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100 Things You Should Know About
SAP NetWeaver® BW
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Introduction

This book is part of SAP PRESS’s small series of reference books that’s based on 100 tips and tricks for various SAP software components and platforms that come directly from industry experts. It’s designed to make reading and understanding SAP topics more interesting and accessible for your day-to-day work. The tips in this book have been carefully selected to help you gain access to the expert SAP NetWeaver BW knowledge that otherwise might take you years to accumulate. Each part of this book covers a particular task area of SAP NetWeaver BW, but each tip is standalone, so you can look through the book to find the topic you want without having to read an entire chapter.

SAP NetWeaver Business Warehouse is one of SAP's key business intelligence platforms. It is applicable across the entire SAP portfolio, and working with it requires a vast array of knowledge. While the purpose of this book is not to give you a complete overview of the platform, you will benefit from reading the tips in this book to supplement your knowledge or learning to find special insight into the system.

How to Read This Book
This book is organized into five parts, with each part covering a major task within the SAP NetWeaver BW system.

- Part 1, SAP NetWeaver BW Data Modeling: This part of the book will provide insights into some of the most critical aspects of data modeling, beginning with the concept of data warehousing and working with the architecture of SAP NetWeaver BW.

- Part 2, SAP NetWeaver BW Reporting and Analysis: Here you’ll find many tips and tricks that will help you to implement, execute, and optimize reporting and analysis functions with SAP Business Explorer (SAP BEx) tools.

- Part 3, SAP NetWeaver BW Data Flow: This section will cover key topics in the data flow, specifically the extraction, transformation, and loading (ETL) process.

- Part 4, SAP NetWeaver BW Administration and Development: This section will cover some key topics in the administration of the SAP NetWeaver BW system, including system performance optimization and tuning.
Part 5, Integration: This section will cover tips and tricks on SAP NetWeaver BW integration areas such as SAP Data Services, SAP BusinessObjects Business Intelligence tools, and SAP HANA.

Who This Book is For
Each tip in this book aims to replicate a scenario in which a skilled SAP expert is by your side, demonstrating how to best and most efficiently accomplish a task. It assumes a basic knowledge of functionality in SAP NetWeaver BW on your part. This book should be used as a companion and supplement for consultants and users who are working with this platform.
Enabling Dynamic Calculations in BEx by Using the Master Data Attribute Value in the Formula Variable

You can use the master data attribute value in the formula variable to derive calculated key figures in BEx.

Certain business scenarios require dynamic calculations in a BEx query based on the attribute value of the master data. Usually, you can do this by including the attribute value in the InfoProvider and using that value for the calculation. However, in scenarios where the attribute value changes very often, using the value from the InfoProvider won’t work because the value of the attribute will be stored in the InfoProvider and won’t reflect any changes unless the InfoProvider is reloaded with data. Instead, you can use the attribute from the master data because master data is typically loaded more frequently and should always have the most recent value.

This tip describes how to create a formula variable using a master data attribute value as the replacement path and using the formula variable for calculating key figures in BEx.

✔ And Here’s How ...

In this tip, we’ll explain how to dynamically calculate the total cost of a material using the value of price in the material master. In this case, the total cost of material
Enabling Dynamic Calculations in BEx

will not be calculated in the transformations. The material price will not be part of the InfoProvider but will instead be used in the formula variable in BEx from the attribute value of the material.

Follow these steps to set up the scenario:

1. Log in to SAP NetWeaver BW and use Transaction RSD1 to create a new master data object named “ZMATERIAL”. Go to the Attributes tab and add OPRICE as an attribute (see Figure 1).
2. Save and activate the InfoObject. The attribute OPRICE will hold the value for the material price.

3. Create a test DSO ZTEST_MT, and include ZMATERIAL and OQUANTITY in the DSO. Load data for the DSO and ZMATERIAL using the regular ETL process.
4. Using the BEx Query Designer, create a simple BEx query on the DSO using sales document number & ZMATERIAL as characteristics and OQUANTITY as the key figure.
Your next step is to create a calculated key figure based on the master data attribute. Follow these steps:

1. Open the BEx query in change mode, and create a new calculated key figure named CKF_MT. In the screen for CALCULATED KEY FIGURE, right-click on the FORMULA VARIABLE option under AVAILABLE OPERANDS, and select the NEW VARIABLE option.

2. In the next screen, name the variable "FMVAR_MT". In the PROCESSING BY dropdown box, select REPLACEMENT PATH. As soon as you select REPLACEMENT PATH as the processing type, the screen will show another field for entering the reference characteristic. Select ZMATERIAL as the reference material.

You have now created a calculated key figure CKF_MT, which is based on a formula variable derived from an attribute value 0PRICE of ZMATERIAL master data object. This key figure will now calculate the material cost based on the value of 0PRICE in the ZMATERIAL InfoObject. Follow these steps:

1. Go to the REPLACEMENT PATH tab on the CHANGE VARIABLE screen. In the REPLACE WITH field, select the ATTRIBUTE VALUE option. Also in the field attribute, select 0PRICE from the dropdown box. Click on OK, and you will be back in the CHANGE CALCULATED KEY FIGURE screen.

2. In the CHANGE CALCULATE KEY FIGURE screen, drag and drop both 0QUANTITY from the KEY FIGURES section and the newly created formula variable FMVAR_MT to the DETAIL VIEW box. From the OPERATORS section, use the multiplication operator to calculate the material cost as shown in Figure 2.

![Figure 2 Defining the Calculated Key Figure Using the Formula Variable](image-url)
Creating a Custom Method to Search for Invalid Characters in an InfoObject

You can create a custom function module to help prevent load failure by checking for invalid characters in an InfoObject.

Handling invalid characters is always a problem in SAP NetWeaver BW and is a common cause for load failures. This tip describes a method you can use to check for invalid characters on text fields that are extracted from source systems in SAP NetWeaver BW. We'll show you how to create a custom function module to code the logic necessary to check a text field for invalid characters in SAP NetWeaver BW so that you can attempt to convert to a valid character prior to stopping the extraction due to an invalid character error.

✅ And Here's How ...

The ABAP logic discussed here will call a standard function module RSKC_CHAVL_OF_IOBJ_CHECK in SAP to check for invalid characters against permitted characters in Transaction RSKC and the standard character set allowed in SAP NetWeaver BW.

First, create a function module ZFIX_INVCHAR_CHAR with input parameters to pass the InfoObject name and the field content containing the text string that needs to be checked for invalid characters (see Figure 1). In this case, I_LOWE_CASE will contain the text string and I_INFOOBJECT will have the name of the InfoObject.
Tip 68  Creating a Custom Method to Search for Invalid Characters in an InfoObject

This function module, if passed by a string, should check for invalid characters and convert them to blanks if found. The function module will call SAP-delivered, standard function module RSKC_CHAVL_OF_IOBJ_CHECK to pass the entire string to check if any invalid characters are found. If it returns `sy-subrc NE 0`, then it means the text string contains an invalid character as defined in your SAP NetWeaver BW system, including any allowed characters maintained in Transaction RSKC.

If invalid characters are found, loop further through the content of the text field one character at a time and check for invalid characters. When found, replace them if needed using a valid character such as a blank or another special character that is identifiable as a character that replaced the invalid character. This helps to filter in a query or backend to produce a report for the source system to fix the data for reprocessing.

If the `Lower Case Enabled Infoobject` flag is checked for the InfoObject in RSD1, add the optional parameter `I_LOWER_CASE = 'X'` when calling this method to prevent the method from converting to uppercase. Otherwise, you don’t need to include the optional parameter `I_LOWER_CASE` when calling this method. Use this method to check and convert invalid characters only on a `CHAR` field.

Optionally, you can also code logic to check if the entire string has a value of `"#"` or `"!"` and blank out the entire output string so that SAP NetWeaver BW doesn’t flag this as an error.

The sample code to implement the preceding logic in function module `ZFIX_INVCHAR_CHAR` is as follows:

```plaintext
**---------------------------------------------------------------
** This method, if passed a string, will check for invalid
```
characters & convert to blanks if found. If lowercase flag is checked for the InfoObject in RSD1, Add the optional parameter I_LOWER_CASE = 'X' when calling this method to prevent the method from converting to uppercase. Otherwise, you do not need to include the optional parameter I_LOWER_CASE when calling this method. Use this method to check and convert invalid characters only on a CHAR field.

Local Interface:

IMPORTING
  REFERENCE(I_INFOOBJECT) TYPE RSD_IOBJNM
  REFERENCE(I_INP_STRING) TYPE ANY
  REFERENCE(I_LOWER_CASE) TYPE C OPTIONAL

EXPORTING
  REFERENCE(O_OUT_STRING) TYPE ANY

DATA:
  lv_length LIKE sy-Index,
  lv_char TYPE c,
  lv_index TYPE sy-index.

CLEAR : O_OUT_STRING.

  O_OUT_STRING = I_INP_STRING. "source field
* If Lower Case Enabled flag is set, do not convert the input
* field to upper case.
*

IF I_LOWER_CASE IS INITIAL.
  TRANSLATE O_OUT_STRING TO UPPER CASE.
ENDIF.

IF O_OUT_STRING = '#'.
  CLEAR O_OUT_STRING.
ELSEIF O_OUT_STRING(1) = '!' .
  O_OUT_STRING(1) = ' '.
ENDIF.
Creating a Custom Method to Search for Invalid Characters in an InfoObject

* Check the entire input field to see if it contains any invalid characters to see if further check needs to be done at a character level to replace them with blank.
* If no invalid character is found, no further checks will be necessary.

IF sy-subrc NE 0.

* Since the above check determined that there may be one or more invalid characters in the input field, check individual characters in the input field to see if any of characters are invalid and replace them with blank.

lv_length = STRLEN( O_OUT_STRING ).

DO lv_length TIMES.

lv_index = sy-index = 1.
lv_char = O_OUT_STRING+lv_index(1).

CALL FUNCTION 'RSKC_CHAVL_OF_IOBJ_CHECK'
EXPORTING
  i_chavl   = O_OUT_STRING
  i_iobjnm  = I_INFOOBJECT
EXCEPTIONS
  chavl_not_allowed = 1.
  OTHERS            = 2.

IF sy-subrc NE 0.

  IF lv_char = '#' OR
     lv_char = '!'.
    O_OUT_STRING(1) = ' '.
  ENDIF.
ENDIF.
ENDDO.
Narrowing Down Data Selection on MultiProviders with Query Pruning

You can improve system performance for reporting in SAP NetWeaver BW by using the query pruning functionality to optimize reading access.

Generally, when queries are executed on a MultiProvider, the system performs a data selection on all InfoProviders that are part of the MultiProvider, even though the data selection made is applicable for only one InfoProvider. This data selection approach can slow the query execution time, particularly if the query needs data from only specific InfoProviders within the MultiProvider.

This tip describes a query pruning functionality that helps to identify which InfoProvider the query has to fetch data from. This is based on the selection made during execution of the query, and retrieves data from the relevant InfoProvider in the MultiProvider. With this approach, the end user gets vastly improved performance on the SAP Business Explorer (BEx) queries that are built on MultiProviders. This is a simple technique that is easy to set up and, if used for the right scenarios, can help improve the performance of the queries.

☑️ And Here’s How ...

This method of query pruning automatically determines the base InfoProvider(s) in a MultiProvider that needs to be restricted for querying based on a partitioning criteria that is maintained in a table on the SAP NetWeaver BW side. This solution
will work only on MultiProviders that only have InfoCubes as base InfoProviders and will not work on DataStore Object (DSO) InfoProviders.

To do this, you first need to maintain the partitioning criteria in the customizing table RRKMULTIPROVHINT on the SAP NetWeaver BW system. Follow these steps:

1. Go to Transaction SE16, enter the table name as “RRKMULTIPROVHINT”, and click on the Create icon. Access Table RRKMULTIPROVHINT, and specify the MultiProvider and a Characteristic for partitioning.
2. The Change View screen appears. Click on the New Entries icon.
3. Specify the name of the MultiProvider that you are trying to optimize and also characteristic(s) that can be used for partitioning. In this case, we will use an existing MultiProvider “ZM_TEST1” and use the characteristic “0COUNTRY” as the partitioning criteria. 0COUNTRY will now be set as a global filter for all queries on this MultiProvider (see Figure 1).

![Figure 1 Creating a New Entry for the MultiProvider and Partitioning Criteria](image)

When the query is executed, based on the selection made on 0COUNTRY, the system will fetch the data from the relevant PartProvider.

During the query execution time, the PartProviders that aren’t needed are automatically filtered out. Because we have specified 0COUNTRY as the partitioning criteria for the MultiProvider, the OLAP processor will determine which InfoCubes in the MultiProvider can return data for the value of the country that is selected in the query. Based on this, the data manager will completely ignore the remaining InfoCubes that do not have the value.
Enabling the Use of SAP BusinessObjects Explorer in an SAP NetWeaver BW on SAP HANA Environment

You can expose SAP NetWeaver BW InfoProviders to SAP BusinessObjects Explorer to enable search and exploration functionality for end users to look for data that’s relevant to their business.

Business users often use SAP BusinessObjects Explorer to search for business information (based on SAP NetWeaver BW InfoProviders) without creating specific reports. However, in an SAP NetWeaver BW on SAP HANA scenario, SAP BusinessObjects Explorer is currently (at the time of this book’s publication) not able to connect to SAP NetWeaver BW InfoProviders directly, so the only way to access the data is by using SAP HANA views.

This tip describes the steps you need to follow to expose SAP NetWeaver BW InfoProviders in an SAP NetWeaver BW on HANA scenario to SAP HANA views to enable reporting using SAP BusinessObjects Explorer.

And Here’s How ...

To illustrate this tip, we’ll use the InfoProvider DSO as an example. The following steps are applicable to InfoCubes as well. Follow these steps to expose DSOs created in SAP NetWeaver BW to SAP BusinessObjects Explorer by creating an SAP HANA view on the DSO:
1. Execute Transaction RSA1 in the SAP NetWeaver BW system.

2. Create a DSO in SAP NetWeaver BW, and make sure that the **In-Memory Optimized** box is checked as shown in Figure 1. Note that you need to follow all of the other basic steps involved in creating a DSO such as defining key fields, data fields, indexes, and so on.

![Figure 1 Creating In-Memory Optimized DSO](image)

3. Log on to SAP HANA Studio.

4. Import the DSO created in the previous step by clicking **File • Import**. Select the SAP HANA CONTENT folder, and then choose **Import SAP NetWeaver BW Models**. Click **Next**.

5. Select a source system from where the SAP NetWeaver BW DSO will be imported with the following options:
   - Create a connection to the SAP NetWeaver BW on SAP HANA application server (ABAP-based) by providing all relevant information, such as server name, host name, instance number, client number, user name, and password. Click **Next**.
   - If a connection already exists, then select a connection and provide a **User Name** and **Password** to log in to the SAP NetWeaver BW system to import the SAP NetWeaver BW DSO.

6. Navigate to the relevant InfoArea, and move the relevant available object from left to right by selecting the SAP NetWeaver BW model and clicking on the **ADD** button. Click **Next** and **Finish** (see Figure 2). Note that imported models will
be created as an SAP HANA model (analytic or calculation view) under TARGET PACKAGE SAP.BW.

7. Select the OVERWRITE EXISTING OBJECTS checkbox if this model was previously imported and has changes to overwrite. (If the previously imported model, which is an SAP HANA model, has any local changes, then those changes are removed and a new SAP HANA model is recreated.)

8. The SAP HANA model will be created and activated. You can view the SAP HANA model by going to the SAP HANA system, choosing the content folder, and then clicking on SAP • BW and then the package (see Figure 3).
You can create information spaces on the analytical view that we created in the previous step and make them available to a report using SAP BusinessObjects Explorer. Views that are created are available in BEx.

This method can be used to import an InfoCube or a DSO to the SAP HANA Studio as SAP HANA views and expose these SAP NetWeaver BW InfoProviders (Info-Cubes and DSOs) to SAP BusinessObjects Explorer for searching and exploring business information.
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