objects.

Business Content: Overview

If you need a specific analysis, you should first check whether Business Content contains the query definition you need or a similar query definition.

Business Content contains all objects that enable you to structure your reporting quickly, from data extraction from SAP source systems, to roles that supply employees in a company with information they need to complete their work. These information models include:

- Roles
- Queries and workbooks (BI reports, and particular views of them)
- InfoProviders that the reports are based on
- InfoObjects that provide the characteristics and key figures used in your reports
- Update rules and extractors for SAP business applications, and other selected applications

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Business Content has the advantage that all necessary and related objects can be activated at the same time. Afterwards, all relevant data from the SAP source systems can be loaded into the BI system and analyzed immediately with Business Content queries.

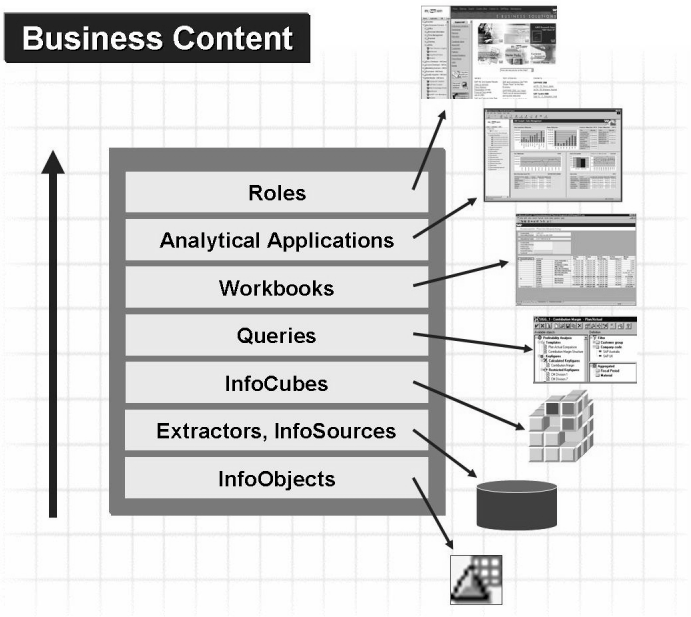

Figure 165: Business Content

Roles

The objects are grouped together into **roles** for optimum use.

A role corresponds to a specific function in a company, for example, purchasing manager. A role is linked to particular tasks, areas of responsibility, and the information requirements that result from them.

There are roles for the different areas within your company. Targeted reports and applications are available for these roles, according to what employees assigned to the various roles need to do their job.

Industries

In the case of many **industries**, for example, Retail, Pharmaceuticals, Banking, and so on, roles and the objects that belong to them in Business Content are delivered to meet the needs of the individual areas.

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Analytical Applications

In conjunction with *mySAP Enterprise Portal*, the *BI* release delivers cross-component applications such as **analytical applications** in the form of business packages.

These **business packages** deliver targeted access to information for a process. They enable the analysis of this process, as well as the actions and reactions to it in the systems that deliver the data.

The functions are independent of the operative, transactional systems. However, the analytical application can read the data from the operative systems and write back to them.

The areas for analytical applications include Sales Analysis, Campaign Management, Market Exploration, Procurement Analysis, Production Analysis, Inventory Analysis, Customer Credit Management, and Packages for E-Analytics.

Each business package consists of an overview page, the cockpit, and additional target-oriented user interfaces known as worksets.

SAP DemoContent

You can also use **SAP DemoContent** with delivered examples. The data is stored as flat files during installation on the BI server. This allows demo scenarios from the Purchasing, Sales and Distribution, Financial Analysis, Profitability Analysis, Mobile Applications, AC Nielsen, and SEM to be activated and displayed.

The corresponding roles are:

- Demo role (SAP_BW_0D_SAPDEMO)
- Demo ACNielsen US (SAP_BW_0D_ACNUS1)
- Mobile Executive (SAP_BW_0D_MOBILE_EXECUTIVE)

In addition, the **Demo Web Applications** are delivered for the following roles:

- Sales Cockpit (SAP_BW_SALES_COCKPIT)
- Demo Role (SAP_BW_0D_SAPDEMO)

Hint: Activate the *Demo Role (SAP_BW_0D_SAPDEMO)* in your system. The *Demo Role* contains a Web management InfoCockpit, GIS functions, and a Web application.

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Metadata Repository

The **metadata repository** can be found in the Data Warehousing Workbench of the BI system. It contains definitions of all active objects delivered in Business Content, as well as their links to other objects. The metadata repository is particularly suited to comparing your reporting requirements with objects and information available in Business Content, and to identifying objects that fully or partially meet your requirements.

You can find the following information on all objects in your BI system in the metadata repository:

Technical data

Technical name, object version, content release, and description

Graphical display

For example, the data flow and star schema (the latter available only for InfoCubes)

Additional objects

For example, required objects, objects to which data is forwarded, and objects that supply data

Business Content Browser

Business Content can be found in the Data Warehousing Workbench of the BI system.

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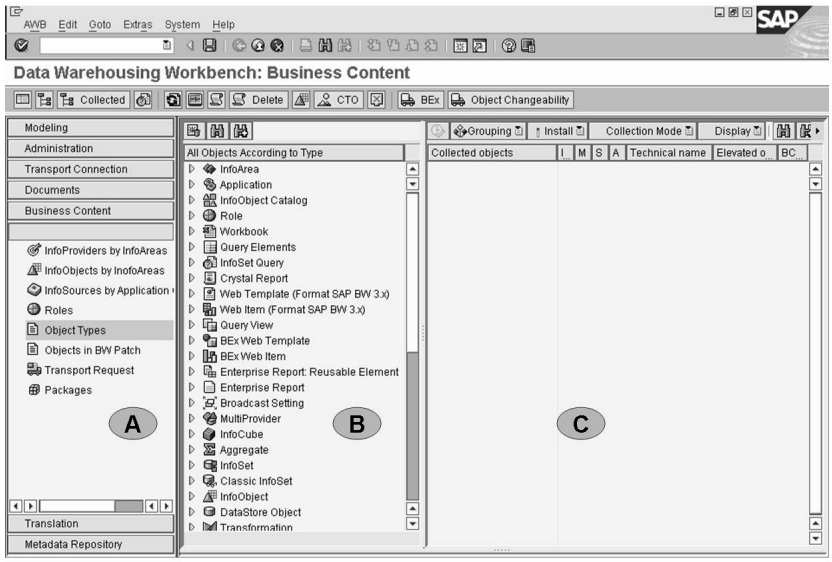

Figure 166: Business Content

You can use the bar on the left (indicated by **A** in the graphic) to choose how objects delivered in Business Content are to be listed in the middle section of the screen (**B**). The objects that you transfer are then listed in the right hand window (**C**).

You can subdivide the objects into *InfoProviders by InfoArea*, for example.

Under the *InfoAreas*, the various assigned *InfoProviders*, such as *InfoCubes*, are listed.

You can also sort by *role* or *object type*.

The drilldown by **object type** option is especially useful to compare an analysis demand with Business Content content.

The query definitions delivered by SAP can be found in the middle section of the screen in the *BI menu* by object types, with a sub-entry of *query elements*.

- Query Definitions
- Global Structures for Key Figures
- Restricted Key Figures
- Calculated Key Figures
- Variables

You can find the *Select Objects* option beneath the *Query* sub-node.

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Clicking on *Select Objects* brings you immediately to a selection menu with all the queries in Business Content. They are listed under the corresponding *InfoAreas* and *InfoProviders*. An integrated search function makes it easier to find queries from specific areas.

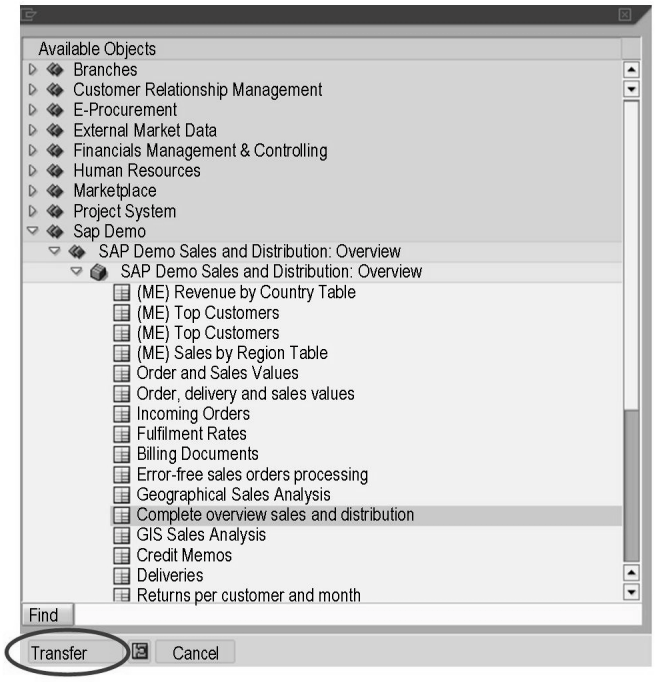

Figure 167: Transferring Objects from Business Content

When you have found the query definition you need, select it with the mouse and choose *Transfer*. The system then gathers together all the objects related to the query. This takes place as a background job.

Note: You can also copy several queries at the same time by choosing the control key when you select the definitions.

After objects have been gathered, the selected query displays in the right-hand window (**C**). If a green circle appears in the *Active version available* column next to the selected object, the object is already actively available in the system.

If the object is only available in the system as the delivered version, the icon does not appear and the object can be transferred from Business Content in the active version.

If an active version of the transferred object is already available in the system, a check mark appears in the *Comparison* column after the object has been gathered.

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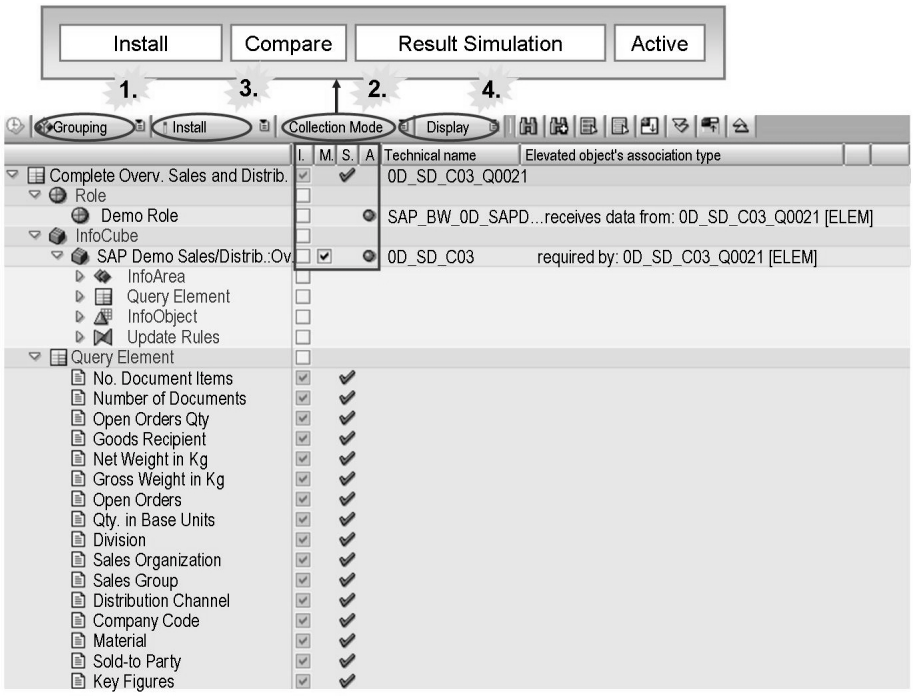

Figure 168: Query Gathered for Activation

You can make the following settings in Business Content for gathering and activating objects:

1. **Grouping**

   Under *Grouping*, you can determine what is to be gathered.

   You can choose between:

   - **Only Necessary Objects:**

     Only objects that are needed to transfer the selected object from Business Content are gathered. This is the minimal variant of Business Content transfer.

   - **In Data Flow Before:**

     All objects that give data to the object being activated are gathered.

   - **In Data Flow Afterwards:**

     All objects that receive data from the object being activated are gathered.

   - **In Data Flow Before and Afterwards:**

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All objects that give data to, or receive data from the object being activated are gathered. This is the maximal variant of Business Content transfer.

2. **Collection Mode**

   Under *Collection Mode*, you can choose between:

   - **Collect Automatically:**

     The objects are collected automatically after the object has been selected. This is the default setting.

   - **Start Manual Collection:**

     The objects to be activated are only collected if you choose the *Gather Dependent Objects* function.

3. **Type of Transfer**

   You can choose the type of transfer:

   - **Simulate Installation:**

     The system tests whether errors would occur if the most important objects were transferred. The simulation serves as orientation help before activation. The result of the activation is shown by a green or red icon beneath the *Simulation result* header.

   - **Install:**

     The selected objects are activated directly.

   - **Install in Background:**

     The selected objects are activated in the background as a batch job. This setting is useful if you want to activate a large number of objects.

   - **Installation and Transport:**

     The selected objects are activated and written to a transport request.

4. **Display**

   Under *Display*, you can choose between:

   - **Hierarchy:**

     The gathered objects display hierarchically according to their dependencies.

   - **List:**

     The gathered objects display in a normal list.

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In the *Gathered Objects* window (**C**), there are the following columns:

- In the *Install* column, the following Business Content objects are indicated by default:
  - Objects transferred for the first time
  - Objects that have been redelivered by Business Content in a more recent version
- In the *Match (X) or Copy* column, a checkbox displays if it is possible to compare the SAP delivery version with the active version.

  This indicator is set by default. If this is the case, your version is matched to the new SAP delivery version and enhanced. If you remove this indicator, the new SAP delivery version is copied in its entirety.

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Lesson Summary

You should now be able to:

- Understand and list the advantages of Business Content
- Use the Metadata Repository
- Use Business Content Browser to evaluate available and used content

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Unit Summary

You should now be able to:

- Understand and list the advantages of Business Content
- Use the Metadata Repository
- Use Business Content Browser to evaluate available and used content

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Test Your Knowledge

1. What are the advantages of Business Content?

2. Why are the objects in Business Content organized in roles?

3. What does the metadata repository contain?

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Answers

1. What are the advantages of Business Content?

   Answer: Business Content contains all SAP-supplied objects (information models) that ensure the fast extraction of data from SAP source systems and allow you to carry out comprehensive analyses. You can activate all necessary/related objects at the same time.

2. Why are the objects in Business Content organized in roles?

   Answer: There are roles for all the areas within your company. Targeted reports and applications are available for these roles, according to what employees assigned to the various roles need to do their job.

   In the case of many **industries**, roles and the objects that belong to them in Business Content are delivered to meet the needs of the individual areas.

3. What does the metadata repository contain?

   Answer: The metadata repository contains definitions for all active objects that are delivered in Business Content, as well as their links to other objects. The metadata repository is particularly suited to comparing your reporting requirements with objects and information models in Business Content, and to identifying objects that fully or partially meet your requirements.

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Unit 16

Further SAP BI Reporting Tools

Unit Overview

Unit Objectives

After completing this unit, you will be able to:

- Describe the purpose and the results of BEx Analyzer (Formatting and Formulas; Design Mode)
- Describe the purpose and the results of BEx Web Application Designer
- Describe the purpose and the results of BEx Report Designer
- Describe the purpose and the results of NetWeaver Visual Composer

Unit Contents

Lesson: Further SAP BI Reporting Tools 514

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Lesson: Further SAP BI Reporting Tools

Lesson Overview

In this short lesson we will take a look at some other reporting possibilities which are related to SAP BI.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the purpose and the results of BEx Analyzer (Formatting and Formulas; Design Mode)
- Describe the purpose and the results of BEx Web Application Designer
- Describe the purpose and the results of BEx Report Designer
- Describe the purpose and the results of NetWeaver Visual Composer

Business Example

In order to enhance and to adapt layouts to individual needs further reporting tools are available within the Business Explorer.

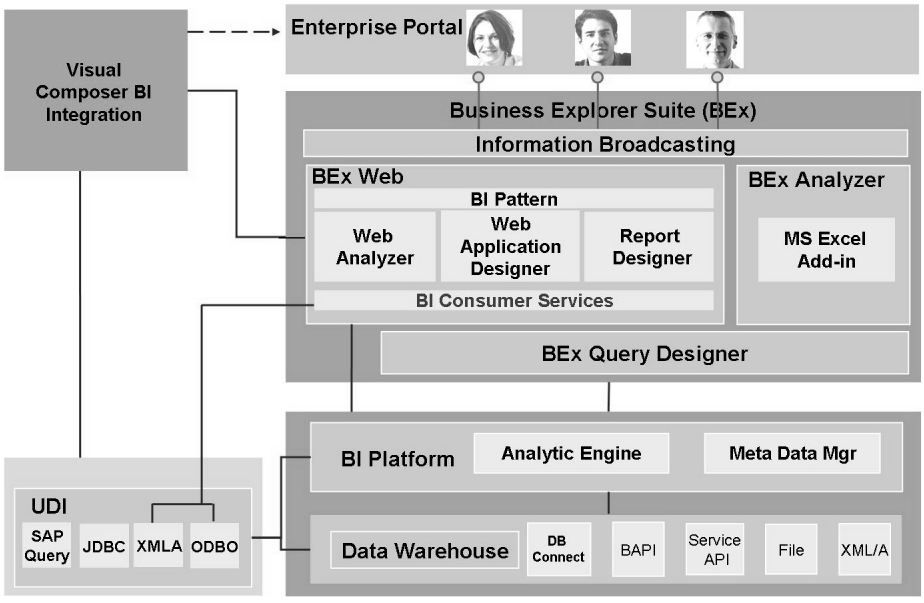

Figure 169: Overview of BEx tools and related components

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BEx Analyzer : Advanced design options

In this class we looked at the BEx Analyzer and how this is used to present BI data within an Excel environment. We covered the navigation options and various workbook settings. However we did not cover the Design Mode of the BEx Analyzer which provides a range of tools to allow an experienced BI developer to create highly customized and sophisticated workbooks. There are also a number of advanced features available to the develop including the ability to interpret the BEx results as native Excel formulas. These features are covered in the class BW306.

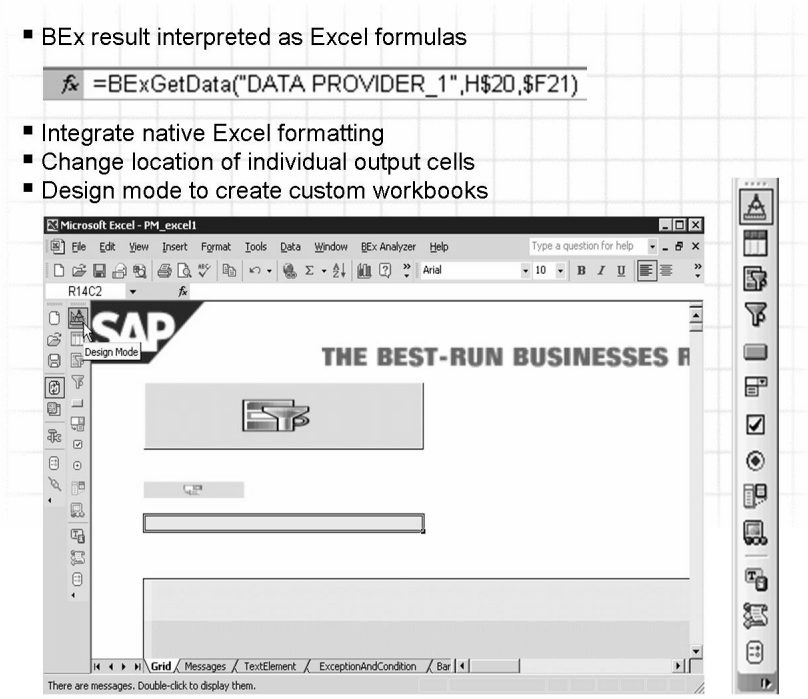

Figure 170: BEx Analyzer Design Mode and additional features

BEx Web Application Designer

In this class we looked at using web based reports with the BEx Web Analyzer. Another key tool in the BEx Suite is the BEx Web Application Designer which makes designing advanced web templates easy. The BEx Web Application Designer provides a wide range of *web items*which represent various useful features of a web report, e.g. drop down lists, buttons, charts, filters. Although it certainly helps to understand web technology when using the BEx Web Application Designer, the tool is designed to be used by relative web novices with wizards and auto-prompts to assist in complex areas of development. The template can be enhanced with native web languages such

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as HTML and Java Script. The templates created with the BEx Web Application Designer can be immediately published to the Portal. These features are covered in the class BW306.

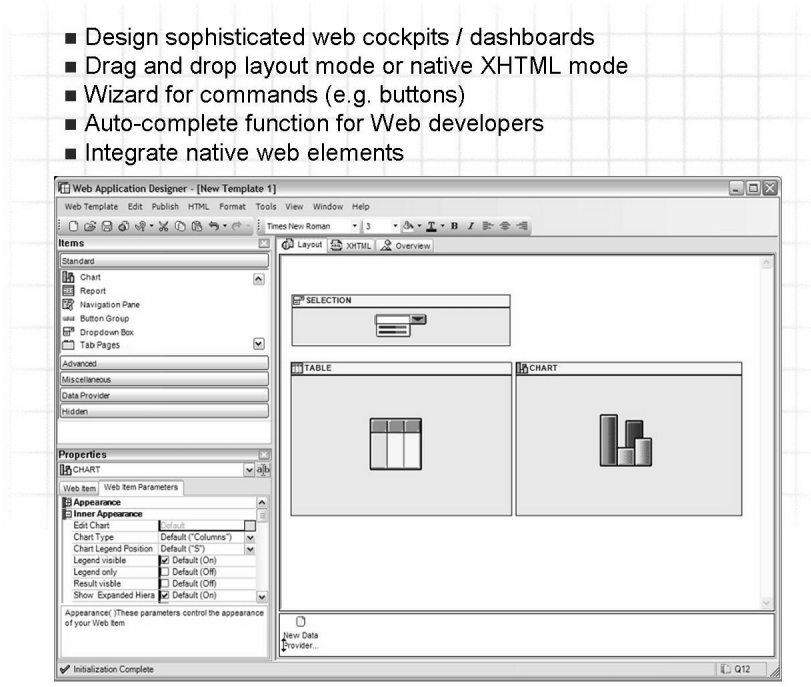

Figure 171: BEx Web Application Designer

BEx Report Designer

Sometimes reports results are easier to interpret if the output is highly formatted. For example using color, repositioning result cells, re-sizing values, adding spaces. The BEx Report Designer takes the output from a query or query view and allows you control the precise positioning and formatting of the output. The result can be viewed on the web, broadcast or generated as a PDF to save or print. These features are covered in the class BW306.

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- Highly formatted web based report design
- Improve clarity of complex results
- Re-position result cells
- Send results Broadcaster or PDF
- Insert headers, footers, logos
- Basic filtering

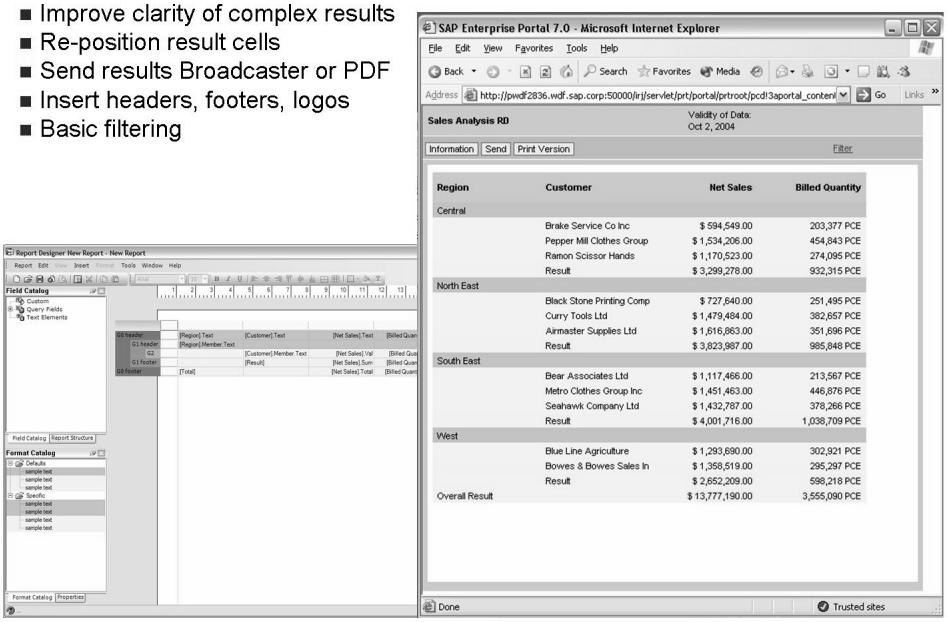

Figure 172: BEx Report Designer

NetWeaver Visual Composer

NetWeaver Visual Composer is not actually part of the BEx Suite, it is part of SAP Analytics. It is mentioned briefly here simply to provide a basic understanding of this powerful tool and to help you to understand how it works in conjunction with BI. NetWeaver Visual Composer is used to build interactive Analytical Applications, BI can provide content to the Visual Composer via the BI Integration Wizard. An example of an Analytical Application is shown in the graphic below. Here you can see that a list of blocked orders is produced at the top of the screen (assume this detailed information comes from the SAP ECC system). We need to make a decision to remove the orders or release them. On the same screen you can see we are also showing some statistics from the ECC system and also from BI together with key customer master data relating to credit class etc. This is an example of a closed loop analytical application which bring together all the key information required (from transactional and analytical sources) in one place to support my decision making. NetWeaver Visual Composer provides the tools to help us build these types of applications. BI content (queries, views, InfoProviders) can easily be integrated into the Visual Composer using a special Wizard.

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Figure 173: Visual Composer : Example Analytical Application

- Design Analytical Applications
- Model driven design
- BI Integration Wizard
- Integrate output from BI and other sources
- Context sensitive embedded applications

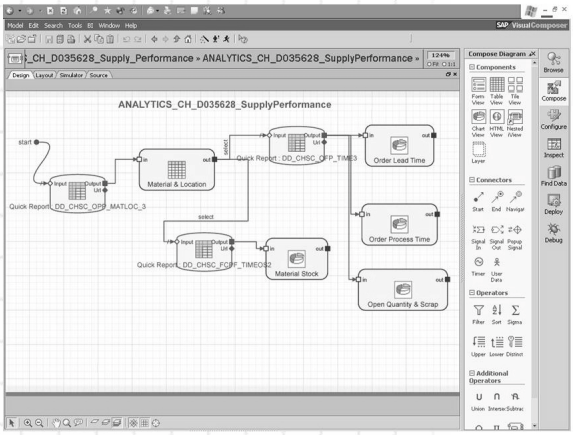

Figure 174: Visual Composer : Model Drive Design

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Lesson Summary

You should now be able to:

- Describe the purpose and the results of BEx Analyzer (Formatting and Formulas; Design Mode)
- Describe the purpose and the results of BEx Web Application Designer
- Describe the purpose and the results of BEx Report Designer
- Describe the purpose and the results of NetWeaver Visual Composer

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Unit Summary

You should now be able to:

- Describe the purpose and the results of BEx Analyzer (Formatting and Formulas; Design Mode)
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Unit 17

Appendix

Unit Overview

This content is optional.

Unit Objectives

After completing this unit, you will be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis in the *BEx Analyzer* and on the Web
- Explain the reason for the need to migrate objects from BW 3.x to SAP NetWeaver 2004s BI
- Describe the migration requirements related to the BEx Query Designer
- Describe the migration requirements related to the BEx Analyzer
- Describe the migration requirements related to the BEx Web Application Designer
- Explain the eliminations performed in internal business volumes

Unit Contents

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Lesson: BW 3.5 Query Designer

Lesson Overview

This lesson presents the BW 3.5 version of the *BEx Query Designer* as an independent tool for defining queries in the *SAP Business Information Warehouse*.

Lesson Objectives

After completing this lesson, you will be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis in the *BEx Analyzer* and on the Web

Business Example

You use *SAP BW* to define reports that enable standardized navigation functions in analyses, independent of the source operational system.

You want to define simple reports, execute these, and make changes to the report definition.

Calling the *BEx Query Designer*

Using the *SAP BW* reporting functions, you can evaluate a dataset from an InfoProvider according to various characteristics and key figures. To do this, you define a query for your chosen InfoProvider in the *BEx Query Designer*.

By selecting and combining the InfoObjects in a query, you determine the way in which data from the chosen InfoProvider is evaluated.

You have various options for calling up the Query Designer:

- From the *BEx Analyzer* open dialog box
- As a separate program using *Start* → *Programs* → *Business Explorer* → *Query Designer*
- Using the *Web Application Designer* (see the *BEx Web Application Designer* unit)
- With Crystal Reports (Crystal Reports >=8.5 including CR add-ons for SAP)

The Open Dialog Box

If you have chosen to access the Query Designer from the BEx Analyzer, the *SAP BEx: Choose Query* dialog box is called before the Query Designer is opened.

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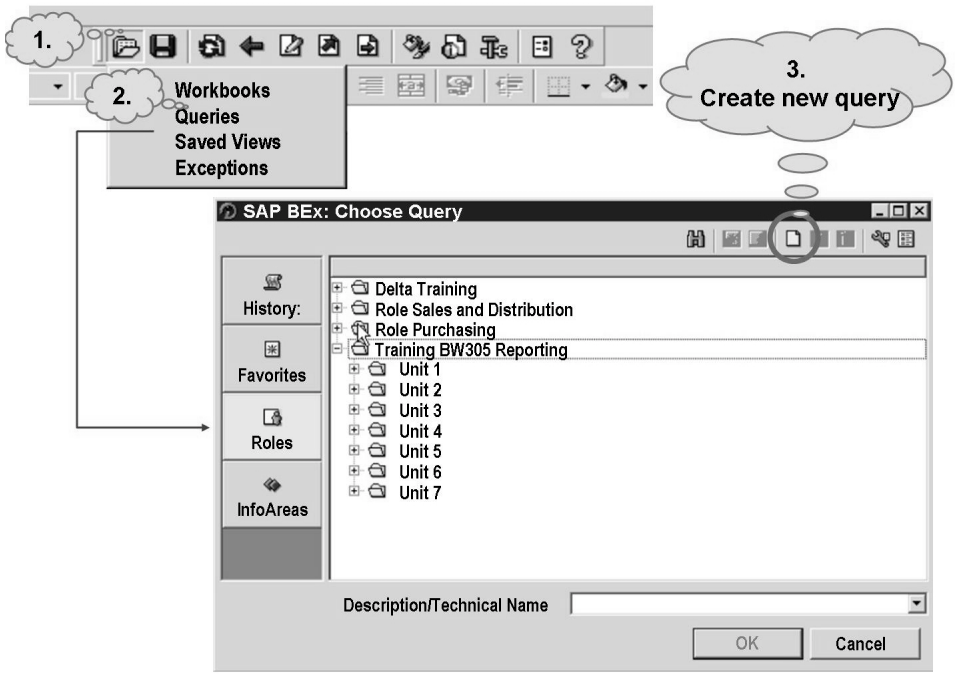

Figure 175: SAP BEx: Choose Query

This dialog box is context sensitive, which means that it offers different choices depending on the type of object selected:

Object Type:	**Dialog Box Available**:
Workbooks:	History, Favorites, Roles
Queries:	History, Favorites, Roles, InfoAreas
Stored Query Views:	History, Favorites, Roles, InfoAreas
Exceptions:	History, InfoAreas

Within the relevant dialog box, you have the option of creating a new query or of finding and selecting an existing query. You can then change or execute the query.

Functions of the *BEx Query Designer*

The following graphic gives an overview of the *BEx Query Designer* functions that you can call from the Query Designer toolbar. The functions are described within the context of query definition.

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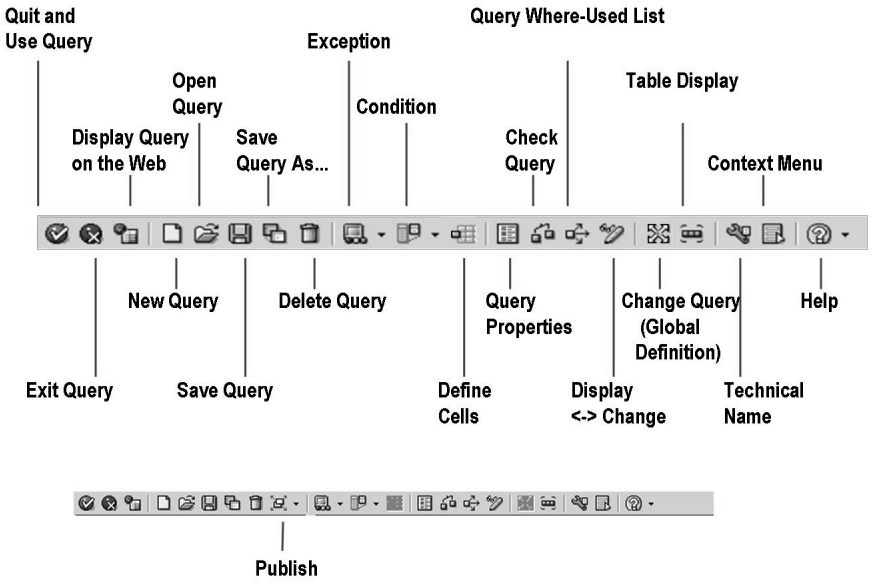

Figure 176: Functions of the Query Designer Toolbar

Quit and Use Query: With this function, you leave the Query Designer and use the query you have defined.

Exit Query: Choose *Exit Query* if you want to leave the Query Designer. Your entries are not saved.

Display Query on the Web: Using this function, you can display the query in a default view on the Web, once you have saved your query definition.

New Query: Choose this function if you want to create a query. The BEx Open dialog box appears and you can select the InfoProvider here that contains the data that you want to evaluate in the query.

Open Query: This function takes you directly to the BEx Open dialog box. There you can choose from queries in your *History, Favorites, Roles,* or from the *InfoAreas*.

Save Query: You use this function to save a modified query under its current name. If the query does not yet have a technical name, the system automatically offers the function *Save Query As...*.

Save Query As...: You use this function to save a query under a new technical name. You can save the query in your favorites or in a role.

Delete Query: You use this function to delete the query. You can only delete the query if it is not being used in workbooks, Web templates, Crystal Reports, or Reporting Agent settings.

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Exception: You use this function to define exceptions for a query.

Note: Exceptions are deviations from normal key figure values, as defined by you, and are highlighted in color in the query view.

Using the small arrow next to the exceptions symbol, you can change or create exceptions. For more information, see the *Exceptions and Conditions* unit.

Condition: You use this function to define conditions for a query.

Note: For each characteristic, you can give limit conditions to the key figure values in order to determine, for example, all sales revenues above or below a specified threshold value. The chosen characteristics are displayed in the query with restricted key figures.

Using the small arrow next to the conditions symbol, you can change or create conditions.

Define Cells: This function is only available for queries with two structures. You can define formulas and selection conditions for cells explicitly. In this way, you control the values of cells that appear at the intersections of structural components. This function enables you to access individual cells in queries or to assign special values to these.

Query Properties: Choose this function if you want to change the description of the query or define the settings for the result position, display options, numeric display, zero display and key date of the query.

Check Query: Using this function, you can check a new or saved query for errors before you save it.

Query Where-Used List: Using this function, you can find out in which objects (workbooks, Web templates, Crystal Reports, or Reporting Agent settings) the query is used.

Display <-> Change: Using this function, you can switch between the display and change modes.

Change Query (Global Definition): You choose this function if you are in the *Local Query Definition* and want to switch to the *Global Definition*.

Table Display: You can create a query for tabular reporting, as well as for Online Analytical Processing (OLAP) reporting, by activating or deactivating the *Table Display* mode in the query definition when defining a query. This function is only available for queries with one structure. You can only have queries with two structures in the multi-dimensional display. They are not suitable for OLAP reporting.

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Technical Name: Using this function, you can show/hide the technical names of the query components.

Context Menu: This function enables you to display the current context menu without using the right mouse button (for example, for use with a touch screen).

Help: This function takes you to the *SAP BW* online documentation. The *BEx Query Designer* section is displayed automatically there in the BEx documentation.

Using the small arrow next to the help symbol, under the *About...* entry, you can see the version of the Query Designer, with the support package number and the revision level.

Creating a Query

This section describes the most important functions required for creating, saving and modifying a query.

To define a new query, start the *Query Designer* and choose *New Query*.

In the *New Query: Select InfoProvider* dialog box, select the required InfoProvider.

The following example uses the InfoProvider *Customer Cube T_SDDEMO2 (T_SDDEMO2)* under *InfoAreas → BW Training → BW Customer Training → BW305 Reporting*.

Once you have selected the InfoProvider, the Query Designer is displayed as shown in the following graphic.

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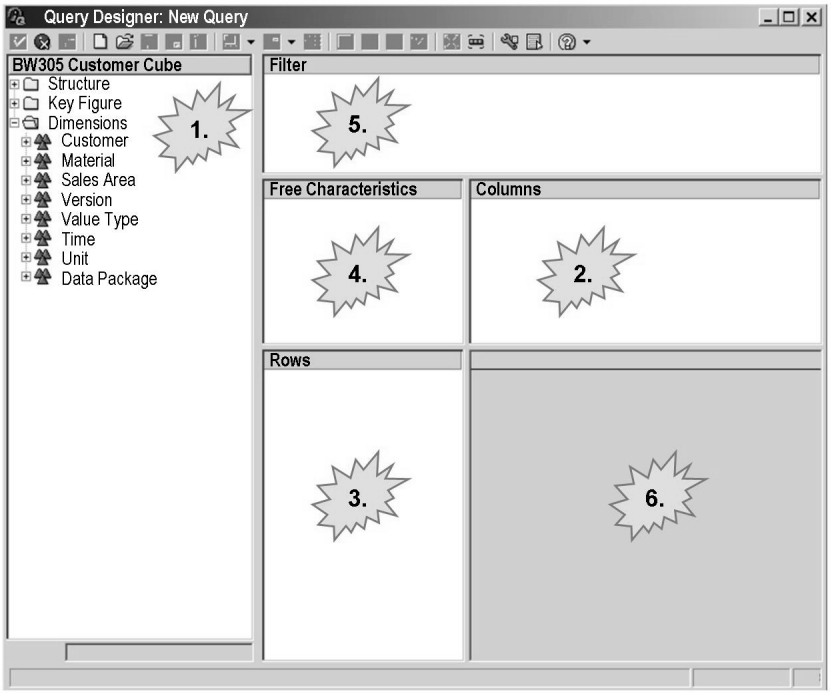

Figure 177: Query Designer: New Query

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The Query Designer is divided into six subareas:

1. **Directory tree of the selected InfoProvider**.

   Once you have selected the required InfoProvider, all available objects (dimensions, key figures, structures) are display in the directory tree in the left screen area of the Query Designer.

   In this example, you can see the directory tree for the InfoProvider *InfoCube Customer Cube T_SDDEMO2*.

2. *Columns*

   You define the columns of your report in this area.

3. **Rows**

   You define the rows of your report in this area.

4. **Free Characteristics**

   You transfer those characteristics into the free characteristics area that are not displayed in the initial view of the results when you execute the query in the BEx Analyzer or on the Web. You can then integrate these characteristics into the results through navigation steps. You can also use free characteristics for selecting filter values in the report.

5. **Filter**

   The characteristics displayed in the filter appear neither in the drilldown nor as free characteristics in the query analysis. These characteristics are only used as global filters on the InfoCube data.

6. **Preview** (displayed in gray on the screen)

   This area gives a preview of the query results area.

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To create a query, you can expand or collapse the InfoProvider directories by clicking on the plus or minus symbol. By expanding the key figure node in the InfoProvider tree, for example, you can display a list of all the key figures for the InfoProvider.

- Use Drag&Drop to transfer the characteristics, key figures, and structures of the InfoProvider into the *Filter, Rows, Columns,* or *Free Characteristics* areas of the Query Designer.

  Note: You can also transfer these using the keyboard and the clipboard. Choose CTRL+C to copy and CTRL+V to paste.

  You can also include characteristic attributes and variables in the query definition in this way.

- You can use the right mouse button to call all of the functions that are in the current context menu. To do this, first select the required query component, then select a menu entry from the context menu.
- By double-clicking on an element in the query designer, you call a dialog box that offers the default function for that element. For example, if you double-click on a characteristic, the dialog box for restricting characteristics appears.

The following graphic shows the Query Designer with a query definition.

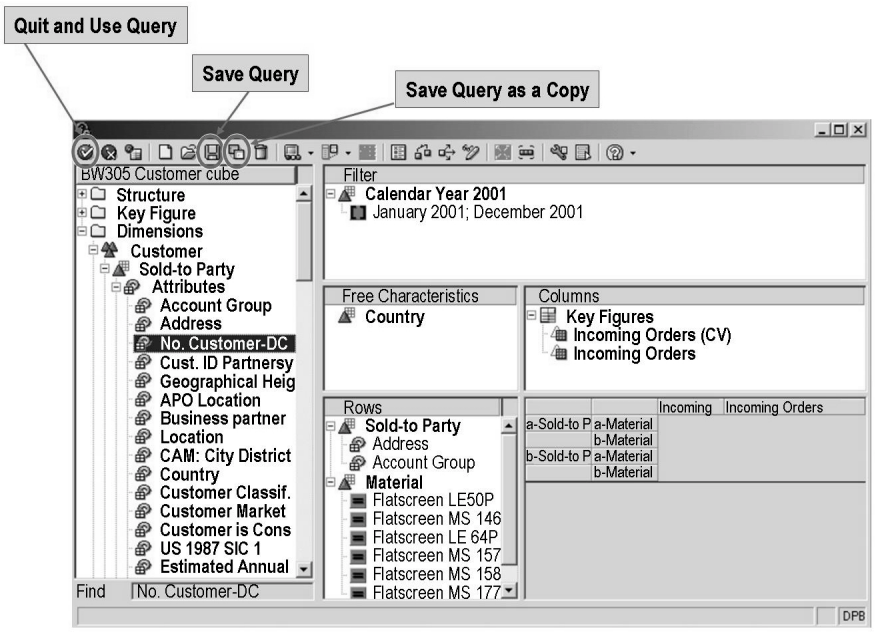

Figure 178: Defined Query

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The following definitions were made:

- The characteristic *Cal. Year/Month (0CALMONTH)* was chosen as a global filter and restricted to the months *January* to *April 2001*.
- The characteristic *Country* was selected as a free characteristic.
- The key figures *Incoming Orders Quantity* and *Incoming Orders EUR* were placed in the columns.
- The *Sold-to Party* characteristic, with addresses and account groups, was included in the rows. The material was also included in the rows. This was restricted to a range of materials.
- The preview area shows how the report is structured.

Once you have defined a query, choose *Save Query* or *Save Query As...*.

If you have not yet saved the query, you must enter a query description and a unique technical name. You can also choose where you want to save the query (in your roles or in your favorites folder). You can use *Save Query As...* to save existing queries under a different name.

You can also execute a query immediately. To do this, choose *Quit and Use Query*.

If you have not yet saved the query, you must enter a query description and a technical name.

Once you have saved the query, you have the following options:

- You can execute the query in the BEx Analyzer and include it in a workbook. To do this, choose *Quit and Use Query*.
- You can display the query on the Web in a default view. To do this, choose *Display Query on the Web*.
- You can use the query in the Web Application Designer as a data provider for Web items.
- You can use the query in the tabular display in Crystal Reports as a data source for formatted reports.

The individual steps for creating a query and the various options for defining a query are described in more detail in the following section.

Finding a Query

In order to find a query for which you already know a part of the description or other information, choose *Find* .

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In the *Search for Queries* dialog box, enter the technical name or description of the query. If necessary, you can restrict the search to additional criteria.

Choose *Find* .

- If you are in the BEx Analyzer and have called the search function from the *Choose Query* dialog box, the query result is displayed as an Analyzer report.
- If you are using the search function from the Query Designer, the query definition is displayed.

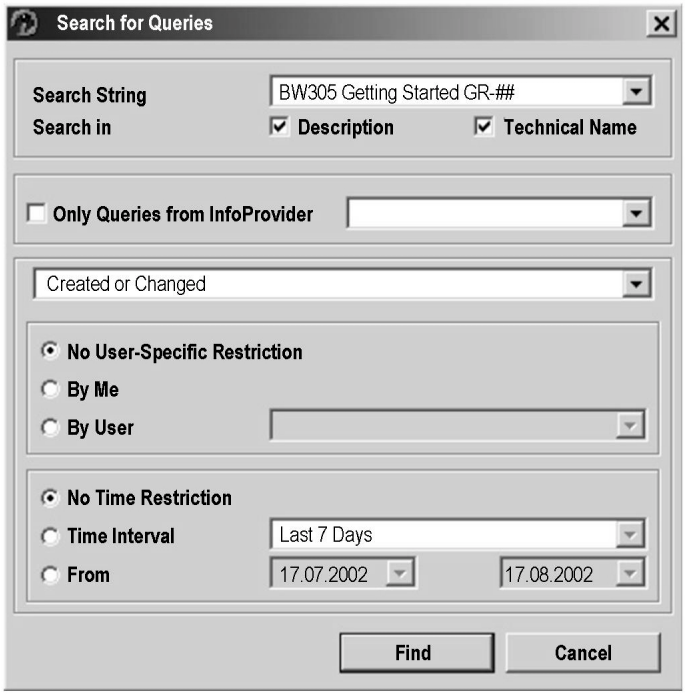

Figure 179: Finding a Query

Changing a Query

As a rule, report requirements are not final at the start of the conversion phase. Many new requirements often arise once users have discovered the range of options in the Query Designer. Therefore, reports are often subject to change.

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Depending on your current position in the Query Designer or Analyzer, you have different options for changing a query:

- If you have called the Query Designer, in the *SAP BEx Query: Choose Query*, select a query. You can either select a query using the technical name or the query description. The queries are also listed under *InfoArea* under the relevant InfoProvider (which you used to define the query).
- You have two options for changing the query definition from a report in the Analyzer:
  - Choose *Change Query (Global Definition)*.

    By doing this, you can change the query definition.
  - Choose *Change Query (Local View)*.

    Changes made to the query here correspond to navigation in the report and are not saved in the query definition.

    Note: If you are in the *Change Query (Local View)* mode, you can switch directly to the global definition by choosing *Change Query (Global Definition)*.

Filtering Data in the Query Definition

It is often necessary to restrict (filter) characteristics to specific characteristic values in your reports. For example, if you are interested in the sales volume of a particular branch of a worldwide corporate group, but the InfoProvider contains the sales volume for the entire organization, you can restrict the query definition to the relevant branch, so that only the key figure for this branch appear in the report.

You can restrict (filter) the characteristic values of a characteristic in the *Rows, Columns, Free characteristics,* and *Filter* areas of the Query Designer.

There are two ways of restricting characteristics:

- By selecting a characteristic from the InfoProvider of the characteristic (in the tree structure in the left part of the screen) and double-clicking on the values icon, the selection menu for fixed values is displayed. You can select single values or values from a value area. The fixed values selected appear in the directory tree under *Values*. You can use Drag&Drop to include these in your query definition.
- You can also restrict a characteristic that you have already included in the definition. Call the context menu for the characteristic and choose *Restrict*. The *Selection for ...* dialog box appears.

The following graphic shows the selection dialog box for the *Material* characteristic.

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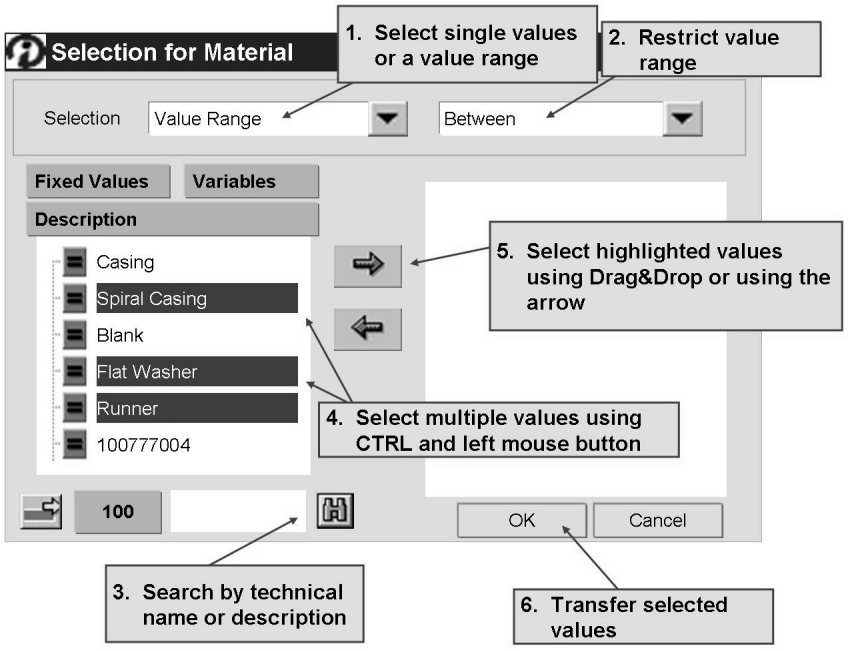

Figure 180: Selection Dialog Box for Filtering/Restricting a Characteristic

You can find all of the characteristic values available for the chosen characteristic in the left screen area. The right screen area contains the characteristic values that you want to use to restrict the characteristic.

To select a characteristic value, highlight the relevant value in the left screen area. You can select single or multiple characteristic values. Using the input field in the lower left area of the selection dialog box, you can find specific characteristic values by entering their description or technical name. The values found are then highlighted automatically.

You can then use Drag&Drop to move the highlighted values into the right screen area. Alternatively, you can transfer the selected values using the arrow. If you want to remove the restriction, simply reverse the procedure.

Hint: Note:

- A restriction on a free characteristic affects the entire query, even if the free characteristic is not in the drilldown.
- Characteristics in the global filter appear neither in the drilldown nor as free characteristics in the analysis. You cannot navigate in the analysis using the characteristic values in the filter. These characteristics are only used to filter the data from the InfoProvider.

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Including Text Elements in BEx Analyzer Reports

You have the option of displaying different text elements as additional information in a query (for example, the author, last changed by, InfoProvider, etc.). These text elements are referred to as the header information of the query.

- Choose *Layout* and *Display Text Elements*.
- You can either display *All* or individual (*General, Filters, Variables*) text elements.

The text elements are displayed between the filter cells and the results area. You can move or delete individual text elements by moving or deleting the corresponding cells using *Microsoft Excel* menu functions.

Explanation of the Text Elements

Author:

User who defined the query.

Last Changed by:

User who last changed the query definition. Navigation steps are not recorded as changes to the definition.

InfoProvider:

InfoProvider whose data is evaluated in the query.

Query Technical Name:

Technical name that you entered when you saved the query.

Key Date:

Contains the date for which the **time-dependent master data** is selected.

You create a key date either in the query definition (in Query Properties) or provide the value using a variable (for more information, see the *Query Properties* unit). If no key date has been defined, the system date is taken as the key date.

Changed At:

Date and time at which the query definition was last changed.

Status of Data:

Time at which the data from the last request was posted to the InfoProvider. This can be evaluated for reporting.

Note: For **MultiProviders**, the current InfoPackages are determined from the individual BasicCubes and from there, the one with the **oldest date** is referred to for the status of the data.

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Current User:

User who currently has the query open or who has inserted it into a workbook.

Last Refreshed:

Data and time at which the query data was last refreshed.

This is the time at which you displayed the text elements (the system has to refresh the query in order to display the text elements).

Variables, Filter Values, Conditions, Exceptions:

Depending on the current query definition, additional text elements (variables, filter values, conditions, and exceptions) may also be displayed.

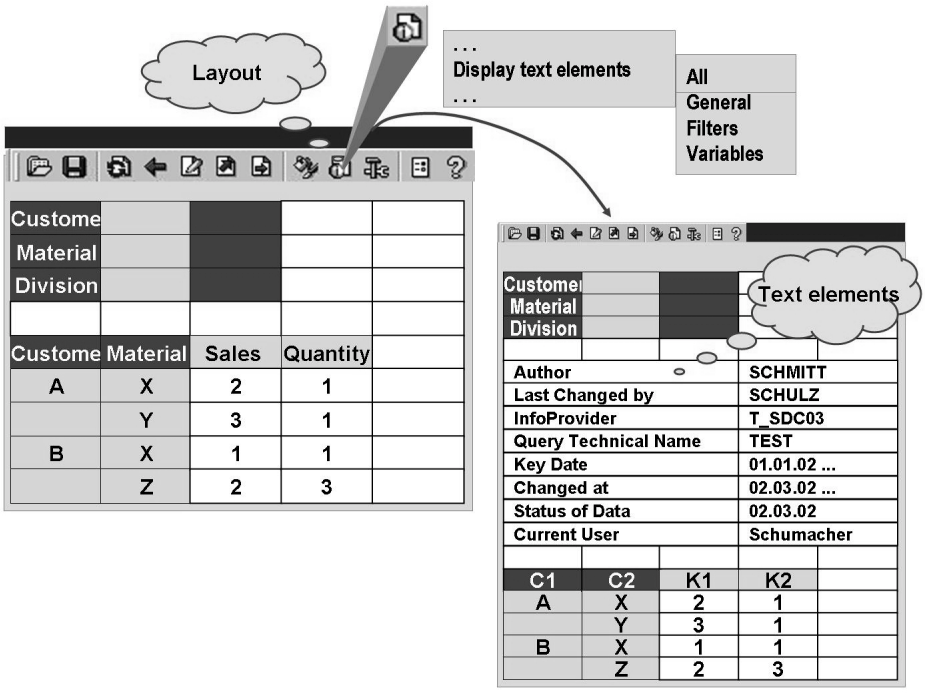

Figure 181: Inserting Text Elements

Publishing the Query on the Web

To publish the query on the Web, save it and choose *Display Query on the Web*.

The query is displayed in a standard Web template. You can change the Web template, if required.

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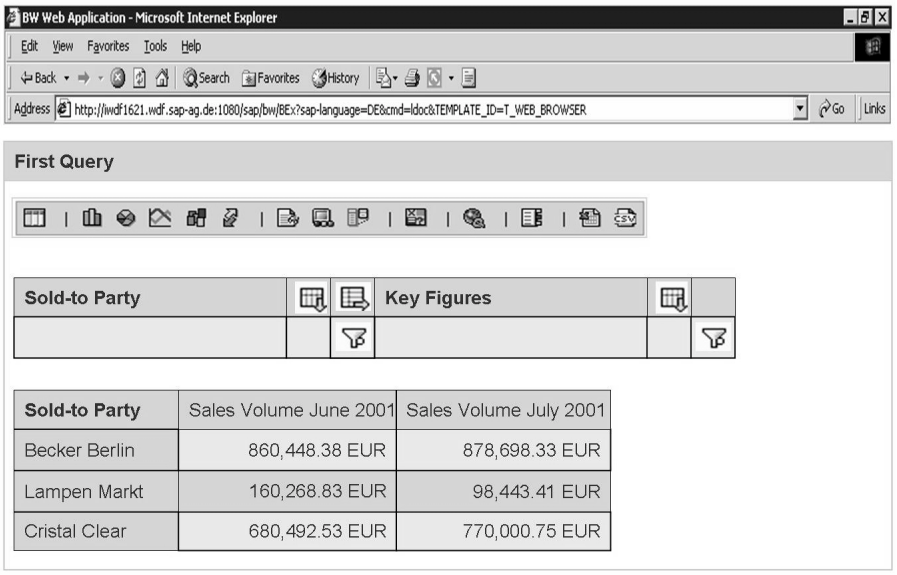

Figure 182: Web Query

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Lesson Summary

You should now be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis in the *BEx Analyzer* and on the Web

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Lesson: BI Migration Aspects

Lesson Overview

This lesson covers the aspects of migrating objects from BW 3.x to NetWeaver 2004s BI.

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the reason for the need to migrate objects from BW 3.x to SAP NetWeaver 2004s BI
- Describe the migration requirements related to the BEx Query Designer
- Describe the migration requirements related to the BEx Analyzer
- Describe the migration requirements related to the BEx Web Application Designer

Business Example

Since your company has already implemented several forms of analysis in SAP BW 3.x, you need to evaluate the migration process to the new SAP NetWeaver 2004s BI platform. You want to learn more about how each BEx tool is affected by the upgrade.

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Migrating to the NetWeaver 2004s BI Environment

- New BEx Tools in SAP NetWeaver 2004s
  - New SAP NetWeaver 2004s frontend features are ONLY available with the new SAP NetWeaver 2004s BEx Tools.
  - Objects that were created with the SAP NetWeaver 2004s BEx tools can no longer be edited with 3.x BEx Tools.
- 3.x Tools on top of SAP NetWeaver 2004s BI
  - To ensure that existing customer scenarios can continue to be edited (mainly for correction purposes), an additional set of 3.x BEx tools is delivered with the SAP NetWeaver 2004s BEx frontend installation.
  - It is possible to work with these 3.x BEx tools in connection with the new SAP NetWeaver 2004s BI Server.
- Transition from BEx 3.x to SAP NetWeaver 2004s BEx Tools
  - Conversion (if possible) occurs when the previous objects are opened in the new tools. This enables transition on an as-needed basis. There is no mass conversion of objects.
  - Converted objects are stored as new objects. Old objects are never automatically deleted.
  - The recommendation is to make the change step by step, because further new features will only be made for the new tools.

Figure 183: BEx Tools and SAP BI

With SAP NetWeaver 2004s, new BEx tools and a new runtime are available in the Business Explorer Suite. At the same time, all of the previous tools and the runtime from SAP BW 3.5 will be delivered in order to guarantee a step-by-step, demand-oriented transition.

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- Usage Type BI Java, including the usage types Portal and AS Java, is required for using the SAP NetWeaver 2004s BEx Suite

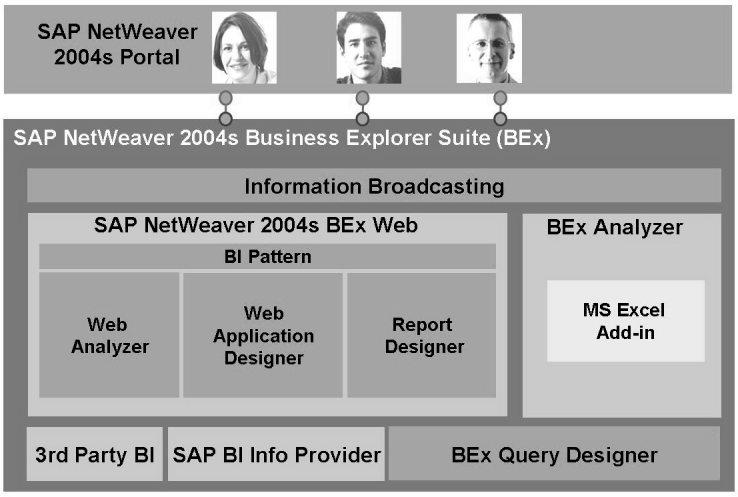

Figure 184: Business Explorer Suite and BI Java

In order to use the new SAP NetWeaver 2004s BI BEx Suite, the usage type BI Java, including the usage types Portal and AS Java, must be installed. The BEx Suite now can access any data source including:

- SAP BI InfoProviders
- SAP and non-SAP OLTP sources
- Other data warehouse sources

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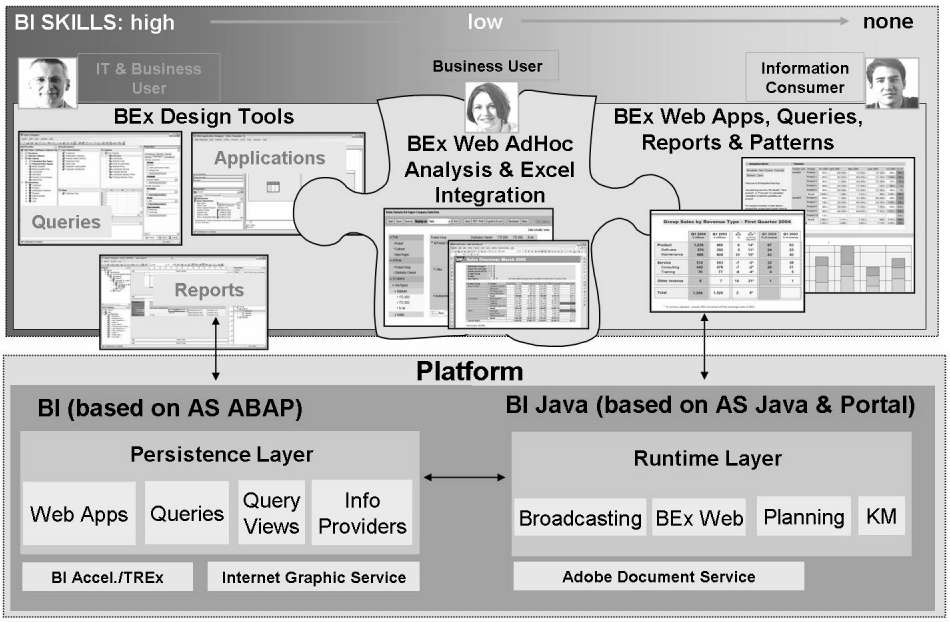

Figure 185: BEx Design and Runtime

The BEx design and runtime environment has expanded with new tools, functions and a new runtime. These tools allow users at all skill levels to perform a wide variety of tasks. The BEx design tools such as the BEx Query Designer, BEx Report Designer and BEx Web Application Designer provide both the IT and Business User groups with the necessary tools to create a wide variety of queries, reports and web applications. The Business User group can also make use of the BEx Web Analyzer and the BEx Analyzer to integrate information from all types of sources.

Information Consumers require virtually no Business Intelligence skills to access needed information via web applications, queries, reports and patterns. Access to these tools is typically provided via objects created by the IT and Business User groups. The platform to support these tools consists of usage types SAP BI and SAP BI Java. These two usage types are used to form a persistence layer and a runtime layer.

Within the NetWeaver AS ABAP stack, a persistence layer is formed supporting the development and execution of web applications, queries, query views and InfoProviders. Additionally, this persistence layer is necessary for the new BI Accelerator functionality based on the TREx search engine.

Within the NetWeaver AS J2EE engine, a runtime layer is formed supporting the BEx Broadcaster, BEx Web, Integrated Planning and Knowledge Management functions of SAP NetWeaver 2004s BI. Here too is the new Adobe Document Service to support web-based printing.

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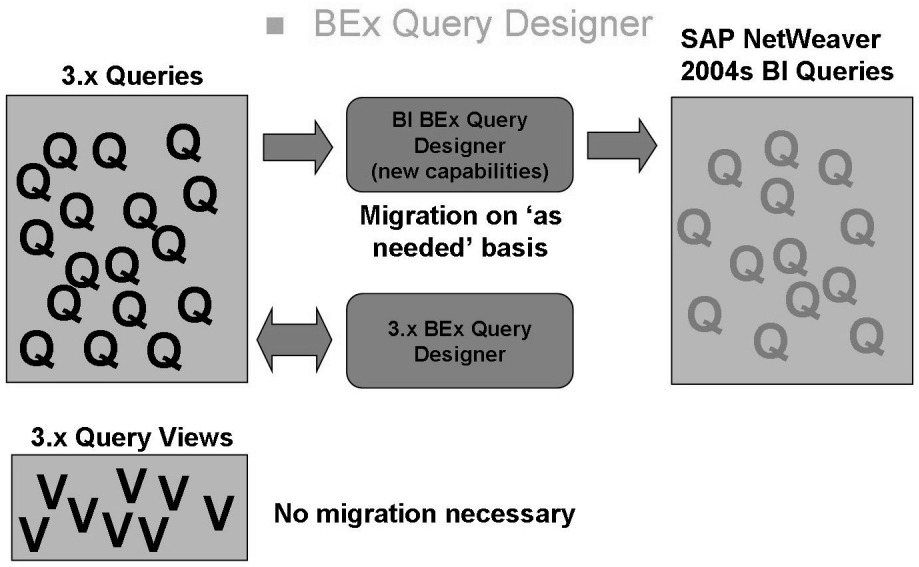

Figure 186: BEx Query Migration to BI

All existing 3.x queries can be edited with the SAP NetWeaver 2004s BEx Query Designer without further manual adaptation. In general there is no migration and there is no new GUID or new objects in the database tables. After editing with the new tool, queries cannot be edited with the 3.x BEx Query Designer anymore.

The system logic allows you to still edit other BW 3.5 queries in the BW 3.5 Query Designer even if they are re-using elements of a query that has been edited with the NW2004s BEx Query Designer as long as the reusable elements use no 2004s features (i.e. planning settings, new aggregation on formulas, variables with multiple default values).

Queries created or adapted with the SAP NetWeaver 2004s BEx Query Designer will still appear in the Open Dialog of the 3.x tool but they cannot be opened anymore. For those scenarios where customers do not want to use the SAP NetWeaver 2004s BEx Query Designer, SAP ships a 3.x version of the BEx Query Designer in addition to the SAP NetWeaver 2004s BEx Query Designer. New capabilities are only implemented in the SAP NetWeaver 2004s Query Designer.

Query Views that were created before will still run after a query has been changed with the new BEx Query Designer. In general, query views do not need to be migrated.

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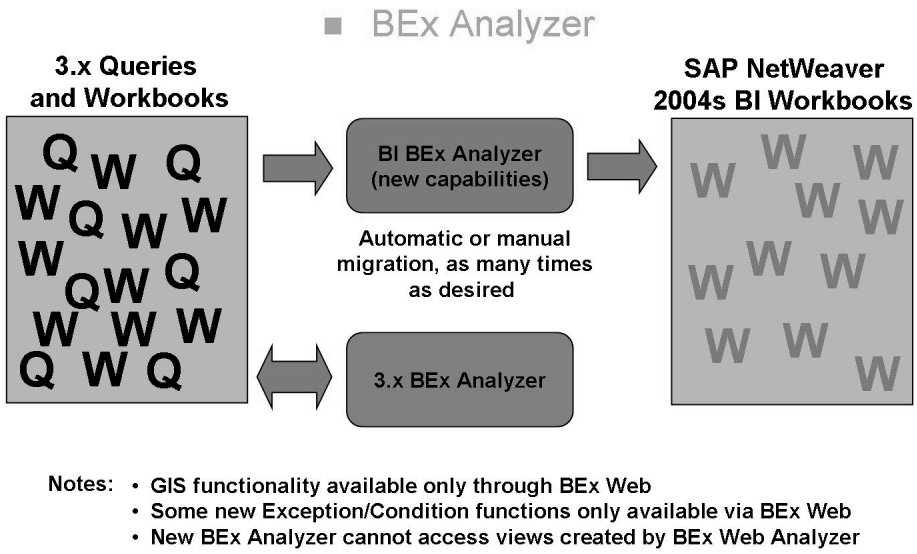

Figure 187: BEx Workbook Migration to BI

Existing BW 3.x queries and workbooks can be opened and executed with the SAP NetWeaver 2004s BEx Analyzer. Standard workbooks are automatically upgraded and workbooks with customer coding will be upgraded with a best guess strategy. Manual adaptation might be necessary to ensure the proper behavior of the workbook. (e.g. customer Visual Basic has to be manually adapted). After saving in the new tool, workbooks cannot be used in the 3.x BEx Analyzer. They will no longer appear in the Open dialog.

For those scenarios where customers do not want to use the SAP NetWeaver 2004s BEx Analyzer, SAP ships a 3.x version of the BEx Analyzer in addition to the SAP NetWeaver 2004s BEx Analyzer. After migration, the old version of a workbook is still available in the old 3.x BEx Analyzer. Migration can be done as many times as need. Old workbooks are not deleted.

New capabilities are only implemented in the SAP NetWeaver 2004s BEx Analyzer. GIS functionality is only available via BEx Web (Web Application Designer). Several features of the new BEx Query Designer and BEx Web (e.g. in the area of exceptions and conditions) are not available in the new BEx Analyzer. SAP does not recommend using NetWeaver 2004s queries and query views in the old 3.5 BEx Analyzer.

The new BEx Analyzer gives access to InfoProviders, queries and query views but not to query views created with the new BEx Web Analyzer. On the other hand, query views created with the BEx Analyzer are available within the new BEx Web Analyzer.

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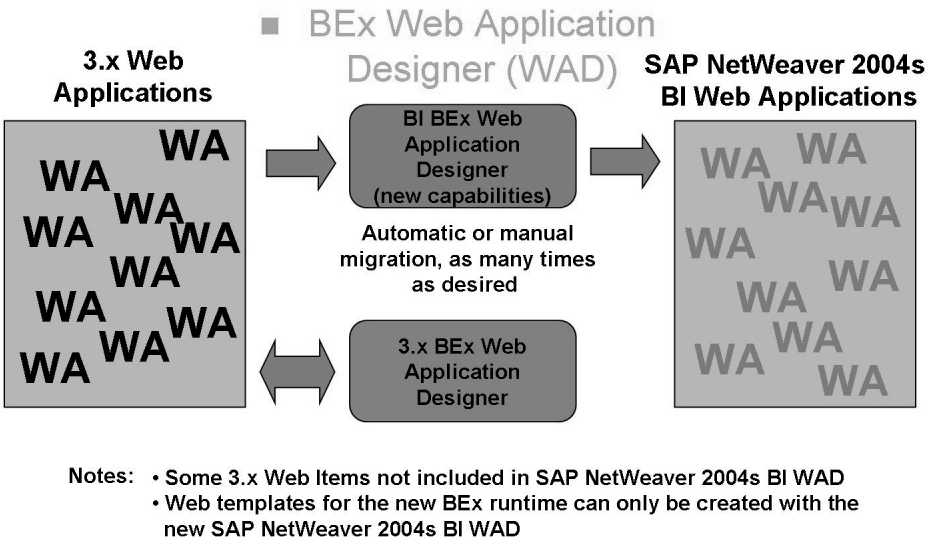

Notes:
- Some 3.x Web Items not included in SAP NetWeaver 2004s BI WAD
- Web templates for the new BEx runtime can only be created with the new SAP NetWeaver 2004s BI WAD

Figure 188: BEx Web Application Migration to BI

SAP ensures that existing customer scenarios continue to be able to be edited with the 3.x WAD that is shipped in SAP NetWeaver 2004s in addition to the SAP NetWeaver 2004s BI WAD. With many new web items in the SAP NetWeaver 2004s BI WAD, some 3.x web items are not included anymore. For example, the Role Menu item is replaced by NetWeaver Portal functionality. Also, the Alert Monitor is replaced by the Universal Worklist within the NetWeaver Portal.

A migration can be triggered if a 3.x web application is opened with the SAP NetWeaver 2004s BI WAD. BEx Web Applications in which certain customer-specific enhancements (e.g. Table Interface, custom Java-Script) were made cannot be automatically converted with SAP NetWeaver 2004s BI WAD. Manual adaptation might be necessary to ensure the proper behavior of the web application.

After saving with the SAP NetWeaver 2004s BI WAD, the migrated version of a web application can no longer be used in the 3.x BEx WAD. Migrated versions will not appear in the open dialog of the old tool. After migration, the previous version of a web application is still available via the previous 3.x BEx WAD. The previous version will still appear in the open dialog of the previous tool. Migration can be done as many times as needed since the previous version of the web application is not deleted. The previous and new versions are stored in different database tables in different formats.

New capabilities are only implemented in the SAP NetWeaver 2004s BI WAD. Web templates for the new BEx Web runtime can only be created with the new SAP NetWeaver 2004s BI WAD. SAP does not recommend using NetWeaver 2004s BI queries and query views in the 3.5 WAD.

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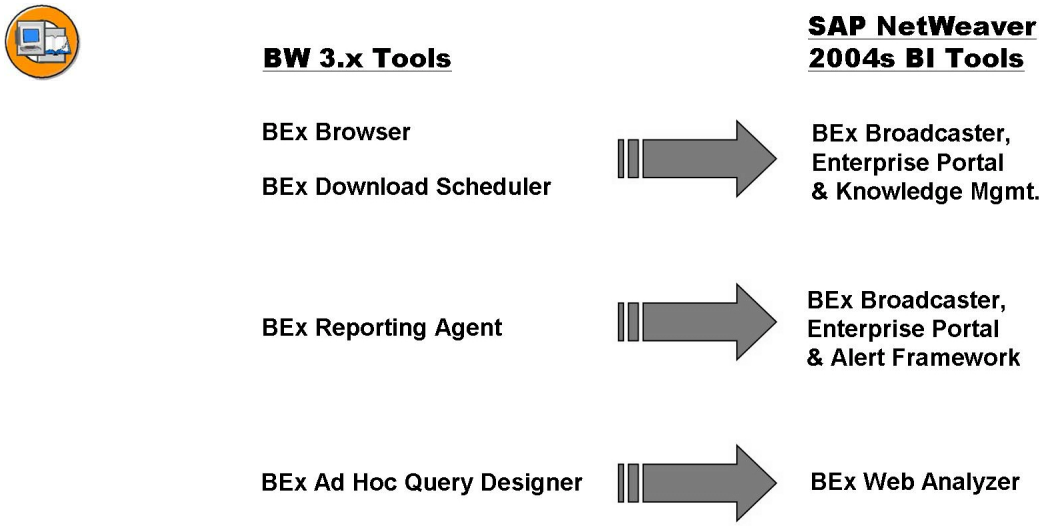

Figure 189: BEx Tool Changes and Replacements

No further development is to be done on the BEx Browser and the BEx Download Scheduler. Their functions are taken over by the SAP NetWeaver 2004s components Portal, KM & BEx Broadcaster. The NW Portal provides a role-based overview of various objects and distribution of documents takes place using the BEx Broadcaster or functions in the BEx Portfolio area and Knowledge Management in the portal.

No further development is to be done on the Reporting Agent. Its functions are taken over by the Broadcaster, the Portal and the NetWeaver Alert Framework. Existing Reporting Agent settings are still available for execution using the 3.x runtime access to the Reporting Agent, so existing scenarios can still be used.

No further development is to be done on the BEx Ad-Hoc Query Designer. It is replaced by the BEx Web Analyzer. In the BEx Web Analyzer, query views can be created based on BEx queries, InfoProviders and third party multidimensional data providers that offer an XMLA or ODBO interface.

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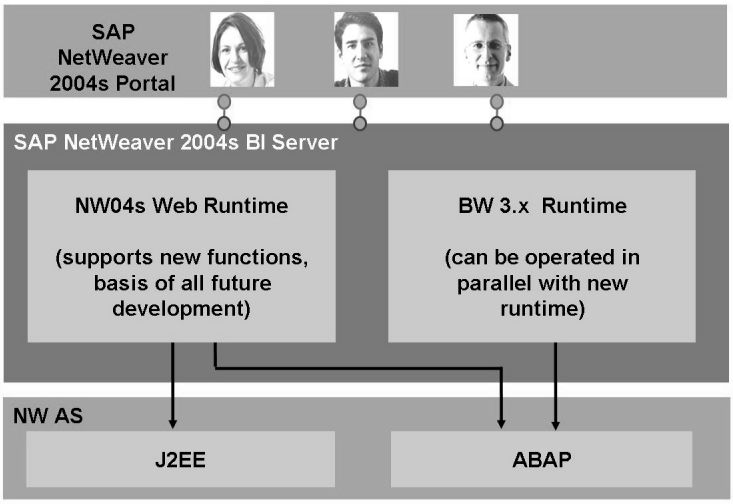

Figure 190: BEx Runtime in BI

New SAP NetWeaver 2004s BI features and functions (e.g. BI-Integrated Planning, Enterprise Reporting and PDF-based printing) are only possible with the new web runtime. This new runtime is based on the technology of the SAP NetWeaver Portal and the NW AS J2EE engine. The new runtime does not support the Table Interface.

The old 3.x runtime is still part of SAP NetWeaver 2004s BI and can be operated in parallel to the new runtime. Therewith SAP ensures that existing customer scenarios continue to run. These scenarios can still be run on the old 3.x runtime within a SAP NetWeaver 2004s BI server. The recommendation is to make the change step by step, since additional new features will only be delivered for the new runtime.

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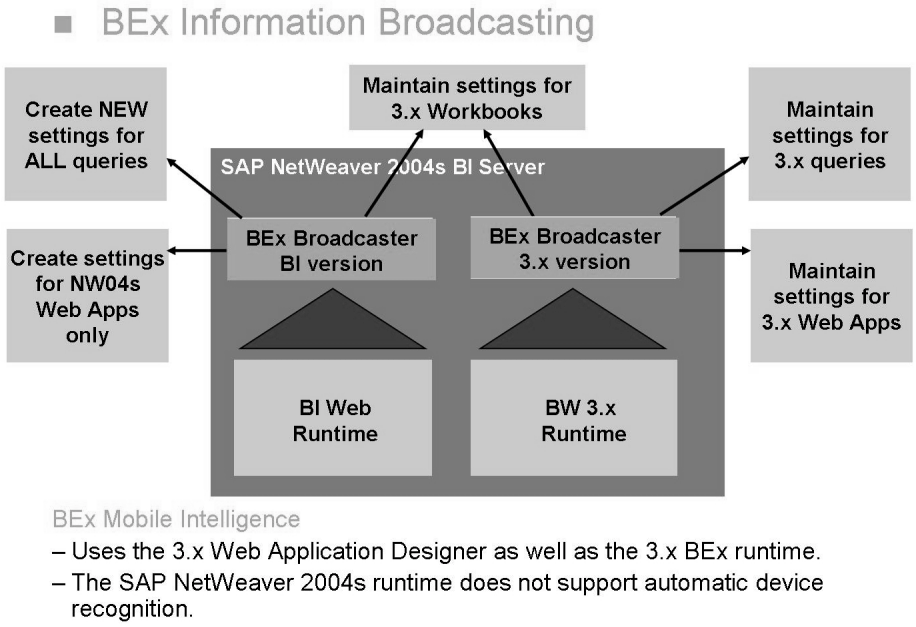

Figure 191: BEx Information Broadcasting and Mobile Intelligence

In SAP NetWeaver 2004s, the BEx Broadcaster is shipped in both a 3.x version and in a SAP NetWeaver 2004s version. The 3.x version is started from the 3.x BEx tools and/or the context menu of Web Applications running on the old runtime. The SAP NetWeaver 2004s version is started from SAP NetWeaver 2004s BEx tools and/or context menu of Web Applications running on the new runtime.

Existing BW 3.x broadcasting settings can still be maintained and processed with the 3.x version of the Broadcaster. If you use the new SAP NetWeaver 2004s Broadcaster, you can build settings on all queries in the system but you have to build them from scratch. You cannot use already existing 3.x broadcasting settings for queries.

You can build settings on all web applications that were built or converted with the SAP NetWeaver 2004s WAD. You cannot build settings on old web applications.

BW 3.x broadcasting settings for workbooks can be used as before. There are no changes.

In order to use Mobile Intelligence (online access to BI queries and web applications via PDAs using automatic device recognition), customers need to use the 3.x Web Application Designer as well as the old 3.x BEx runtime. The SAP NetWeaver 2004s runtime does not support automatic device recognition.

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Summary

New features and functions are only supported with the new BEx Design Tools and the new BEx Runtime. There is no general automatic mass migration of previous scenarios to the new Business Explorer. Migration can be triggered on a 1:1 basis. With migrated web applications or workbooks, program changes that were made (for example using the Web Design API for tables or the Web Design API) cannot be converted. Generally, a manual change needs to be made with the new BEx tools.

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Lesson Summary

You should now be able to:

- Explain the reason for the need to migrate objects from BW 3.x to SAP NetWeaver 2004s BI
- Describe the migration requirements related to the BEx Query Designer
- Describe the migration requirements related to the BEx Analyzer
- Describe the migration requirements related to the BEx Web Application Designer

Related Information

- Additional information on this topic can be found in the SAP Service Marketplace (http://service.sap.com/bi).

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Lesson: Intercompany Elimination

Lesson Overview

In this lesson you will learn about various eliminations performed for internal business volumes.

Lesson Objectives

After completing this lesson, you will be able to:

- Explain the eliminations performed in internal business volumes

Business Example

Your company structure is complex, with many international divisions. When profit centers do business internally, that revenue must be eliminated from the totals at higher levels of the reports to avoid overstating revenue.

Elimination of Internal Business Volumes

The elimination functionality provides ad hoc eliminations similar to accounting consolidations.

SAP BI eliminates the key figure value; this is different from legal consolidation, which is provided in SEM-BCS and R/3-ECCS.

Prerequisite:

- Two InfoObjects: Sender and Receiver, sharing the same master data and in the same hierarchy node
  - e.g., Sending Cost Center ←→ Receiving Cost Center
    Business Area ←→ Partner Business Area
- A special reference key figure
  - Stores the result after elimination
  - Is set up with reference
  - Is added to the InfoCube, but not stored in database

Figure 192: Elimination of Internal Business Volume

With this function you can eliminate the internal business volume by executing a BEx query. Internal business volume is then no longer displayed in the report.

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This solution provides a unique opportunity to do eliminations between partner objects in BI for example. As part of an OLAP scenario, this ad hoc consolidation is very flexible.

BCS stands for Business Consolidation System and is essentially the same as ECCS (Enterprise Controlling Consolidation System) up to version 4.0 of SEM (Strategic Enterprise Management). The 4.0 release of BCS provides full OLAP functionality to do consolidations.

Example: Profit Center PC0301(UK) has internal revenue of $50.00 from Partner Profit Center PC0102 (DE). This revenue must be eliminated for the European rollup.

Record Number	PartnerProfit Center	Profit Center	Country	Partner Country	Revenue
1	PC0102	PC0181	DE	DE	$ 100.00
2	PC0103	PC0203	DE	DE	$ 200.00
3	PC0102	PC0301	UK	DE	$ 50.00
4	#	PC0201	DE	AT	$ 100.00
5	PC0301	PC0201	DE	UK	$ 300.00
6	PC0201	PC0201	DE	CDN	$ 200.00
7	PC0203	PC0302	UK	US	$ 250.00
8	PC0203	PC0302	SGP	DE	$ 150.00
9	#	PC0201	DE	US	$ 80.00
10	PC0201	PC0201	DE	AT	$ 500.00
Overall Result	**Result**	**Result**	**Result**	**Result**	**$ 1,930.00**

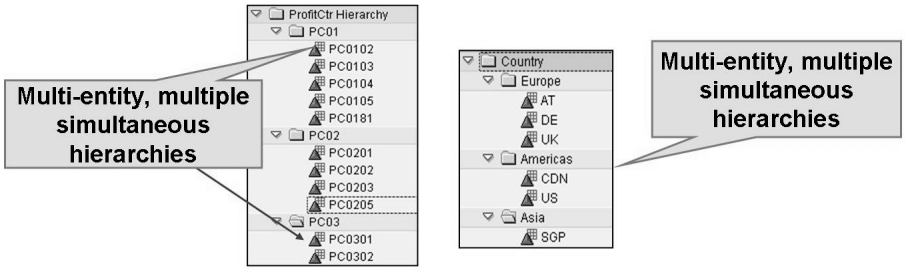

Figure 193: Example: Internal Business Volume Elimination

Eliminations are performed when both the object and partner object belong to the same node of the hierarchy. In your example for the profit center PC0301 and partner profit center PC0102, internal revenue is shown in the third record.

Based on the profit center hierarchy, revenue must be eliminated at the “ProfitCtr Hierarchy” profit center node.

Based on the region hierarchy, revenue must be eliminated at the “Europe” node and the “Country” node.

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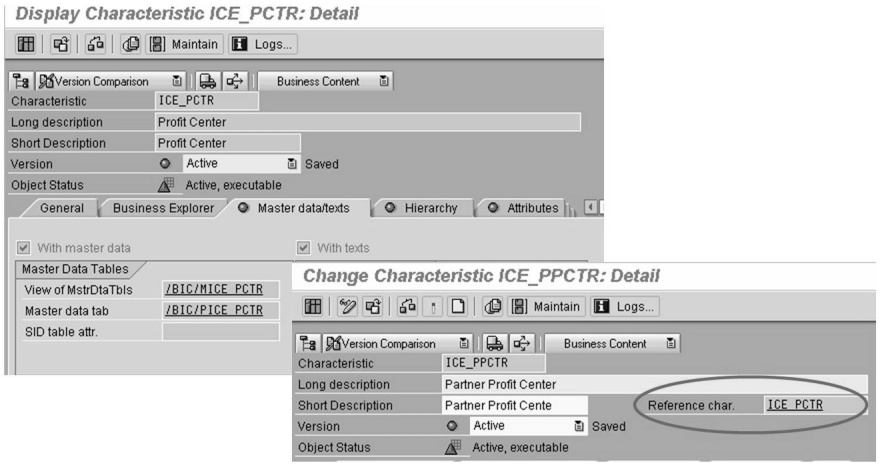

Figure 194: Reference Characteristics

You have an InfoProvider that contains two characteristic InfoObjects (sender and receiver) that have the same master data. This sharing of master data is done by creating one of the characteristic InfoObjects with reference to the other.

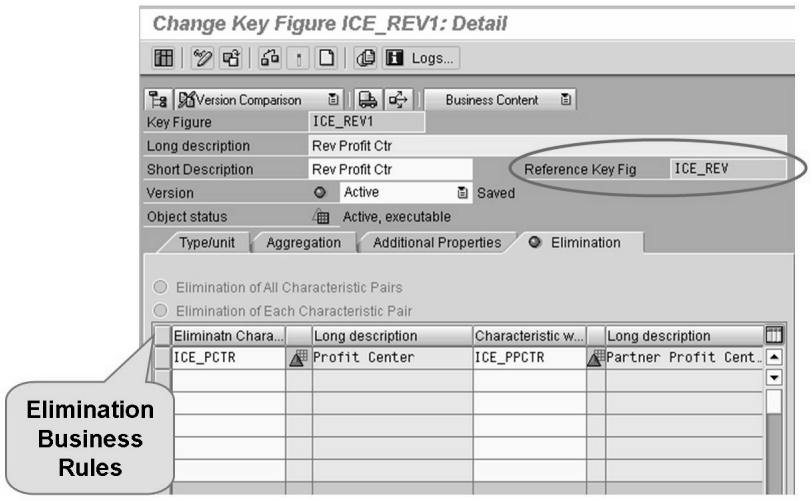

Figure 195: Reference Key Figures

To eliminate internal business volume in an InfoProvider, you als have to create a key figure with a reference to another key figure InfoObject. You then include both of these key figures in the InfoProvider.

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When creating a key figure with reference to another key figure, you select *Key Figure with Reference*. In the InfoObject maintenance you then have an additional tab page, *Elimination*. Enter one or more characteristic pairs here regarding the key figure to be eliminated. The characteristics of such a pair must have the same reference characteristic. You can also enter the names of the navigation attributes here.

You can display permitted characteristics for an elimination characteristic by using the input help.

If several characteristic pairs are maintained, you still have to specify one of the following, using the selection buttons:

- All characteristic pairs need to be eliminated (then the key figure value is only eliminated if the elimination condition described above is fulfilled for all characteristic pairs) => AND
- Each individual characteristic pair needs to be eliminated (then the key figure value is eliminated as soon as the elimination condition for a characteristic pair is fulfilled) => OR

Table RSDICE – Logic for Elimination of Internal Business Volume

KYFNM	OBJVERS	POSIT	IOBJNM1	IOBJNM2	BOOLEOP	BOOLEOP2
ICE_REV1	A	0001	ICE_PCTR	ICE_PPCTR		

KYFNM	OBJVERS	POSIT	IOBJNM1	IOBJNM2	BOOLEOP	BOOLEOP2
ICE_REV2	A	0001	ICE_CTRY	ICE_PCTRY		

KYFNM	OBJVERS	POSIT	IOBJNM1	IOBJNM2	BOOLEOP	BOOLEOP2
ICE_REV3	A	0001	ICE_PCTR	ICE_PPCTR	OR	
ICE_REV3	A	0002	ICE_CTRY	ICE_PCTRY		

KYFNM	OBJVERS	POSIT	IOBJNM1	IOBJNM2	BOOLEOP	BOOLEOP2
ICE_REV4	A	0001	ICE_PCTR	ICE_PPCTR	AND	
ICE_REV4	A	0002	ICE_CTRY	ICE_PCTRY		

Table RSDICE contains the business rules for performing the elimination on the special key figures:

- The characteristic senders and receivers included in the elimination.
- The appropriate Boolean operator (e.g., AND/OR).

Figure 196: Elimination Business Rule

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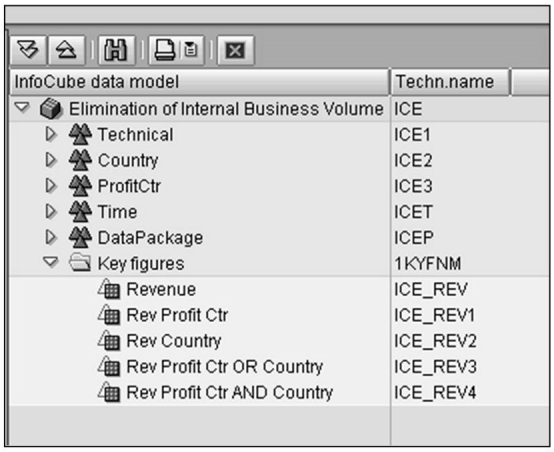
In this example, four eliminations are being performed:

- ICE_REV1 eliminates revenue between a profit center/partner profit center that are assigned to the same node of the profit center hierarchy.
- ICE_REV2 eliminates revenue between a country/partner country that are assigned to the same node of the country hierarchy.
- ICE_REV3 eliminates revenue between a profit center/partner profit center where EITHER the profit centers are assigned to the same node of the profit center hierarchy OR the countries are assigned to the same node of the country hierarchy.
- ICE_REV4 eliminates revenue between a profit center/partner profit center where BOTH the profit centers are assigned to the same node of the profit center hierarchy AND the countries are assigned to the same node of the country hierarchy.



InfoCube ICE is used to reflect the elimination of internal business volume for profit centers.

Figure 197: Elimination InfoCube Data Model

The last step is to add the special key figure to the InfoCube. In this way, it is included in the data model, but not in the database table.

To see the data model: Go to the *Administrator Workbench (RSA1)* → *InfoProviders* → *Search for the ICE InfoCube* → *Right Mouse Click* → *Display Data Model*.

To confirm that only the basic key figure ICE_REV in the fact table, go to transaction *LISTSCHEMA* → *Enter B* for type, then *InfoCube* → *Enter ICE* for the InfoCube name and *Execute* → *Display* table contents for the Fact table.

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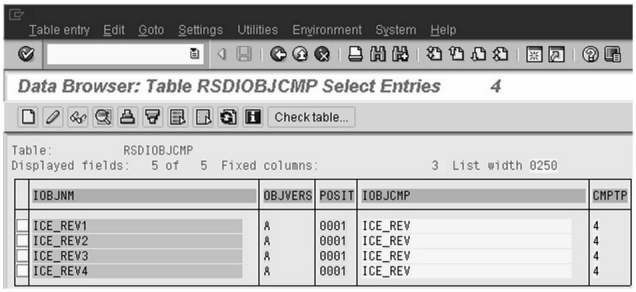
Table RSDIOBJCMP



This is a control table for InfoCube maintenance; the key figure will be part of the data model, but not the database table.

The special key figure InfoObjects are inserted into table RSDIOBJCMP with type Referenced Key Figure.

Figure 198: Establishing Elimination Key Figure

Use SE16 to view the table RSDIOBJCMP as well as the fact table for the ICE InfoCube. (You will NOT see any of the artificial key figures.)

ICE_REV1-4 are artificial key figures referenced to ICE_REV and they use business logic to eliminate transactions between partners, for example.

The values for ICE_REV1-4 are not stored in the database but are calculated by the query.

ICE_QUERY1

Profit Center	Revenue	Rev Profit Ctr
▽ ProfitCtr Hierarchy	$ 50,00	
▽ PC03	$ 50,00	$ 50,00
PC0301	$ 50,00	$ 50,00

ICE_QUERY3

Country	Profit Center	Revenue	Rev PCtr OR Ctry
▽ Country	▽ ProfitCtr Hierarchy	$ 50,00	
	▽ PC03	$ 50,00	
	PC0301	$ 50,00	
▽ Europe	▽ ProfitCtr Hierarchy	$ 50,00	
	▽ PC03	$ 50,00	
	PC0301	$ 50,00	
UK	▽ ProfitCtr Hierarchy	$ 50,00	
	▽ PC03	$ 50,00	$ 50,00
	PC0301	$ 50,00	$ 50,00

ICE_QUERY2

Country	Revenue	Rev Country
▽ Country	$ 50,00	
▽ Europe	$ 50,00	
UK	$ 50,00	$ 50,00

ICE_QUERY4

Country	Profit Center	Revenue	Rev PCtr AND Ctry
▽ Country	▽ ProfitCtr Hierarchy	$ 50,00	
	▽ PC03	$ 50,00	$ 50,00
	PC0301	$ 50,00	$ 50,00
▽ Europe	▽ ProfitCtr Hierarchy	$ 50,00	
	▽ PC03	$ 50,00	$ 50,00
	PC0301	$ 50,00	$ 50,00
UK	▽ ProfitCtr Hierarchy	$ 50,00	$ 50,00
	▽ PC03	$ 50,00	$ 50,00
	PC0301	$ 50,00	$ 50,00

Figure 199: Elimination of Internal Business Volume in Queries

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The elimination is performed when the query is run with the special key figures. The queries above illustrate:

- ICE_QUERY1: “Rev Profit Ctr” is eliminated at the first common node for profit center PC0301 and partner profit center PC0102, which is the ProfitCtr Hierarchy node.
- ICE_QUERY2: “Rev Country” is eliminated at the first common node for country UK and partner country DE, which is the Europe node, and all higher level nodes (Country).
- ICE_QUERY3: “Rev PCtr OR Ctry” is eliminated if EITHER the “profit center” or “country” rule applies.
- ICE_QUERY4: “Rev PCtr AND Ctry” is eliminated if BOTH the “profit center” and “country” rules apply.

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Lesson Summary

You should now be able to:

- Explain the eliminations performed in internal business volumes

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Unit Summary

You should now be able to:

- Describe the functions of the *BEx Query Designer*
- Define your own queries and modify these when necessary
- Publish reports for analysis in the *BEx Analyzer* and on the Web
- Explain the reason for the need to migrate objects from BW 3.x to SAP NetWeaver 2004s BI
- Describe the migration requirements related to the BEx Query Designer
- Describe the migration requirements related to the BEx Analyzer
- Describe the migration requirements related to the BEx Web Application Designer
- Explain the eliminations performed in internal business volumes

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Test Your Knowledge

1. Which type of elimination is performed for eliminating revenue between a country and partner country that are assigned to the same node of the country hierarchy?

   Choose the correct answer(s).

   - □ A ICE_REV1
   - □ B ICE_REV2
   - □ C ICE_REV3
   - □ D ICE_REV4

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Answers

1. Which type of elimination is performed for eliminating revenue between a country and partner country that are assigned to the same node of the country hierarchy?

   Answer: B

   ICE_REV2 elimination is performed for eliminating revenue between a country and partner country that are assigned to the same node of the country hierarchy.

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Course Summary

You should now be able to:

- Outline the architecture and reporting structure in *NetWeaver BI*
- Analyze reports in the *Business Explorer Analyzer (BEx Analyzer)* and on the Web by using the navigation functions
- Evaluate the data set in SAP BI by defining queries using the *BEx Query Designer* or the *BEx Web Analyzer* and executing them in the *BEx Analyzer* and in the standard layouts on the Web
- Use Information Broadcaster to distribute reports via Email and the Enterprise Portal
- Integrate documents in reports
- Configure the Report-Report-Interface for navigating within *NetWeaver BI* and for jumping into other attached systems
- Evaluate reports in the Business Content by using the Metadata Repository and the Business Content Browser

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Glossary

Ad-hoc Query Designer

Web item that enables you to create and change ad hoc queries in a Web application. You can use the Web item Ad-hoc Query Designer in the Web Application Designer to design Web applications in which you can create or change queries

Alert Monitor

A monitoring tool for displaying exceptions whose threshold values have been exceeded or have not been reached. The critical exceptions are found in background processing with the help of the reporting agent. They are then displayed in the alert monitor as a follow-up action. Exceptions are displayed in the BEx Analyzer as well as in the reporting agent scheduler of the Administrator Workbench. Exceptions can also be displayed as an alert monitor in a Web application. Significance in BEx Web Reporting: Web item that displays the query views, which were found in background processing (with the help of the reporting agent) as a list or hierarchy in a Web application. You can jump between query views and see at a glance conspicuous key figure values that deviate from the defined threshold values. You can also set filters.

Analytical applications

A key functional area of mySAP Business Intelligence that integrates business processes, provide predefined closed-loop business scenarios and predefined metrics that measure business operations' effectiveness and enable users to take immediate corrective action. Analytics within mySAP BI are built on consistent data stored in the data warehouse.

Attribute

InfoObjects that are logically assigned or subordinated to a characteristic and that cannot be selected in a query.

BEx Analyzer

Analytical and reporting tool in the Business Explorer that is embedded in Microsoft Excel. In the Business Explorer Analyzer, you can analyze selected InfoProvider data by navigation to queries created in the BEx Query Designer and can create different query views for the data.

BEx Mobile Intelligence

The process of using Web applications on mobile devices that have an online connection to a BI system.

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BEx Query Designer

Tool for defining queries that are based on a selection of characteristics and key figures (InfoObjects) or on reusable InfoProvider structures. In the BEx Query Designer, you can parameterize queries by defining variables for characteristic values, hierarchies, hierarchy nodes, texts or formulas. You can specify the selection of InfoObjects more precisely by: Restricting characteristics and key figures by characteristic values, characteristic value intervals and hierarchy nodes Defining calculated and restricted key figures for reuse Defining structures for reuse Defining exceptions Defining conditions Defining exception cells You can use all queries that you define in the BEx Query Designer for OLAP reporting, and also for flat reporting.

BEx Web Application Designer

Desktop application for creating Websites with BW contents. With the BEx Web Application Designer you can create an HTML page that contains BW-specific contents, such as different tables, charts, or maps. This HTML page serves as the basis for Web applications with complex interactions like BI Cockpits. You can save the Web applications as a URL and access them by using the intranet or by using mobile terminals. Additionally, you can save the Web applications as an iView and integrate them into an enterprise portal.

Business Content

Predefined role and task-related information models that can be suited to enterprise-specific requirements. Business Content makes the supply of information available to roles in an enterprise, that require this to complete tasks. Business Content essentially consists of roles, workbooks, queries, InfoCubes, InfoObjects, InfoSources and update rules, as well as extractors, for SAP R/3, SAP New Dimension Applications and for additional selected applications.

Characteristic

Type of InfoObject. An evaluation group such as company code, product, customer group, fiscal year, period, or region. Characteristics provide classification possibilities for the dataset. An InfoCube generally contains only a partial quantity of the characteristic values from the master data table at a time. The master data includes the permitted values for a characteristic, also called characteristic values. Characteristic values are discrete names.

Chart

Web item that retrieves data from a query view to create a diagram for a Web application. You can choose from a range of display options for the diagram. You can also navigate within interactive charts and analyze the displayed data.

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Context Menu

A list of functions displayed next to the mouse pointer when you click the right-hand mouse button. The context menu displays the currently available functions. To select a function from the list, you either click on the function or press the corresponding function key on the keyboard.

Crystal report

BI object type. Report definition created using the Crystal Reports Designer and saved in BI. In a Crystal Report, several queries can be imbedded with several queries (similarly to an EXCEL workbook). A Crystal Report contains no current data.

DataStore object

Object that stores consolidated and cleaned transaction data on a document level. A DataStore object describes a consolidated dataset from one or several InfoSources. This dataset can be evaluated using a BEx query. A DataStore object contains a key (for example, document number, position) as well as data fields that, as key figures, can also contain character fields (for example, customer). You can update DataStore object data into InfoCubes or other DataStore objects in the same system or a different system using a delta update. In contrast to multi-dimensional data stores for InfoCubes, data in DataStore objects is stored in transparent, flat database tables.

Drag and Relate

A function that enhances browser-based navigation. Drag and Relate allows you to execute transactions across different systems by linking data from one application to data in another application. You simply select a business object (for example, a purchase order) by clicking and drag it onto another object (for example, a link to an external Web page) on the Launch Pad and the system performs an activity (for example, the delivery status of the purchase order is displayed).

Dropdown box

Web item that places characteristic values for filtering in a Web application in a dropdown box.

Exception

A deviation from a defined threshold value. Exceptions are defined in the Query Designer and can be evaluated either online (in BEx Web Applications, BEx Mobile Applications, or in the BEx Analyzer), or in the background, using the Reporting Agent. Exceptions are defined by setting the threshold values or intervals, which are given a priority (bad, critical, good), and by determining the areas of the query for which the exception is valid. In the evaluation, the areas of the query lying above or below the threshold are marked in different colors. Up to nine shades of the red, yellow, and green traffic light colors are used here.

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Filter
Web item that displays those filter values for a query view in a Web application that you created when navigating. Also allows you to select single values

InfoCube
Objects that can function both as data targets as well as InfoProviders. An InfoCube describes a self-contained dataset (from the reporting view), for example, for a business-oriented area. This dataset can be evaluated with the BEx query. An InfoCube is a quantity of relational tables that are created according to the star schema: a large fact table in the center, with several dimension tables surrounding it.

InfoObject
Business evaluation objects (for example, customers or sales) are called InfoObjects in BI. InfoObjects are subdivided into characteristics, key figures, units, time characteristics, and technical characteristics (such as request numbers).

InfoProvider
Objects for which the queries in SAP BI can be created or executed. There are two types of InfoProviders. One type includes objects that contain physical data. These are known as data targets, such as InfoCubes, DataStore objects, and InfoObjects (characteristics with attributes, texts, or hierarchies). The other type includes objects that display no physical data storage, such as InfoSets, Virtual Providers, and MultiProviders. InfoProviders are the objects or views that are relevant for reporting.

InfoSet
A semantic view of DataStore objects, InfoCubes and InfoObjects (characteristics with master data) that allows you to create reports on these objects, particularly on the joins between these objects. Unlike the classic InfoSet, this view of data is BI-specific. In the InfoSet builder, InfoSets are created and changed. InfoSets allow you to use the Query Designer to define reports.

Key Figures
A quantifiable measure of the technical, commercial and personal performance in a company. Key figures can be used to assess performance, profitability, productivity, and liquidity both within an organization and between one organization and another.

Label
Web item with which you display characteristic, attribute, and structure component descriptions, and with which you can set a link to the context menu for the characteristic, attribute, or structure component

Map
Web item containing all the information needed to display a geographical map in a Web application.

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Metadata
Data about data. Metadata describes the origin, history, and other aspects of data.

Metadata Repository
Provides central access to information about metadata objects in SAP BI: Information about active objects in the system (activated objects) Information about SAP delivery objects in the system (Business Content) The metadata repository provides the following functions: Metadata search Metdata exchange HTML page exports Graphical object display

MIME Repository
Central repository for MIME objects in an SAP system. The MIME Repository allows you to store MIME objects such as style sheets, icons and graphics as objects in the SAP database. You display the contents of the MIME Repository in a browser, which is integrated into the Object Navigator. All objects in the Repository are arranged in a hierarchy and grouped together in directories. Both the directories and the MIME objects themselves use the SAP development infrastructure. This allows you, for example, to write updates such as the importing of new MIMEs into a transport request to the MIME Repository.

MultiProviders
Type of InfoProvider that combines data from several InfoProviders and makes it available for reporting. The MultiProvider itself contains no data; its data comes exclusively from the InfoProviders on which it is based (collated using a union operation). You can assemble a MultiProvider from different combinations of InfoProviders. MultiProviders, like InfoProviders, are objects or views that are relevant for reporting.

Multipurpose Internet Mail Extensions (MIME)
Standard that enables you to send sound, video and binary files over the Internet without first converting them to ASCII format. Multipurpose Internet Mail Extensions (MIME) are organized into MIME types and subtypes that are able to interpret the contents of different documents. For example, the MIME type/subtype text/html refers to a text in HTML format. Web browsers and Web servers use MIME to interpret the files they send and receive.

Navigation
Analysis of the InfoProvider data by displaying different views on the data of a query or a Web application. With the aid of the various navigational functions, such as: 'Fix as Filter Value' 'Insert Drilldown According to' You can generate different views of the data (query views) that are presented in the results area of the query or Web application. Changing views is considered to be navigation.

Navigation Area
An object in the displayed query results that includes the characteristics, navigation attributes and structures available for navigation.

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Navigation Attributes
Attributes that you can select in the query.

Node
Objects that create a hierarchy. A node can have subnodes. We differentiate between two types of nodes: Postable nodes Unpostable nodes "

Personal Digital Assistant (PDA)
A hand-held device combining computing, telephony, and networking functions. A personal digital assistant (PDA) with Open PS can connect to the SAP system.

Query
Collection of a selection of characteristics and key figures (InfoObjects) for the analysis of the data of an InfoProvider. A query always refers exactly to one InfoProvider, whereas you can define as many queries as you like for each InfoProvider. You define a query in the BEx Query Designer, in which you select InfoObjects or reusable structures for an InfoProvider and specify the view of the data (query view) by distributing them to filters, rows, columns, and free characteristics. You used this saved query view as a basis for data analysis and reporting in the BEx Analyzer, in BEx Web applications, in BEx Mobile Intelligence, or in formatted reporting.

Radio button group
Web item that allows you to filter characteristic values using a group of radio buttons.

RemoteCube
InfoCube whose transaction data is not managed in SAP BI, but rather externally. Only the structure of the RemoteCube is defined in BI. The data for reporting is read from another system using a BAPI.

Role
Combination of similar positions. Example: The role “Purchasing Manager” covers the responsibility for orders in the framework of providing basic material, goods and business methods. The task area of the Purchasing Manager entails optimizing the relationship between price and value. Included in the task area of the Purchasing Manager are managing the order process, determining purchasing policies, and procurement market research (process tasks). The Purchasing Manager also plays the role of a superior, that is, he/she supervises the efficiency of the order process, controls the cost center data and is responsible for personnel administration in his/her area (administrative activity functions).

SAP BI
A set of solutions providing a comprehensive toolset for data warehousing, knowledge management, and data analysis delivered through an enterprise portal.

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Text Elements

Web item that displays query information on which the query view, and consequently the Web application, are based. You can select individual text elements to be displayed in the Web application. The 'text element' Web item can contain variables, static filter values, and general text elements (for example, technical name of the query, the query key date, or query author).

Text Variables

Variable for creating language-specific texts.

Web Application Designer

Desktop application for creating web sites with BI contents. With the BEx Web Application Designer you can create an HTML page that contains BI-specific contents, such as different tables, charts, or maps. This HTML page serves as the basis for Web applications with complex interactions like BI Cockpits. You can save the Web applications as a URL and access them by using the intranet or by using mobile terminals. Additionally, you can save the Web applications as an iView and integrate them into an enterprise portal.

Web item

An object that retrieves data from a data provider and presents it as HTML in a Web application.

Web templates

An HTML document that determines the structure of a Web application. It contains placeholders for Web items, data providers, and BW URLs.

Wireless Application Protocol (WAP)

Transfer protocol optimized for the compressed transfer of WML contents to the cellular phone network.

Workbook

A file containing several worksheets (an expression from Microsoft Excel terminology). You insert one or more queries in the workbook in order to be able to display them in the Business Explorer Analyzer. You can save the workbook in your favorites or in your roles.

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