

Reading Sample

This chapter walks through the end-to-end setup of an embedded SAP BPC planning model. You'll learn how to create and use MultiProviders, CompositeProviders, DataStore objects, and local providers.



"Embedded SAP BPC Architecture"



Contents



Index



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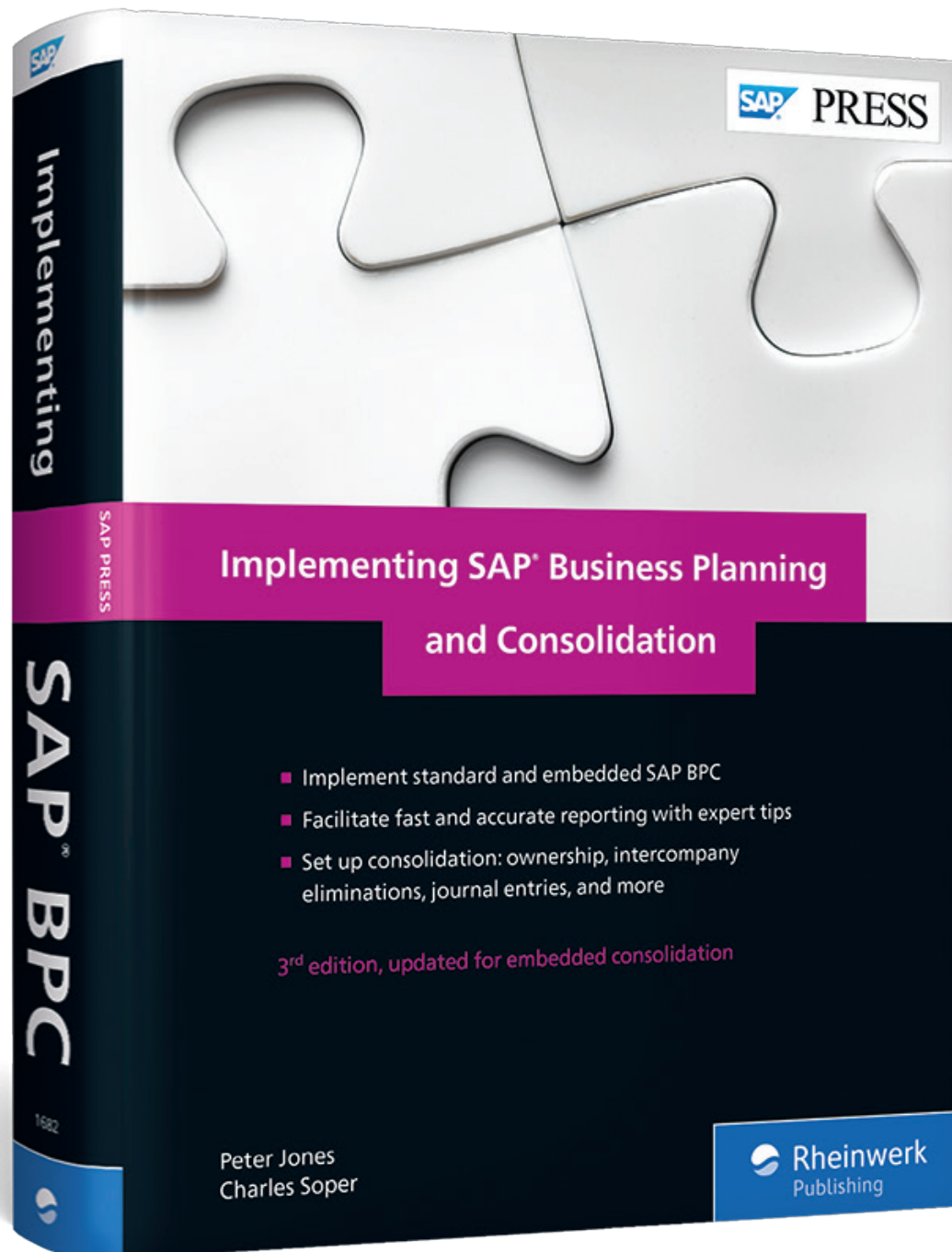
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Chapter 10

Embedded SAP BPC Architecture

Before we move too far into our coverage of embedded SAP BPC, we should examine its architecture. In this chapter, we'll review the SAP BW tables and queries and the Integrated Planning objects that will be used moving forward.

Embedded SAP BPC provides quite a bit of flexibility and options to meet customer planning and reporting requirements. Sometimes, we have so many options that half the challenge is figuring out when to use each one! As we go through this chapter, we'll emphasize a given business scenario first, discuss its architecture second, and then go through the configuration steps third.

In this chapter, we'll discuss the end-to-end process to set up a basic embedded SAP BPC planning scenario. We'll go through the buildup of the SAP Business Warehouse (SAP BW) InfoProviders, the Integrated Planning (IP) objects, the SAP BW planning query, and then how to use the query and a basic planning function in the Enterprise Performance Management (EPM) add-in. After that, we'll talk about how MultiProviders, DataStore objects (DSOs), and local providers can be used in planning scenarios as well.

Note: Using SAP HANA-Based Providers

During our discussions in this chapter, we'll focus on the InfoCube and MultiProvider as examples of providers that would be used for the architecture of the embedded SAP BPC process—but remember that we need to align with the future view of SAP's roadmap. Therefore, wherever InfoCubes and MultiProviders are referenced, you could also use advanced DataStore objects (aDSOs) and CompositeProviders, respectively. The significant difference is that the creation process for these providers happens in the SAP HANA studio component of SAP Lumira, designer edition versus the SAP BW Administration Workbench. The concept of assigning InfoObjects is similar to that for MultiProviders and InfoCubes.

10.1 Setting Up the Embedded Planning Model

In this section, we'll go through the use cases and set up of a real-time InfoCube, the IP objects, the SAP BPC objects, and the EPM add-in report and action pane from start to finish. The main idea in this first pass is to give you a feel for how the components work together in an end-to-end scenario and do the deep dive later.

You need the following components for a planning scenario:

- Real-time InfoCube
- Aggregation level
- Planning function
- EPM workbook with an EPM report and a planning function
- Planning-enabled query
- Embedded environment
- Embedded model

10.1.1 Using Real-Time InfoCubes

InfoCubes represent a type of activity, whether they're being used for reporting or planning. An InfoCube has a group of homogeneous characteristics and key figures to meet the task at hand. Recall that real-time InfoCubes are write-optimized; they are the primary tables used in embedded SAP BPC 10.1.

As a point of reference, in standard SAP BPC, the real-time InfoCube is generated when you create the model; it can only use InfoObjects in the SAP BPC namespace, and only one key figure is allowed. If we compare real-time InfoCubes used for the embedded version to real-time InfoCubes used for the standard version, the following four main differences stand out:

- Embedded InfoCubes use standard InfoObjects.
- Embedded InfoCubes can have multiple key figures.
- Embedded InfoCubes are created from SAP BW, not SAP BPC.
- Embedded InfoCubes use the normal SAP BW namespace.

As a result, using normal SAP BW objects means that you can share data more easily, resulting in less data redundancy, and you can use more than one key figure, which provides data modeling flexibility. But using real-time InfoCubes in embedded SAP BPC involves a bit more discussion than it did in standard SAP BPC. With standard SAP BPC, when you create a model, the system generates the real-time InfoCube and associated MultiProvider automatically. Recall from Chapter 3 that each standard model always has one corresponding real-time InfoCube and one MultiProvider. In embedded SAP BPC, you create the real-time InfoCube first, and then you create the

SAP BPC model. Furthermore, embedded SAP BPC models can use one or more real-time InfoCubes, DSOs, local providers, and VirtualProviders, so now it's much easier to merge data from multiple sources.

Although standard SAP BPC models can use different types of InfoProviders, real-time InfoCubes will remain the primary choice because DSOs, local providers, and virtual InfoCubes are intended for more specialized scenarios as we'll explain shortly.

Before we start talking about how to create a real-time InfoCube, we need to think about the planning activity first because that will drive the selection of InfoObjects of the InfoCube. In our scenario, we need to perform product planning by material group by year for pricing data initially and then quantities revenue and costs by material and period later on. Because there isn't a delivered InfoCube that meets this requirement exactly, we'll create a custom real-time InfoCube.

To create an InfoCube, just go to Transaction RSA1, right-click on an InfoArea, and choose **Create InfoCube** (Figure 10.1).

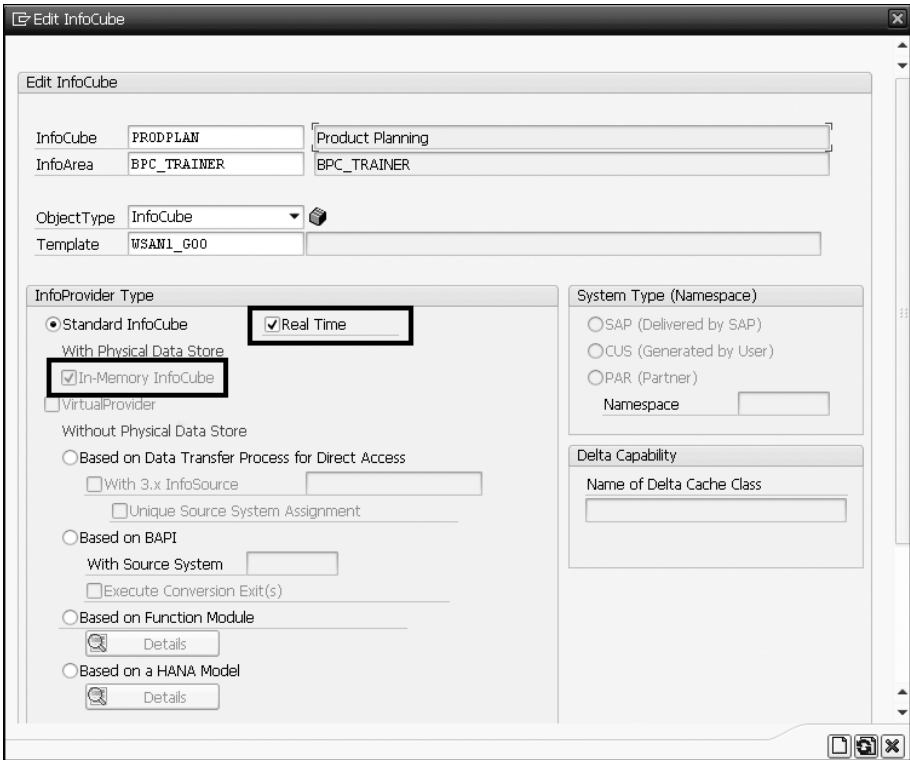


Figure 10.1 Creating Real-Time InfoCube

In Figure 10.1, InfoCube **WSAN1_G00** is used as a template to bring in most of the required InfoObjects. Of course, the **Real Time** checkbox is checked, and because we’re using SAP HANA with SAP BPC 10.1, this is an **In-Memory InfoCube** by default.

Choose **Create**, and the system brings in the InfoObjects from the template InfoCube (**WSAN1_G00**; see Figure 10.2).

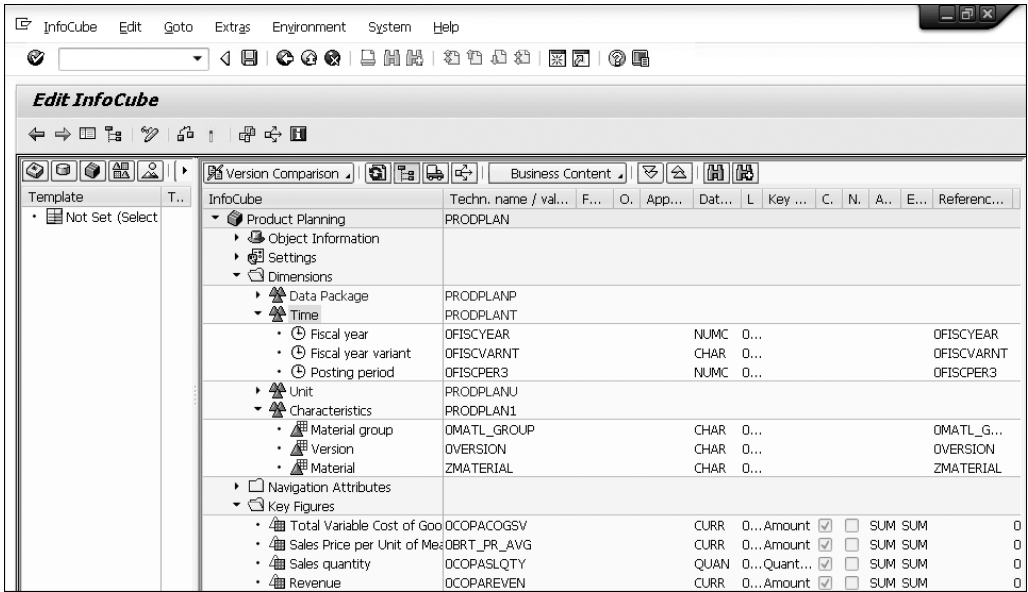


Figure 10.2 InfoCube Structure in Transaction RSA1

Before SAP HANA, InfoCubes were star schemas with table joins from the surrogate ID (SID) table to the dimension table to the fact table, and characteristics were grouped into dimension tables (Chapter 3). With SAP BW on SAP HANA, the InfoCube is flattened out. The SID tables join directly into the fact table, and there is only one dimension table, which is used to keep track of uncompressed request IDs.

To see the dimension and fact table, review the structure for the InfoCube via **Extras • Information Log/Status • Dictionary/DB Status**.

As you can see in Figure 10.3, there are only two tables in this InfoCube: the fact table **/BINFOCUBE/FPRODPLAN** and the dimension table **/BINFOCUBE/DPRODPLAN**.

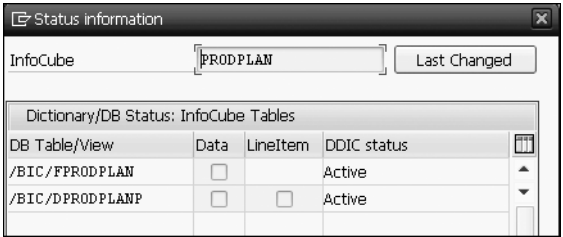


Figure 10.3 Two Tables in InfoCube

After you activate the InfoCube and return to Transaction RSA1, you can see the icons that signify the InfoCube as a real-time InfoCube and an SAP HANA-optimized InfoCube (see Figure 10.4)

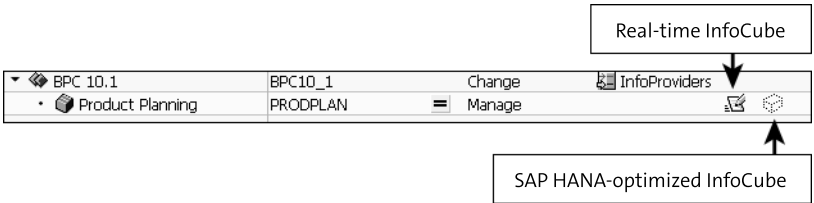


Figure 10.4 Real-Time Optimized InfoCubes

At this point, you can create an aggregation level on the real-time InfoCube. Of course, you can create the aggregation level from the context menu (accessed via right-clicking) of an InfoArea, but let’s do it from the planning modeler because that’s where the other IP objects are maintained.

10.1.2 Using Aggregation Levels

You might recall that our real-time InfoCube has more InfoObjects than necessary for the initial planning phase. The real-time InfoCube has period, material, quantity, revenue, and cost InfoObjects that aren’t needed until later.

You need to create a structure that only includes the InfoObjects required for this planning phase. This is called an *aggregation level*, and one of its main purposes is to provide a slice of the real-time InfoCube for your planning activities. After you create the aggregation level, you’ll also need IP planning functions, filters, and planning-enabled queries. All these objects are created against the aggregation level.

Because planning-enabled queries are created against aggregation levels, the aggregation level is therefore an InfoProvider. It doesn't contain any data, so it's basically a view created against the real-time InfoCube.

To create an aggregation level, go into the planning modeler. From the **SAP Easy Access** screen, open **Business Planning and Simulation**, and choose **RSPLAN—BI Integrated Planning**, or go to Transaction RSPAN, as shown in Figure 10.5.

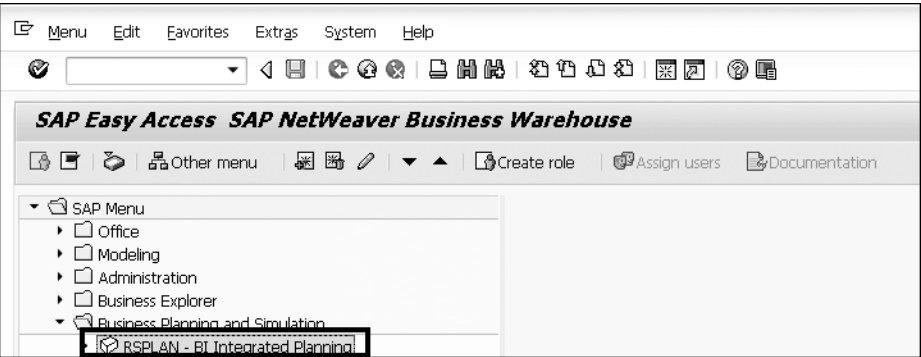


Figure 10.5 Accessing Transaction RSPLAN

When you enter Transaction RSPLAN, you arrive at the InfoProvider screen that includes the following five buttons for the five objects used in RSPLAN:

- **InfoProvider**
On this screen, you maintain characteristic relationships and data slices and specify which planning sequences need to be executed as data is saved.
- **Aggregation Level**
The aggregation level forms a conceptual slice of the real-time InfoCube for a planning scenario, and it owns other planning objects. They can be created against real-time InfoCubes, DSOs, MultiProviders, and local providers.
- **Filters**
Filters are used primarily to define the data region for planning functions bundled into planning sequences.
- **Planning Function**
Planning functions are used to perform mass updates in planning scenarios such as copying actual to plan, deletions, and calculating revenue.
- **Planning Sequence**
Planning sequences are used for testing and for bundling planning functions to be executed in real time or in batch mode.

The first thing to do in Transaction RSPLAN is select the real-time InfoCube InfoProvider (**PRODPLAN**, as shown in Figure 10.6) so that you can configure it for planning activities.

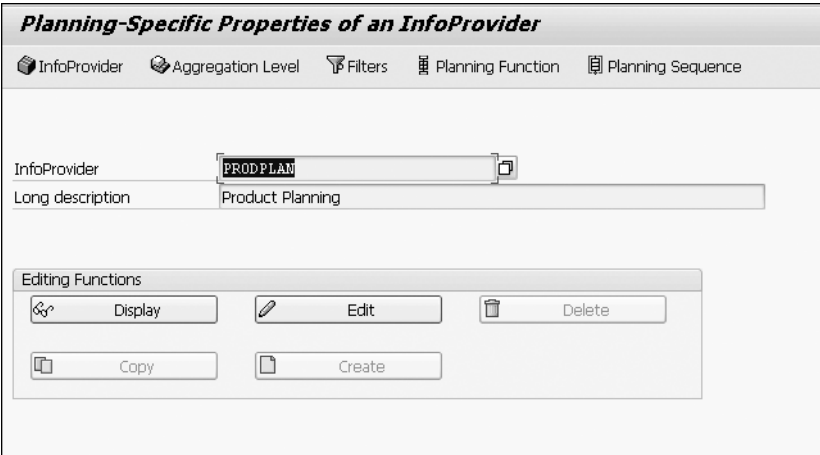


Figure 10.6 Getting Ready to Configure InfoCube in Transaction RSPLAN

To configure the InfoProvider for planning, choose **Edit**. Figure 10.7 shows the meta-data view in the **InfoProvider** tab. There are also tabs for the following:

- **Central Settings**
You can select a planning sequence to be executed when data is saved and set a key date for time-dependent master data selections.
- **Characteristic Rels**
You can provide valid characteristic combinations when planning and perform derivations.
- **Data Slices**
You can lock a data region to prevent data changes when a process has been completed. The SAP BPC work status creates data slices automatically, so you don't need to create them here.

To create the aggregation level, return to the main Transaction RSPLAN screen, proceed to the aggregation level screen, and choose **Create**. Then name the aggregation level and select the **PRODPLAN** real-time InfoCube InfoProvider that it belongs to, as shown in Figure 10.8.

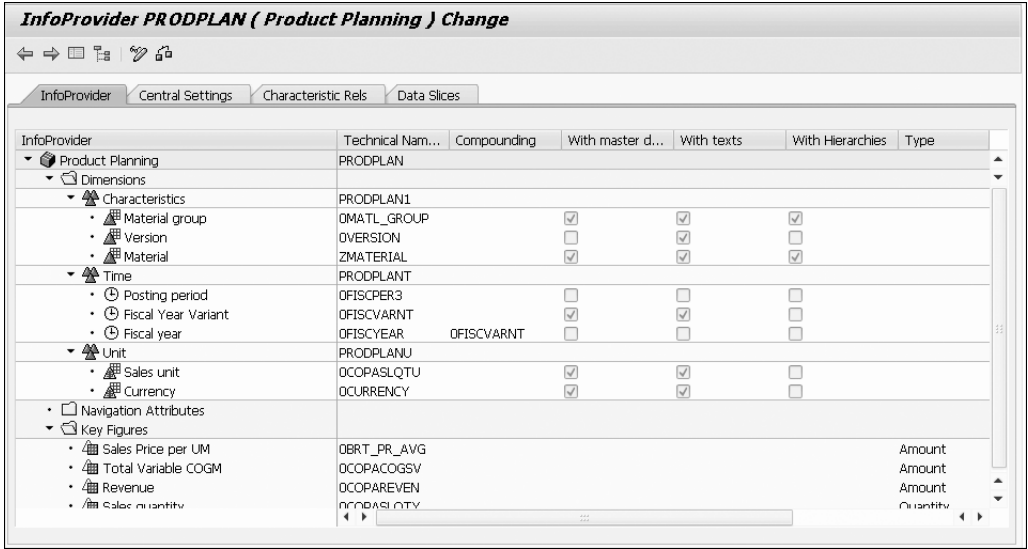


Figure 10.7 Viewing InfoCube Metadata from Transaction RSPLAN

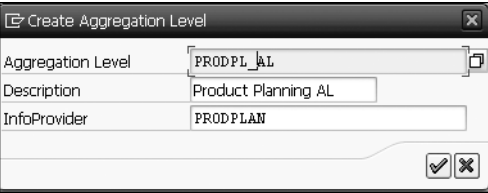


Figure 10.8 Creating Aggregation Level

The resulting configuration screen looks the same as when you created the real-time InfoCube, except that the real-time InfoCube's InfoObjects automatically appear on the left under **Basis InfoProvider**, as shown in Figure 10.9.

Based on the planning requirement, all you have to do is drag and drop the InfoObjects you need into the aggregation level on the right. As you can see in Figure 10.10, all of the InfoObjects in the real-time InfoCube have been selected except for **Posting period**, **Material**, **Sales unit** (Units reference **Quantity** so it needs to be included), **Total Variable Costs**, **Sales Quantity**, and **Revenue**. In other words, the planning activity is yearly planning, so you don't need **Posting period**; you're planning by material group only, so you don't need **Material**; and so forth.

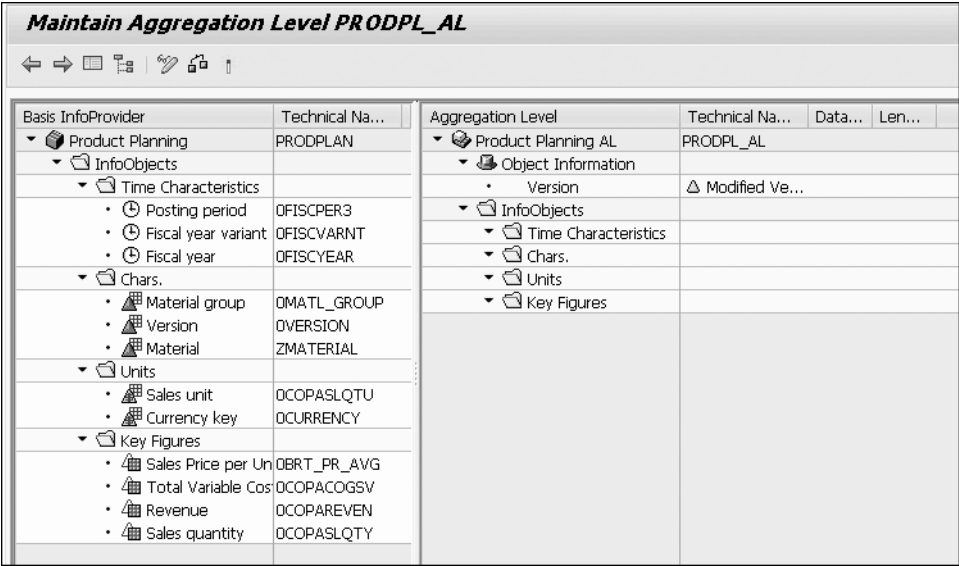


Figure 10.9 Creating Aggregation Level

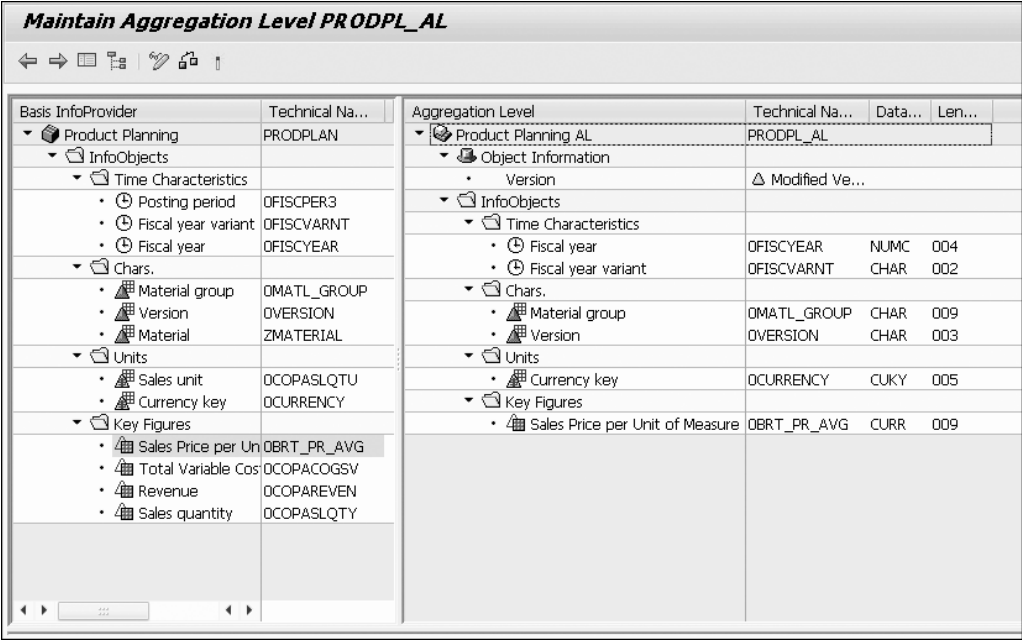


Figure 10.10 Completed Aggregation Level

After the aggregation level is activated, you can use it to create planning functions.

10.1.3 Using a Copy Planning Function

IP provides quite a few planning functions, and being able to use them in embedded SAP BPC is a big advantage. We'll be spending quite a bit of time going over these in Chapter 15.

To create a planning function, you leave the **Aggregation Level** screen and move into the **Planning Function** screen. When you choose **Create**, you can select the function type, provide a name and description, and select the aggregation level, as shown in Figure 10.11.

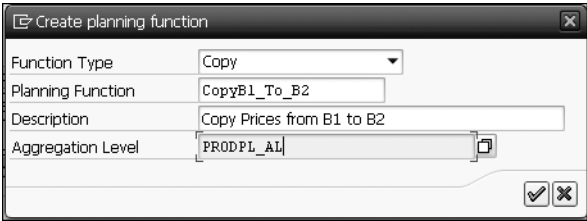


Figure 10.11 Naming New Planning Function

This planning function will be used in a scenario in which you plan prices in version B1 and then copy them to version B2, where you can run a revaluation function to mark them up or down.

In the next step, shown in Figure 10.12, you can start to parameterize the function in the **Edit Planning Function** screen. Because you'll be changing values only in version B2, select **Version** in the **Fields to be changed** column. Because the prices will be copied to version B2 for any currency, fiscal year, and material group, you don't need to select any **Fields for Conditions**. We'll spend more time on this in Chapter 12.

To specify that version B1 is the source and B2 is the target, open the **Edit Planning Function** parameters screen (see Figure 10.13), and select **B1** as the **From** value and **B2** as the **To** value. You could also use variables in this case as well, and this will also be developed once we get to Chapter 12.

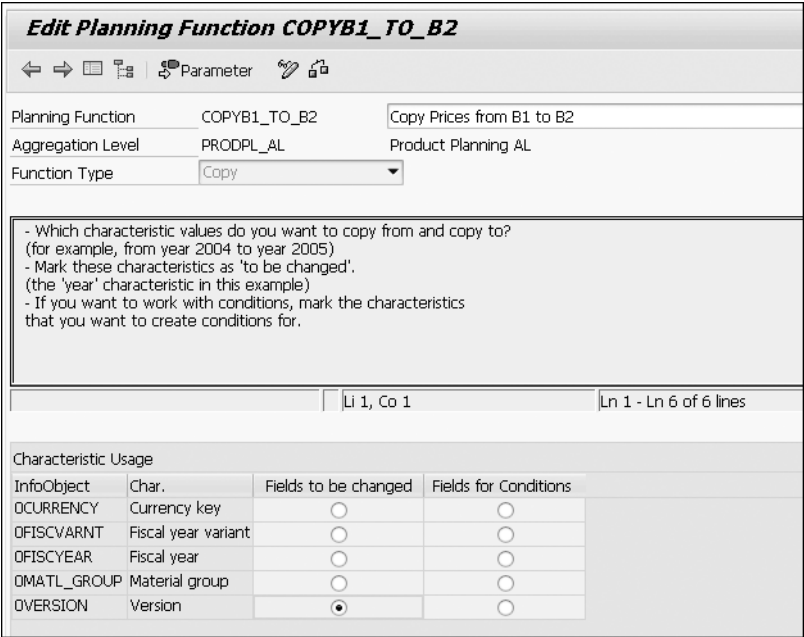


Figure 10.12 Selecting Fields to Be Changed and Fields for Conditions

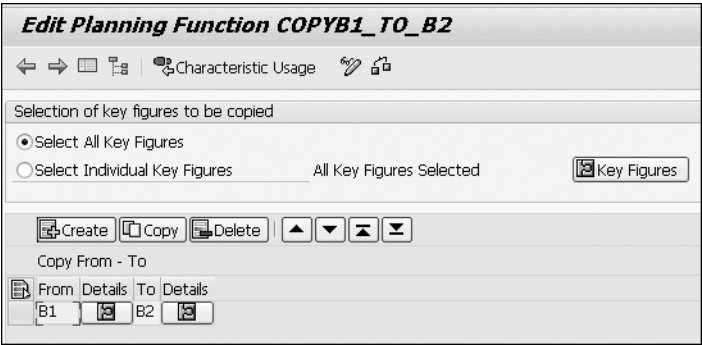


Figure 10.13 Selecting Source and Target Values in Copy Function

After you save the planning function, you can proceed with the planning query.

10.1.4 Using Planning-Enabled Queries

One of the main features of any planning system is the ability to perform manual input planning in Excel workbooks. In this example, this means the EPM add-in for Excel. To do this, you need a planning-enabled query.

Planning-enabled queries must be created on an aggregation level and not on the real-time InfoCube. More could be said about how to use the basic and advanced planning related features of the BEx Query Designer, but for our purposes, we'll stick to the basic query features and the fundamental planning settings so that you have a very clear understanding of the components and how they depend on each other. Also, this scenario uses an aggregation level on the real-time InfoCube, but we'll cover queries on aggregation levels on MultiProviders, DSOs, and local providers later in this chapter.

To access the BEx Query Designer, go to your **Start** menu. Choose **All Programs • Business Explorer • Analyzer**. From the **Add-Ins** tab, select **Create New Query**. On the **Query Designer** screen, choose **New Query** and select the aggregation level.

When you create queries for SAP BW *reporting* scenarios, you can always pick and choose which InfoObjects to include in the query. In a reporting scenario, for example, if you don't need to report by material group, you can simply choose not to include it in the query.

When creating queries for *planning*, however, the rules are a little different. In this case, you need to include every InfoObject in the query to allow for manual input planning because when performing manual planning, every cell must represent single-characteristic values. In other words, any characteristic that isn't in the rows or columns must be included in the filter and restricted to single values. In this case, the business requirement calls for year and material group in the rows, with three columns for prices in version B1, B2, and B. The three columns will include the price key figure that is restricted to version B1, B2, and B. The scenario for the three key figures is to allow the planner to test prices in B1 and B2, and, when they are ready, they will copy their final price to version B, which will then be used in the next part of the planning process.

Fiscal Year Variant will always be set to **K4**, so you can put that in the **Characteristic Restrictions**. **Fiscal year** will be selected by the user at runtime, so it's placed in the **Characteristic Restrictions** as well and restricted by a variable.

The **Currency** will initially be **USD**, but the planner is allowed to change it, so we'll put that in the **Default Values**. Because **Currency** is in the **Default Values**, it's available in **Free Characteristics** for the business user to add it into the rows or columns.

In Figure 10.14, you can see that every InfoObject is in the **Rows**, **Columns**, or **Free Characteristics** except for **Version** because that will be included in the columns as part of the three restricted key figures. **Fiscal Year Variant** is restricted to **K4 (Cal. Year, 4 Special Periods)**. To restrict it, select **Filter • K4** in the context menu, then click **OK**.

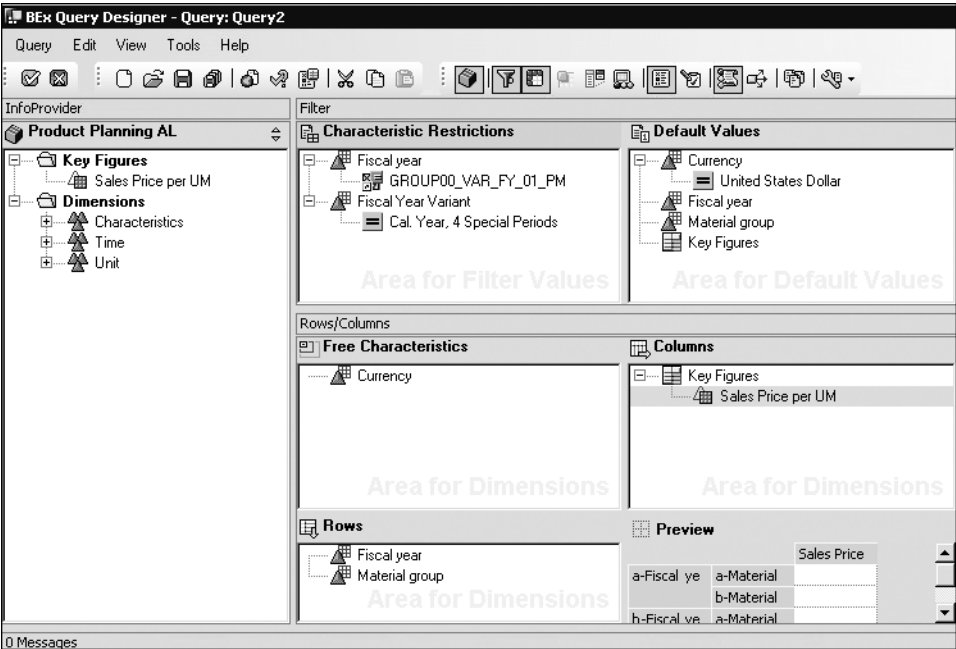


Figure 10.14 Selecting InfoObjects in BEx Query Designer

Currency was restricted to **USD** in the **Default Values** using the same technique. **Fiscal year** is restricted by a variable so that users can choose the year to plan on when they run the query.

To restrict the first column **Sales Price per UM** to version **B1**, simply double-click on it, add the version to **Details of the Selection**, and restrict it to **B1**. Figure 10.15 also shows that the **Description** has been changed to **B1 Price**.

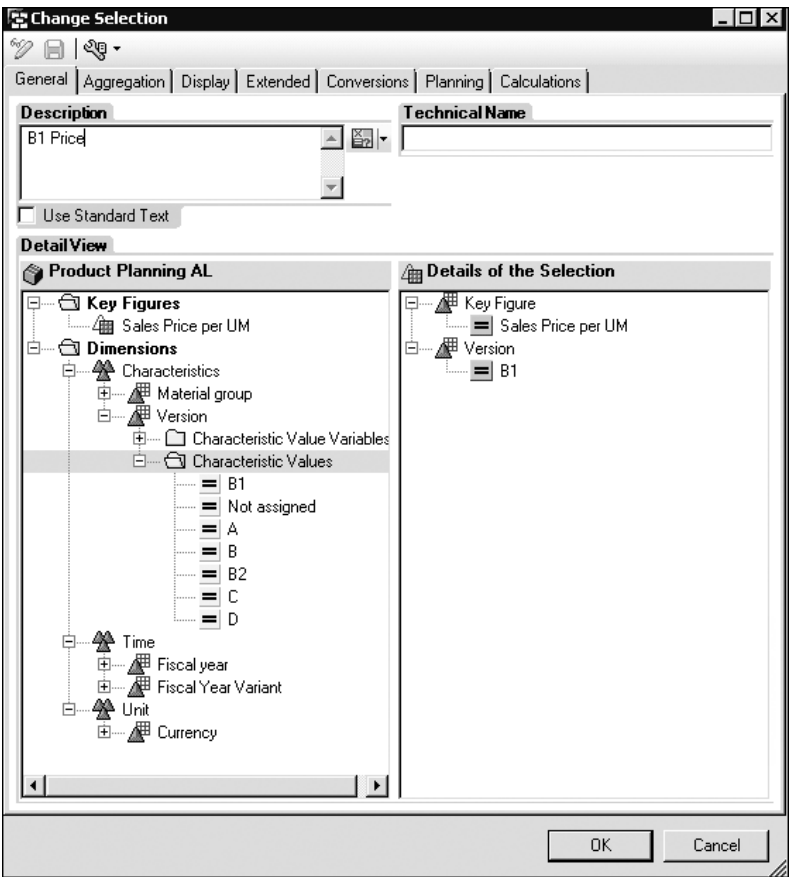


Figure 10.15 Creating Restricted Key Figure for Price Version B1

For this query to be plannable, you need to set at least one key figure to be input-ready. Figure 10.16 shows the **Planning** tab; under **Change Data**, **Input-Ready (Relevant for Locking)** has been selected. The three options under **Change Data** are used for the following purposes:

- **Not Input-Ready (Not Relevant for Locking)**
Use this to read the data without blocking others from changing it while you're viewing it.
- **Not Input-Ready (Relevant for Locking)**
Use this to read the data but lock it so no else can change it while you're viewing it.

- **Input-Ready (Relevant for Locking)**
Use this to allow write access and block others from changing it while you're viewing it or changing it.

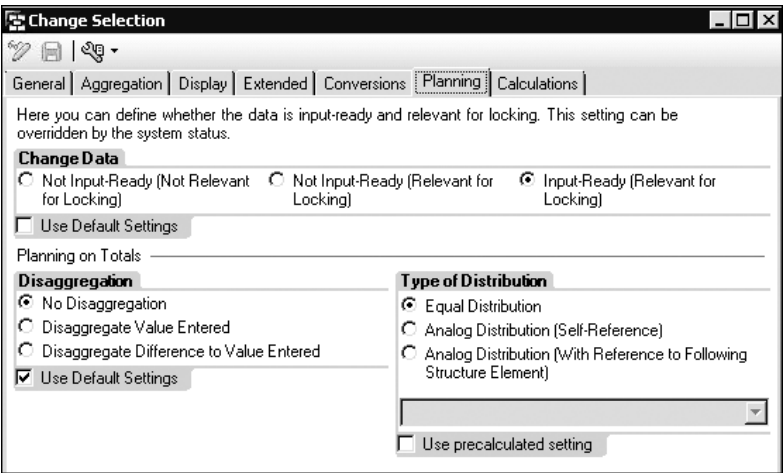


Figure 10.16 Planning Settings for Key Figure

To adopt these settings, click **OK**, copy **B1 Price**, rename it to **B2 Price**, and restrict it to **B2**. Then, copy **B2 Price**, rename it to **B Price**, and restrict it to **B**; however, in this case, you want this key figure to be written to only via the planning function, so **Change Data** will be set to **Not Input-Ready**.

When at least one key figure is set to allow input, the query will be set to open in change mode when initially executed. In the query **Properties** shown in Figure 10.17, the query is now set to **Start Query in Change Mode**.

The business requirement for this example calls for the rows to be available for input. Queries normally only display characteristic values if they have postings in the InfoProvider. Of course, because this is a planning scenario and you haven't created any data yet, you need to set the characteristics to display based on their master data. To do that, just select **Fiscal Year/Material Group** in the **Rows**, go to the **Properties** on the upper right, and in the **Extended** tab choose **Master Data**, as shown in Figure 10.18.

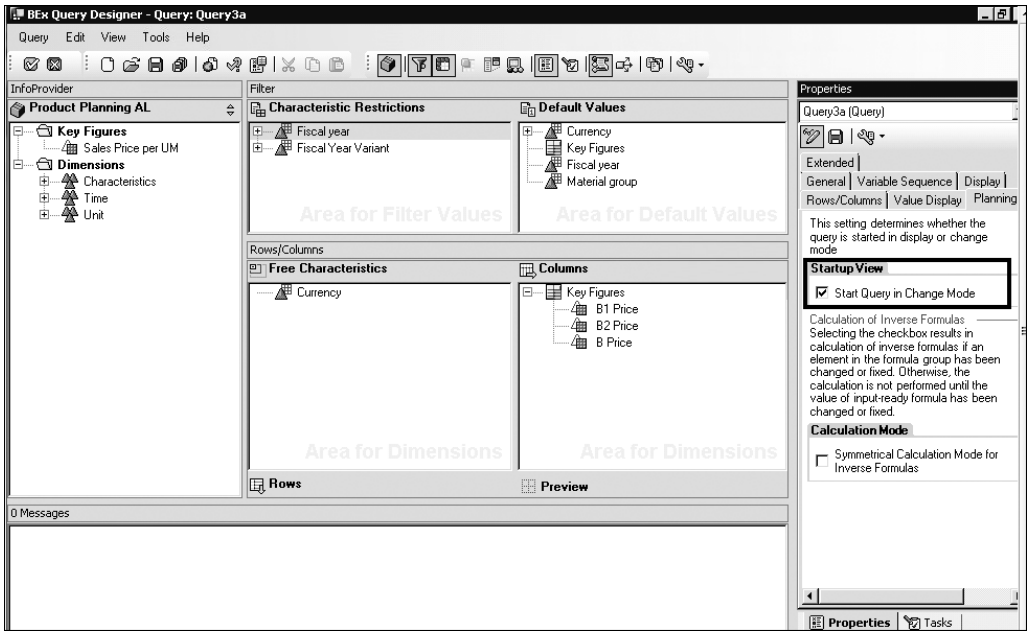


Figure 10.17 Query Planning Properties

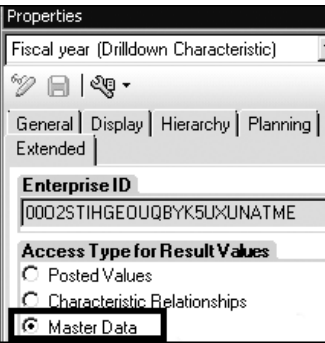


Figure 10.18 Setting Characteristics to Display Based on Master Data

Let's summarize the planning-related settings in the query:

- Key figures are set to allow input.
- The query is set to run in plan mode.
- The characteristics are set to display based on master data.

Now, test the planning-enabled query in the BEx Analyzer by choosing **Query • Exit and Use**.

In the result set in Figure 10.19, **B1 Price** and **B2 Price** are available for input based on the light blue border in the data cells, whereas **B Price** isn't and therefore just has the black border.

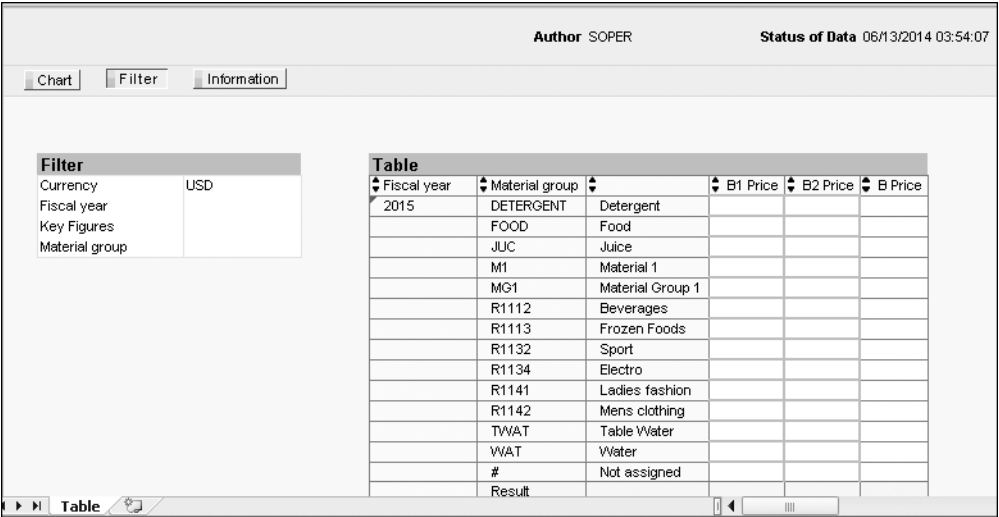


Figure 10.19 Query Default View in BEx Analyzer

In this case, the BEx Analyzer is being used only for testing; the ultimate UI will be the EPM add-in in Excel. To be able to use the EPM add-in, however, you first must create an embedded environment and a model.

10.1.5 Using Embedded SAP BPC Environments

If you have experience with standard SAP BPC, you know that when you've created environments, dimensions, and models in that version, the system generated the corresponding InfoArea, characteristic, and real-time InfoCubes in SAP BW—all in their own namespaces.

In contrast, embedded SAP BPC environments don't have a corresponding InfoArea, and the characteristic and real-time InfoCubes aren't created from the environment's administration UI because they already exist in SAP BW with the normal namespace. Why do you need an environment? In essence, the embedded SAP BPC environment

provides a framework that allows you to use work status, BPFs, data audit, web reports/input forms, and the EPM add-in. After we’ve walked through the creation of an embedded environment, we’ll make some more comparisons to standard environments.

In the administration screen, standard SAP BPC environments are still created by copying from an existing environment. Embedded SAP BPC environments, on the other hand, can only be created from scratch by choosing **Create**.

Because embedded SAP BPC environments don’t generate any SAP BW InfoAreas, characteristics, and InfoCubes, it doesn’t take very long to create them. To create an embedded environment, go to the web client, choose the currently connected environment at the bottom of the screen, and then choose **Manage • Manage All Environments • Create**.

In the resulting **Create an Environment** pop-up (see Figure 10.20), the **Type** defaults to **Unified** (remember that embedded SAP BPC was initially referred to as unified SAP BPC).

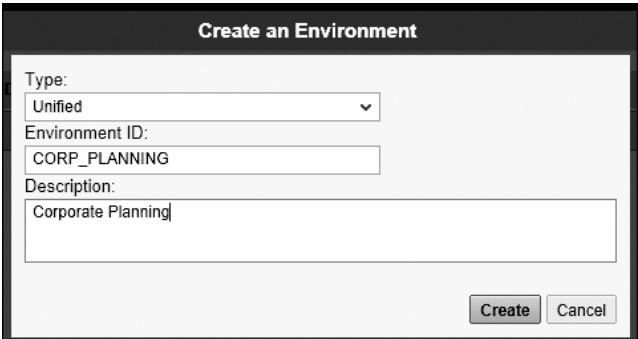


Figure 10.20 Creating Embedded Environment

After you input the **Environment ID** and **Description** and then choose **Create** again, the new embedded environment is available for use.

In Figure 10.21, you can see the initial web client view with the **Library** screen selected. To perform configuration in the web client, go to **Administration** (see Figure 10.22). There, you can use the hypertext links to configure anything from **Models** to **Data Audit**.

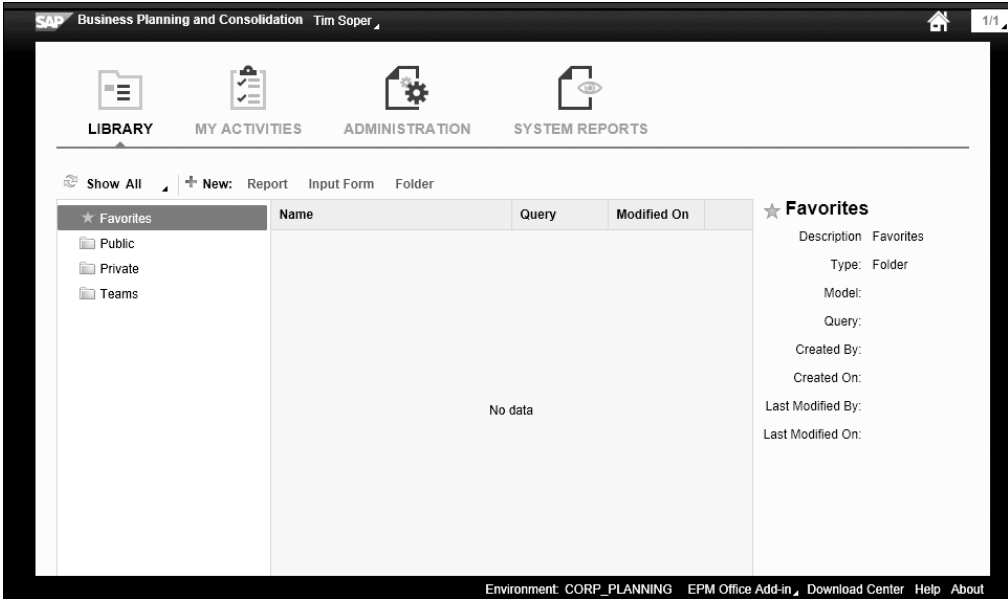


Figure 10.21 Embedded Web Client Library Screen

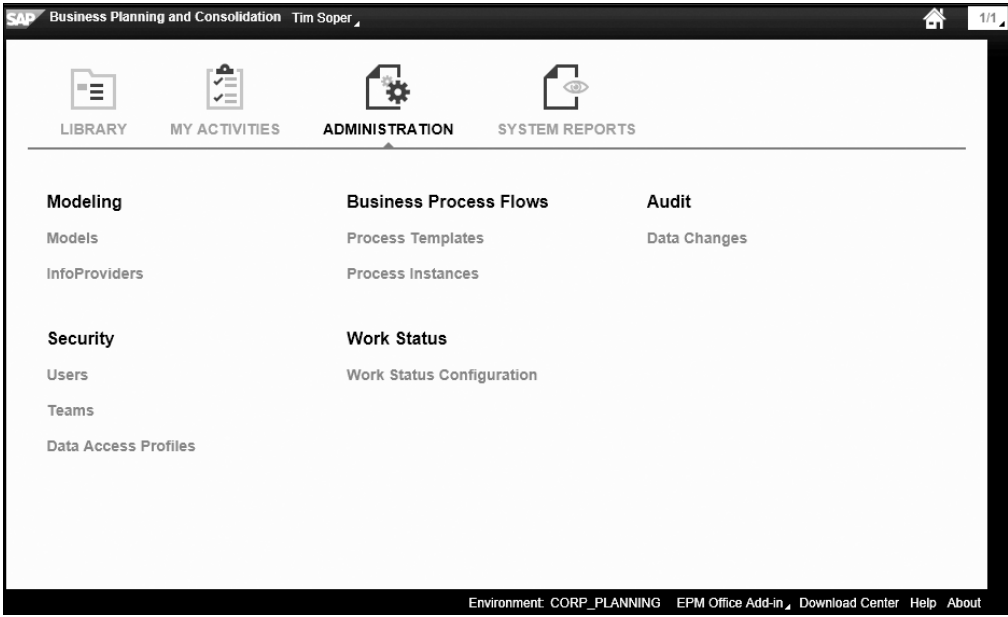


Figure 10.22 Embedded Web Client Administration Screen

You can now create an embedded model.

10.1.6 Using SAP BPC Models

Before we discuss the configuration of embedded SAP BPC models, let’s talk about what purpose they serve. Embedded SAP BPC models are used to select InfoProviders to report or plan on. In addition, these models and their linked InfoProviders contain the configuration for data profiles, work status, data audit, and BPFs.

How many embedded models will you need? The answer always depends on various factors, but in general you’ll most often use one model for each InfoProvider. For example, in the simplest scenario, a real-time InfoCube is linked to one embedded SAP BPC model. If you’re using a MultiProvider, then you only need one embedded model for that as well. Conceptually, the model represents the type of reporting or planning activity. If you need to do CapEx and HR planning, you’ll use a model for CapEx and another model for HR, and so forth.

Now that we’ve discussed the use case for embedded SAP BPC models, we can go into the configuration steps. To create an embedded model, go to **Administration** and choose **Models**. The **Create New Model** dialog will open, as shown in Figure 10.23.

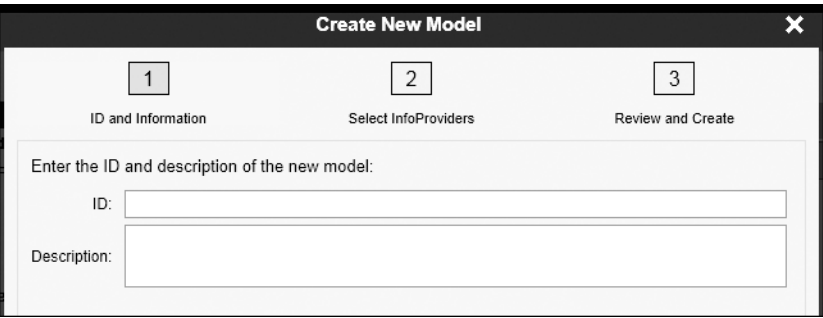


Figure 10.23 Creating Embedded Model

After providing an **ID** and **Description**, select an InfoProvider, as shown in Figure 10.24. When you go through the MultiProvider scenario later in this chapter, you’ll select several InfoProviders.

By choosing **Next** and then **Create**, you attach the model to an existing real-time InfoCube. If you want to view the structure of the underlying real-time InfoCube from the web client, you can just select the model’s link; in the **Structure** tab, you can see the **Characteristics** and **Key Figures**, as shown in Figure 10.25.

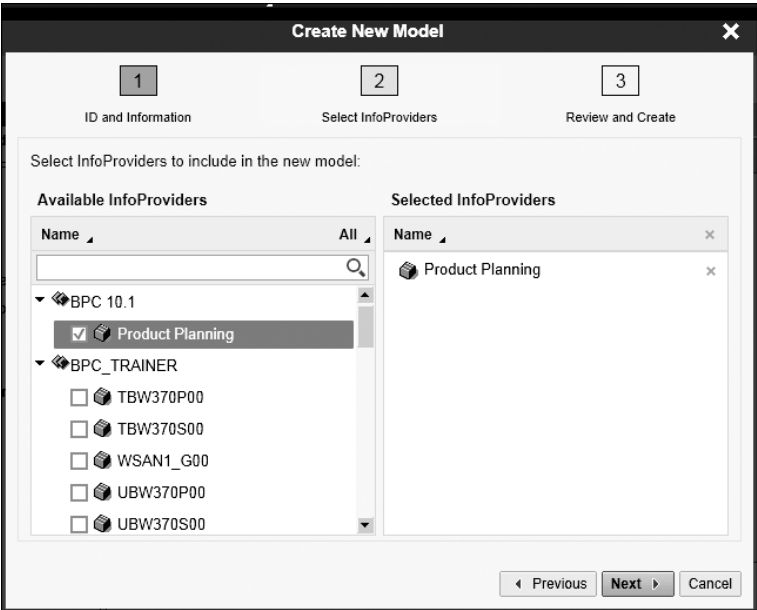


Figure 10.24 Selecting InfoProvider

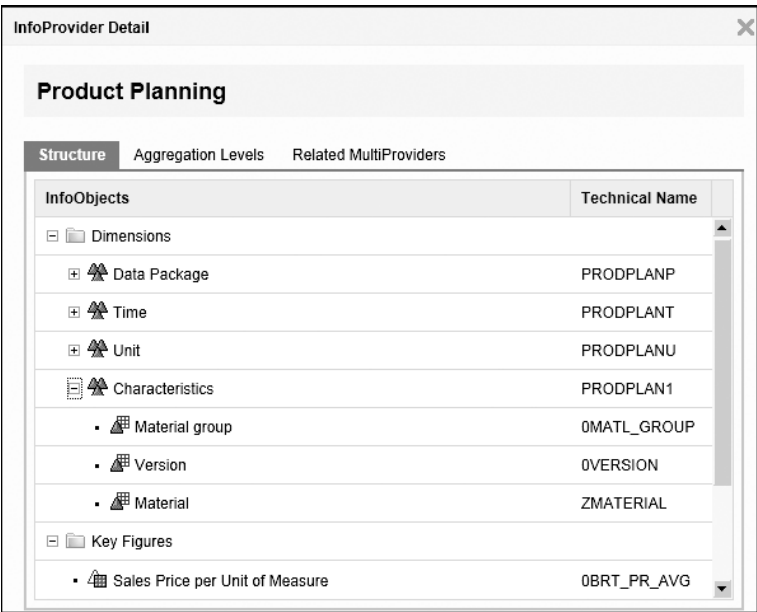


Figure 10.25 Viewing Characteristics and Key Figures of Embedded Model

The **Aggregation Levels** and **Related MultiProviders** tabs display the structure of the related aggregation level and MultiProvider.

Note

Because the real-time InfoCube is compressed in SAP BW using process chains, the embedded web client doesn't contain the model optimization option like the standard version does. This could be a decision point in terms of using an aDSO versus an InfoCube. The aDSO, if switched to a planning-based provider, doesn't have a standard option to handle the compression process nor the optimized process of dealing with the zero-based records (elimination of zero records during compression).

Now that the embedded model is complete, you can configure data access profiles, work status, and BPFs. It's also available for web and EPM add-in planning and reporting.

10.1.7 Using the EPM Add-in Workbooks for Basic Planning Scenarios

The EPM add-in for Excel is, of course, the main user interface for planning and analysis of embedded SAP BPC data. Building workbooks that include multiple EPM reports, drop-downs, buttons, VBA for before and after events, and so on will take up a large portion of the development in an implementation.

Chapter 4 describes all the basic and advanced features of the EPM add-in for standard SAP BPC models. This chapter describes all the basics when using the EPM add-in for embedded connections. In Chapter 11, we'll get into the finer points of how the EPM add-in works when connected to embedded models.

To access the EPM add-in, you can get there from the web client and use a system-generated connection, or you can use the **Start** menu and create a new connection. For this discussion of how to create a new connection for the embedded version, launch Excel from the **Start** menu and go to the **EPM** tab. After you create a connection, it will be available the next time you log in.

In the **EPM** tab, go to **Report Actions**, and choose **Manage Connections**. In the **Connection Manager**, create the connection with the parameters shown in Figure 10.26.

If you're familiar with standard SAP BPC, you'll notice that there is a new connection type: **SAP BW (INA Provider)**, with INA standing for *information access*. This new connection type is required for embedded SAP BPC and provides the following services:

- Work with SAP BW queries with or without variables
- Retrieve data using EPM reports
- Enter and save data using input forms
- Execute IP functions using data processes

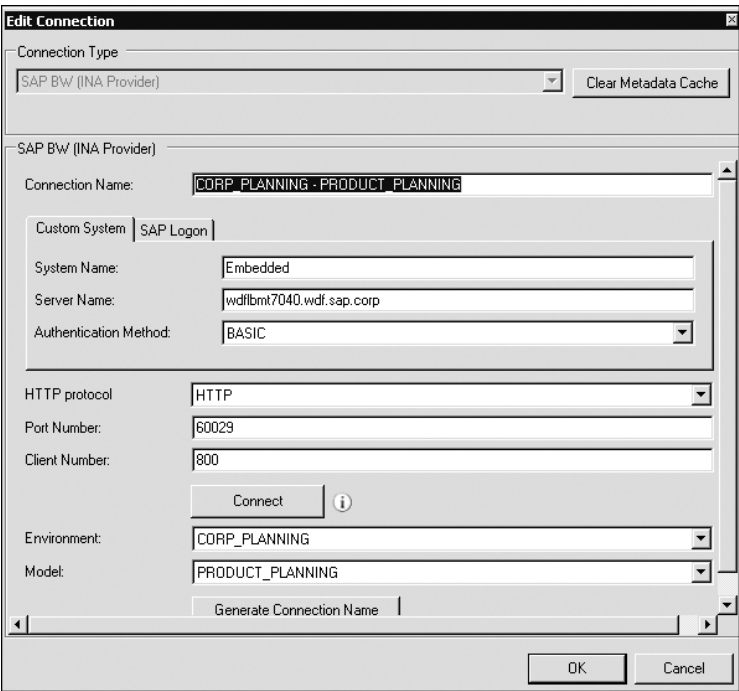


Figure 10.26 Creating Embedded Connection

Let's walk through the parameters shown in Figure 10.26:

- **Connection Name**
Enter a name of your choice, or use the **Generate Connection Name** button at the bottom of the screen.
- **Custom System**
Provide the server name manually.
- **SAP Logon**
Use the server from your SAP GUI logon.
- **System Name**
Enter a name of your choice.

- **Server Name**
You can get this from the URL for the web client.
- **Authentication Method**
Use **BASIC**.
- **HTTP protocol**
Use **HTTP** or **HTTPS**.
- **Port Number**
You can get this from the URL for the web client.
- **Client Number**
Use the SAP BW server client number.
- **Environment**
Choose an embedded environment.
- **Model**
Choose an embedded model.

When using the new connection, you get the **EPM—Query Selection** screen, as shown in Figure 10.27. In the top part of figure, you can search for either queries or workbooks.

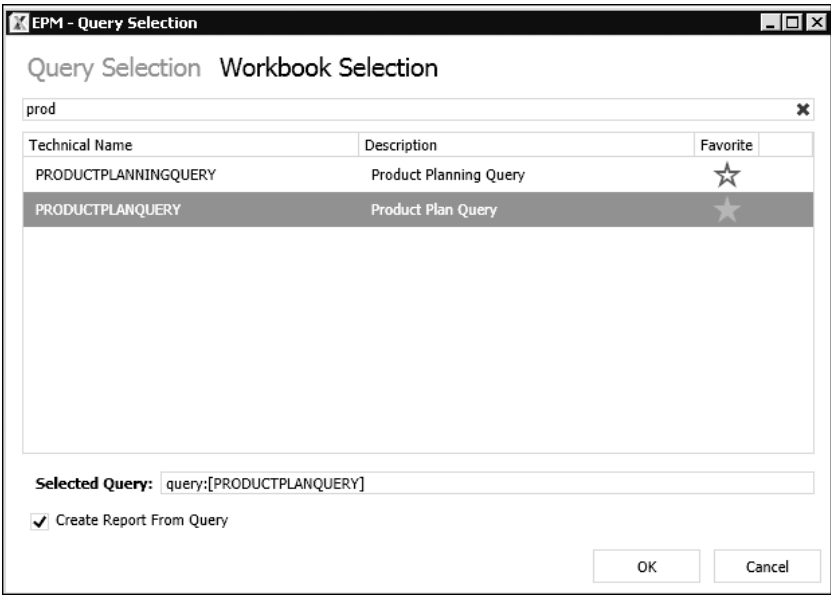


Figure 10.27 Selecting SAP BW Query in EPM Connection

If you want to run a plannable query, you can enter a character string such as “prod” under **Query Selection**, and the system will return a hit list of available queries to pick from. If you want to use a query more than once, you can make it a favorite by clicking the star icon under the **Favorite** column.

Notice that the **Create Report From Query** option is selected at the lower left of Figure 10.27. This will automatically create an EPM report based on the default query view. Choose **OK**, and the **EPM-Set Variable** prompt for fiscal year pops up. After you select the year, the EPM report is displayed in **Sheet1**; you can then enter prices for **B1**, for example, and use the **EPM Save Data** button to store the data in memory (see Figure 10.28).

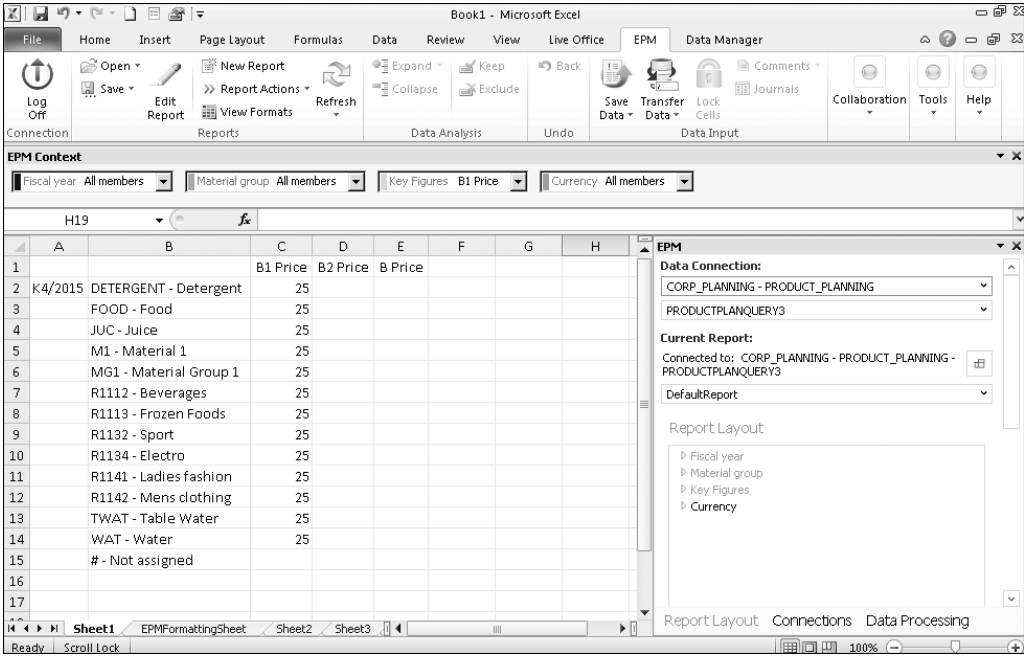


Figure 10.28 EPM Report Result Set

In Chapter 11, we’ll go through the **EPM** tab, the **EPM Context** area, and the **EPM** pane on the right in more detail, but for now we want to mention that the **Transfer Data** option is only available for embedded SAP BPC connections. The **Data Manager** tab is only for standard SAP BPC connections.

To use a planning function, select the **Data Processing** tab at the lower right, right-click on the EPM connection, and select a planning function. In this first pass, select the **Copy** function and add it to the EPM connection, as shown in Figure 10.29.

Then choose **Execute** to copy the prices from version B1 to B2.

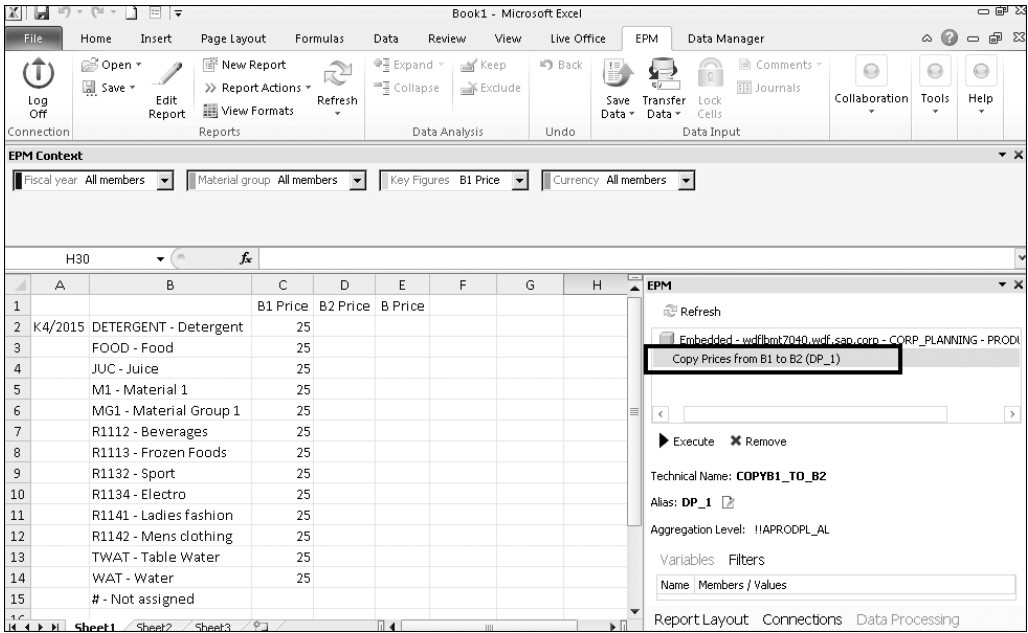


Figure 10.29 Data Processing Tab with Planning Function

In Chapter 12, we'll add a revaluation function to mark up or mark down prices, a delete function, and a copy function that will take either B1 or B2 prices via a variable and copy them to the final price data in version B.

For now, however, let's save the workbook for future use by choosing **Save • Save as Input Form to Server Folder** on the EPM tab. In the **Save** dialog box, save the new workbook to the **Public Folder** so others can access it.

That just about completes our initial goal of an end-to-end pass-through. However, there is usually a need to view the data in the database for debugging purposes, to clear up confusion over what a planning function is doing to the data, or to show how the system writes delta records when data is changed. We also need to discuss compression because that plays a slightly different role now that we're on SAP HANA.

10.1.8 Browsing and Compressing Data in SAP BW

To take a comprehensive approach, we also need to look at the data first from SAP BW and then from the SAP HANA modeler.

But before we look at any data, let's look at what data we've entered and saved in advance for this test example:

- Enter "25" for JUC.
- Enter "25" for WAT and save the data.
- Enter "35" for JUC.
- Enter "0" for WAT and save the data.

Then compress the real-time InfoCube with zero suppression turned on. Compression, you might recall, is used to reduce the redundancy of the database by aggregating data over common key fields. We'll describe this process next.

Now, you can use SAP BW Transaction LISTCUBE to display the data as in Figure 10.30. Enter the InfoProvider, press **[F8]**, and choose **Fld Selection for Output • Select All**. Then press **[F8]** twice.

Before compression

"PRODPLAN", List output

...	L_GROUP	Version	Material	OFISCPER3	OFISCVARNT	Fiscal ye...	Sales unit	Currency	...	PR_AVG	OCOPACOGSV	Revenu...	Sales quantity
JUC	B1				K4	2015		USD		25.00	0.00	0.00	
WAT	B1				K4	2015		USD		25.00	0.00	0.00	
JUC	B1				K4	2015		USD		10.00	0.00	0.00	
WAT	B1				K4	2015		USD		25.00-	0.00	0.00	

After compression

"PRODPLAN", List output

...	L_GROUP	Version	Material	OFISCPER3	OFISCVARNT	Fiscal ye...	Sales unit	Currency	...	PR_AVG	OCOPACOGSV	Revenu...	Sales quantity
JUC	B1				K4	2015		USD		35.00	0.00	0.00	

Figure 10.30 Viewing Data via ListCube

Before compression, the records in Figure 10.30 demonstrate that the real-time InfoCube works the way it always has: delta records are written to the database to get the

net result (i.e., **JUC** has a delta of 10 to get a net of 35, and **WAT** has a delta of -25 to get a net of 0). After the zero-based compression, there is only one record (-35 for **JUC**); because the records for **WAT** net to zero, they were eliminated.

Compressing data in InfoCubes normally is carried out in a process chain. To do it manually for test purposes, follow these steps:

1. Go to Transaction RSA1.
2. From the context menu of the real-time InfoCube, choose **Planning Specific InfoCube Properties • Change Real-Time Load Behavior**.
3. Choose **Load Mode** to close the open request ID.
4. Choose **Plan Mode • Continue**.
5. Choose **Manage**, then go to the **Collapse** (compress) tab shown in Figure 10.31.
6. Select the **With Zero Elimination** checkbox, then click **Release**.

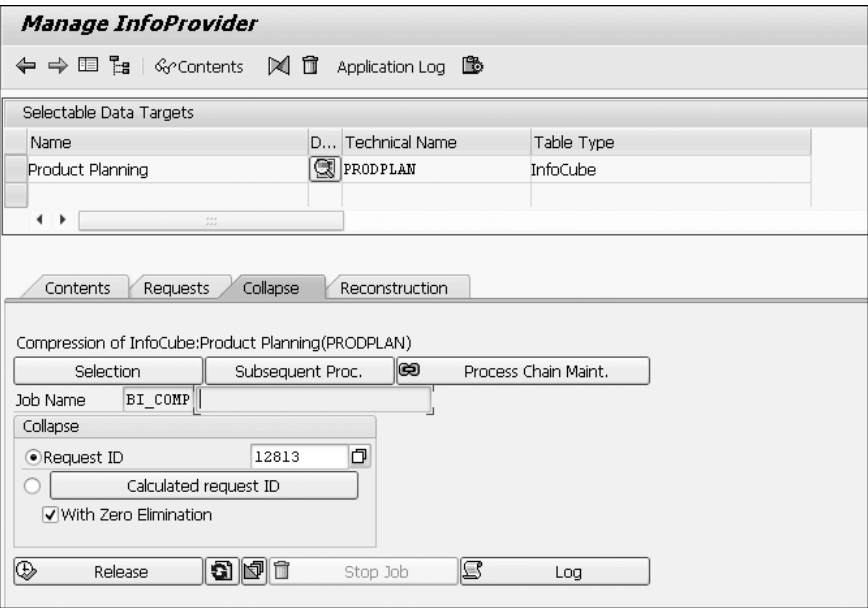


Figure 10.31 Compressing Real-Time InfoCube

Here you can see that with SAP BW on SAP HANA, InfoCubes no longer have a **Rollup** tab because aggregates aren't used with SAP HANA. In addition, there is no **Performance** tab either because the data statistics aren't relevant when SAP HANA is being used.

10.1.9 Browsing Data and Statistics in SAP HANA

Because SAP HANA has modeling and ETL capabilities, there no doubt will be some development work in SAP HANA in support of SAP BPC planning and analysis scenarios. You may also want to browse the data in SAP HANA as well to erase any doubts about what the application is doing to the data or to debug.

In Chapter 9, we discussed some of the basics of SAP HANA along with the important planning implications; now we'll browse the data in SAP HANA and view the memory-consumption statistics.

Let's look at the data using the SAP HANA Administration Console. To access the console, go to **Start • All Programs • SAP HANA • SAP HANA Studio • Open Administration Console**. Under **Systems**, right-click, choose **Add System**, and enter the information shown in Figure 10.32. The **Host Name** and **Instance Number** can be accessed from your SAP HANA administrator.

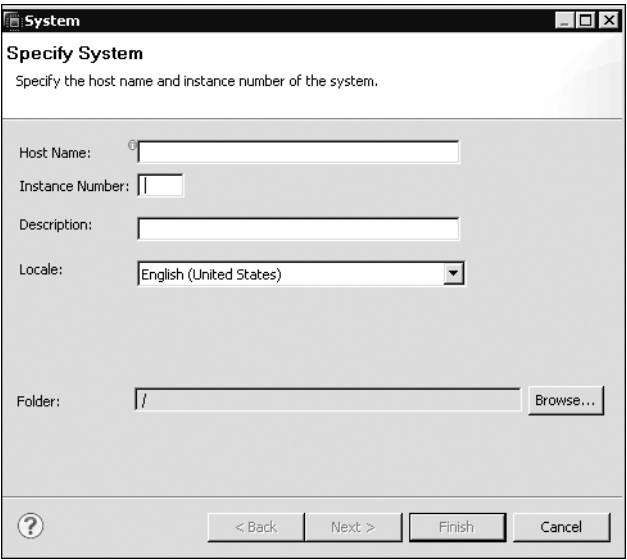


Figure 10.32 Adding SAP HANA System

Choose **Next**, then enter your **User Name** and **Password**, as shown in Figure 10.33. Choose **Finish**. Expand the **Systems** tab at the upper left of the screen, open the **Catalog** folder, right-click on the table, and choose **Filter**. Enter your InfoCube name and choose **OK**. Right-click the fact table (**/BINFOCUBE/FPRODPLAN**) and choose **Open Data Preview**.

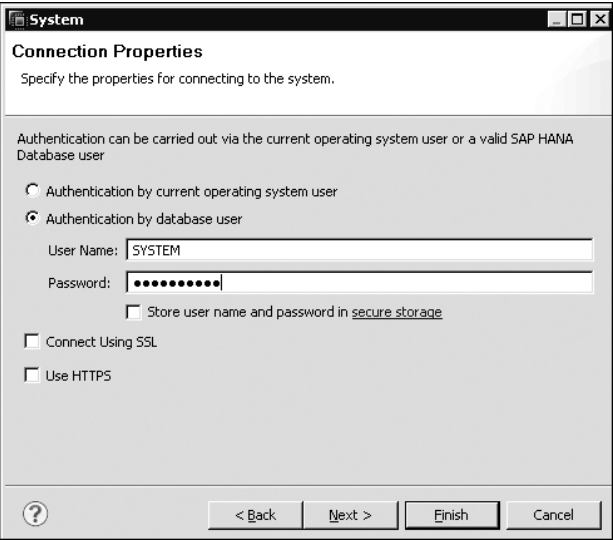


Figure 10.33 SAP HANA Connection Credentials

Figure 10.34 shows basically the same data before compression as you saw in SAP BW: the two initial prices of 25, 10 for the change to 35, and -25 for the change from 25 to 0.

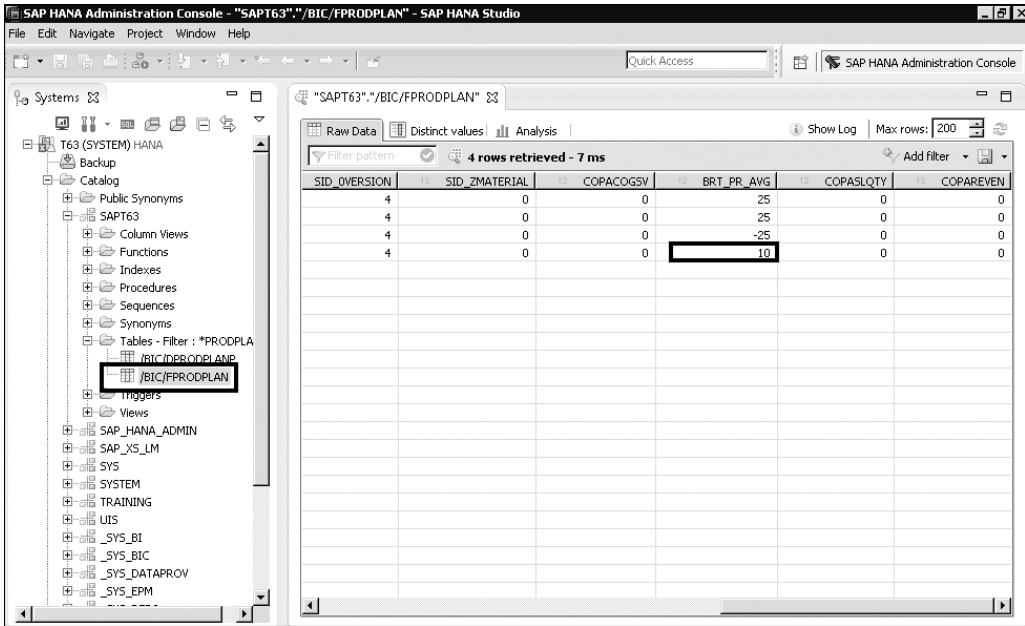


Figure 10.34 SAP HANA Data Preview before Compression

After zero-based compression, there is only one data record (Figure 10.35), as you saw previously. Because this data browser hits the fact table directly, the surrogate IDs (SIDs) are displayed. For example, the SID for version (SID_OVERSION) is 4, which is an alias for version B1.

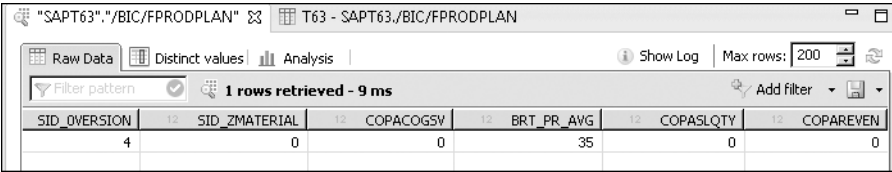


Figure 10.35 SAP HANA Data Preview after Compression

Embedded SAP BPC works the same as standard SAP BPC when it comes to writing delta records to the real-time InfoCube. Both embedded and standard applications compress the data as well. In addition, compression also triggers a merge of the data from delta storage to main memory in SAP HANA, which improves performance because subsequent reads won't have to the merge the data from delta and main memory.

To see this in the SAP HANA administration console, right-click the fact table and choose **Open Definition**. Go to the **Runtime Information** tab shown in Figure 10.36.

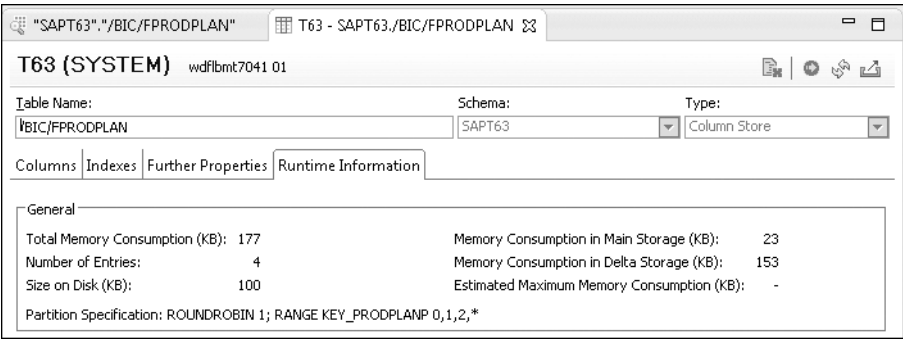


Figure 10.36 SAP HANA Memory Consumption before Compression

Before compression, the **Memory Consumption in Main Storage (KB)** is 23 and **Memory Consumption in Delta Storage** is 153. After compression, **Main** increases to 56 and **Delta** goes down to 92 (see Figure 10.37).

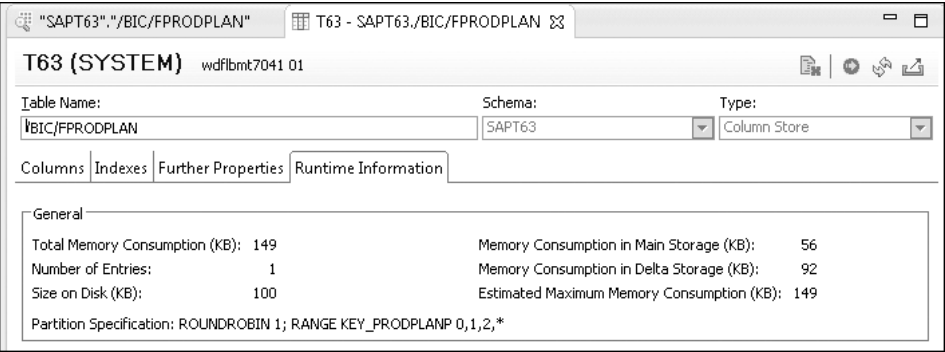


Figure 10.37 SAP HANA Memory Consumption after Compression

In our scenario, we only used one real-time InfoCube, but in many cases you’ll need to use multiple InfoProviders. For example, you might want to store granular actual data in one InfoProvider and less granular plan data in another, or you might want to plan on product price data in one InfoProvider and at the same time plan quantities and revenue in another. You can do this with a MultiProvider.

10.2 Using MultiProviders

Just as a refresher, remember that MultiProviders can be used to union data in other InfoProviders. Although there is no data in a MultiProvider, it’s a structure that you can use in reporting and planning scenarios that involve multiple InfoProviders.

Note: MultiProviders vs CompositeProviders

Remember from our discussion earlier that the best practice going forward with the SAP HANA layer is to use CompositeProviders versus MultiProviders. Very much the same approach is used in terms of building the CompositeProviders, but the work is done via SAP HANA studio versus the SAP HANA Administration Workbench.

Of course, we could have used a MultiProvider in our previous scenario by adding an additional InfoProvider to it for the quantity and revenue planning. In reality, you should always use MultiProviders even if you only need one real-time InfoCube because they provide flexibility for modeling changes such as adding a new InfoProvider or switching to a different InfoProvider. Therefore, using MultiProviders provides a lower cost of maintenance for design changes.

Our new scenario calls for two real-time InfoCubes under a MultiProvider (Figure 10.38): PRICEPLAN and REVPLAN. The key difference between the two real-time InfoCubes is that PRICEPLAN has the price key figure, whereas REVPLAN has the revenue and quantity key figures.

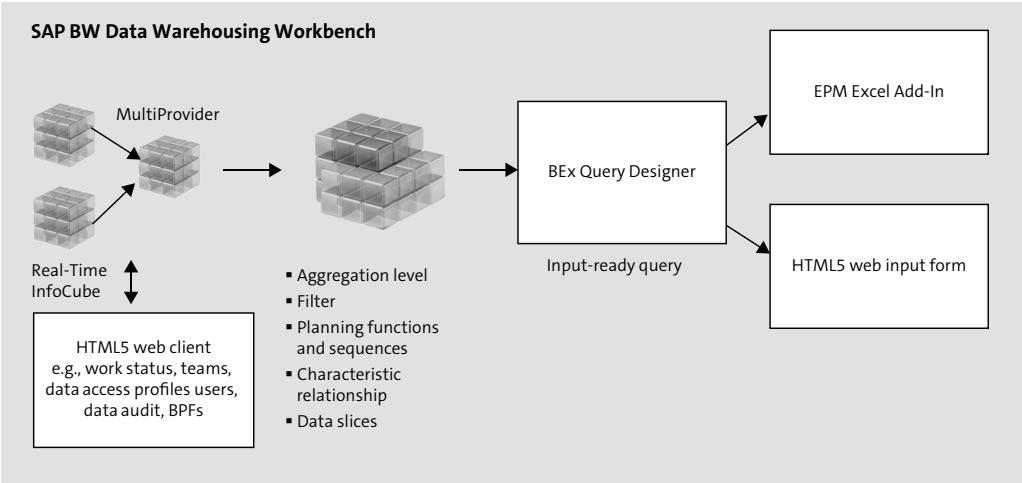


Figure 10.38 Embedded SAP BPC Components (Two Real-Time InfoCubes)

The following components you need for this scenario are essentially the same as in the previous example with one InfoCube except you need a MultiProvider:

- Real-time InfoCubes
- MultiProvider
- Aggregation level
- Planning function
- Planning query
- Embedded environment
- Embedded model
- EPM workbook with an EPM report and planning functions

10.2.1 Creating the MultiProvider

The data model of the MultiProvider from Transaction RSA1 is shown in Figure 10.39. In this example, all InfoObjects from both real-time InfoCubes have been included in the MultiProvider, as well as the output from the characteristic and key figures.

Data Model for MultiProvider PLANMP		
InfoCube data model		
Plan MultiProvider	Techn.name	
Characteristics	PLANMP2	
Company code	OCOMP_CODE	
Controlling area	OCO_AREA	
Customer group	OCUST_GROUP	
Material group	OMATL_GROUP	
Version	OVERSION	
Data Package	PLANMPP	
Time	PLANMPT	
Posting period	OFISCPER3	
Fiscal year variant	OFISCVARNT	
Fiscal year	OFISCYEAR	
Data Package	PLANMPP	
Unit	PLANMPU	
Key Figures	1KYFNM	
Sales Price per Unit of Measure	OBRT_PR_AVG	
Total Variable Cost of Goods Manufactured	OCOPACOGSV	
Contribution margin 1	OCOPAMRGN1	
Revenue	OCOPAREVEN	
Sales quantity	OCOPASLQTY	

Figure 10.39 MultiProvider Structure from Transaction RSA1

Follow these steps to create a MultiProvider:

1. Go to Transaction RSA1.
2. In the **InfoProvider** tree, right-click on an **InfoArea** and choose **Create MultiProvider**.
3. Input a **Name** and **Description** and click **Continue**.
4. Select the relevant InfoProviders and click **Continue**.
5. Select the desired InfoObjects and choose **Identify Characteristic • All • Continue • Continue • Identify Key Figures • All • Continue • Continue • Activate**.

Before we head to Transaction RSPLAN to create the aggregation level, we should point out that because MultiProviders don’t store any data, you can’t use the characteristic relationships, use the IP data slice, or run planning sequences as data is saved. Those features, however, are inherited from the underlying InfoProviders, so you can only choose **View** in the InfoProvider screen of Transaction RSPLAN.

10.2.2 Creating Aggregation Levels for MultiProviders

In this scenario, the aggregation level is created on the MultiProvider, not directly on the real-time InfoCube. In Transaction RSPLAN, you can see the aggregation level, as shown in Figure 10.40.

Maintain Aggregation Level PLANMPAL				
Basis InfoProvider				
Plan MultiProvider	Techn...	Aggregation Level		
InfoObjects	PLANMP	Plan MP AL	Technical N...	Data... Len...
Time Characteristics		Object Information	PLANMPAL	
Posting period	OFISCPER3	InfoObjects		
Fiscal year variant	OFISCVARNT	Time Characteristics		
Fiscal year	OFISCYEAR	Fiscal year variant	OFISCVARNT	CHAR 002
		Fiscal year	OFISCYEAR	NUMC 004
Chars.		Chars.		
Company code	OCOMP_CODE	Company code	OCOMP_CODE	CHAR 004
Controlling area	OCO_AREA	Controlling area	OCO_AREA	CHAR 004
Customer group	OCUST_GRP	InfoProvider	OINFOPROV	CHAR 030
InfoProvider	OINFOPROV	Material group	OMATL_GROUP	CHAR 009
Material group	OMATL_GRP	Version	OVERSION	CHAR 003
Version	OVERSION	Units		
		Sales unit	OCOPASLQTU	UNIT 003
Sales unit	OCOPASLQ	Currency key	OCURRENCY	CUKY 005
Currency key	OCURRENC	Key Figures		
		Sales Price per Unit of Measure	OBRT_PR_AVG	CURR 009
Sales Price per Un	OBRT_PR_	Total Variable Cost of Goods Manufactured	OCOPACOGSV	CURR 009
Total Variable Cos	OCOPACOG	Contribution margin 1	OCOPAMRGN1	CURR 009
Contribution marg	OCOPAMRC	Revenue	OCOPAREVEN	CURR 009
Revenue	OCOPAREV	Sales quantity	OCOPASLQTY	QUAN 009
Sales quantity	OCOPASLQ			

Figure 10.40 Aggregation Level on MultiProvider

If you have experience with MultiProviders, you know that the system provides a characteristic called **InfoProvider**. In Figure 10.40 you can see it in the **Chars.** folder. The InfoProvider characteristic can be used to select data in the underlying tables.

10.2.3 Creating Queries in the MultiProvider Scenario

The InfoProvider characteristic is also needed in the query. Figure 10.41 shows that the **Characteristic Restrictions** for **InfoProvider** include the **Price Planning** and **Revenue Planning** real-time InfoCubes.

In addition, because you’ll be planning on key figures in both real-time InfoCubes, the key figures need to be restricted by the appropriate InfoProvider. For example, in Figure 10.42, you can see that the key figure **Sales Qty CC1000** is restricted to the **Revenue Planning** InfoCube.

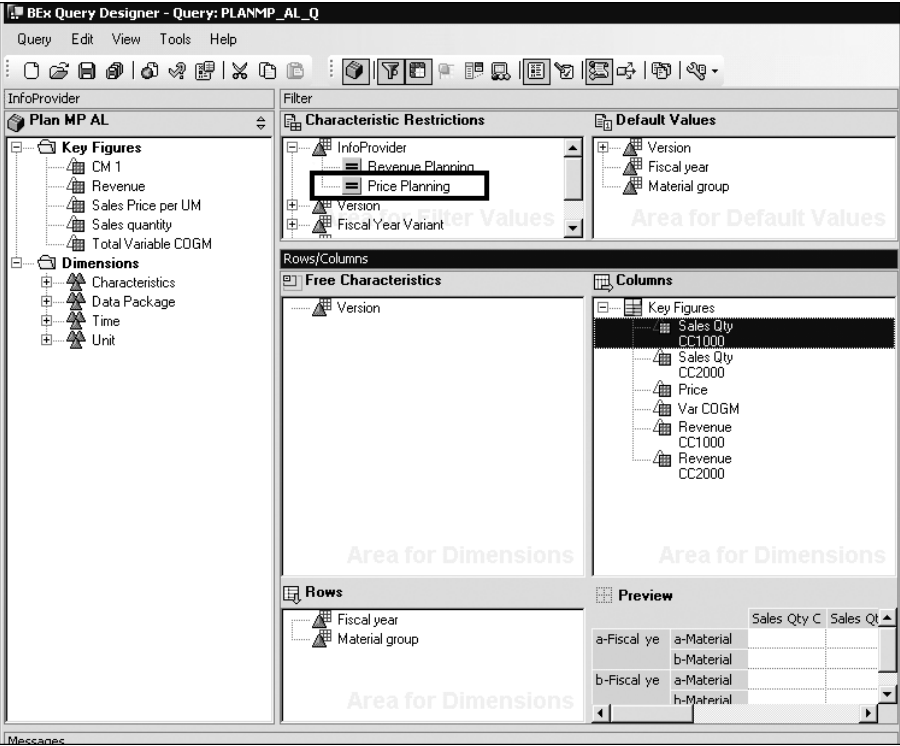


Figure 10.41 Query in MultiProvider Scenario

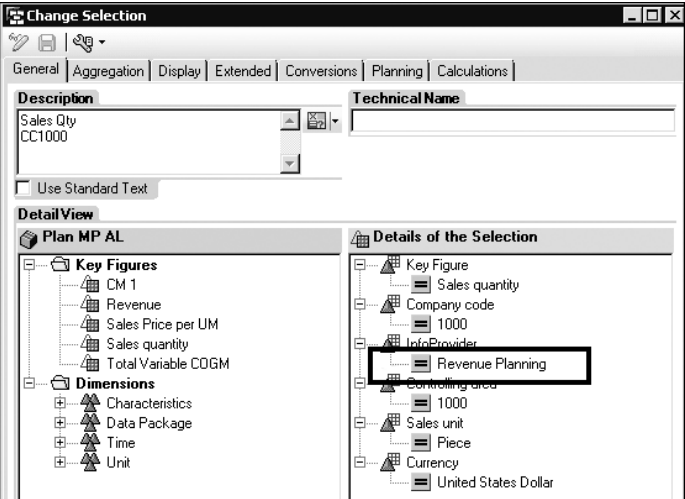


Figure 10.42 Sales Quantity Key Figure Restricted to Revenue Planning InfoCube

In contrast, the **Price** key figure is restricted to the **Price Planning** real-time InfoCube, as shown in Figure 10.43.

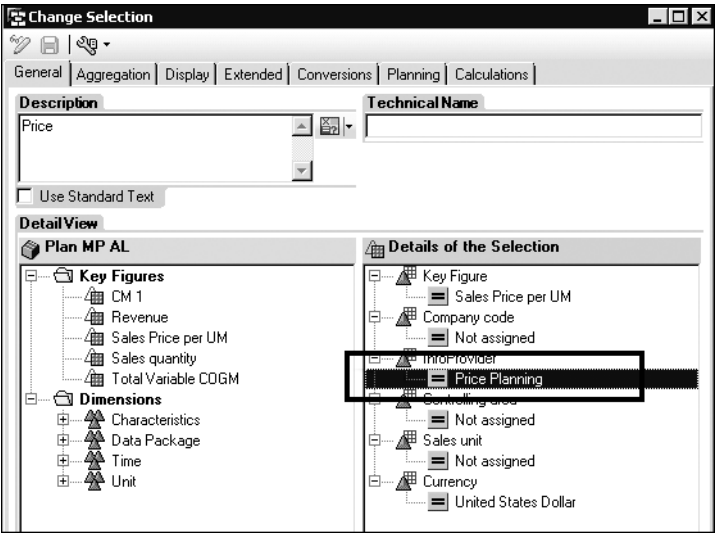


Figure 10.43 Price Key Figure Restricted to Price Planning InfoCube

To use the query in an EPM workbook, you need to create an embedded SAP BPC model.

10.2.4 Creating Embedded Models in the MultiProvider Scenario

To create an embedded model, go to the web client, choose **Administration**, and click the **Models** link. Then choose **New**, enter the **ID** and **Description** of the model, and click **Continue**.

Next select the **Price Planning** and **Revenue Planning** InfoProviders shown in Figure 10.44. You may have expected that you would select the MultiProvider at this point, but the SAP BPC features such as data audit, security, and work status all relate to the InfoProviders themselves, which is why you select them and not the MultiProvider. Note that you are selecting them based on the MultiProvider that will show up in the selection options screen.

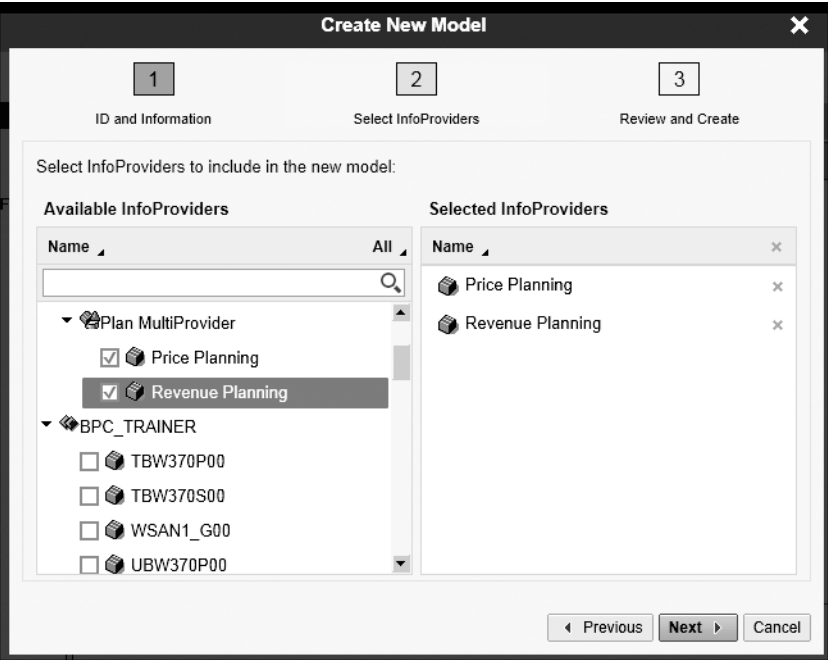


Figure 10.44 Selecting Real-Time InfoCubes for MultiProvider Scenario

After selecting the InfoCubes, choose **Next**, then **Finish**. Now you can use the planning-enabled query in the EPM add-in.

10.2.5 EPM Add-In for the MultiProvider Scenario

You'll use the same process as before to open Excel and connect to the new model and then use the new query to generate an EPM report (see Figure 10.45). Notice the **Not assigned** member for material group in row 3. This appears in the result set because the query filter is set to **Juice, Table Water**, and **#** (not assigned).

The hash symbol **#** can be used in planning scenarios when you want to plan at a higher level and distribute the unassigned values. For example, you could input a sales quantity of 300,000 in row 3 for the year and input **#** for material group to run a top-down distribution that would zero out the 300,000 for **#** and distribute it to 150,000 for juice and 150,000 for table water (assuming an even split). In Chapter 12, we'll discuss this in more detail.

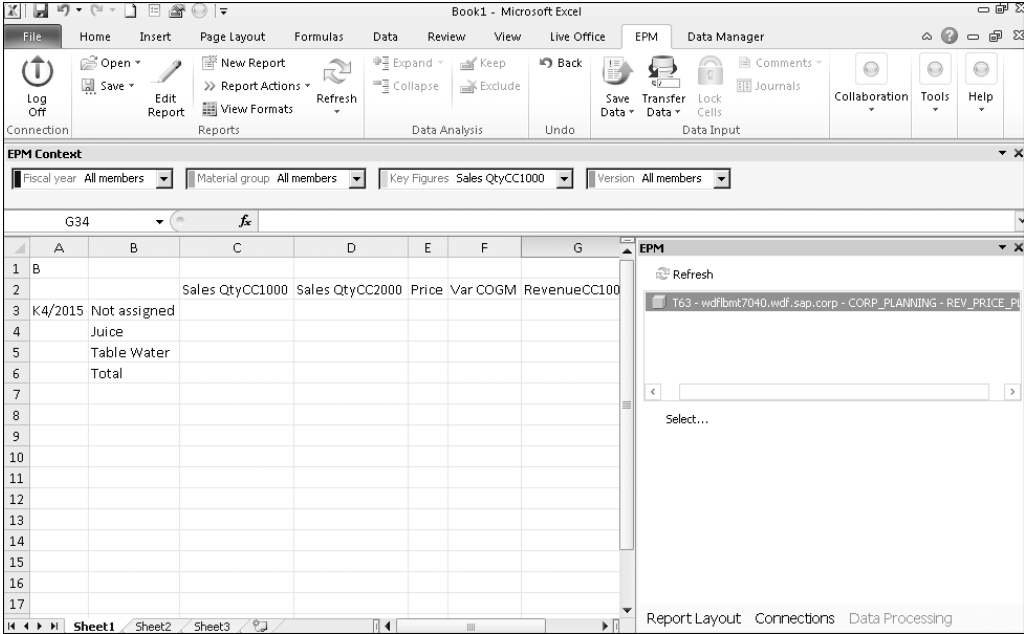


Figure 10.45 Excel EPM Add-In for MultiProvider Scenario

Now that you've seen how to use a MultiProvider in embedded SAP BPC, let's look at how embedded SAP BPC works with another VirtualProvider.

10.3 Using CompositeProviders

CompositeProviders are used for unions just like MultiProviders except that they can be maintained by business users in SAP BW workspaces, easy-to-use Web Dynpro screens in which business users can model their own ETL solutions in a controlled environment.

CompositeProviders also can be used to perform joins and, because the join is executed on the SAP HANA database, it's therefore suitable for mass amounts of data.

CompositeProviders can include a local provider, for example, and a real-time InfoCube to access global plan data. You can then create an aggregation level on top of the CompositeProvider and therefore the touch point for the ABAP Planning Manager in IP, as shown in Figure 10.46.

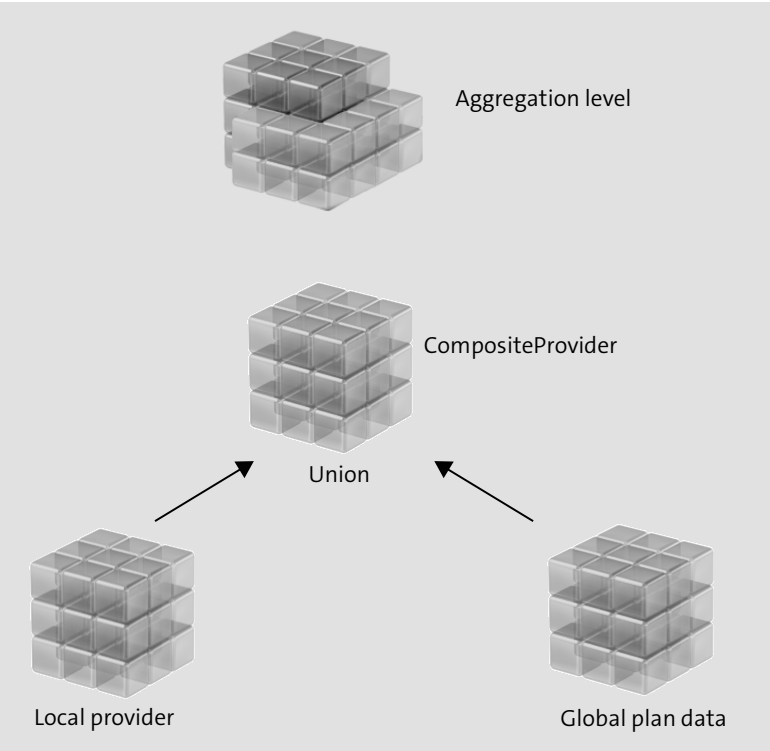


Figure 10.46 Using CompositeProvider to Union Local and Global Data

CompositeProviders are a good example of how SAP HANA helps to provide data modeling options for planning by making data consumption so much easier. Now that you’ve seen how to use a MultiProvider and CompositeProvider in embedded SAP BPC, let’s look at how to plan with DSOs.

10.4 Using DataStore Objects

Recall that real-time InfoCubes used with MultiProviders are the primary InfoProviders for embedded SAP BPC. DSOs can be used to fit more specialized scenarios such as price planning and comments. In addition, planning-enabled DSOs handle data changes a bit differently, so we’ll discuss that as well.

Note: Advanced DataStore Objects

Our discussion of MultiProviders versus CompositeProviders in Section 10.2.1 holds true for DSOs versus aDSOs as well. Again, these are similar objects, and the difference is that the DSO is built in the SAP BW Administration Workbench versus the aDSO, which is built in SAP HANA studio.

To use a DSO in embedded SAP BPC, you’ll need to create the following objects:

- Planning-enabled DSO
- Aggregation level
- Planning functions
- Planning query
- Embedded model
- Planning-enabled query
- EPM workbook with an EPM report and planning functions

You would normally include the DSO in a MultiProvider and build the aggregation level on the MultiProvider in a real-life scenario.

10.4.1 Creating a Planning-Enabled DSO

To create a DSO, go to Transaction RSA1, right-click on an InfoArea, and choose **Create DSO**. Input a name and description, and use a template (here, **tbw370s00**) if you want to copy in a set of InfoObjects (see Figure 10.47).

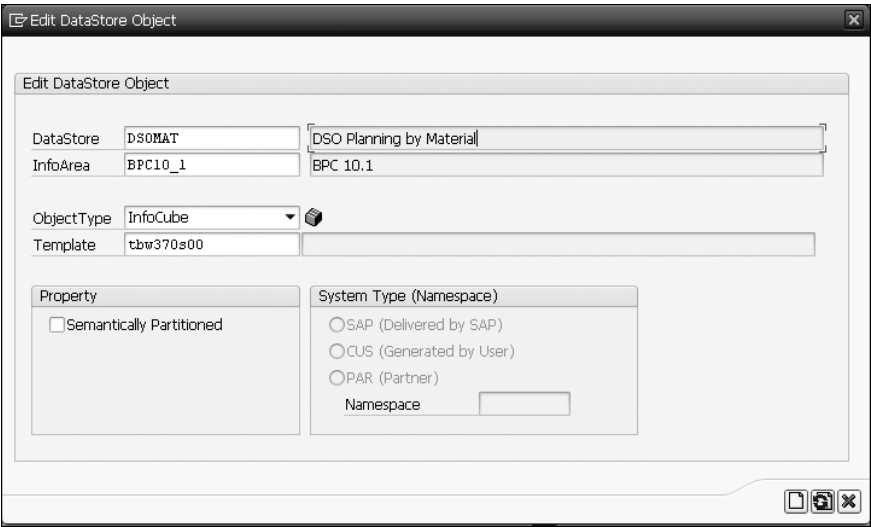


Figure 10.47 Creating DSO from Transaction RSA1

After choosing **Create**, you can change the **DataStore** type (use the pencil icon) to **Direct Update** and check the box next to **Planning Mode** to make it plannable. These settings can't be changed after there is data in the DSO.

As shown in Figure 10.48, we've moved all characteristics into the **Key Fields** folder, which is required to make it plannable.

If you ever need to expose the DSO data via an analytic view in SAP HANA, check the box next to **External SAP HANA View for Reporting**. The package in SAP HANA in which the view is generated is set up in Transaction SPRO, and the SAP BW analysis authorizations are automatically created in the SAP HANA privileges.

When the DSO is activated, the system creates an active table that will be used to store the data (direct update DSOs don't have three tables like standard DSOs do, and planning-enabled DSOs can't be loaded via SAP BW ETL).

In Transaction RSPLAN, you can use the characteristic relationships, data slices, and central settings (i.e., to run planning sequences as data is saved) for planning-enabled DSOs.

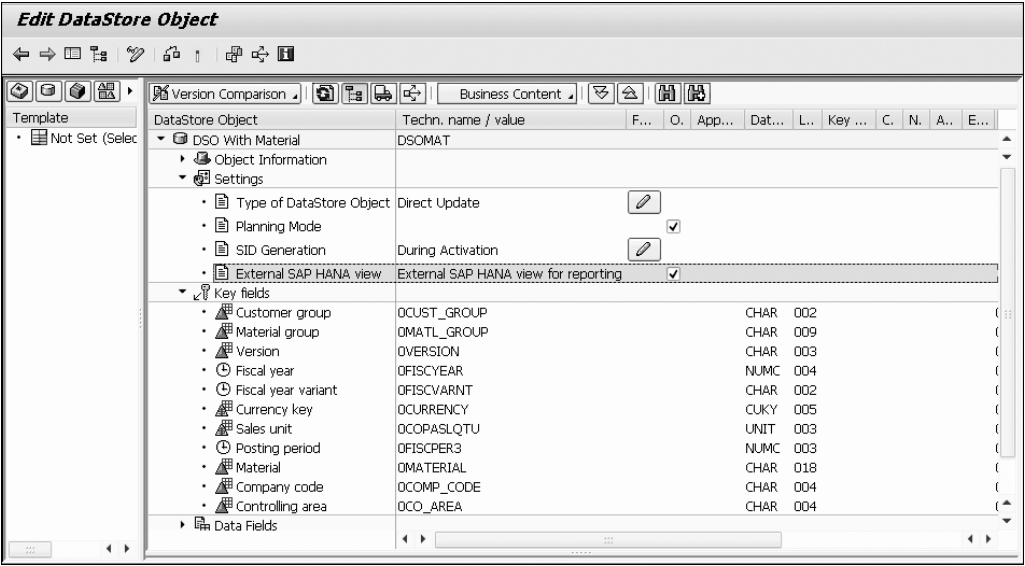


Figure 10.48 Creating Planning-Enabled DSO

10.4.2 Creating an Aggregation Level for a DSO

An aggregation level for a planning-enabled DSO must contain all the DSO InfoObjects, as shown in Figure 10.49.

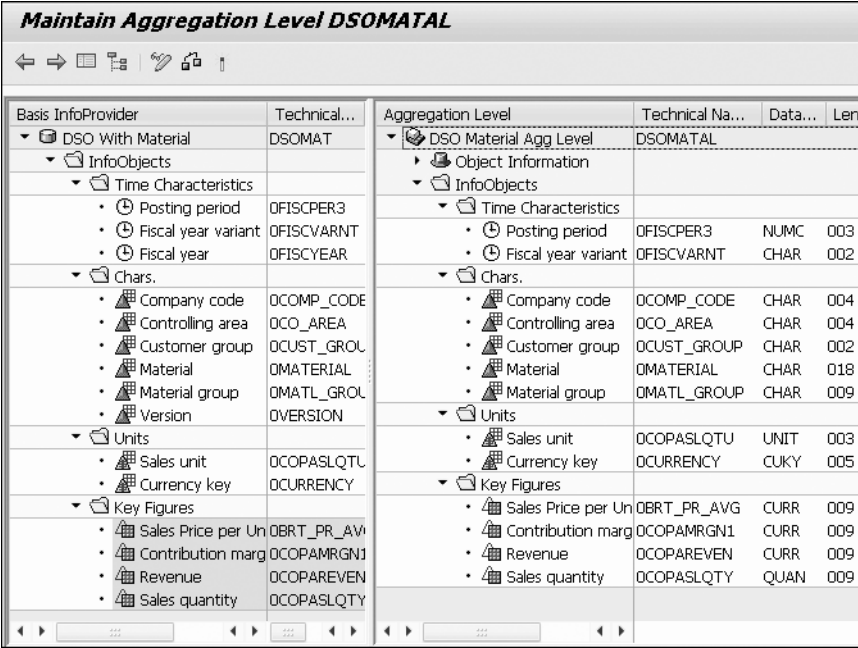


Figure 10.49 Aggregation Level for DSO

The process to create a model for the DSO in the web client is the same as for a single real-time InfoCube, for example. Although you can't use data audit for a planning-enabled DSO, all the other features, such as work status, BPFs, and data profiles, are available.

10.4.3 EPM Add-In for DSO Scenario

There are no unique settings in planning-enabled queries on DSOs, so we'll go right to the output in the EPM add-in after running the query (see Figure 10.50).

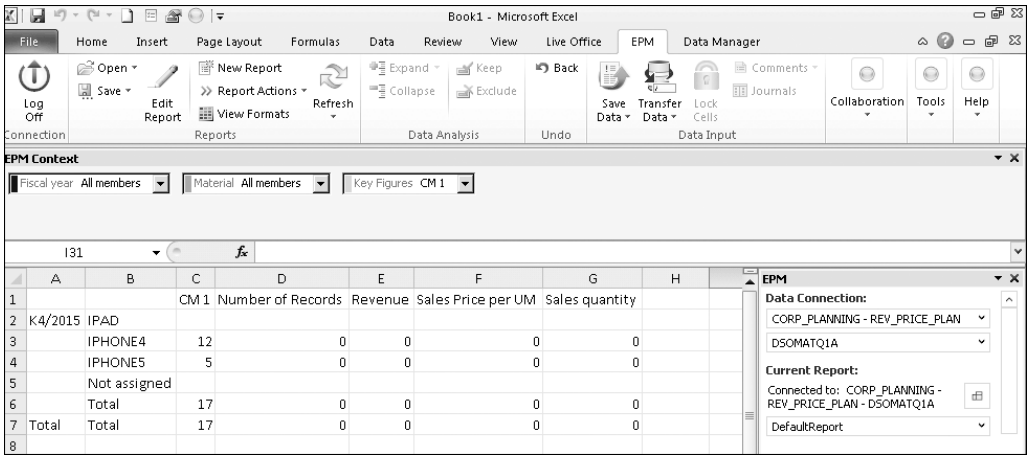


Figure 10.50 EPM Add-In for DSO Scenario

In general, the EPM add-in functions the same for a DSO as it does for a real-time InfoCube or MultiProvider. However, here the delta buffer for a DSO works in overwrite mode.

For example, if you change the **CM1** contribution margin for **IPHONE4** from 12 to 20, and **IPHONE5** from 5 to 0, then the DSO only stores the latest data and not the original value of 12 and the incremental change. After saving 20 and 0 from the EPM add-in, Figure 10.51 shows the database values.

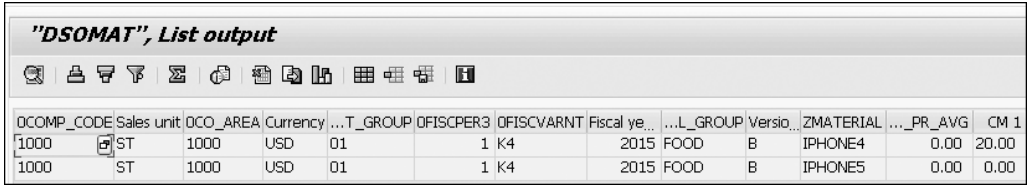


Figure 10.51 Data in DSO after Saving Changes

10.4.4 DSO Price Planning

If you need to perform price planning, consider using a planning-enabled DSO because it offers unique aggregation on parents. In general, you don't usually want to aggregate prices because the total would be meaningless.

In plannable DSOs, if the children have different prices of 1.20, 1.30, and 1.50 EUR, the parent (Water) value will display as NONEX in Figure 10.52. On the other hand, if all

the children of a parent have the same price of 1.20 EUR, then that price (1.20 EUR) is displayed for the parent.

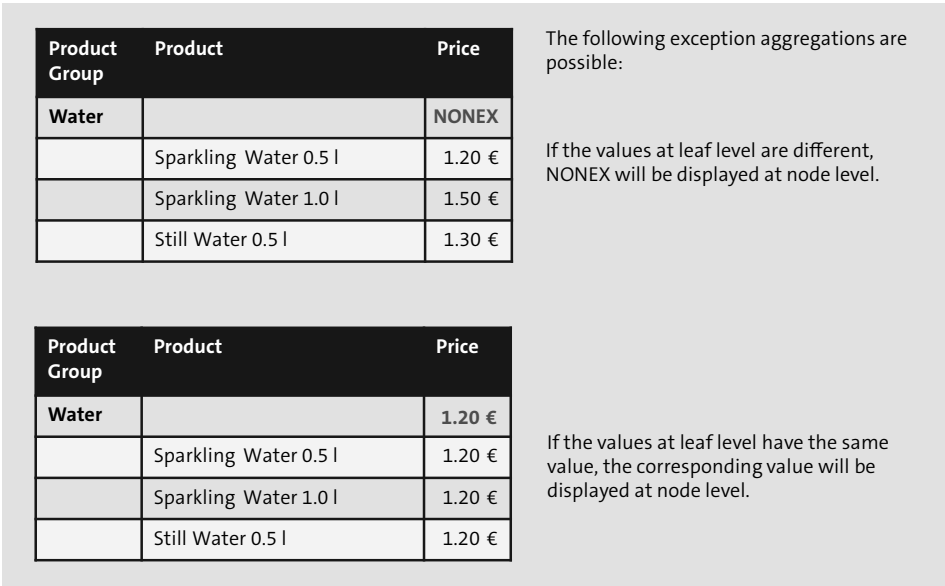


Figure 10.52 DSO Price Planning Example

Let's look at another use case for DSO price planning. If the product prices are different, the planner can input a price for the parent (Water) and that price will be used for the individual products. For example, if you enter 25 for Water, then all three water products would have a price of 25. In addition, if one of the water products doesn't have a price, then the price for water would display as an asterisk *.

10.4.5 DSO Comments

Aside from the price planning feature, you can also use plannable DSOs to store comments. Comments can be used to record planning assumptions in the database, and then other users can run reports on the comments.

The architecture is shown in Figure 10.53. A planning-enabled DSO is included in a MultiProvider along with a real-time InfoCube. The real-time InfoCube contains the transaction data, and the DSO is used to store the comments. The input form has a separate column for comments and that column is a key figure in the DSO with planning-enabled input.

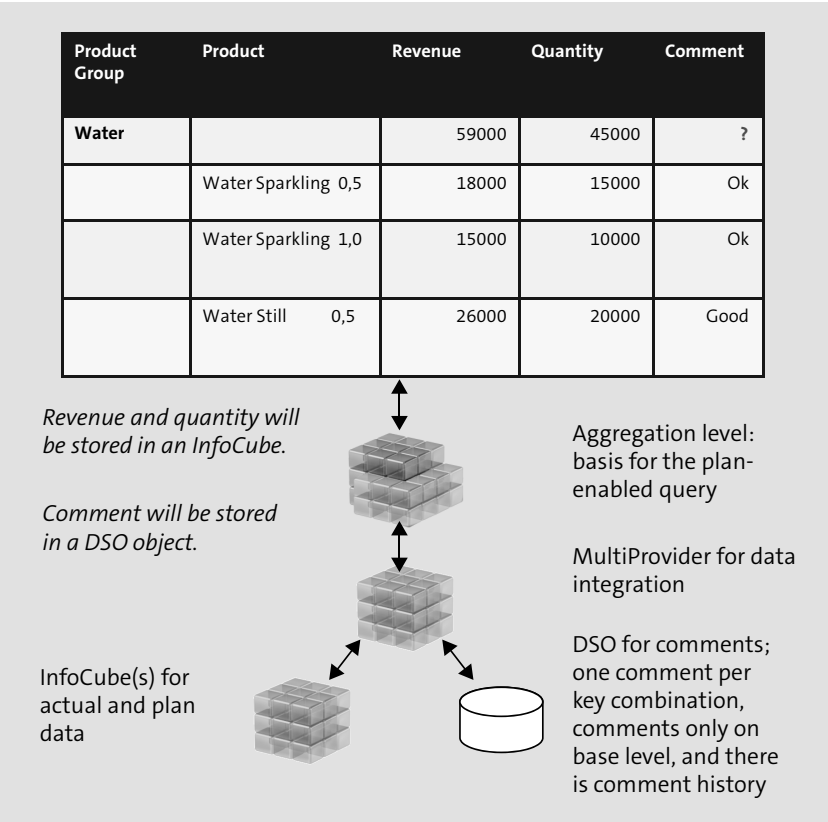


Figure 10.53 Embedded Comments with DSO

The length of the comment can be up to 250 characters. If there’s a need for a longer field for comments, the key figure would have to be extended by using a customized domain in BW.

10.5 Using Local Providers

The main use case for local providers is to provide a quick ad hoc reporting and planning solution. Local providers are tables in SAP HANA that can be used without any corresponding SAP BW InfoObjects, so it’s potentially a low cost of development alternative that can be configured without any support from IT.

Local providers aren’t new with SAP BPC 10.1. They were originally offered as part of SAP BW workspaces, which is a small sandbox for business users to perform ETL activities.

To use a local provider in a typical embedded SAP BPC planning scenario, you’ll need the following components:

- Local InfoProvider
- Embedded model
- Aggregation level (system-generated)
- Planning functions
- Planning query
- EPM workbook with an EPM report and planning functions

Now let’s review the details of each of these objects.

10.5.1 Creating a Local Provider and Model

The use case for a local provider is based on a planning user who has a flat file of actual data to upload into a database and then performs both manual input and automatic planning via planning functions to further develop the result set. In this example, assume that you don’t want to use any existing InfoObjects as well. The flat file for the example has a header row and two rows of actual data (see Figure 10.54).

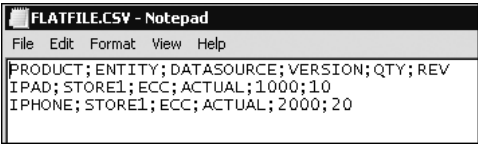


Figure 10.54 Flat File for Local Provider Scenario

To create the local provider, go to the web client, and choose **InfoProviders • Local Providers • New** in the **Administration** screen. Enter a name and description and choose **Next**.

In the subsequent step (**Upload Data File**), you need to upload a flat file, which will be used to derive the structure of the resulting SAP HANA table and to provide the initial result set. The flat file needs to have a .csv extension. As you can see in Figure 10.55,

these are the normal settings used in flat file loads to indicate if there is a header row, data separators, decimal indicators, and so forth.

1

2

3

4

5

ID and Information

Upload Data File

Map InfoObjects

Create Model

Review

Data File:

FLATFILE.CSV

Browse...

Header:

1

☐ Without Header

First Data Row:

2

Separator (CSV):

;

Decimal Display (CSV):

Comma

Field Delimiter Character (CSV):

"

Date Display (CSV):

DD.MM.YYYY

Figure 10.55 Upload Flat File to Create Local Provider

In the next step, **Map InfoObjects**, you can turn on data audit to track who made changes to the data. This causes the system to add audit fields into the SAP HANA table.

Figure 10.56 shows **QTY** and **REV** selected as the key figures. SAP HANA will create these as data fields.

In the **Type** column, select the data type for each field. For characteristics, you have the following **Type** options:

- Character String with Leading Zeroes
- Date (Saved as yyyyymmdd)
- Time (Saved as hhmmss)
- InfoObject

If you select **InfoObject**, you can select a characteristic and choose whether to use its conversion routine or not.

For the **Key Figure** fields, you have the following **Type** options:

- Integer
- Decimal

- Floating Point
- InfoObject

If you select **InfoObject** here, you can select a key figure.

1

2

3

4

5

ID and Information

Upload Data File

Map InfoObjects

Create Model

Review

☒ Enable Data Audit

☒ Activate Data Audit

Map Column Name to InfoObjects

Column Name	Key Figure	Type	Type Details
PRODUCT	<input type="checkbox"/>	Character String	▼
ENTITY	<input type="checkbox"/>	Character String	▼
DATASOURCE	<input type="checkbox"/>	Character String	▼
VERSION	<input type="checkbox"/>	Character String	▼
QTY	<input checked="" type="checkbox"/>	Integer (Example: 1025)	▼
REV	<input checked="" type="checkbox"/>	Integer (Example: 1025)	▼

Figure 10.56 Turning on Data Audit and Selecting Data Types for Local Provider

In this example scenario, use **Character String** for characteristics and **Integer** for key figures. While you’re creating the local provider, you can also create the model on the fly. In the next step (**Create Model**), enter a model ID and description (here, use “LMODEL”, as shown in Figure 10.57).

1

2

3

4

5

ID and Information

Upload Data File

Map InfoObjects

Create Model

Review

☒ Create a new model for this local provider

ID:

LMODEL

Description:

LMODEL

Figure 10.57 Create Model for Local Provider

Finally, the system displays, among other things, the name of the aggregation level and the query that it created automatically (see Figure 10.58).



Figure 10.58 Automatic Generation of Aggregation Level for Local Provider

10.5.2 Aggregation Level for a Local Provider

You can view the generated aggregation level in Transaction RSPLAN. Figure 10.59 shows the generated field names beginning with @3B. Although they appear under the InfoObjects folder, they don't exist in the normal SAP BW Data Dictionary but only in SAP HANA. Note that the aggregation level is considered to be an InfoProvider and can be viewed in Transaction RSA1.

Display Aggregation Level B860_0001			
Basis InfoProvider	Technical Name/Value	Aggregation Level	Technical Name/Value Data... Len...
Local Provider	@3B860_L_PROV	Workspace Aggregation Level B860_0001	
InfoObjects		Object Information	
Chars.		Version	Active Version
PRODUCT	@3B860_L_PROV@F0000	InfoObjects	
ENTITY	@3B860_L_PROV@F0001	Chars.	
DATASOURCE	@3B860_L_PROV@F0002	PRODUCT	@3B860_L_PROV@F0000 CHAR 250
VERSION	@3B860_L_PROV@F0003	ENTITY	@3B860_L_PROV@F0001 CHAR 250
Key Figures		DATASOURCE	@3B860_L_PROV@F0002 CHAR 250
QTY	@3B860_L_PROV@F0008	VERSION	@3B860_L_PROV@F0003 CHAR 250
REV	@3B860_L_PROV@F0009	Key Figures	
		QTY	@3B860_L_PROV@F0008 INT4 004
		REV	@3B860_L_PROV@F0009 INT4 004

Figure 10.59 Aggregation Level for Local Provider

Note

The description **Workspace Aggregation Level of Local Provider** serves as a reminder that local providers first came on the scene as a component of SAP BW workspaces, as mentioned earlier.

10.5.3 Query and Workbook for a Local Provider

In the query for the local provider scenario, all the fields of the aggregation level have been placed into the query. The characteristic restrictions are set to single values, the characteristics in the rows are set to display on master data, and the key figures are set to allow input, as shown in Figure 10.60.

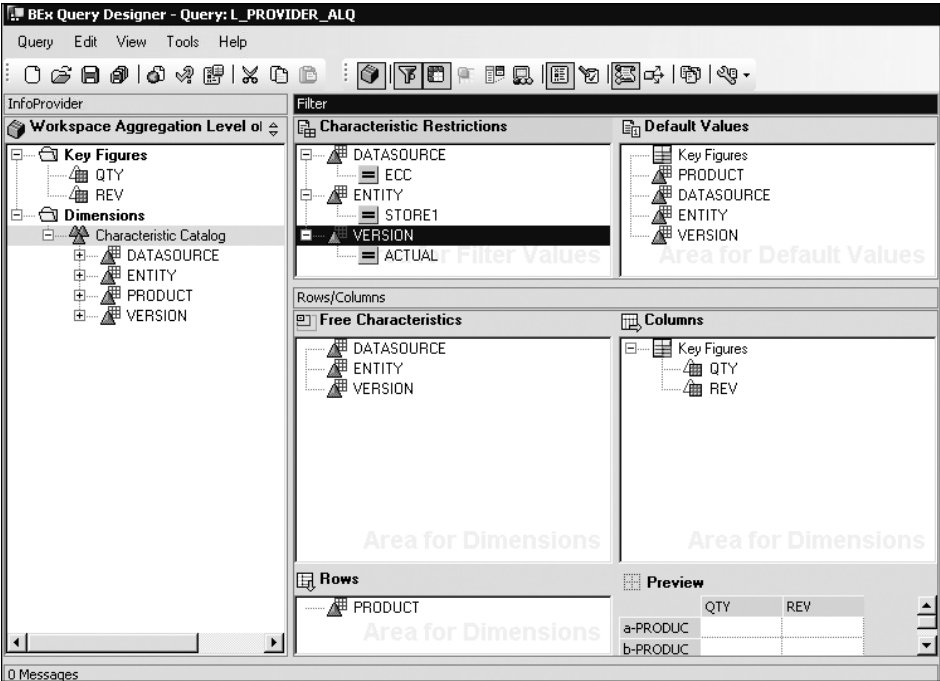


Figure 10.60 Planning-Enabled Query for Local Provider Scenario

When the query is rendered in the EPM add-in in Excel, the data can be manually changed, and planning functions can be executed if desired. Updated values for IPAD have been entered, as you can see in Figure 10.61. QTY was changed from 1000 to 1100, and REV was changed from 10 to 15.

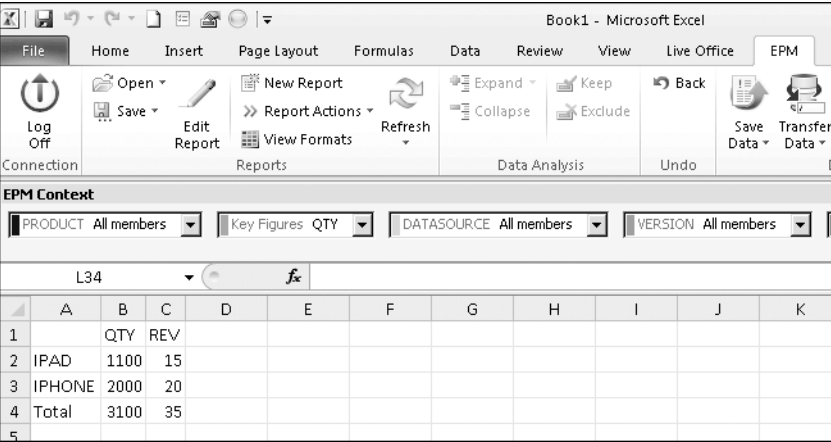


Figure 10.61 EPM Excel Add-In for a Local Provider Scenario

10.5.4 View Data in SAP HANA for a Local Provider

When you view the data in SAP HANA, you can see in Figure 10.62 that the data changes of 100 for QTY and 5 for REV are stored in memory.

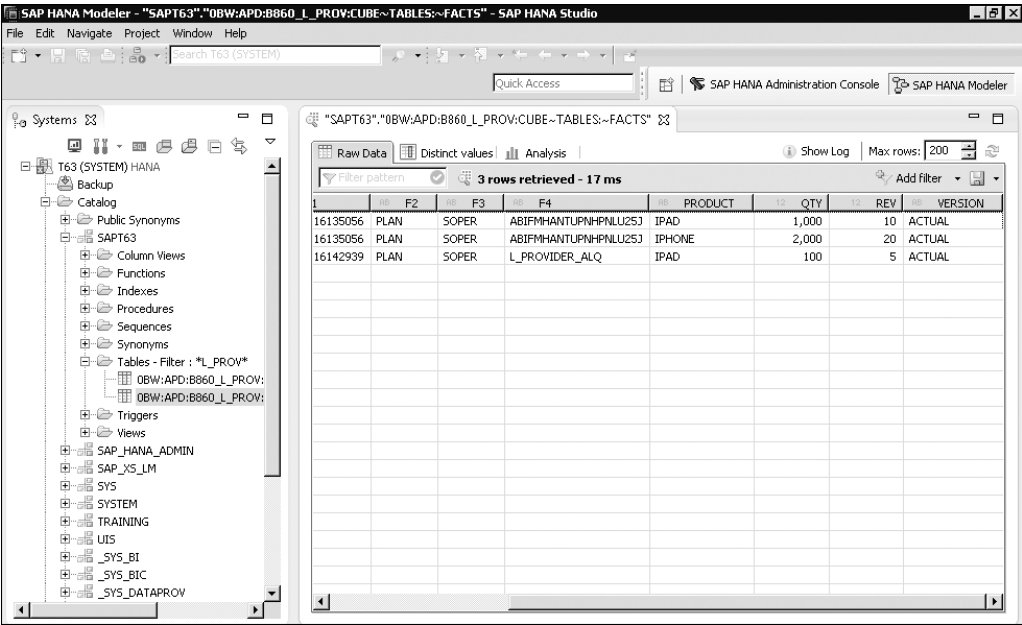


Figure 10.62 Viewing Local Provider Data in SAP HANA

Because you turned on data audit, the SAP HANA table also includes four audit fields:

- User
- Data Mode—PLAN
- Timestamp
- Source

See Chapter 15 for more information on data audit.

10.6 Summary

In this chapter, we touched on most of the major components for embedded SAP BPC architecture: real-time InfoCubes, MultiProviders, DSOs, CompositeProviders, and local providers. You now know the positioning to use for each one. We moved into the IP planning modeler in Transaction RSPLAN, and you saw how to create aggregation levels and planning functions. We created several planning-enabled queries and described the key planning settings. We then ran the queries in the EPM add-in, and you saw how to run IP functions from the data processing panel.

We’re now ready to look at how to perform reporting in embedded SAP BPC, starting with the SAP BEx query in plan mode and moving into the EPM add-in in Excel and the web client.

Contents

Acknowledgments	19
Introduction	23

1 Planning and Consolidation at a Glance 39

1.1 Planning Basics	40
1.2 Consolidation Basics	43
1.3 Selecting Your SAP BPC Product	45
1.3.1 Standard SAP BPC	46
1.3.2 Embedded SAP BPC	48
1.3.3 SAP BW/4HANA and Real-Time Consolidation	49
1.4 Summary	51

PART I Standard SAP BPC

2 The Fundamentals of Standard SAP BPC 55

2.1 System Architecture	55
2.1.1 Microsoft Version	56
2.1.2 SAP NetWeaver Version	58
2.2 Accessing the System	60
2.3 SAP BPC System	67
2.3.1 Library Objects	69
2.3.2 Component Toolbar	69
2.3.3 Support Toolbar	73
2.3.4 Enterprise Performance Management Add-In	75
2.4 SAP BPC Starter Kit Information	84
2.4.1 IFRS Starter Kit	86
2.4.2 Other Starter Kits	87
2.5 Summary	88

3	Standard SAP BPC Architecture	89
3.1	Terminology and Objects in SAP BPC	89
3.2	Basic Data Modeling for SAP BPC	92
3.2.1	Key Data Modeling Questions	93
3.2.2	EnvironmentShell	97
3.2.3	Configuration/Copy of the EnvironmentShell	101
3.3	Dimensions and Properties	104
3.3.1	Definition of Dimensions	104
3.3.2	Dimension Types	106
3.4	Creating a Dimension	108
3.4.1	Time Dimension	112
3.4.2	Category Dimension	113
3.4.3	Account Dimension	115
3.4.4	Entity Dimension	119
3.4.5	Intercompany Dimension	120
3.4.6	Subtable/Flow Dimension	121
3.4.7	DataSource/AuditTrail Dimension	122
3.4.8	Scope Dimension	123
3.4.9	Rptcurrency Dimension	125
3.4.10	Additional Dimensions and Properties	126
3.5	Developing Components of the Dimensions	128
3.5.1	Dimension Security	128
3.5.2	Hierarchies in Dimensions	129
3.5.3	Custom Measure Formulas	130
3.5.4	Dimension Member Formulas	133
3.5.5	Owner Properties	138
3.5.6	Reviewer Properties	139
3.6	Models	139
3.6.1	Model Types	140
3.6.2	Developing Models	142
3.7	SAP BW Objects	149
3.7.1	SAP BW Objects Support for SAP BPC for SAP NetWeaver	149
3.7.2	SAP BW/SAP BPC InfoObjects	153
3.7.3	SAP BW/SAP BPC InfoCubes	154
3.8	Summary	156

4	Reporting in Standard SAP BPC	159
4.1	Reporting Basics	160
4.1.1	Report Considerations	161
4.1.2	Creating a Web-Based Report	163
4.1.3	Standard EPM Reports and Templates	166
4.2	Introducing the EPM Add-In	170
4.2.1	Navigating in the EPM Add-In	176
4.2.2	Using the Context and Current Report Panes	179
4.2.3	Building a Basic Report	180
4.3	Using the EPM Ribbon Tab	187
4.3.1	Reports	188
4.3.2	Data Analysis	194
4.3.3	Undo	196
4.3.4	Data Input	196
4.3.5	Collaboration	205
4.3.6	Tools	217
4.4	Using the EPM Add-In	238
4.4.1	Report Editor and Report Selection	238
4.4.2	Local Members	246
4.4.3	Formatting of Reports	250
4.4.4	Multiple Reports in a Workbook	255
4.5	Excel Add-In Advanced Features	257
4.5.1	Asymmetric Reports	258
4.5.2	EPM and FPMXL Functions	259
4.6	PowerPoint and Word Documents in the EPM Add-In	263
4.7	Summary	265
5	Data Loading in Standard SAP BPC	267
5.1	Basic Data Loading with SAP BPC	267
5.1.1	Data Manager	268
5.1.2	SAP BW	276
5.1.3	Flat Files	279

5.2	Loading Data in SAP BW	283
5.2.1	Master Data, Text, and Hierarchies	284
5.2.2	Transactional Data	293
5.3	Loading Data from SAP BW to SAP BPC	296
5.3.1	Master Data and Text	297
5.3.2	Hierarchies	307
5.3.3	Transactional Data	317
5.4	Loading Data from a Flat File to SAP BPC	327
5.4.1	Master Data and Hierarchy	328
5.4.2	Text	332
5.4.3	Transactional Data	334
5.5	Using the Data Manager	340
5.5.1	Data Manager Configuration	341
5.5.2	Process Chains	347
5.6	Uploading Currency Exchange Rates for SAP BPC	350
5.6.1	Data Flow of Currency Exchange Rates to the Rate Model	352
5.6.2	Configuring SAP BW and SAP BPC for Exchange Rate Uploads	354
5.7	Advanced Data Loading for SAP BW for SAP BPC	359
5.7.1	Analysis of the DELTA INIT Process	361
5.7.2	Setup of the SAP BW Process Chain to Execute the SAP BPC Data Manager Package	365
5.8	Summary	373
6	Forecasting, Planning, and Budgeting in Standard SAP BPC	375
6.1	Basic Forecasting, Planning, and Budgeting	375
6.1.1	Driver-Based Approach	381
6.1.2	Top-Down and Bottom-Up Approaches	381
6.2	Script Logic in SAP BPC	383
6.2.1	Worksheet Logic	384
6.2.2	Dimension Member Logic	385
6.2.3	Standard Script Logic Prompts for SAP BPC	385
6.2.4	Using Script Logic in the Planning Process	398

6.2.5	Allocation Script Logic	411
6.2.6	Script Logic in the Automation of Data Loading	412
6.2.7	BADIs and the ABAP Program	415
6.3	Generic Planning Process	419
6.3.1	Initial Planned Data	419
6.3.2	Copy Process	419
6.3.3	Executing Calculations	421
6.3.4	Top-Down Planning	422
6.3.5	Bottom-Up Planning	430
6.3.6	Data-Transfer Process	430
6.4	Summary	431
7	Consolidation in Standard SAP BPC	433
7.1	Basic Consolidation	433
7.1.1	What Consolidation Is All About	433
7.1.2	Performing Consolidation with SAP BPC	435
7.1.3	Introducing Business Rules	437
7.2	Ownership Data and Elimination Methods	440
7.2.1	The Ownership Process	440
7.2.2	Setting Up Ownership Data	441
7.2.3	The Purchase Method Concept	447
7.2.4	The Proportional and Equity Method Concepts	448
7.3	Setting Up Journal Entries	449
7.3.1	Creating Journal Templates	449
7.3.2	Controlling Journal Activity	450
7.3.3	Creating Journal Entries	451
7.4	Setting Up and Executing Consolidation Tasks	453
7.4.1	Balance Carryforward	453
7.4.2	Reclassification	459
7.4.3	Currency Translation for Consolidation	462
7.4.4	Purchase Method Elimination	471
7.4.5	Proportional Method Elimination	482
7.4.6	Equity Method Elimination	485
7.4.7	Ownership Elimination	488

7.4.8	Intercompany Matching	495
7.4.9	Intercompany Elimination	499
7.4.10	US Eliminations	502
7.5	Setting Up Balancing Script Logic for Consolidation	506
7.5.1	Balancing Logic Components	506
7.5.2	Balancing Logic Results	508
7.6	Setting Up and Executing Equity Pickup	509
7.6.1	Prerequisites for Using Equity Pickup for Banking	510
7.6.2	Equity Pickup Business Rule	511
7.6.3	Equity Pickup Monitor	515
7.7	Consolidation Monitor	516
7.8	Summary	522
8	Managing the Standard SAP BPC Process	523
8.1	Security	523
8.1.1	Users	526
8.1.2	Teams	529
8.1.3	Task Profiles	531
8.1.4	Data Access Profiles	533
8.1.5	Security in the EPM Add-In	536
8.2	Work Status	537
8.2.1	Configuration of Work Status	538
8.2.2	Reporting and Managing Work Status	542
8.3	Controls	545
8.3.1	Configuration	545
8.3.2	Control Monitor	552
8.4	System Reporting	555
8.4.1	Auditing	556
8.4.2	System Reporting	559
8.4.3	Audit Tables Reports	566
8.5	Transports	571
8.6	Summary	580

PART II	Embedded SAP BPC	585
9	The Fundamentals of Embedded SAP BPC	585
9.1	The Evolution of SAP BPC	585
9.2	A Primer on SAP HANA	594
9.3	Comparing Standard and Embedded Features	599
9.4	Strategy for Conversion	606
9.4.1	From IP with PAK Turned On	607
9.4.2	From SAP SEM-BPS	608
9.4.3	From SAP BPC 7.x	609
9.4.4	From SAP BPC 10.0 without SAP HANA	609
9.4.5	Hybrid/Mixed Scenarios	610
9.4.6	New Customer with Business Ownership Focus	610
9.4.7	New Customer with EDW Integration Focus	611
9.5	Deployment Options	612
9.6	Summary	613
10	Embedded SAP BPC Architecture	615
10.1	Setting Up the Embedded Planning Model	616
10.1.1	Using Real-Time InfoCubes	616
10.1.2	Using Aggregation Levels	619
10.1.3	Using a Copy Planning Function	624
10.1.4	Using Planning-Enabled Queries	626
10.1.5	Using Embedded SAP BPC Environments	631
10.1.6	Using SAP BPC Models	634
10.1.7	Using the EPM Add-in Workbooks for Basic Planning Scenarios	636
10.1.8	Browsing and Compressing Data in SAP BW	641
10.1.9	Browsing Data and Statistics in SAP HANA	643
10.2	Using MultiProviders	646
10.2.1	Creating the MultiProvider	647
10.2.2	Creating Aggregation Levels for MultiProviders	648
10.2.3	Creating Queries in the MultiProvider Scenario	649

10.2.4	Creating Embedded Models in the MultiProvider Scenario	651
10.2.5	EPM Add-In for the MultiProvider Scenario	652
10.3	Using CompositeProviders	653
10.4	Using DataStore Objects	654
10.4.1	Creating a Planning-Enabled DSO	655
10.4.2	Creating an Aggregation Level for a DSO	657
10.4.3	EPM Add-In for DSO Scenario	657
10.4.4	DSO Price Planning	658
10.4.5	DSO Comments	659
10.5	Using Local Providers	660
10.5.1	Creating a Local Provider and Model	661
10.5.2	Aggregation Level for a Local Provider	664
10.5.3	Query and Workbook for a Local Provider	665
10.5.4	View Data in SAP HANA for a Local Provider	666
10.6	Summary	667
11	Reporting with Embedded SAP BPC	669
11.1	System Architecture Review	669
11.2	Web Client Reporting	671
11.3	EPM Add-In in the Embedded Model	678
11.3.1	EPM Features	680
11.3.2	Using the EPM Add-In	682
11.4	Comparing the EPM Add-In for Standard and Embedded SAP BPC	687
11.5	EPM Add-In for SAP HANA Data	688
11.6	SAP Analysis for Microsoft Office	692
11.7	Using SAP Lumira with Embedded SAP BPC	696
11.8	Summary	703

12	Forecasting, Planning, and Budgeting in Embedded SAP BPC	705
12.1	Standard IP Planning Functions	706
12.1.1	Copy Function	706
12.1.2	Revaluation Function	708
12.1.3	Delete Function	709
12.1.4	Repost Function	709
12.2	Executing Planning Functions from Excel	710
12.2.1	Data Processing Tab	710
12.2.2	Pushbuttons	712
12.3	Disaggregation and Inverse Formulas	714
12.3.1	Disaggregation	715
12.3.2	Inverse Formulas	717
12.4	Planning Filters and Planning Sequences	720
12.4.1	Planning Filters	720
12.4.2	Planning Sequences	722
12.5	FOX Formulas	725
12.5.1	Creating a Driver-Based Formula	726
12.5.2	Creating a Formula to Calculate Revenue Based on the Prior Year	729
12.5.3	Creating a Formula with a Loop	731
12.6	Characteristic Relationships	733
12.6.1	Combination Checking	733
12.6.2	Characteristic Derivation	736
12.7	Advanced Planning Functions	738
12.7.1	Currency Translation	739
12.7.2	Unit of Measure Conversion	744
12.7.3	Top-Down Distribution	747
12.7.4	Distribution with Keys	751
12.7.5	Deletion of Invalid Combinations	753
12.7.6	Reposting on Basis of Characteristic Relationships	754
12.7.7	Generating Combinations	756
12.7.8	Custom Planning Functions	757
12.8	Summary	761

13 Data Loading for Embedded Consolidation	763
13.1 Basics for Consolidation in Embedded SAP BPC	764
13.1.1 Scenarios for Data Loading in Embedded Consolidation	765
13.1.2 Mixed Architecture Approach in Embedded SAP BPC	769
13.1.3 Use of the Special Period 000	773
13.1.4 SAP BEx Variables for Reporting	776
13.2 Data Loading Process for Embedded Consolidation	779
13.3 Summary	784
14 Consolidation in Embedded SAP BPC	787
14.1 Embedded Consolidation Configuration	787
14.1.1 Overview of Embedded Consolidation System	788
14.1.2 Architecture and Setup of the Model	792
14.2 Introduction to Business Rules	806
14.3 Ownership Data and Elimination Methods	808
14.3.1 The Ownership Process	809
14.3.2 Setting Up Ownership Data	810
14.3.3 The Purchase Method Concept	816
14.3.4 The Proportional and Equity Method Concepts	817
14.4 Setting Up and Executing Consolidation Tasks	818
14.4.1 Balance Carryforward	818
14.4.2 Reclassification	822
14.4.3 Currency Translation for Consolidation	826
14.4.4 Purchase Method Elimination	834
14.4.5 Proportional Method Elimination	844
14.4.6 Equity Method Elimination	847
14.4.7 Ownership Elimination	850
14.4.8 Intercompany Matching	856
14.4.9 Intercompany Elimination	860
14.4.10 Task Sequences for Consolidation Monitor	863
14.5 Summary	865

15 Managing the Embedded SAP BPC Process	867
15.1 Security	867
15.1.1 Users	869
15.1.2 Teams	871
15.1.3 Data Access Profiles	871
15.1.4 Matrix Security	879
15.1.5 Authorization Objects	880
15.2 Work Status	882
15.2.1 Configuration	882
15.2.2 Using Work Status	887
15.2.3 Reporting	889
15.3 Data Audit	891
15.3.1 Configuration	891
15.3.2 Using Embedded Data Audit	895
15.4 Transports	899
15.5 Summary	903
16 Migrating to SAP BPC 10.1	905
16.1 SAP BPC 10.0 to Standard SAP BPC 10.1	907
16.2 Integration Planning to Embedded SAP BPC 10.1	909
16.3 SAP BPC 10.0 to Embedded SAP BPC	910
16.4 SAP BPC 10.0 to Mixed Standard/Embedded SAP BPC 10.1	911
16.5 Summary	911
Appendices	913
A Real-Time Consolidation	913
B The Authors	949
Index	951

Index

.NET	56, 58	ABAP program	415
*ADD /*ENDADD	409	ABAP/BAdI	398
*ADD/*ENDADD	389	ACCOUNT	111
*COL(X)	335	Account and key figure-based InfoCubes ...	591, 596–597
*COMMIT	390, 395, 401	Account dimension	115
*DESTINATION_APP	393	Account-based calculations	439, 808
*ENDALLOCATION	412	Account-based view	91
*ENDWHEN	392	ACCTYPES	108, 117
*INCLUDE	390	Activate Local Member Recognition	
*LOOKUP	395	option	226, 246
*LOOKUP {MODEL}	394	Activate Member Recognition option ..	180, 226
*MVAL	318	Active cell	202
*NEWCOL	318	Activities	545, 560
*NEWCOL(X)	335	<i>audit</i>	556–557
*REC	390, 406–407	<i>monitor</i>	543
*RUNALLOCATION	411	<i>report</i>	560–561
*SELECT	392, 409	Add Comment option	202
*WHEN	392	Add Conversion Sheet option	276
*WHEN/*ENDWHEN	392	Add Data Link option	218–219
*WHEN/*IS/*ENDWHEN	407	Add dimension	164
*XDIM_ADDMEMBERSET	395, 406	Add Member Link option	218
*XDIM_FILTER	406	Add Report Link option	218
*XDIM_MEMBERSET	391, 394, 400, 405	Add/Remove button	550
/CPMB/	62, 155, 348	Adding comments	400
/CPMB/LOAD_DELTA_IP	322	Admin console	906
%APPLICATION%	410	Admin Package option	337
%APPSET%	410	ADMINISTRATION	71
%ENTITY_DIM%	346	Administration	413
%TIME_SET%	396	Administration activity audit	557
%YEAR%	410	Adobe Flex	587
\$INFOCUBE	82	Advanced	191
OFISCPER InfoObject	776	Aggregate overwrite option	324
OGL_ACCOUNT	290, 307	Aggregation level	592, 616, 619–620, 624, 626, 647–648, 653, 655, 657, 661, 663, 665, 669–670, 686, 798
OGLACCEXT	360	<i>create</i>	620, 622
OTCAACTVT	874	Allocation	375, 411, 431, 597
OTCAIPROV	874	Allocation script logic	411
OTCAVALID	874	ALLOCATION.LGF	388
501	274	Allow Member Formulas option	111
		AMOUNTDECIMALPOINT	300
A			
ABAP code	283		

Analog distribution	716
<i>with reference</i>	716
Analytic view	599
Answer Prompt field	370
Append	342
Append option	324
APPROVALSTATUSMAIL	542
APPROVALSTATUSMSG	542
Assign dimension name	315
Assignment of the transport	576
Assignments of the control set	551
Asymmetric report	173, 258–259
Attribute	92, 284
<i>assigning</i>	802
<i>List tab</i>	304
<i>predefined</i>	803
<i>SAP BW</i>	274
<i>view</i>	599
Audit	559
<i>data</i>	558
<i>process component</i>	571
<i>report</i>	559
<i>security</i>	562
<i>tables</i>	555, 566
<i>tables reports</i>	566
Authorization	611
Authorization objects	880
Authorization relevant	873
Automated data processing	412
B	
Backup	908
BAdI	398, 415–417, 431
Balance carryforward	436, 453, 818
<i>business rule</i>	774
Balancing script logic	506
Basic InfoCube	162
BEx Analyzer	585–586, 631, 891
BEx queries	911
BEx Query Designer	805
Block number	725
Body	405
Body/code	404, 406
Book Publication option	205, 208, 216
Bottom-up planning	375, 381–382, 430–431
BPS	585, 608
Budget SAP BPC model	335
Budgeting	376
Business ownership	610
Business process flow (BPF) ...	138–139, 312, 559
<i>activity audit</i>	557
<i>activity report</i>	561
<i>creation</i>	556
<i>reporting</i>	560
Business rule	437, 556
<i>configuration</i>	440, 809
<i>embedded consolidation</i>	806
<i>methods</i>	438, 806
By Percentage	199
C	
CALCACCOUNT.LGF	388
Calculate Parents in Hierarchies option	229
Calculated key figure	188
Calculated Members option	250
Calculation view	599
Calling script logic	405
Cancel execution	183
Cancel option	183
Capital expenditure (CapEx)	87, 634
Capital expenditure E	377
Capital Expenditure Planning Starter Kit	87
Cases sold	334
Category	351, 378
Category dimension	113
Central settings	621
Central unit of measure	746
CFSV	316
Change Connection option	189, 237
Change status	103
Change Status button	579
Change Work Status option	201, 542
Changed Members option	250
Characteristic ...	92, 284, 616, 618, 629, 634–635,
662–663, 665	
<i>derivation</i>	733, 736
<i>relationships</i>	597, 621, 706, 733
<i>restrictions</i>	626
<i>SAP BW</i>	274
<i>values</i>	92

Children option	194, 226
Clear	269, 342
Clear Data Data Manager package	402
Clear data values	325
Clear Metadata Cache option	237
Collaboration	205
Collapse option	195
Collection	216, 574
Column axis	185
COM add-in	177
Combination checking	733
Command Display Options screen	235
Comments	201, 541, 564, 607, 678, 680, 687,
695, 909	
<i>options</i>	227
<i>saving</i>	196
Commit	404
Components of security	867
CompositeProvider	653, 770, 792–793
Compound characteristic	306
Compound InfoObject	306, 316, 359
Compounding	154, 162
Compression	641, 644–646
Concatenation of the compound	316
Conditional logic	411
Configuration of work status	538
Configuration parameters	65
Consistent security process	536
Consolidation	43, 160, 587
<i>embedded</i>	787
<i>overview</i>	435
<i>standard</i>	433, 776
Consolidation Central component	59
Consolidation document types	931
Consolidation entities	919
Consolidation ledgers	921, 927
Consolidation model	99, 317, 344
Consolidation Monitor	59, 70, 437, 516, 791
<i>task sequences</i>	863
Consolidation providers	
<i>SAP BW view</i>	794
Consolidation task	453, 818
Consolidation views	923, 925
CONSOLIDATION.LGF	388
Constants	344
Constants in the logic file	389
Context and current report panes	179
Context Favorite option	203
Context Options feature	230
Control component	554
Control data for work status	539
Control Monitor	551–552
Control set	549
CONTROL_LEVEL	545
Controlled by section	540
Controller by Permitted Data Entry Methods	
<i>section</i>	541
Controls	545, 551, 553–554
<i>configuration</i>	546
<i>RTC</i>	939
Controls Monitor	70, 553, 940
Conversion	274, 299
Conversion file	271–272, 309
<i>options</i>	275
Conversion to SAP BPC 10.0	606
Copy	269, 431, 705
<i>function</i>	706
<i>process chain</i>	344, 419
<i>tasks</i>	343
Copy Data Manager package	401
Copy report	191
COPY_OPENING.LGF	388
Core Data Service (CDS) views	925
Cost center	91
CPM software components	910
Create a DSO	655
Create a MultiProvider	647
Create a query	649
Create embedded connection	637
Create journal entries	451
Create journal templates	449
Create portion	164
CREDITPOSITIVE	300
CSV file	329
CSV format	280
CTRL_CURRENCY_NOT_LC	546
Currency	705, 738–739, 741
Currency exchange rate	350
Currency keyword	465, 828
Currency translation ...	436, 439, 462, 739, 807,
826	
<i>function</i>	742
<i>SAP BPC versus SAP S/4HANA</i>	930

Currency translation (Cont.)	
<i>SAP S/4HANA</i>	924, 941
<i>type</i>	742
Current Report pane	179–180, 184
Current Report screen	185
Custom context	203
Custom Expand option	194, 226
Custom measure formula	130
Custom member	250
Custom Member Default Format option	250
Custom planning functions	757
Customer dimension with properties	328
D	
Data	303
Data access profile	524–526, 529–530, 533, 535, 563, 636, 871, 876
Data analysis	194
Data audit	555, 557, 565, 592, 607, 632, 663, 891, 909–910
<i>configuration</i>	558
<i>information</i>	556
<i>process</i>	556
<i>purge</i>	559
Data changes	564, 895
Data collection component	347
Data connection	255–257
Data flow	268, 277, 764
<i>ODP</i>	772, 781
<i>real-time</i>	771
Data input options	196, 226
Data loading	
<i>advanced</i>	359
<i>embedded consolidation</i>	763, 779
<i>last-minute postings</i>	779
<i>master data</i>	780
<i>SAP BW</i>	283
<i>SAP BW to SAP BPC</i>	296
<i>SAP HANA tables</i>	913
<i>SAP S/4HANA</i>	913
<i>standard</i>	267, 779
Data Manager	263, 268–269, 281, 299, 340, 387, 680, 688, 696
<i>configuration</i>	341
<i>upload dialog</i>	271
Data Manager group	270, 328
<i>options</i>	271, 281
Data Manager import	567
Data Manager package	361, 401, 417
Data mapping	298
Data modeling	97
Data preview	281
Data Preview option	270–271, 330
Data processing	681, 687, 693, 710, 712, 742
Data Processing tab	688, 710
Data profile	594, 607
Data slice	621
Data submission and locking	934
<i>delta changes</i>	936
<i>mass lock/unlock</i>	937
<i>scenario</i>	935
Data transfer	375
Data transfer process (DTP)	293, 574
data transfer process objects	783
Data type	303, 321, 731
Data validation	436
Database migration	910
Database procedure	760
DataSource	277–278, 284–285, 287, 293, 361, 574
DataSource object	615, 654, 657–659, 677, 688
DataSource/AuditTrail dimension	122
DataStore object (DSO)	278, 293, 352
Default values	627
DEFAULT.LGF	386–387
Defer Layout Update option	185–186
Delete function	706, 709
Delete invalid characteristic combinations	733
Delete invalid combinations	753
Delete reports	191
Delimited or Fixed Width options	282
Delimiter	300
DELTA INIT package	361
Delta initialization	361
Delta loading process	273
Delta Update option	294
Delta updating	286
Denied	534–535
Deployment options	607

Depreciation calculation	420
Derivation	734
Descendant option	194, 226
Design Studio	696
DETAILS	326
Dimension	90, 145, 208, 267, 284, 378
<i>AUDITTRAIL</i>	804
<i>embedded consolidation</i>	794
<i>formulas</i>	133
<i>group</i>	921
<i>mapping</i>	800
<i>partner entity</i>	918
<i>SAP BPC</i>	274
<i>security</i>	128
<i>type</i>	106, 800
Dimension member formula	383, 599
Dimension member logic	385
Dimension Member/Property Formatting	
section	251, 254
Disaggregation	705, 715–716, 747, 753
Display component	340
Display EPM Context Bar option	232
Display input template	723
Display MDX option	236
Distribution	205, 208, 705, 715, 750
<i>by key</i>	747
<i>Collect option</i>	205
<i>Distribute option</i>	205
<i>nonassigned</i>	749
<i>Now option</i>	212
<i>option</i>	208
<i>template</i>	211
<i>with keys</i>	751–752
<i>with reference</i>	747–748, 751
Do Not Load Members at Connection	
option	83, 175
Do Not Store Connection option	169
Document type	207
Documents feature	73
Documents option	101
Download Center option	75
Download Data option	271
Drill Through option	217–218, 223
Drillthrough	223, 680, 688, 696
Driver	376
Driver-based formula	726
Driver-based planning	381
Drivers and rates	140
Dynamic Package Script	342
E	
Edit E-Mail Notification Settings dialog	
box	541
Edit layout	164
Edit report	238
Edit Report and New Report	192
Edit Report option	238, 264
EDW SAP BW Integration	600
Elimination methods	440, 808
Eliminations and adjustments	439, 807
Eliminations and adjustments rule screen	
<i>Details tab</i>	477, 840
<i>General tab</i>	475, 838
Email notification	541
Embedded connections	636–637
Embedded consolidation	764, 787
<i>assigning attributes</i>	802
<i>assignments and mappings</i>	798
<i>business rules</i>	791
<i>configuration</i>	787
<i>data loading</i>	763, 769, 779
<i>data loading scenarios</i>	765
<i>features</i>	790
<i>initial settings</i>	797
<i>model</i>	792–793
<i>system reports</i>	805
<i>versus standard</i>	788
<i>Web Administration UI changes</i>	788
Embedded data model	634, 661
Embedded environment	616, 631, 647
Embedded planning model	615–616, 647, 655
Embedded web client	636
Embedded web client administration	633
Enable Controls by Model parameters	546
Enable Double-Click option	183
Enable work status	882
Enable Work Status by Model section	538
ENABLE_FIXED_CUBENAME	67
Enhancement spot	416
<i>UJ_CUSTOM_LOGIC</i>	415

Enterprise Controlling Consolidation Systems (ECCS) 773

Enterprise information management (EIM) 771

Enterprise Performance Management 159

Entity dimension 119

Environment 92–93, 102, 638

connection 109

offline 578

option 75

EnvironmentShell 60, 65, 89–90, 93, 97–98, 101, 387

alterations 99

EPM 10.1 76, 170

EPM add-in 159–160, 163, 166, 170, 172, 176, 183, 189, 258–259, 383–384, 414, 536–537, 542, 567, 587, 589, 594, 607–609, 615–616, 631–632, 636, 652–653, 657–658, 665

context menu 179–180

description 262

Distribution Template screen 210

for Excel 268, 299

formatting parameters 253

formatting sheet 168, 253

frontend 525

functions 221, 266

options 75

reporting tool 172

ribbon 187–188, 190, 192, 200, 639

SAP Template 168

workbook 616, 647, 655

Worksheet option 226

EPMComparison 262

EPMFormattingSheet 253

EPMMemberDesc 261

Equal distribution 716, 750

Equity method 43

elimination 485, 847

Equity pickup 509

business rule 511

for banking 510

Equity Pickup Monitor 515

Essbase 184

ETL process 779

EvDRE 169, 184, 218

Migration option 237

templates 609

Excel add-in advanced features 257

Exchange rate 281

type 356

Exclude option 195

Excluded Members tab 239, 246

Execute planning sequence 723

Execute Step with Trace option 729

ExecuteDataProcess 712

Expand option 194

Expand Options feature 226

Expand/Collapse options 194

External column 275

External formatting 315

External option 311

Extraction tab 286

F

Favorites feature 69

Field to be changed 708, 729, 731, 740, 745, 748

Fields for conditions 706

Filtering 243

Filtering tab 239, 242

Filters 620, 705, 711

Finance model 168

Financial expenses 377

Financial Information Management 76

Financial model 379

Find Comments option 202–203

Finish editing 166

FireFly 670, 678, 683

First consolidation entries 448, 817

Fixed and variable fields 211

Fixed data format 287

Flash Objects option 235

Flat file 267, 282, 305, 327, 774

Flow 121

FOREACH 732

Forecasting 376

FORMAT 300

Format 164, 303

Formatting of reports 250

Formatting sheet 253

Formatting tab 227

Formula column 275–276, 319

Formula name field 130

Foundation view 915

FOX 597, 705

FOX formula 725

FPMXL 259

FPMXLClient 169, 713

FPMXLClient function 221

FPMXLClient.TechnicalCategory.EPM 169

function 257, 260, 266

Free characteristics 627

Freeze Data Refresh option 236

Full optimization 153

Function arguments 262

Function type 597

Functional area 318

FX restatement 345

FX translation 346

translation method 943

via SAP S/4HANA 941

FX_TRANS.LGF 388

FXTRANS 413–414

FXTRANS logic script 414

G

GAAP 40, 45

Generate combinations 756

Global member 188

Granularity 379

Group 876

dimension properties 490, 852

rate 352

H

HEADER 300

Header text 291

Help website 417

HIER_NAME mapping 309

Hierarchy 89, 104, 129, 162, 267, 307, 316, 801

header information 291

level 310

level formatting 251

node 291–292

Node view 291

root name 307

Hierarchy Selection tab 293

Hierarchy tab 303

HR planning 91

HTML5 610

Hub-and-spoke structure 379

I

IC eliminations US method 437

IC matching 436

ICBooking fields 496, 858

ICBOOKING.LGF 388

ICDATA.LGF 388

ICELIM.LGF 388

IFRS 40

IFRS Starter Kit 55, 85–87

IIF 407

Import actuals 436

Import master data hierarchies 313

Import transactional 269

IMPORT_MD_HIER 330

INCLUDE 387–388

InfoArea 63, 92

InfoCube 92, 156, 293, 296

InfoObject 89, 154, 277, 279, 288, 290

ZMATERIAL 298

InfoPackage 285–286, 293–294

InfoProvider .. 76, 223, 276, 278–279, 293, 615, 634, 646, 648, 651

InfoSource 278, 293

Ingredients and packaging 378

Inherit Sheet Options option 242

Initial planned data 419

Initial planning or budgeting 419

Initialize Delta Process option 287

Initialize with Data Transfer option 287

Initialize without Data Transfer option 287

Initialized 286

Input Form option 73

Input Members option 250

Input template 164, 169

INPUTCURRENCY <0096> MD 355

Input-ready 628

Insert EPMMemberID in EPM Formulas

option 237

Insert feature 264

Insert Function feature	220
Instance report	560
Instances	560–561
Integrated Planning (IP)	615, 620, 870, 905
Interco dimension	120
Intercompany bookings	439, 807
Intercompany eliminations	499, 860
Intercompany matching	45, 495, 856
Internal column	275, 319
Internal formatting	315
Internal option	311
Inventory	377
Inventory planning	91
Inverse formula	717
IP planning modeler	586
iPad	665

J

Journal	70, 205, 436
Journal activity	450
Journal entries (JEs)	449
<i>RTC</i>	939–940
Journal Entry screen	196
Journal IDs	479, 841
Journal template	449

K

Keep Formula on Data option	228
Keep option	195
Key figures	92, 634–635, 648
Keyword	397
<i>EXPRESSION</i>	406
<i>FACTOR</i>	406
Keywords folder	399

L

Language tab	304
Large data volumes	175
Layout	240
Layout tab	239
Ledger groups	921
LGF file	387
LGX file	387
Link List option	272
Liquidity	377
Load transaction data from SAP BW	322
Local connection	173
Local member	187–188, 245
Local Member Recognition option	181
Local Members feature	246
Local Members tab	239, 245
Local provider	620, 660, 665
Local variable	732
Lock cells	680, 687, 695
Locking dimensions	885
Log option	237
Logistics	377

M

Macro	266
Maintain measure formula	132
Manage connections	191
Manage conversion file	276
Manage Transformation File option	274
Management	557
Manufacturing	378
Mapping	299, 306
<i>component</i>	309
<i>process</i>	302
Master data	284
<i>account</i>	917
<i>hierarchy</i>	328
<i>on the fly</i>	420
<i>other</i>	921
<i>text</i>	297
<i>transaction type</i>	920
Master record	287
Material production supply	41
Materials requirements planning (MRP)	41
Matrix security	879
MAXLRCOLUMNS	66
MAXLRROWS	66
MAXREJECTCOUNT	274, 300
MCaaS	612
MDX	398
<i>keywords list</i>	400
<i>statement</i>	411
MDXLIB.LGF	388

Measure	92
Member and Children option	194, 226
Member and Descendants option	194, 226
Member formula	111
Member Insertion Filtering tab	239, 246
Member Names tab	239, 246
Member naming conventions	162
Member Properties option	236
Member recognition	221
Member Recognition options	226
Members	92, 284
Merge Data Values option	325
Method code	446, 815
Method-based multiplier	438, 806
Method-based Multipliers Rule screen	473, 836
Microsoft Analysis Services	174
Microsoft database	328
Microsoft platform	587
Microsoft PowerPoint	263
Microsoft version	524
Migration	905
Migration timeline	906
Mixed architecture	769
Mixed scenarios	610
Model	90, 92, 139–140, 378
Model definition wizard	924
Modify Package dialog box	341
Modify Package option	341
Modify script	342
Modify Script Logic screen	344
Multicore CPU	594
Multiple reports in a workbook	255
MultiProvider	63, 76, 92, 95, 150, 152, 163, 255, 574, 596, 615, 634, 646–647, 651, 686, 703
<i>structure</i>	648
My Activities function	70

N

Navigational attribute	161–162
New Conversion File option	318
New Report option	73, 166, 184, 186, 238
New Report prompt	164
New Template option	208
New Transformation File option	274
Node text	291
NODENAME	309–310
Noncontrolling interest	43
Normal and large SignData	156
Not assigned	683–685

O

ODBO connection	536
Offline	103, 578
Offline Mode option	217, 224
OLE DB link	189
One-sided versus double-sided entries	488, 850
Open and Save	188
Open Controls Results button	553
Open My Input Forms option	189
Open My Reports option	189
Open ODS view	766
Open Planning and Consolidation Documents View option	206
Open Server Input Form Folder option	189
Open Server Report Folder option	189
Open Server Root Folder option	167, 189
Operand button	732
Operation report	560
Operational data provisioning (ODP)	767, 780
<i>configuration</i>	781
<i>data sources</i>	782
<i>source system</i>	783
Operational Delta Queue (ODQ) tables	780
OPTIONS	180, 224, 274
Options link	217
Options tab	239, 242
Order mapping	309
Organize Delta Initialization option	273
Organize dropdown	272
Organize option	272, 336
Organize Package List dialog box	337
Organize Package List option	272, 336
Organize Package List screen	336
Other tab	232
OutlookSoft	587
Overwriting	314
Owner	139, 886

Owner and Manager option	540
Owner properties	138, 539
Ownership data	436, 440, 808
Ownership eliminations	488, 850
Ownership hierarchy	130
Ownership investment structure	434
Ownership Manager	70, 442, 811
Ownership model	98, 148, 168
<i>data</i>	446, 815
<i>settings</i>	441, 810
Ownership process	440, 809
P	
P&L statement	378–379
Package description	337
Package link	269–270
Package Link List option	341
Package List option	272
Package Name option	337
Package status	338
Page axis	184, 254
Page Axis Formatting section	252
PAK	588, 607
Parameters	541
Parent mapping	309
PARENTH3	310
Paste report	191
Period-end activities	538
PERIODIC	133, 279
Periodic approach	776
Periodic format	281
PER-Periodic option	145
Persistent Staging Area (PSA)	278
Plan mode	642
Planning	197
Planning and consolidation keywords	400
Planning and forecasting	160
Planning cycle	376
Planning filter	720
Planning function	616, 620, 647
Planning model	99
Planning query	615
Planning sequence	620, 720, 722, 739, 744
Portal Publication option	205–206
Presentation layer	278
Price planning	658
Priority	202
Private	166
Private folder	69
Process chain	60, 64, 100, 289, 337, 340, 347–348
Process Chains option	64
Process Monitor	544–545
Processing tab	286
Product dimension	298
Profitability and Cost Management	76, 171
Program	
<i>UJA_MAINTAIN_MEASURE_</i>	
<i>FORMULA</i>	130–131
<i>UJD_TEST_PACKAGE</i>	365–366
<i>UJD_TEST_PACKAGE_LINK</i>	365, 367
<i>UJT_MIGRATE_10_TO_101</i>	908
Program variant	368
PROMPT option	342
Properties	92, 109, 267, 284, 378
<i>SAP BPC</i>	274
Property	105
<i>Acctype</i>	289
Property/attribute	95
Proportional	43
Proportional method	448, 817
<i>elimination</i>	482, 844
Protection	229
Public folder	69
Purchase method	43, 447, 816
<i>elimination</i>	471, 834
Purging	558
Pushbuttons	712
Q	
Quantities	377
Quantity conversion type	745
Query structure	683
Quick Links option	217–219
R	
Ranking	243
Ranking tab	239, 242
Rate model	98, 168, 358

Rate type	351
RATETYPE	108, 111
Read	535
Read-Only Data tab	239, 245
Ready for approval	541
Real-Time Consolidation (RTC) ...	763, 765, 794, 913
<i>assignments</i>	926
<i>configuration</i>	917
<i>consolidation model</i>	915
<i>controls and journal entries</i>	939
<i>create foundation view</i>	922
<i>data submission and locking</i>	934
<i>define consolidation ledgers</i>	921
<i>define data categories</i>	921
<i>define number range</i>	931
<i>document types</i>	931
<i>fiscal year</i>	921
<i>flexible upload process</i>	937
<i>maintaining objects in SAP BPC</i>	931
<i>master data and dimensions</i>	916
<i>model</i>	922
<i>setup prerequisites</i>	915
<i>versions</i>	926
<i>VirtualProvider</i>	928
Real-time InfoCube	616–617, 619, 626, 634, 636, 641–642, 645–646, 653, 657–658, 780
Reclassification	436, 459, 822
<i>business rule</i>	776
Reduce total number of COMMITS	403
Reference	431
Reference data	748
Refresh	265
Refresh Only Data option	200
Refresh option	169, 192
Refresh Report Data Only option	193
Refresh selected data	193
Refresh Selected Report	193
Refresh tab	228
Refresh workbook	193
Refresh worksheet	193
Replication	278
Report	164
<i>UJSTAT</i>	556
Report Actions	190
Report Actions link	180
Report Editor	238, 248, 264
Report Format options	228
Report selection	238
Report template	169
Report workbook	212
Reporting	140, 671, 677
Reporting layer	162
Repost function	709
Repost invalid characteristic	
combinations	733
Repost on basis of characteristic	
relationships	754
Requests	339
Required dimensions	146
Reset Report option	186
Restore	908
Restrictions when using *REC	408
Retained earnings	326
Revaluation function	708, 726
Reviewer	139
Rolling forecast	685–686
Rolling trend	421
Row and Column Banding section	251
Row axis	184
Rptcurrency dimension	125
RSBPC_ENVM	881
RSBPC_ID authorization object	870
RSBPC_MODL	882
RSEADMIN	875
Rules options	134
RUN	313, 326
Run and schedule	326
Run controls	553
Run Default Logic Data Manager package ...	401
Run or schedule upload	315
Run Pack button	417
Run package	302
Run Package Link option	269
Run Package option	269, 313, 322
Run package process	305
Running iterative cycles	421
S	
Sales	377
Sales and Operations Planning	87

Sales planning	91
Sales quantities	334
Sales revenue	377
Sales volume	87, 334
SAP Analysis for Microsoft Office	586, 607, 669–671, 692–695, 915
SAP BEx variable for reporting	776
SAP BPC architecture	162
SAP BPC consolidation	318
SAP BPC dimension	316
SAP BPC for Microsoft	56
SAP BPC namespace	589
SAP Business Planning and Configuration (SAP BPC) 11.0	792
SAP Business Planning and Consolidation (SAP BPC)	
<i>create a model</i>	797
<i>RTC modeling</i>	916
SAP BW	268, 332
7.0	909
7.3/7.31	909
7.4	909
<i>Administration Workbench</i>	768
<i>data acquisition</i>	765
<i>RTC modeling</i>	916
<i>scenarios</i>	766
SAP BW Accelerator	597
SAP BW BAPI	78
SAP BW component	787
SAP BW Data Warehousing	285
SAP BW hierarchy	303
SAP BW Implementation Guide (IMG)	65
SAP BW InfoCube	96
SAP BW InfoObject	279, 305, 313
SAP BW InfoProvider	277, 326
SAP BW namespace	592
SAP BW objects	149
SAP BW query	669, 672, 680–681, 685, 693, 695
SAP BW Workbench	569
SAP BW/4HANA	771
SAP BW/SAP BPC InfoCube	154
SAP ERP system	293
SAP Fiori launchpad	936
SAP HANA	112, 594, 618–619, 641–644, 653, 660, 664, 669, 671, 678, 688–692
<i>embedded consolidation</i>	769
<i>INA provider</i>	80
SAP HANA Predictive Analysis Library (PAL)	597
SAP HANA SDI	770
SAP HANA studio	922
SAP Intercompany	495, 856
SAP Lumira, designer edition	696
SAP S/4HANA	765, 913
<i>master data</i>	916
SAP SEM-BPS	910
SAP Service Marketplace	78
SAP Strategic Enterprise Management	377
SAP_BPC_ADMIN	527
Sarbanes-Oxley Act (SOX)	581
Save and Open options	189
Save and Refresh Workbook Data option	200
Save and Refresh Worksheet Data option	200
Save data	200, 639
Save reports	190
Save to Server Root Folder option	190
Save Workbook Data option	200
Save Worksheet Data option	200
SCALING	302
Schedule the Distribution option	212
Scope dimension	123
Scoping	403–405
Script logic	344–345, 375, 383–385, 413, 422, 611
<i>embedded consolidation</i>	790
<i>structure</i>	402
Secured and unsecured dimensions	128, 146
Security	523–524, 526, 535, 559, 561, 867
Security reporting	561
Select a dimension	303
Select Another Connection option	256
Select Dimensions link	208
SELECTION	301
Server configuration	231
Server folder	640
Set Model	66
Set Selection	303, 321, 323
Set Selection dialog box	311

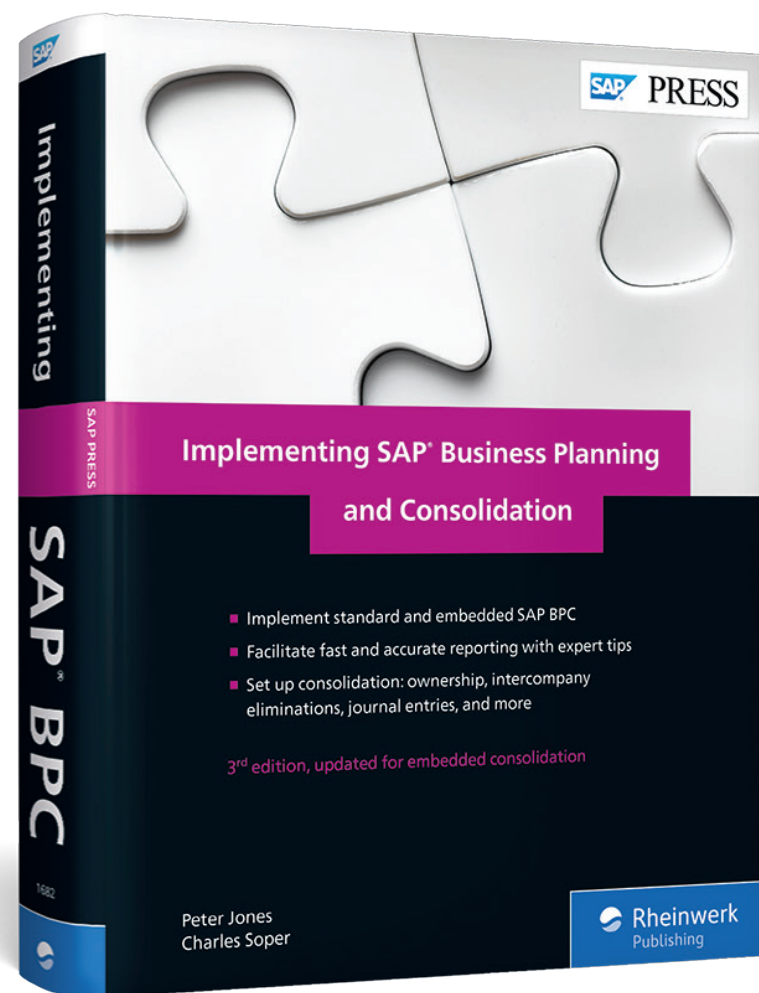
Set variable	639, 672
SetDataProcess variable	712
Setting up multiple group currencies	493, 855
Sheet options	187, 266
<i>dialog box</i>	197
<i>option</i>	225
<i>user options</i>	204
Shift option	240
Show as Microsoft Excel Comments	
<i>option</i>	204, 227
Show Link Symbols option	218
SignData	91–92, 274
SignData key figure	156
Smart data integration (SDI)	764, 771, 783
Smart data quality (SDQ)	771
Software development kit (SDK)	771
Sorting tab	239, 242
Source currency	742
Source model	143
Special period 000	773
<i>criteria</i>	774
<i>reporting</i>	775
Split	877
Spread	198
SQLScript	597
Staging InfoCube	356
Standard planning functions	706
Standard template	166
Standard transport process	571
Standard-delivered role	527
Start Page screen	69
Start query in change mode	629
Strategy	525
Strategy management	171
Submitted	540
Subsequent consolidation entries	448, 817
Subtable/Flow dimension	121
Subtype	207
Support pack enhancements	494, 855
Symmetric report	258
Symmetrical inverse formula	720
System reporting	555, 559
System Reports feature	72
SYSTEM_CONSTANTS.LGF	388
SYSTEM_LIBRARY.LGF	388

T

Table	
ACDOCA	913, 927
ACDOCC	913, 927
TCURR	350–352, 355
UJA_APPL	151–152
UJU_AUDACTDET	566, 568
Table TCURRT	944
Target currency	742
Task	530
Task Name	343
Task profile	524–526, 529–532, 537, 563
Task sequence	
<i>configure task types</i>	864
Task sequences	790, 863
Team	524–526, 529, 533, 535, 563
Team property	886
Teams	871
Teams folder	69
Template	168, 560–561
<i>description</i>	212
<i>location</i>	212
<i>subfolder</i>	212
Template option	208
Terminology	89
Text	284, 332
Text transformation file	332
Text variables	672
Time dependent	162
Time dimension	112, 164
TIME format	320
Time involved	291
TMVL	396
TMVL(offset, base_period)	396
To and from dates	291
Tools	224
<i>options</i>	217
Top-down distribution	747
Top-down planning	375–376, 381, 421–422, 431
Totals Placement options	227
Trace	725
Transaction	
LISTCUBE	641
PFCG	527, 870

Transaction (Cont.)	
<i>RSAI</i>	62, 366, 573, 617, 619, 642, 647, 655, 664, 890, 899
<i>RSBPCADMIN</i>	887
<i>RSCUR</i>	741–742
<i>RSDI</i>	873
<i>RSECADMIN</i>	872–873
<i>RSECENVI</i>	875
<i>RSPC</i>	366
<i>RSPLAN</i>	620–621, 648, 656, 664, 706, 720, 723, 734, 757, 760
<i>RSPLFI</i>	757
<i>RSPLSE</i>	723, 868
<i>RSRT</i>	152
<i>RSRT view</i>	152
<i>RSUOM</i>	744
<i>RTCCMD</i>	918
<i>RTCENT</i>	918
<i>RTCFU</i>	938
<i>RTCGLA</i>	917
<i>RTCMD</i>	915
<i>RTCMPL</i>	864
<i>RTCPL</i>	936
<i>RTCTTP</i>	920
<i>SEO1</i>	579
<i>SEI1</i>	351, 926
<i>SEI2</i>	566
<i>SEI6</i>	64, 746, 936
<i>SEI9</i>	415
<i>SE38</i>	901
<i>SM12</i>	723
<i>SM59</i>	768
<i>SPRO</i>	65, 153, 510, 656, 741, 775, 914, 916
<i>SUO1</i>	869
<i>SUZ1</i>	880
<i>SU53</i>	63
<i>UJBR</i>	85, 573, 907
<i>UJFS</i>	137, 389, 922
<i>UJK_SCRIPT_LOGIC_TESTER</i>	61
<i>UJKT</i>	403
<i>UJLD</i>	160
<i>UJSTAT</i>	555
<i>USO1</i>	673
Transaction code	223
Transactional data	268, 293, 317, 334, 764
Transactional InfoCube	162
Transfer data	675, 680, 687, 695
Transformation	288
Transformation file	271–272, 288, 297–298, 301, 305, 307, 324, 330, 357
Transformation File option	273
Transformation rule	278, 288, 293, 295, 353, 574
Transport Connection option	573
Transport Organizer	579
Transports	571, 576, 899, 901
Trend	199
Trending analysis	421
Types of dimensions	106
Typical conversion	358
U	
UJ	64
Uncommenting	400
Undo	196
Unit conversion	744
Universal Journal	915
UOM translation	705
Update	186, 314
Updating the hierarchy	314
Upload	281, 286
Upload Data link	328
Upload Data option	270, 281
Upload process	329
Uploading currency exchange	350
US eliminations	439, 502, 807
Use as Input Form option	197, 226
Use Position in Axis option	181, 226
USER	527, 556
User activity audit	557
User activity in business rule management audit	557
User Host files	67
User Maintenance	
<i>initial screen</i>	526
User options	183, 187, 266
User Options feature	231
User Package option	337
Users	524, 526, 533, 869

V	
Validate & Process Transformation File	274, 302, 305, 321
Validate and process	330, 334–335
Validate and Process Transformation dialog box	302, 311
Validate Data option	201
Validating	400
Validation Status dialog box	305
VALIDATION.LGF	388
Variable Members field	209
Variables	637
Variants	927
VBA	266, 636
Versioning	375, 419
Versions	919
<i>define variants</i>	921
Vertical line	169
View Format option	253
View Schedule Status	270
Virtual InfoCube	163, 173
Virtual InfoObjects	915
Virtual model	671
Virtual time hierarchy	774
VirtualProvider	928
<i>SAP HANA model</i>	929
VMWare	61
Volume	377
W	
Warehousing	378
Web Administration link	60
Web Administration screen	67
Web client start page	67
Web Documents option	101
Web services	171, 175, 536
Weight	199
Wizard	529
Word document	263
Work status	326, 537–538, 540, 544, 564, 592, 607, 882, 909–910
<i>reporting</i>	889
<i>settings</i>	540
Worksheet generation	191
Worksheet logic	383–384
Worksheet Type options	226
Workspace	74, 166, 549
Write	535
WRITEMODE	371
X	
XDIM_ADDMEMBERSET	395
XDIM_MEMBERSET	401
Y	
Year-to-date (YTD) approach	776, 778
YTD	279
<i>format</i>	281
Z	
ZBPC_LOAD_DATASRC_MDATTR	349



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