BPC Data to WEBI Integration - Best Practice

Abstract:
Since SAP Business Planning and Consolidation 7.0, version for SAP NetWeaver, BI and BPC integration requirement becomes more and more a need. This How To Guide will go through the “Go-Forward” process of integrating BPC Data with WEBI, using SAP Business Planning and Consolidation, version for SAP NetWeaver – powered by SAP HANA. We will also go through a step by step procedure to replicate several BPC Business reporting requirements into WEBI.

Applies To
This guide applies to both BPC 10 version for SAP NetWeaver only, and BPC 10 version for SAP NetWeaver – powered by SAP HANA.
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SOLUTION OVERVIEW

SAP Business Planning and Consolidation, is part of the Enterprise Performance Management suite and provides everything you need to meet your bottom-up and top-down financial and operational planning requirements, as well as a complete consolidation and reporting solution through a single application and user interface.

It can be used for Business Planning (Budgeting, Sales/revenue planning, Expense planning, Forecasting), Consolidations (Intercompany matching/reconciliation/ eliminations, legal consolidations), as well as Financial reporting and analysis.

SAP Business Planning and Consolidation, version for SAP NetWeaver can be powered by SAP HANA. With In-memory technology offered by HANA, SAP Planning and Consolidation for SAP NetWeaver can handle big volumes of data easily, supports real-time planning and analysis, enables cross functional detailed planning and shrinks decision cycle time.

Key Benefits of SAP Business Planning and Consolidation, version for SAP NetWeaver - Powered by SAP HANA:

- Increased Agility – Helps to plan better and act fast with instant insight into all relevant information.
- Boost Performance – Accelerate planning and consolidation processing leveraging the power of in-memory technology.
- Engage Everyone - Simplify the input and exploration of data with a next generation mobile interface

BACKGROUND

Customers still working with former BPC NW 7.5 version might find that BPC NW integration with BI reporting tools is neither performed in a straight-forward way, nor optimized. With BPC NW 10, this integration process has been dramatically simplified, using a BW Virtual InfoCube and an automatically generated BPC Transient Query.

ENABLING BPC MODELS TO BE ACCESSED BY EXTERNAL SYSTEMS

BPC Administration Console

The first step allowing a BPC InfoCube to be accessed from an external reporting tool is to open the BPC 10 NW Administration Console and enable this InfoCube it as “Use as source of data”.

From the BPC Start Page, click the link “Planning and Consolidation Administration”.

<table>
<thead>
<tr>
<th>Launch</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image.png" alt="EPM Office Add-in Excel" /></td>
</tr>
<tr>
<td><img src="image.png" alt="EPM Office Add-in Word" /></td>
</tr>
<tr>
<td><img src="image.png" alt="EPM Office Add-in PowerPoint" /></td>
</tr>
<tr>
<td><img src="image.png" alt="Planning and Consolidation Administration" /></td>
</tr>
</tbody>
</table>
Then, choose the “Model” for which you would like to set external access and click “Edit”. In the below case, we select “Planning” model.

Under the “Features Used with the Model” section, check the option “Use as Source of Data” and save the model. This option will allow external applications to use this model as a source of data, either via SAP ODBO provider from the EPM Add-in, or from the BICS interface for BI Reporting Tools.

What is created in BW back-end?
After enabling “Use as Source of Data” option from the BPC administration console, you will notice a new Virtual InfoProvider is created in the BW back-end.

In above case, as we have enabled the external access for our “Planning” model, this action has automatically created a VirtualProvider called “Planning_B”.

In general terms, VirtualProviders represents a logical view. Meaning it doesn’t have any actual master data tables or a fact table. Its main characteristic is that no data is physically stored in it. The data is directly taken from the source systems only when a query is executed. Meaning that, for the generated “Planning_B” virtual cube, the data is directly taken from the original “Planning” model once the query is executed.
CREATE THE BICS CONNECTION FROM WEBI

Prerequisites
Currently, there is an existing issue in WEBI, which is preventing the BPC transient query to be selected as a data source. You have to follow SAP Note 1808656 (Not able to connect to a BW "transient" Query from Web Intelligence through BICS connection) to work around this limitation.

Another prerequisite is to create an “OLAP Connection” to your BW on HANA server into the BOE CMC (Central Management Console).

For this, access your BOE Central Management Console, and click the “New connection” button.

Enter all required fields, and either select the “Pre-defined” authentication method, or “SSO” (if you enable SSO between your BW on HANA server and BOE). Note that the “Prompt” authentication method is not supported when being used from WEBI. In below screenshot, we select the Pre-defined authentication by entering the credentials to the BW on HANA server. Click “Save”.

![Central Management Console](image)
The newly created connection is then appearing in the OLAP connections list.

This connection will be used to access BPC transient query using BICS.

What is BICS?
BICS (Business Intelligence Consumer Services) is SAP’s interface for accessing BEx queries. BICS is in fact optimized to handle hierarchies and BW specific features, which significantly improves performance. In Business Objects 4.0, WEBI (and other BI reporting tools) uses the BICS connection to access BEx queries. And in the case of BPC, once we enable the model to be used as source of data which creates the transient query, the query becomes a BEx query with the only difference being it cannot be edited in Bex Query Designer.

Connection to the BPC Transient Query from WEBI
Launch Web Intelligence Application from the BI Launch Pad.
On the Web Intelligence tab, click the “New” icon.

Then, select “Bex” in the data source list and click “OK”.
In the predefined OLAP connection created previously, expand “InfoArea” node, then Business Planning and Consolidation” node, and choose “Planning_B”. On the right side of the window, you are now able to select the BPC Transient Query generated from the BPC administration console. It is always named with a “/CPMB/TQ2*” prefix (for Transient Query). Click “OK”.

Note on the BPC Transient Query
Using BPC transient query to integrate BPC Data in WEBI is the go-forward process and is considered best practice. In fact, during the query generation, the automatic process applies BPC security and business logic such as YTD and QTD figures, as well as the ACCTYPE property from the Account dimension which applies the correct signage to accounts (AST, LEQ, EXP and INC). Due to this, BPC transient query is not editable in BEx Query Designer as other queries are.

For sure, you can create your custom BEx Query on the top of “Planning_B” cube, but the business logic won’t be taken into account (unless you know how to recreate the business logic inside it).

Limitations
If you defined a custom measure in BPC, such as MTD (Month To Date) or Rolling 12, the custom measure will not be taken into consideration during the creation of the transient query.
EXAMPLES: WEBI REPORT WITH BPC DATA

Product versions used
For the following examples, our system was based on following product versions:
- BPC NW 10 SP09
- HANABPC component SP03
- HANA revision 53
- BI 4.0 SP5

Query Panel
Before creating any report, you need to edit the query in order to define your report’s scope, ensuring that the report designer will find data for all the defined axis combinations. In following steps, we will create a query definition to filter on dimensions.

Once you select the Transient Query as data source, the Query Panel shows up. On the left side, you can see all BPC dimensions (1) (ACCOUNT here below), the flat dimension structure (2), the dimension hierarchy (3), and the attributes/properties (4).

In the above, PARENTH1 for the ACCOUNT hierarchy is the name defined on the dimension structure in BPC administration console.
The next step is to define the data we would like to render for the report designer (scope). Drag and drop PARENTH1 hierarchy under the ACCOUNT dimension to the Result Objects window, and then click on the small arrow on the right of PARENTH1.

Select “NetIncome”, then right-click on it and select “Descendants”. Once done, click “OK”.

Select “NetIncome”, then right-click on it and select “Descendants”. Once done, click “OK”.
Then, drag and drop CATEGORY (flat list) to the “Result Objects” window, and click the small arrow on the right of CATEGORY object.

Select “Actual” and “Budget”, and click “OK”.
Next, drag and drop PRODLINE (flat list) to the Result Objects window and leave it as is.

Next, drag and drop “/CPMB/PERDATA” (which is the technical name for Periodic Data) to the Result Objects window.

Finally, drag and drop “Calendar” hierarchy from the TIME dimension to the Result Objects window, and click the small arrow near “Calendar” caption.

Notice above LTV_PARENTH1, QTD_PARENTH1, and YTD_PARENTH1 hierarchies. Those 3 extra hierarchies on Time dimension are created for reporting performance reason. See SAP note 1691567 for more details.
Select all quarters from year 2010, and click “OK”.

Then move both H1 (hierarchy) under ENTITY dimension, and RPTCURRENCY (flat list) to the Query Filters window click on the small arrow to define the filter type.
Select the “Prompt” type of filtering and choose “In List” in the drop down, and type “Choose Entity”, and “Choose Currency” for the prompt captions.

Now, click the “Run query” button, on the top right of the Query Panel.

In the Prompts Summary window, choose “North America” as for the Entity, and “LC” as for the Currency, and click “OK”.
Create a cross-tab report
This section will show you the step by step procedure to create a cross-tab/pivot table report in WEBI, showing the Account hierarchy in rows, Category in columns, and displaying Periodic figures. Everything based on the query definition we have just created above.

From the Available Objects window, drag and drop CATEGORY to the report layout.

Then, drag and drop PARENTH1 (which corresponds to our ACCOUNT dimension) to the right of CATEGORY.

Rename PARENTH1 caption with ACCOUNTS, in order to avoid any confusion.

Also drag and drop /CPMB/PERDATA, to the right of ACCOUNTS.
Here our report looks like a table report, and we would like to transform it into a pivot table, called cross table in WEBI.

To do this, right-click on the CATEGORY column, choose “Turn Into”, and then “Cross Table”.

The final layout will add a column axis with CATEGORY in columns and ACCOUNTS in rows, displaying Periodic figures. After drilling-down to the lowest level of your row axis, your report should look like below.
Variance report
When designing reports in the EPM add-in, which is the standard client to consume and input BPC data, it is possible to add additional logic, called Local Members, to display variances or report calculations.

In the following example, we will display actual and budget data, even if no budget data exists in our database, and create a variable, which will do the delta between both.

First, we will need to create all variables needed for this report. Right-click on the “Variables” node in the Available Objects window and select “New Variable”.

The first variable will be a replication of “Actual” data, with a new name called “Periodic Data Actual”. So, enter all the fields like the screenshot below and click “OK”.

```
Name: Periodic Data Actual
Qualifier: Measure
Type: Number
Formula: =[FCM/PERDATA] Where ([CATEGORY]="Actual")
```
The second variable will be exactly the same as above but for the "Budget" data. So create another variable called “Periodic Data Budget”, enter the fields like below, and click “OK”.

![Variable Editor for Periodic Data Budget](image)

The last variable will use both variables created above. Create a third variable, called “Variance”, and enter the fields like below and click “OK”.

![Variable Editor for Variance](image)
In the “Available Objects” window, you should have 3 newly created variables being displayed, which we will now use to create our report.

First, drag and drop PARENTH1 to a new report layout in a new worksheet.

Second, drag and drop “Periodic Data Actual” to the right of ACCOUNTS.

Next, drag and drop “Periodic Data Budget” to the right of “Periodic Data Actual”.
Finally, drag and drop “Variance” to the right of “Periodic Data Budget”.

After drilling-down to the lowest level of your row axis, your report should look like the screenshot below.

![Report Screenshot]

Now that the report is rendering correctly, we would like to utilize the accounting format for the budget column. To apply a specific format for zero values, select “Periodic Data Budget” column, switch to the “Format” tab, then “Numbers” tab, and finally select ",###;(#,###);0--;" in the drop-down list. For instance, if the number is in thousands, it will display the comma; if the number is negative, it will display () around the number and lastly, if the number is 0, the format will render a dash (-).
**Format calculated members**

Occasionally, you might want to display the calculated members in a different format. In BPC, we use the “CALC” hidden attribute for this in order to display calculated members differently than leaf or base members. In WEBI, we need to create a new variable, which will check if a member is a leaf.

To do this, right-click on the “Variables” node in the Available Objects window, and select “New Variable”.

Create a variable called “IsLeaf” by using the IsLeaf function from the “Set” directory, and enter all fields like the screenshot below, and click “OK”.

![Variable Editor](image)
Back to your report, drag and drop the newly created “IsLeaf” variable to the right of “Variance” column.

Notice the “IsLeaf” function returns a boolean value (0 for calculated members and 1 for leaf members).

Now, we will use this boolean value from our “IsLeaf” variable to format calculated members in our report. For this, select the “Analysis” tab, then “Conditional” tab, and click “New Rule”.
Since we would like our calculated members to be displayed in bold, enter following fields as follow, and click “OK”.

Back to your report, delete “IsLeaf” column, by right-clicking it and choose “Delete”.

Select “Remove Column” and click “OK”.
Now apply conditional format “IsCalcBold” to all your columns. For this, click the first row of each column, and choose “IsCalcBold” in the Formatting Rules drop-down list.

Final result is following.

<table>
<thead>
<tr>
<th>ACCOUNTS</th>
<th>Periodic Data Actual</th>
<th>Periodic Data Budget</th>
<th>Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Income</td>
<td>169,000</td>
<td>-</td>
<td>169,000</td>
</tr>
<tr>
<td>Financial Income &amp; Expense</td>
<td>127,000</td>
<td>-</td>
<td>127,000</td>
</tr>
<tr>
<td>Operating Income</td>
<td>72,000</td>
<td>-</td>
<td>72,000</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>435,000</td>
<td>-</td>
<td>435,000</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>338,000</td>
<td>-</td>
<td>338,000</td>
</tr>
<tr>
<td>Labor Cost</td>
<td>167,000</td>
<td>-</td>
<td>167,000</td>
</tr>
<tr>
<td>Material Cost</td>
<td>171,000</td>
<td>-</td>
<td>171,000</td>
</tr>
<tr>
<td>Total Sales</td>
<td>773,000</td>
<td>-</td>
<td>773,000</td>
</tr>
<tr>
<td>Intercompany Sales</td>
<td>365,000</td>
<td>-</td>
<td>365,000</td>
</tr>
<tr>
<td>Third Party Sales</td>
<td>388,000</td>
<td>-</td>
<td>388,000</td>
</tr>
<tr>
<td>Indirect Expenses</td>
<td>363,000</td>
<td>-</td>
<td>363,000</td>
</tr>
<tr>
<td>Advertising &amp; Promotion</td>
<td>121,000</td>
<td>-</td>
<td>121,000</td>
</tr>
<tr>
<td>Personnel Cost</td>
<td>121,000</td>
<td>-</td>
<td>121,000</td>
</tr>
<tr>
<td>Travel &amp; Entertainment</td>
<td>121,000</td>
<td>-</td>
<td>121,000</td>
</tr>
</tbody>
</table>
**Format by hierarchy level**
Another example is to apply a specific format for each hierarchy level. In BPC, we use the “HLEVEL” hidden attribute for this. In WEBI, we need to create a new variable, which will check member’s depth.

Create a variable called “Level” by using the “Depth()” function from the “Misc” directory, enter all fields like the screenshot below, and click “OK”.

![Create Variable](image)

Drag and drop this newly created “Level” variable to the right of “Variance” column.
Level values of each member are retrieved.

<table>
<thead>
<tr>
<th>Budget</th>
<th>Variance</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>199,000</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>127,000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>72,000</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>435,000</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>338,000</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>167,000</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>171,000</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>773,000</td>
<td>3</td>
</tr>
</tbody>
</table>

And now, by creating a new formatting rule, you can set this new “Level” variable to have a different format for each level in the hierarchy. Check previous section to create a new formatting rule based on an existing variable.

**Using charts and sections**

In this last example, we will create a simple chart report displaying product lines by time sections. From the “Available Objects” window, drag and drop “Calendar” hierarchy (Time dimension) to the report layout.
Then, drag and drop PRODLINE to the right of “Calendar”.

Finally, drag and drop “Periodic Data Actual” variable to the right of PRODLINE.

Now, we would like to create a particular section for each quarter. Right-click on the “Calendar” column, and select “Set as section”.

Result is as follows.

<table>
<thead>
<tr>
<th>PRODLINE</th>
<th>Periodic Data Actual</th>
<th>Q1 2010</th>
<th>Q2 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Person Shooter</td>
<td>16,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role Playing Game</td>
<td>11,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sports</td>
<td>15,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategy</td>
<td>10,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Now, for each section, let’s insert a Pie chart displaying percentage values for PRODLINE. Click “Report Element” tab, then “Charts” tab, and choose “Pie”.

Drag and drop this Pie chart to the first section of your report layout.
Now, again, from the Available Objects window, drag and drop PRODLINE into the Pie chart.

Finally, drag and drop “Periodic Data Actual” to the Pie chart as well.

Result is as follow.
To add a percentage value to the chart, right-click on it and choose “Format Chart”.

On the “Global” tab, choose “Data Values”, enable “Data Label displaying mode”, and click “OK”.

![Format Chart Dialog Box](image1.png)

![Format Chart Dialog Box with Data Label Displaying Mode Selected](image2.png)
Final result is as follow.

### Q1 2010

<table>
<thead>
<tr>
<th>PRODUCTLINE</th>
<th>Periodic Data Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Person Shooter</td>
<td>16,000</td>
</tr>
<tr>
<td>Role Playing Game</td>
<td>11,000</td>
</tr>
<tr>
<td>Sports</td>
<td>15,000</td>
</tr>
<tr>
<td>Strategy</td>
<td>10,000</td>
</tr>
</tbody>
</table>

### Q2 2010

<table>
<thead>
<tr>
<th>PRODUCTLINE</th>
<th>Periodic Data Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Person Shooter</td>
<td>12,000</td>
</tr>
<tr>
<td>Role Playing Game</td>
<td>14,000</td>
</tr>
<tr>
<td>Sports</td>
<td>14,000</td>
</tr>
<tr>
<td>Strategy</td>
<td>11,000</td>
</tr>
</tbody>
</table>
RELATED CONTENT

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EPM Roadmap - https://websmp103.sap-ag.de/roadmap
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BPC How to Guides - https://wiki.sdn.sap.com/wiki/display/BPX/Enterprise+Performance+Management+%28EPM%29+How-to+Guides
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BPC Install, upgrade, and logic Guides - https://websmp107.sap-ag.de/instguidesepm-bpc
BPC 10 Consolidation Demo on Youtube - http://www.youtube.com/watch?v=_5nu3v9sVzA
BPC 10 Reporting Demo on Youtube - http://www.youtube.com/watch?v=8u6orTHi1lY
SAP Product Availability Matrix for support end of life and platform support - https://websmp110.sap-ag.de/pam

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