

## Reading Sample

Chapter 11 introduces the embedded environment; the second environment offered with SAP BPC 10.1 version for NetWeaver. You will begin the process of creating an embedded environment. You will also learn the basics for developing a planning application in the SAP BW system by forming the application's building blocks with the SAP BW Integrated Planning Modeler.

-  **"Embedded Environment"**
-  **Contents**
-  **Index**
-  **The Authors**

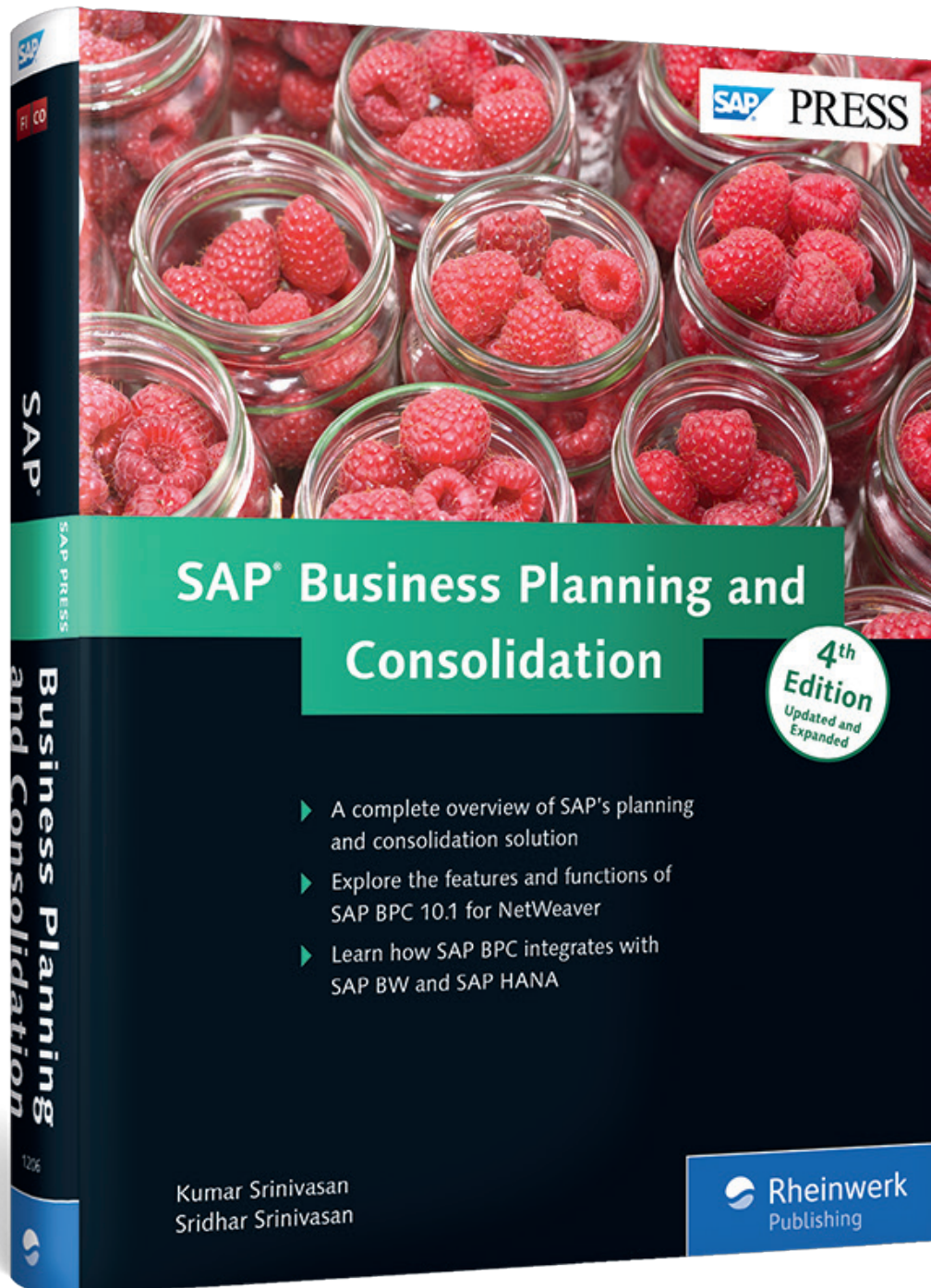
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*SAP BPC 10.1 version provides the capability to create two different types of environments—standard and embedded. The embedded environment is a new type of environment that has been introduced in SAP BPC 10.1. In this chapter, we will introduce you to this environment.*

## **11 Embedded Environment**

The previous chapters discussed how to configure a standard environment and use its features to develop applications for planning and consolidation. For the next three chapters, we will look at the embedded environment and its role in SAP BPC. We will begin by introducing you to an embedded environment.

In Section 11.1, we will discuss advantages of using the embedded environment in SAP BPC. In Section 11.2, we will introduce you to a case study for Financial Planning. This case study will be used as the basis for developing a planning application in the subsequent sections. In Section 11.3, we will go over the steps to build the data model for the planning application in the SAP BW system. In the chapters that follow, we will use these building blocks to develop a planning application with the SAP BW Integrated Planning Modeler, and then create an embedded environment within SAP BPC.

To begin, let's look at the characteristics of an embedded environment within the SAP BPC framework.

### **11.1 Embedded Environment in SAP BPC**

The embedded environment is based on SAP BW metadata and provides tighter integration with objects created in the system. Specifically, the environment leverages the BW Integrated Planning Modeler (SAP BW-IP) framework, which includes pre-defined planning functions and reporting capabilities.

The SAP BW system has seamless integration with external source systems, which includes the SAP ECC system. SAP provides business content for extraction, trans-

formation, and loading (ETL) of data from SAP ECC to SAP BW. This data can be consumed in an embedded environment of the SAP BPC system without addition replication of the data. This saves time and reduces cost of ownership by using existing data in the SAP BW system.

The embedded environment is based on the Planning Application Kit (PAK) paradigm, where the planning capabilities can be handled using SAP HANA. This provides improved performance when running tasks related to planning, such as planning functions.

The creation of an embedded environment involves the following high-level tasks, which will be discussed across this and the next two chapters:

- ▶ Gathering the requirements for building application
- ▶ Building a data model to support application in the SAP BW system
- ▶ Designing an application using the BW-IP
- ▶ Creating an input-enabled query using BEx Query Designer
- ▶ Designing an application using an embedded environment in SAP BPC

We will now introduce you to a case study that presents a scenario for creating a planning application in an embedded environment.

## 11.2 Case Study for Financial Planning

The case study that we introduce will be used as the basis for developing a planning application in SAP BPC. This section will give you an overview of a fictitious sample company, along with detailed information about its operations.

The objective of the case study is to project the *gross profit margin* of the company's operations. The gross profit margin is a measurement of the efficiency of the company's operations. It is the company's total sales revenue minus its cost of goods sold. It can also be expressed as a percentage.

### 11.2.1 Rich Bloom Case Study

Rich Bloom is a popular clothing retailer that caters to the teenage market. The company has a large presence in the US and also has operations in Europe, with companies set up in the UK and Germany.

Rich Bloom products and business model have been well-received in the market, and it has been expanding since it was founded in 2007.

The company is incorporated as follows:

- ▶ Rich Bloom Inc., incorporated in San Diego, California (parent company)
- ▶ Rich Bloom Ltd., incorporated in London, England (subsidiary)
- ▶ Rich Bloom AG, incorporated in Frankfurt, Germany (subsidiary)

The details of the company's teenage line of products are as follows:

- ▶ RB T-shirts
- ▶ RB shirts
- ▶ RB jackets
- ▶ RB designer jeans

The company sells most of its products to large department stores, which in turn sell them to retail customers. Rich Bloom also has a few retail stores of its own that sell directly to retail customers. The RB T-shirt and RB designer jeans product lines are especially popular among teenagers and have contributed to large profits for the company in recent years. The company introduced RB jackets in 2006 and has been selling them at a promotional price. The promotional price is 20% less than the original price. The company plans to continue using the promotional price for selling this item for the whole of 2014.

From a financial and monetary transaction standpoint, the company is organized in the following manner, using a unique company code:

- ▶ 20—Rich Bloom Inc., San Diego, CA, USA
- ▶ 25—Rich Bloom Ltd., London, UK
- ▶ 30—Rich Bloom AG, Frankfurt, Germany

The subsidiaries operate as independent entities but report their operations to the parent company. Each of the companies has its own production centers to cater to market demand.

The currencies for transactions are the respective currencies of the countries in which the companies operate. They are as follows:

- ▶ US Dollar—Rich Bloom Inc., San Diego, CA, USA
- ▶ British Pound—Rich Bloom Ltd., London, UK
- ▶ Euro—Rich Bloom AG, Frankfurt, Germany

For the purpose of analysis and reporting the operations of the company as a whole, the operations of the subsidiaries are converted into the currency of the parent company, which is US Dollars (USD). The calendar year is used as the fiscal year for reporting.

### 11.2.2 Requirements of the Case Study

The company has a fully functional SAP R/3 system. It also implemented SAP BW four years ago and has fully realized the benefits of using this tool for analysis. It recently upgraded the SAP BW system to the 7.4 version on SAP HANA and wants to do financial planning in SAP BPC. The actual and historic sales and cost data for the last four years are maintained in SAP BW.

The company's management is convinced that it can increase sales and reduce costs by implementing a robust process for planning. A good planning system will help the company anticipate demand for its products and position itself to meet customer requirements. The company also believes that it can reduce production-related labor and material costs by having a good planning system for procurement in place. Moreover, labor costs and other overheads can be planned effectively to increase productivity. The objective of the planning in this case study is to project the gross profit margin of the company's operation.

The company wants to compare the plan data with actual data and project how well it will perform over time. The planning application will use the current and historical sales revenue and cost of sales data as the source for planning for the future. This, in addition to marketing research, will form the basis for projecting the gross profit margin.

The company has decided to use the bottom-up approach for planning. Using this method, the initial planning of sales revenue and cost of sales for the individual sales areas will be done by the sales representatives. The sales representatives will complete the sales-revenue and cost-of-sales plan for their respective areas and send it to the sales manager for approval. The sales manager will then combine the data from all of the sales reps, make any necessary changes, and send it on to

the regional manager. This process will continue up the hierarchy to upper management until the entire plan data is consolidated and approved.

### Proposed Planning Application

To meet the outlined requirements, a planning application needs to be developed and made available to the users involved in the planning process. The functional aspects of the planning should be incorporated into the planning application, which should in turn meet the planning requirements of the business. The planning application must also be flexible, reliable, and easy to use, as well as comprehensive with respect to the integration of various sources of data.

### Determining the Required Information

The company has determined that it needs the following pieces of information to plan effectively:

- ▶ Financial Organization
  - ▶ Company Code
  - ▶ Controlling Area
  - ▶ Cost Center
  - ▶ Business Area
- ▶ Product
  - ▶ Material
  - ▶ Material Group
- ▶ Customer
  - ▶ Customer
- ▶ Sales Organization
  - ▶ Sales Organization
  - ▶ Sales Office
  - ▶ Distribution Channel
  - ▶ Division

- ▶ Version
  - ▶ Version
  - ▶ Value Type
- ▶ Country
  - ▶ Country
- ▶ Period
  - ▶ Calendar Year
  - ▶ Calendar Period
- ▶ Values (key figures)
- ▶ Quantity (including units)
- ▶ Sales Amount
- ▶ Cost Amount

The above elements correspond to the different characteristics of the business and will be used to develop a data model for the purpose of planning.

In the next section, we will delve into the details of building a data model to suit the planning requirements of our sample company. In the subsequent sections, we will explain the process of configuring the planning objects and the integration of the planning objects into a comprehensive application in SAP BPC. The planning application will be used for creating, modifying, reporting, and analyzing the planned data.

### 11.3 Building a Data Model in SAP BW

In this section, we will start building the objects required for supporting our case study. Note that we will build the objects sequentially. This will give you a clear understanding of the steps involved in creating the necessary objects before building a planning application. First, we will build objects in the SAP BW system.

#### 11.3.1 SAP BW Integrated Planning Prerequisites

SAP BW Integrated Planning (BW-IP) is a tool that allows developers to create planning application in the SAP BW system. SAP BW-IP was introduced as an option for planning with the release of SAP NetWeaver BI 7.0. The main advantage of using SAP BW-IP for developing a planning application is that it provides a common interface for data entry, reporting, and analysis of actual and plan data. The ability to leverage the objects created in the SAP BW reporting environment by using the BEx Query Designer tool is an added benefit when using the SAP BW-IP. This brings down the TCO and provides the flexibility of enabling a web-based configuration.

The following is a summary of the prerequisites for planning in the SAP BW-IP:

##### ▶ Real-Time InfoCube

You must have at least one real-time InfoCube. When a standard InfoCube is checked as real-time at creation, it becomes available for planning using planning objects. This InfoCube can be used to generate and modify data using planning objects in the SAP BW system. A standard InfoCube that is not checked as real-time does not support generation or modification of plan data using the planning tools.

##### ▶ MultiProvider

While the plan data is always stored in a real-time InfoCube, you may need a planning application to reference data in an InfoProvider that may not be a real-time InfoCube. For example, let us assume that an organization's sales data ("actuals") is maintained in a standard InfoCube and that the plan data is maintained in a real-time InfoCube. In this case, a MultiProvider can be defined to include both the standard InfoCube and the real-time InfoCube. This MultiProvider then can be used in the context of a planning application, and the planning objects can reference the data in both InfoCubes.

In the following section, we will discuss the model of InfoCubes that will be used to develop our application.

#### 11.3.2 Designing a Data Model in SAP BW

To begin design our data model, we will create the InfoCubes in SAP BW to store actual sales and plan data.

An InfoCube called "Sales InfoCube" will store the actual sales and cost data for the last four years. It will also be used as one of the sources of data for the purpose of planning for the future. Market research will also be used to determine the current trends in clothing in the teenage market. The data in the Sales InfoCube will be loaded with data from the SAP R/3 system on a daily basis.

An InfoCube called "Plan InfoCube" that will store the plan data will also need to be created. The structure of the Plan InfoCube will mirror the structure of the Sales InfoCube. The Plan InfoCube will be configured as a real-time InfoCube.

The InfoObjects to be included in the Sales and Plan InfoCubes are listed in the following tables and are SAP-delivered unless indicated by the words *Custom Info-Object*. Characteristics and their values are listed in Table 11.1, the time characteristics and their values are listed in Table 11.2, the unit characteristics are listed in Table 11.3, and the key figures (quantitative measures) are listed in Table 11.4.

| Characteristic | Values  |
|----------------|---|
| OCOMP_CODE     | <ul style="list-style-type: none"> <li>▶ 20, 25 and 30</li> <li>▶ 20 – Rich Bloom Inc., San Diego, CA, USA</li> <li>▶ 25 – Rich Bloom Inc., London, UK</li> <li>▶ 30 – Rich Bloom Inc., Frankfurt, Germany</li> </ul> |
| OCO_AREA       | 1000  |
| OCOSTCENTER    | <ul style="list-style-type: none"> <li>▶ CC1 and CC2</li> <li>▶ CC1 – Cost center for T-shirts, shirts, and jackets</li> <li>▶ CC2 – Cost center for designer jeans</li> </ul>  |
| OBUS_AREA      | BA1 and BA2   |
| OSALESORG      | <ul style="list-style-type: none"> <li>▶ 20, 25 and 30</li> <li>▶ 20 – Rich Bloom Inc., San Diego, CA, USA</li> <li>▶ 25 – Rich Bloom Inc., London, UK</li> <li>▶ 30 – Rich Bloom Inc., Frankfurt, Germany</li> </ul> |
| OSALES_OFF     | <ul style="list-style-type: none"> <li>▶ SO1, SO2 AND SO3</li> <li>▶ SO1 – US sales office</li> <li>▶ SO2 – UK sales office</li> <li>▶ SO3 – Germany sales office</li> </ul>  |
| ODISTR_CHAN    | 70 (Direct Distribution)  |

**Table 11.1** Characteristics

| Characteristic | Values  |
|----------------|---|
| ODIVISION      | <ul style="list-style-type: none"> <li>▶ D1 and D2</li> <li>▶ D1 – Shirt division</li> <li>▶ D2 – Jeans division</li> </ul>   |
| OVTYP          | <ul style="list-style-type: none"> <li>▶ 10, 20 and 60</li> <li>▶ 10 – Actual</li> <li>▶ 20 – Plan</li> <li>▶ 60 – Forecast</li> </ul>  |
| OVERSION       | <ul style="list-style-type: none"> <li>▶ 00, 01</li> <li>▶ Actual data is always stored with version 00</li> <li>▶ Plan data is stored with version 01</li> </ul>   |
| OMATERIAL      | <ul style="list-style-type: none"> <li>▶ CK2000, CK2001, CK2002</li> <li>▶ CY7000</li> <li>▶ CK2000 – T-shirts</li> <li>▶ CK2001 – Shirts</li> <li>▶ CK2002 – Jackets</li> <li>▶ CY7000 – Jeans</li> </ul>  |
| OMATL_GROUP    | <ul style="list-style-type: none"> <li>▶ Material group is also an attribute of material</li> <li>▶ CK – Shirts</li> <li>▶ CY – Jeans</li> </ul>  |
| OCUSTOMER      | <ul style="list-style-type: none"> <li>▶ C1-C4, C20-C21, C30-C31</li> <li>▶ C1 - C4 – Customers in the US</li> <li>▶ C20 - C21 – Customers in the UK</li> <li>▶ C30 - C31 – Customers in Germany</li> </ul> |
| OCOUNTRY       | <ul style="list-style-type: none"> <li>▶ US, UK and DE</li> <li>▶ US (United States of America)</li> <li>▶ GB (United Kingdom)</li> <li>▶ DE (Germany)</li> </ul>   |

**Table 11.1** Characteristics (Cont.)

| Time Characteristic | Values                              |
|---------------------|-------------------------------------|
| OCALMONTH           | Calendar period for sales/plan data |
| OCALYEAR            | Calendar year for sales/plan data   |

**Table 11.2** Time Characteristics

| Unit Characteristic | Values                                       |
|---------------------|--|
| OD_UQTY             | Used in Key Figure OD_QTY                    |
| OCURRENCY           | Used in Key Figures ZCTAMT_GC and ZSLAMT_GC. |

**Table 11.3** Unit Characteristics

| Key Figures                      | Values   |
|----------------------------------|--|
| OD_QTY                           | Quantity in units (Key Figure of type unit; associated with OD_UQTY unit measure)      |
| ZCTAMT_GC<br>(Custom InfoObject) | Cost amount (Key Figure of type currency; associated with OCURRENCY currency measure)  |
| ZSLAMT_GC<br>(Custom InfoObject) | Sales amount (Key Figure of type currency; associated with OCURRENCY currency measure) |

**Table 11.4** Key Figures

Now, create an InfoArea called ZSALES (“Sales Management”) and create three InfoCubes under it. These include a Sales InfoCube for storing the actual sales and cost data, a Plan InfoCube for storing plan data, and a MultiProvider InfoCube that provides a unified view of the Sales InfoCube and Plan InfoCube. These are outlined in Table 11.5.

| InfoCube | Description                             |
|----------|---|
| ZSLS_ACT | Sales InfoCube                          |
| ZSLS_PLN | Plan InfoCube                           |
| ZSLS_CMB | Sales and Plan InfoCube (MultiProvider) |

**Table 11.5** InfoCubes for Creating a Financial Planning Application

Next, we will go through the steps to create a Sales InfoCube.

### Creating a Sales InfoCube

This section explains how to create the Sales InfoCube based on the requirements listed in Table 11.1, Table 11.2, Table 11.3, and Table 11.4. The dimensions and key figures used in the Sales InfoCube are shown in Table 11.6 and Table 11.7.

| Dimensions             | Characteristics  |
|------------------------|--|
| Financial Organization | <ul style="list-style-type: none"> <li>▶ Company Code (OCOMP_CODE)</li> <li>▶ Controlling Area (OCO_AREA)</li> <li>▶ Cost Center (OCOSTCENTER)</li> <li>▶ Business Area (OBUS_AREA)</li> </ul>             |
| Sales Organization     | <ul style="list-style-type: none"> <li>▶ Sales Organization (OSALESORG)</li> <li>▶ Sales Office (OSALES_OFF)</li> <li>▶ Distribution Channel (ODISTRCHAN)</li> <li>▶ Sales Division (ODIVISION)</li> </ul> |
| Version                | <ul style="list-style-type: none"> <li>▶ Value Type (OVTYPE)</li> <li>▶ Version (OVERSION)</li> </ul>  |
| Material               | <ul style="list-style-type: none"> <li>▶ Material (OMATERIAL)</li> <li>▶ Material Group (OMATL_GROUP)</li> </ul>   |
| Customer               | Customer (OCUSTOMER)   |
| Country                | Country (OCOUNTRY)   |
| Time                   | <ul style="list-style-type: none"> <li>▶ Calendar Month (OCALMONTH)</li> <li>▶ Calendar Year (OCALYEAR)</li> </ul>   |
| Unit                   | <ul style="list-style-type: none"> <li>▶ Sales Quantity Unit (OD_UQTY)</li> <li>▶ Currency (OCURRENCY)</li> </ul>  |

**Table 11.6** Dimensions for the Sales InfoCube

| Key Figures | Description  |
|-------------|--------------|
| OD_QTY      | Quantity     |
| ZCTAMT_GC   | Cost Amount  |
| ZSLAMT_GC   | Sales Amount |

**Table 11.7** Key Figures for the Sales InfoCube Creating a Plan InfoCube

We will now explain how to create the Plan InfoCube based on the case study requirements listed in Table 11.1, Table 11.2, Table 11.3, and Table 11.4. The Plan InfoCube is created in much the same way as the Sales InfoCube except that this InfoCube is set as a “real-time InfoCube.” The dimensions and key figures used in the Plan InfoCube are displayed in Table 11.8 and Table 11.9 respectively.

| Dimensions             | Characteristics  |
|------------------------|--|
| Financial Organization | <ul style="list-style-type: none"> <li>▶ Company Code (0COMP_CODE)</li> <li>▶ Controlling Area (OCO_AREA)</li> <li>▶ Cost Center (OCOSTCENTER)</li> <li>▶ Business Area (OBUS_AREA)</li> </ul>             |
| Sales Organization     | <ul style="list-style-type: none"> <li>▶ Sales Organization (0SALESORG)</li> <li>▶ Sales Office (0SALES_OFF)</li> <li>▶ Distribution Channel (ODISTRCHAN)</li> <li>▶ Sales Division (ODIVISION)</li> </ul> |
| Version                | <ul style="list-style-type: none"> <li>▶ Value Type (OVTYPE)</li> <li>▶ Version (OVERSION)</li> </ul>  |
| Material               | <ul style="list-style-type: none"> <li>▶ Material (0MATERIAL)</li> <li>▶ Material Group (0MATL_GROUP)</li> </ul>   |
| Customer               | Customer (0CUSTOMER)   |
| Country                | Country (0COUNTRY)   |
| Time                   | <ul style="list-style-type: none"> <li>▶ Calendar Month (0CALMONTH)</li> <li>▶ Calendar Year (0CALYEAR)</li> </ul>   |
| Unit                   | <ul style="list-style-type: none"> <li>▶ Sales Quantity Unit (0D_UQTY)</li> <li>▶ Currency (0CURRENCY)</li> </ul>  |

**Table 11.8** Dimensions for Plan InfoCube

| Key Figures | Description  |
|-------------|--------------|
| 0D_QTY      | Quantity     |
| ZCTAMT_GC   | Cost Amount  |
| ZSLAMT_GC   | Sales Amount |

**Table 11.9** Key Figures for Plan InfoCube

Finally, we will create a MultiProvider using these two InfoCubes.

### Creating a MultiProvider Using Sales and Plan InfoCubes

A *MultiProvider* does not physically store data but instead provides a unified view of data from the InfoProviders used in its definition. A MultiProvider is necessary

for our case study because one of the requirements for the planning application is to use the data in the Sales InfoCube as the source of data for planning.

The MultiProvider we'll create, called *Sales, Actual, and Plan*, will provide a unified view of the data in the Sales and Plan InfoCubes and will be used as the basis for configuring the planning application. When creating a MultiProvider, in addition to selecting the InfoProviders and the InfoObjects required, you will have to map the characteristic InfoObjects and the key figure InfoObjects in the MultiProvider to the respective InfoObjects in the selected InfoProviders, The process of mapping is also called identification.

The dimensions and key figures used in the Sales, Actual, and Plan MultiProvider are shown in Table 11.10 and Table 11.11 respectively.

| Dimensions             | Characteristics  |
|------------------------|--|
| Financial Organization | <ul style="list-style-type: none"> <li>▶ Company Code (0COMP_CODE)</li> <li>▶ Controlling Area (OCO_AREA)</li> <li>▶ Cost Center (OCOSTCENTER)</li> <li>▶ Business Area (OBUS_AREA)</li> </ul>             |
| Sales Organization     | <ul style="list-style-type: none"> <li>▶ Sales Organization (0SALESORG)</li> <li>▶ Sales Office (0SALES_OFF)</li> <li>▶ Distribution Channel (ODISTRCHAN)</li> <li>▶ Sales Division (ODIVISION)</li> </ul> |
| Version                | <ul style="list-style-type: none"> <li>▶ Value Type (OVTYPE)</li> <li>▶ Version (OVERSION)</li> </ul>  |
| Material               | <ul style="list-style-type: none"> <li>▶ Material (0MATERIAL)</li> <li>▶ Material Group (0MATL_GROUP)</li> </ul>   |
| Customer               | Customer (0CUSTOMER)   |
| Country                | Country (0COUNTRY)   |
| Time                   | <ul style="list-style-type: none"> <li>▶ Calendar Month (0CALMONTH)</li> <li>▶ Calendar Year (0CALYEAR)</li> </ul>   |
| Unit                   | <ul style="list-style-type: none"> <li>▶ Sales Quantity Unit (0D_UQTY)</li> <li>▶ Currency (0CURRENCY)</li> </ul>  |

**Table 11.10** Dimensions for Sales Actual and Plan MultiProvider



| Key Figures | Description  |
|-------------|--------------|
| OD_QTY      | Quantity     |
| ZCTAMT_GC   | Cost Amount  |
| ZSLAMT_GC   | Sales Amount |

**Table 11.11** Key Figures for Sales Actual and Plan MultiProvider

We have now successfully developed the data models in SAP BW to support the creation of an embedded environment.

#### 11.4 Summary

In this chapter, we introduced you to an embedded environment. We also introduced you to a case study that will be used to define requirements for building an embedded application for planning. We developed data models that will be used to build a planning application. In the next chapter, we will design an application using the SAP BW-IP.

# Contents

|          |  |           |
|----------|--|-----------|
| <b>1</b> | <b>Overview of SAP Enterprise Performance Management .....</b> | <b>31</b> |
| 1.1      | Enterprise Performance Management .....                        | 31        |
| 1.2      | Planning, Budgeting, and Forecasting .....                     | 36        |
| 1.2.1    | Planning Horizon .....   | 38        |
| 1.2.2    | Planning Types .....   | 39        |
| 1.2.3    | Planning Areas .....   | 41        |
| 1.2.4    | Common Scenarios for Planning in Business .....                | 43        |
| 1.2.5    | Considerations in Planning .....                               | 45        |
| 1.3      | Consolidation .....  | 47        |
| 1.3.1    | Elimination of Intercompany Transactions .....                 | 48        |
| 1.3.2    | Consolidation of Investments .....                             | 49        |
| 1.4      | Summary .....  | 50        |
| <b>2</b> | <b>Overview of SAP BPC .....</b>                               | <b>51</b> |
| 2.1      | SAP BPC: Features .....  | 52        |
| 2.1.1    | Software Designed to Support Change .....                      | 53        |
| 2.1.2    | SAP BPC Product Characteristics .....                          | 54        |
| 2.1.3    | SAP BPC for NetWeaver .....                                    | 58        |
| 2.2      | Unified Planning and Consolidation .....                       | 60        |
| 2.2.1    | Planning in SAP BPC .....                                      | 60        |
| 2.2.2    | Consolidation in SAP BPC .....                                 | 60        |
| 2.3      | SAP BPC for NetWeaver Architecture .....                       | 63        |
| 2.3.1    | BPC Clients .....  | 64        |
| 2.3.2    | Connectivity .....   | 65        |
| 2.3.3    | SAP NetWeaver Application Server .....                         | 66        |
| 2.3.4    | Database Server .....  | 66        |
| 2.4      | Introducing SAP BW .....                                       | 68        |
| 2.4.1    | Objects Used in SAP BW .....                                   | 68        |
| 2.4.2    | Extracting, Transforming, and Loading Data in SAP BW ....      | 71        |
| 2.4.3    | Process Chains .....   | 73        |
| 2.4.4    | Business Content .....   | 74        |
| 2.4.5    | Key Features in SAP BW .....                                   | 74        |
| 2.5      | Terminology and Objects in SAP BPC .....                       | 78        |
| 2.6      | Summary .....  | 83        |

|          |  |            |
|----------|--|------------|
| <b>3</b> | <b>Designing a Model with SAP BPC for NetWeaver</b>                    | <b>85</b>  |
| 3.1      | Rich Bloom Case Study  | 85         |
| 3.1.1    | Business   | 86         |
| 3.1.2    | Offices  | 86         |
| 3.1.3    | Products   | 86         |
| 3.1.4    | Currency   | 87         |
| 3.1.5    | Case Study   | 87         |
| 3.1.6    | Decision to Use SAP BPC for NetWeaver                                  | 88         |
| 3.2      | Building the Data Model in SAP BW                                      | 89         |
| 3.2.1    | Creating and Activating InfoObjects                                    | 92         |
| 3.2.2    | Creating an InfoArea   | 102        |
| 3.2.3    | Creating a Sales InfoCube  | 102        |
| 3.3      | Building Models in SAP BPC   | 108        |
| 3.3.1    | Accessing the SAP BPC System   | 110        |
| 3.3.2    | Environment  | 114        |
| 3.3.3    | Dimensions   | 120        |
| 3.3.4    | Model  | 130        |
| 3.4      | Summary  | 138        |
| <b>4</b> | <b>Loading, Scheduling, and Managing Data in SAP BPC for NetWeaver</b> | <b>139</b> |
| 4.1      | Loading Data into an InfoCube in SAP BW                                | 140        |
| 4.1.1    | Creating a DataSource  | 140        |
| 4.1.2    | Creating Transformations   | 143        |
| 4.1.3    | Creating the Data Transfer Process                                     | 145        |
| 4.1.4    | Creating InfoPackages  | 147        |
| 4.1.5    | Loading Data from the PSA to the Data Target                           | 150        |
| 4.2      | Loading Data into SAP BPC  | 152        |
| 4.2.1    | Transformation and Conversion  | 152        |
| 4.2.2    | Data Manager Packages  | 160        |
| 4.2.3    | Process Chains   | 167        |
| 4.2.4    | Loading Master Data from a Flat File into a Dimension                  | 168        |
| 4.2.5    | Loading Master Data from an InfoObject into an SAP BPC Dimension       | 178        |
| 4.2.6    | Loading Hierarchy Data from an InfoObject into an SAP BPC Dimension    | 186        |
| 4.2.7    | Loading Data from an InfoCube into an SAP BPC Model                    | 191        |

|          |  |            |
|----------|--|------------|
| 4.3      | Copying Data Inside an SAP BPC Model                               | 197        |
| 4.4      | Summary  | 199        |
| <b>5</b> | <b>Reporting, Planning, and Analysis in SAP BPC</b>                | <b>201</b> |
| 5.1      | Reporting and Analysis in SAP BPC                                  | 202        |
| 5.1.1    | SAP EPM Add-In Interface for Excel: Connecting to a Model          | 204        |
| 5.1.2    | Creating Reports   | 213        |
| 5.1.3    | Developing Reports Using Dynamic Templates                         | 232        |
| 5.1.4    | Developing Reports Using EPM Functions                             | 233        |
| 5.1.5    | Developing Reports Using the EPMRetrieveData Function              | 237        |
| 5.1.6    | Developing a Static EPM Report—Rolling Forecast Report             | 237        |
| 5.1.7    | Developing Customized Reports                                      | 242        |
| 5.1.8    | Quick Links  | 246        |
| 5.1.9    | Migrating 7.5 Version EvDRE Reports                                | 247        |
| 5.1.10   | Developing Reports Using the New API for EPM                       | 248        |
| 5.1.11   | Developing Reports Using the SAP BPC Web Client                    | 249        |
| 5.2      | Planning in SAP BPC Using Input Forms                              | 253        |
| 5.2.1    | Standard Templates for Input Forms                                 | 254        |
| 5.2.2    | Developing an Input Form   | 254        |
| 5.2.3    | Using the EPMSaveData Function to Save Data                        | 257        |
| 5.3      | Other Features   | 258        |
| 5.3.1    | Drill-Through Feature  | 258        |
| 5.3.2    | Integration with SAP BusinessObjects Dashboards                    | 258        |
| 5.4      | Summary  | 259        |
| <b>6</b> | <b>Developing Business Logic in SAP BPC</b>                        | <b>261</b> |
| 6.1      | Dimension Logic  | 262        |
| 6.1.1    | Dimension Formulas   | 262        |
| 6.1.2    | Solve Order  | 263        |
| 6.2      | Logic Script   | 267        |
| 6.2.1    | Logic Script Construct   | 268        |
| 6.2.2    | Executing Logic Script   | 276        |
| 6.2.3    | Creating Logic Script to Revalue Plan Data                         | 276        |
| 6.2.4    | Creating Logic Script to Push Data from the YTD to PERIODIC Models | 286        |
| 6.2.5    | Logic Script Files Provided by SAP                                 | 287        |

- 6.3 Business Rules Overview ..... 288
  - 6.3.1 Currency Translation ..... 288
  - 6.3.2 Carry Forward ..... 288
  - 6.3.3 Account Transformation ..... 288
  - 6.3.4 Intercompany Matching/Booking ..... 289
  - 6.3.5 Intercompany Elimination ..... 289
  - 6.3.6 Eliminations and Automatic Adjustments ..... 289
- 6.4 Currency Translation ..... 290
- 6.5 Allocations ..... 301
- 6.6 Using BAdIs to Code Logic ..... 305
- 6.7 Validation ..... 308
- 6.8 Controls ..... 313
- 6.9 Summary ..... 313

**7 Process Management and Collaboration ..... 315**

- 7.1 Work Status ..... 316
- 7.2 Comments ..... 323
  - 7.2.1 Adding Comments ..... 323
  - 7.2.2 Viewing Comments ..... 326
  - 7.2.3 Reporting on Comments ..... 329
  - 7.2.4 EPM Functions for Comments ..... 331
- 7.3 Distribution and Collection ..... 332
  - 7.3.1 Creating a Distribution Template ..... 334
  - 7.3.2 Offline Distribution Wizard ..... 339
  - 7.3.3 Collection ..... 343
- 7.4 Book Publishing ..... 344
  - 7.4.1 Creating a Book Publishing Template ..... 346
  - 7.4.2 Book Publication ..... 349
- 7.5 Integrating SAP BPC Data into Word and PowerPoint ..... 355
- 7.6 Summary ..... 356

**8 Essential Tools for Building Models ..... 357**

- 8.1 Transporting SAP BPC Objects ..... 358
- 8.2 Concurrency Locking ..... 364
  - 8.2.1 Approaches to Locking ..... 364
  - 8.2.2 Locking Features in SAP BPC for NetWeaver ..... 365
  - 8.2.3 Locking Process in SAP BPC for NetWeaver ..... 365
- 8.3 Administration Parameters ..... 366
- 8.4 Statistics ..... 372
- 8.5 Audit ..... 375

- 8.6 Documents ..... 378
  - 8.6.1 Accessing the Documents ..... 378
  - 8.6.2 Posting a Document ..... 378
- 8.7 Security ..... 379
  - 8.7.1 Users ..... 379
  - 8.7.2 Team ..... 379
  - 8.7.3 Task Profile ..... 380
  - 8.7.4 Data Access Profile ..... 381
  - 8.7.5 Security Model ..... 381
- 8.8 Summary ..... 382

**9 Consolidation with SAP BPC ..... 383**

- 9.1 Steps in Consolidation ..... 384
- 9.2 Business Rules ..... 384
  - 9.2.1 Carry Forward ..... 386
  - 9.2.2 Account Transformation ..... 394
  - 9.2.3 Intercompany Matching/Booking ..... 398
  - 9.2.4 Intercompany Eliminations (U.S. Elimination) ..... 405
  - 9.2.5 Controls ..... 412
- 9.3 Consolidation of Investments ..... 421
  - 9.3.1 Purchase Method ..... 421
  - 9.3.2 Equity Method ..... 422
  - 9.3.3 Proportional Method ..... 423
  - 9.3.4 Consolidation of Investments ..... 424
- 9.4 Intercompany Elimination—Eliminations and Adjustments  
Business Rule ..... 443
- 9.5 Journals ..... 447
  - 9.5.1 Create Journal Template ..... 448
  - 9.5.2 Manage Journals ..... 450
  - 9.5.3 Journal BAdI ..... 452
- 9.6 Summary ..... 453

**10 Business Process Flow Interface ..... 455**

- 10.1 Business Process Flow ..... 455
  - 10.1.1 Creating a Business Process Flow Template ..... 456
  - 10.1.2 Creating a Business Process Flow Instance ..... 460
  - 10.1.3 Executing Activities ..... 461
  - 10.1.4 Process Monitor ..... 463
- 10.2 Summary ..... 463

|  |            |
|--|------------|
| <b>11 Embedded Environment .....</b>   | <b>465</b> |
| 11.1 Embedded Environment in SAP BPC .....                                   | 465        |
| 11.2 Case Study for Financial Planning .....                                 | 466        |
| 11.2.1 Rich Bloom Case Study .....   | 466        |
| 11.2.2 Requirements of the Case Study .....                                  | 468        |
| 11.3 Building a Data Model in SAP BW .....                                   | 470        |
| 11.3.1 SAP BW Integrated Planning Prerequisites .....                        | 471        |
| 11.3.2 Designing a Data Model in SAP BW .....                                | 471        |
| 11.4 Summary .....   | 478        |
| <b>12 Designing an Application in SAP BW-IP .....</b>                        | <b>479</b> |
| 12.1 Designing a Planning Application .....                                  | 479        |
| 12.1.1 InfoProvider .....  | 480        |
| 12.1.2 Aggregation Level .....   | 481        |
| 12.1.3 Filter .....  | 485        |
| 12.1.4 Planning Functions .....  | 488        |
| 12.1.5 Planning Sequence .....   | 519        |
| 12.1.6 Characteristic Relationships .....                                    | 523        |
| 12.1.7 Data Slices .....   | 526        |
| 12.1.8 Settings .....  | 527        |
| 12.2 Creating Input-Enabled Query for Planning .....                         | 527        |
| 12.2.1 Planning and Reporting Tools .....                                    | 528        |
| 12.2.2 Input-Enabled Query Process .....                                     | 531        |
| 12.3 Summary .....   | 538        |
| <b>13 Creating an Embedded Environment .....</b>                             | <b>539</b> |
| 13.1 Creating an Embedded Planning Application .....                         | 540        |
| 13.1.1 Creating an Embedded Environment .....                                | 540        |
| 13.1.2 Creating a Model .....  | 541        |
| 13.1.3 Creating a Web Input Form .....                                       | 543        |
| 13.1.4 Creating a Web Input Form Using the BPC EPM<br>Add-in Interface ..... | 546        |
| 13.2 Managing an Embedded Environment .....                                  | 551        |
| 13.2.1 Enabling Audit .....  | 551        |
| 13.2.2 Work Status .....   | 553        |
| 13.2.3 Locking .....   | 555        |
| 13.2.4 Security .....  | 560        |

|   |     |
|---|-----|
| 13.2.5 Transporting Embedded Environment Objects .....  | 567 |
| 13.3 Integrating Planning Functions with SAP HANA ..... | 569 |
| 13.4 Conclusion .....                                   | 574 |
| The Authors .....                                       | 575 |
| Index .....   | 577 |

# Index

.NET Application Server, 65  
\*ADD\_DIM, 275  
\*COMMIT, 273  
\*END\_BADI, 307  
\*ENDWHEN, 271  
\*FOR, 272  
\*IS, 271  
\*NEXT, 272  
\*REC, 271  
\*RENAME\_DIM, 275  
\*SKIP\_DIM, 275  
\*START\_BADI, 307  
\*WHEN, 271  
\*XDIM\_MEMBERSSET, 268, 275

## A

---

ABAP, 59, 66  
Account Rate Type, 296  
Account transformation, 55, 288, 385, 394  
Account trend, 254  
Active cell, 327  
Active context, 327  
Administration parameters, 366  
Administration view, 112  
Aggregation level, 481, 532, 533  
    *complex*, 482  
    *defining*, 483  
    *rules*, 482  
    *simple*, 482  
Allocation, 55, 165, 261, 301  
AMDP, 570  
Analysis, 202, 565  
Analysis Authorization, 562  
API, 248  
Append, 164, 196  
Application, 80  
    *set*, 78  
Apply to Periodic, 297  
Architecture, 63  
Archive audit data, 167  
Asset planning, 42  
Asymmetric, 242

Attribute, 82  
Attribute List tab, 182  
Audit, 357, 375, 551  
    *activity*, 375  
    *data*, 375  
AuditTrail, 158, 293  
Automatic adjustment, 56, 289  
Available interface, 204

## B

---

Backup, 364  
BAdI, 261  
    *code logic*, 305  
Base member, 296  
BEx Analyzer, 489, 529  
BEx Query Designer, 479, 528  
BEx Web Application Designer, 530  
Book Publication Wizard, 349  
Book publishing, 344  
    *menu*, 344  
    *publication*, 349  
    *template*, 346  
BPC\_STATISTICS, 372  
Budgeting, 31, 37  
Business Content, 74  
Business logic, 261  
Business Process Flow (BPF), 111, 455  
    *executing activities*, 461  
    *instance*, 460  
    *template*, 456  
Business rules, 55, 261, 287, 288, 384  
    *eliminations and adjustments*, 433  
    *setup*, 445

## C

---

Calculate ownership, 166  
Carry forward, 288, 385, 386  
    *business rules*, 388  
    *opening balance*, 56  
Case study, 85

- Central settings, 481
  - Change and Transport System (CTS), 362
  - Characteristics, 69, 533
    - custom*, 95
    - relationship*, 523
    - relationships*, 481
  - Clear, 163
    - BPC Tables*, 278
    - comments*, 167
    - journal table*, 166
  - Client interface, 64
  - Collaboration, 54, 210, 315
  - Collection, 332, 334, 343
    - mode*, 568
  - Column axis, 211, 213
  - Command
    - display*, 211
    - groups*, 208
  - Comments, 315, 323
    - add*, 323
    - EPM functions*, 331
    - reporting*, 329
    - viewing*, 326
  - COMMIT, 273
  - Comparative, 254
  - Concurrency locking, 253, 365
  - Condition statements, 509
  - Conditions, 528
  - Configuration parameters, 366
  - Connection, 208
  - Consolidation, 47, 60, 131, 166, 254, 383
    - investments*, 421, 424
    - methods*, 428
    - process*, 442
    - rate*, 426
    - rules formula*, 443
    - steps*, 384
    - tasks*, 48
  - Consolidation Central, 111, 442
  - Consolidation Monitor, 112, 301
  - Content management, 357
  - Context
    - options*, 211, 223
    - pane*, 211
  - CONTROL\_LEVEL, 413
  - Controls, 313, 386, 412
    - definition*, 413
  - Controls (Cont.)
    - equation type*, 413
    - level*, 413
    - Monitor*, 112
    - threshold*, 413
    - type*, 413
  - Conversion, 152
    - file*, 159
  - Copy, 164
  - Cost center planning, 42
  - Cost of goods sold, 466
  - CTRL\_CURRENCY\_NOT\_LC, 413
  - Currency
    - conversion*, 292
    - translation*, 55, 261, 288, 290, 385, 490
  - Current View (CV), 212
  - Custom context, 327
  - Custom planning functions, 489
- ## D
- 
- Data, 139, 365
    - access profile*, 381
    - analysis*, 209
    - copying*, 197
    - grid*, 213
    - input*, 219
    - loading*, 140, 191
    - loading into SAP BPC*, 152
    - package*, 80
    - slices*, 316, 481, 526
    - target*, 150
    - transfer process (DTP)*, 72, 145
    - type decimal*, 483
  - Data Level Access, 561, 565
  - Data Manager, 316
    - packages*, 160, 280
  - Data model, 89, 115
    - building*, 470
    - designing*, 471
  - Data Warehousing Workbench, 93, 143, 562
  - Database server, 66
  - DataSource, 140
  - DB Connect, 71
  - Demand planning, 45
  - Destination Account, 296

- Destination Flow, 296
  - DESTINATION\_APP, 275
  - Development, 359
  - Dimension, 79, 120, 168, 178
    - copying*, 125
    - custom*, 127
    - formulas*, 123, 262
    - Gross Margin*, 262
    - hierarchies*, 122
    - logic*, 57, 262
    - manual entry*, 128
    - Measures*, 207
    - member*, 79, 110, 330
    - members*, 121, 268, 269
    - properties*, 120
    - reference dimension*, 122
  - Direct Share Method, 430, 432
  - Distribution, 315, 332, 333
    - data*, 315
    - template*, 333, 334
  - Distribution and collection, 54
  - Documents, 112, 316, 378
    - posting*, 378
  - Drill across dimensions, 233
  - Drill in place, 233
  - Drill-down capabilities, 528
  - Drill-through, 258
  - Drivers and rates, 131
  - Dynamic template, 232
- ## E
- 
- Embedded, 114
  - Embedded environment, 465, 479, 539, 551
    - creation*, 540
    - differences*, 114
    - management tools*, 551
    - transporting objects*, 567
  - Embedded model, 68
  - End Routine, 307
  - Enterprise Performance Management (EPM), 31
  - Entity FX type, 297
  - ENVIRONMENTSHELL, 115
  - EPM
    - Add-in*, 538, 539, 546
- EPM (Cont.)
    - context pane*, 211
    - function*, 203, 233, 331
    - pane*, 212
  - EPM Report, static, 237
  - EPMAxisOverride, 242, 244
  - EPMCommentFullContext, 331
  - EPMCommentPartialContext, 323, 332
  - EPMComparison, 236
  - EPMContextMember, 235
  - EPMDimensionList, 236
  - EPMDimensionOverride, 242, 245
  - EPMDimensionType, 234
  - EPMEnvDatabaseID, 234
  - EPMFullContext, 236
  - EPMMemberDesc, 236
  - EPMMemberOffset, 235
  - EPMMemberProperty, 235
  - EPMModelCubeDesc, 234
  - EPMModelCubeID, 234
  - EPMReportID, 236
  - EPMRetrieveData, 235, 237
  - EPMRetrieveData function, 237
  - EPMSaveComment, 323, 331
  - EPMSaveData, 233, 257
  - EPMSelectMember, 236
  - EPMServer, 234
  - EPMUser, 234
  - EPMWorkStatus, 236, 318
  - Equity method, 49, 422
  - EvCGT, 331
  - EvDRE reports, 247
  - Exceptions, 528
  - Exchange rates, 131
  - Export journal table, 166
  - Extraction, transformation, and loading, 71
- ## F
- 
- Filter, 485, 533
    - characteristics*, 486
    - creation*, 485
  - Financial, 131
    - interest rate*, 426
    - planning*, 41, 466
    - process packages*, 161

Fixed Member, 336  
 Flat file, 71, 152, 168  
   *into dimension*, 168  
 Flow dimension, 386  
 FOR/NEXT, 272  
 Force closing, 296  
 Forecasting, 31, 38, 506  
 Formatting, 227  
   *tab*, 220  
 Formula, 296  
 Formula Extension (FOX), 508  
 Fourth generation language, 508  
 Free characteristics, 533  
 Full Optimize, 133, 167  
 Functional parameters, 366  
 FX restatement, 165

## G

---

Generation, 565  
 Gestation period, 40  
 Granularity, 40  
 Gross profit margin, 466, 479  
 Grouping, 568

## H

---

Hierarchy  
   *data*, 186  
   *tab*, 182  
 Historic time frame, 508  
 Historical data, 506  
 History, 330

## I

---

IC data, 166  
 IC elimination, 165  
 ICBOOKING, 403  
 Import, 162  
 Import and send mail, 167  
 Import using FTP, 167  
 InfoArea, 82, 102  
 InfoCube, 140, 191  
   *Plan*, 472

InfoCube (Cont.)  
   *real-time*, 471  
   *Sales*, 89, 102, 472, 474  
   *Sales Actual*, 145  
 InfoObject, 68, 82, 92, 107, 178, 485  
   *Custom*, 90  
 InfoPackage, 73  
   *creation*, 147  
 InfoProvider, 471, 480, 482, 504, 525, 527,  
   535, 536  
   *Logical InfoProvider*, 70  
 Information Broadcasting, 529  
 Initialization of balances, 386  
 Input forms, 253  
   *development*, 254  
 Input schedule, 203, 254  
 Input template, 520  
 Input-enabled query, 479, 527, 529, 539  
   *creating*, 531  
 Integrated Planning, 63, 64, 76  
 Intercompany elimination, 55, 289, 385, 405  
 Intercompany investment, 49  
 Intercompany matching, 289, 385  
   *booking*, 398  
   *ICDATA*, 402  
   *report*, 402  
   *setup*, 400  
 Intercompany receivables/payables, 49  
 Intercompany sales, 48  
 Intercompany transactions  
   *automatic booking*, 403  
   *logic script*, 405  
 Investment planning, 44

## J

---

Journals, 112, 316, 447  
   *BAdI*, 452  
   *managing*, 450  
   *template*, 448

## K

---

Key figure, 69, 97  
   *custom*, 97

## L

---

Labor planning, 44  
 Language tab, 182  
 Legal consolidation, 62  
 Library view, 111  
 Light Optimize, 132, 167  
 Liquidity planning, 41  
 Loading, 71  
 Local  
   *currency*, 290  
   *members*, 224  
   *providers*, 542  
   *variable*, 509  
 Lock, 558  
   *Characteristics*, 557  
   *mode*, 558  
   *Server*, 556  
   *Table*, 556  
 Locking, 357, 364, 555, 556  
   *avoiding*, 555  
   *concurrency locking*, 365  
   *configuration*, 556  
   *conflict*, 559  
   *features*, 365  
   *process*, 365  
 Logic script, 267, 276  
   *files*, 287  
 LOOKUP/ENDLOOKUP, 273  
 Loop constructs, 509  
 Looping, 271

## M

---

Maintenance, 565  
 Maintenance planning, 43  
 Manage comments, 328  
 Management consolidation, 62  
 Mapping, 156  
 Marketing planning, 42  
 Master data, 99  
   *loading*, 168, 178  
 Master Locks, 559  
 MDX, 273  
 Member access profile, 81  
 Member set, 268

Menu role, 561, 567  
 Method-based multiplier rule, 428, 429  
 Microsoft Word, 355  
 Miscellaneous packages, 161  
 Model, 102, 130, 143, 191, 197  
   *optimization*, 132  
   *parameters*, 133  
 Model and Dimensions, 457  
 Modify dynamically, 278  
 Monitor, 149  
 Move, 163  
 Multiple standard planning functions, 489  
 MultiProvider, 471, 474, 479, 483, 491  
   *creation*, 476

## N

---

Nested row, 233, 254  
 Non-cumulative key figures, 483

## O

---

Objects  
   *transporting*, 358  
 Offline Distribution Wizard, 339  
 Opening balances, 166  
 Operative planning, 39  
 Options, 153  
 Overwrite Hierarchy, 175  
 Overwrite mode, 184  
 Ownership, 131  
   *application*, 445  
   *manager*, 112  
   *model*, 426, 430

## P

---

Page axis, 211, 213  
 PAK, 569  
 Parallelize script, 269  
 Parameters, 357  
 Parent member, 296  
 Periodic, 207  
 Persistent staging area (PSA), 72, 142, 150  
 Plan data, 486



Planning, 31, 36, 60  
   *application*, 469, 479  
   *areas*, 41  
   *bottom-up*, 46  
   *gross profit margin*, 43  
   *human resources*, 42  
   *input forms*, 253  
   *long-term planning*, 39  
   *methods*, 46  
   *profit and loss*, 44  
   *top-down*, 46  
   *types*, 39  
 Planning application kit (PAK), 466  
 Planning function, 488, 492, 513  
   *copy*, 491  
   *Currency Translation*, 517  
   *Custom*, 512  
   *delete*, 497  
   *Distribution by Key*, 500  
   *Distribution by Reference*, 503  
   *forecast*, 506  
   *Formula*, 508  
   *menu*, 495  
   *repost*, 498  
   *reevaluation*, 494  
 Planning horizon, 38  
   *medium-term planning*, 38  
   *short-term planning*, 38  
 Planning sequence, 519, 520, 522  
   *creation*, 521  
   *trace mode*, 520  
 Plant material, 482  
 PMCommentFullContext, 323  
 PowerPoint, 355  
 Process chain, 73, 167, 522  
 Process dimension, 263  
 Process management, 315  
 Process monitor, 463  
 Process owner, 460  
 Production, 359  
 Production planning, 42  
 Profitability planning, 42  
 Properties, 79, 110  
 Property selection, 230  
 Proportional method, 49, 423  
 Protection tab, 222  
 Purchase method, 49, 421

## Q

---

Quality assurance, 359  
 Quarter-to-date (QTD), 203, 207  
 Quick Links, 246

## R

---

RATES model, 290, 291  
 Real-time InfoCube, 523, 524, 525, 526, 527, 531  
 Record Count, 197  
 Reference dimension, 122  
 Refresh, 221  
 Replace, 196  
 Report, 131, 202  
   *creation*, 213  
   *customized*, 242  
   *edit options*, 214  
   *layout*, 215  
   *saving*, 227  
   *visual basic macros*, 248  
 Report Actions, 209  
 Report-to-report interface (RRI), 258  
 Required information, 469  
 Restore, 364  
   *journal table*, 166  
 Rolling forecast report, 237  
 Row axis, 211, 213  
 RSCUR, 519  
 RSUOM, 519  
 Run package, 172, 179

## S

---

Sales planning, 44  
 Sales revenue, 466  
 SAP Business Planning and Consolidation (SAP BPC), 54  
   *Excel EPM Add-in*, 489  
   *for Excel*, 202, 204  
   *for NetWeaver*, 88  
   *PowerPoint*, 323  
   *security*, 380

SAP Business Planning and Consolidation (SAP BPC) (Cont.)  
   *Web Client*, 202, 249  
   *web interface*, 539  
   *Word*, 323  
 SAP Business Planning and Simulation, 316  
 SAP Business Warehouse (SAP BW), 140  
   *data model*, 89  
   *objects*, 372  
 SAP BusinessObjects Dashboards, 258  
 SAP BW Integrated Planning (BW-IP), 316, 471, 529  
 SAP Disclosure Management, 33, 34  
 SAP Financial Closing Cockpit, 34  
 SAP Financial Consolidation, 33  
 SAP Financial Information Management, 34  
 SAP HANA, 63, 64, 66, 67, 76, 83, 468, 490, 569  
   *AMDP (ABAP Managed Database Procedures)*, 570  
   *SQL procedure*, 569  
   *Studio*, 570  
 SAP Intercompany Reconciliation, 34  
 SAP Profitability and Cost Management, 34  
 SAP Spend Performance Management, 34  
 SAP Supply Chain Performance Management, 34  
 SAP Sustainability Performance Management, 35  
 Scheduler, 148  
 Script logic, 57  
 Secured dimension, 79  
 Security, 112, 379, 560, 561  
   *model*, 381  
   *roles*, 561  
 Selection Relationships, 217  
 Server configuration, 222  
 Service API, 71  
 Shared Object Memory of Server, 556  
 Shared query engine, 372  
 Sheet options, 211, 219  
 SIGNEDDATA, 109  
 Simple Mail Transfer Protocol (SMTP), 222, 333  
 Skip Count, 197  
 SOAP, 71  
 Solve order keyword, 263

Sort on  
   *member*, 233  
   *values*, 233  
 Source  
   *characteristic*, 523  
   *dimensions*, 198  
   *Flow*, 296  
 Staging, 85  
 Standard environment, 114  
   *creation*, 116  
   *differences*, 114  
   *management*, 119  
 Standard planning model, 89, 108, 357  
 Standard template, 254  
 Star schema, 59  
 Start Routine, 307  
 Statement delimiter, 509  
 Statistics, 357, 372  
 Strategic planning, 40  
 Strategy Management, 32  
 Sub-Table dimension, 386  
 Symmetric, 242  
 System  
   *administration packages*, 161  
   *parameters*, 366  
   *reports*, 112

## T

---

Tactical planning, 40  
 Target characteristic, 523  
 Task, 80  
 Task Level Access, 561  
 Task Profile, 81, 380  
   *types*, 380  
 Team, 80, 379  
 Template, 345  
 Third-party  
   *applications*, 529  
   *system*, 71  
 Time characteristics, 69  
 Time offset, 274  
 TMVL, 274  
 Total cost of ownership (TCO), 53  
 Transaction  
   *RSA1*, 359

Transaction (Cont.)

- RSD1*, 100
- RSECADMIN*, 565
- RSECENVI*, 566
- RSPFL1*, 490
- RSPLAN*, 480, 483, 486, 491
- SPRO*, 367
- UJ\_VALIDATION*, 311
- UJKT*, 287
- UJRO*, 365

Transformation, 71, 72, 143, 152, 171

Transport, 565

- connection*, 568
- request*, 568

---

**U**

- U.S. elimination, 405
- UJ\_CUSTOM\_LOGIC*, 305, 306, 307
- UJ\_VALIDATION*, 306
- UJ\_VALIDATION\_RULE\_LOGIC*, 306
- UJD\_RETRACT*, 306
- UJD\_ROUTINE*, 305
- UJJ\_CALCULATED\_AMOUNT*, 306
- UJQ\_SHARED\_QUERY*, 306
- UJR\_WRITE\_BACK*, 306
- Unit characteristics, 69
- Unit Conversion, 490
- Universal Data Connect, 71
- Update mode, 184
- User, 80, 379
  - options*, 211, 222

---

**V**

- Validate logic file, 166
- Validation, 56, 62, 261, 308
- Value type, 486
- Variable Members, 336
- Variable values, 270
- Variables, 528
- Variance, 232
- Visual basic macro, 248
- Visual Composer, 531

---

**W**

- Web application, 71
- Web input form, 543
- WHEN/ENDWHEN, 271
- Work status, 253, 315, 316, 317, 553,  
554, 564
- Worksheet type, 220
- Write back, 365, 372

---

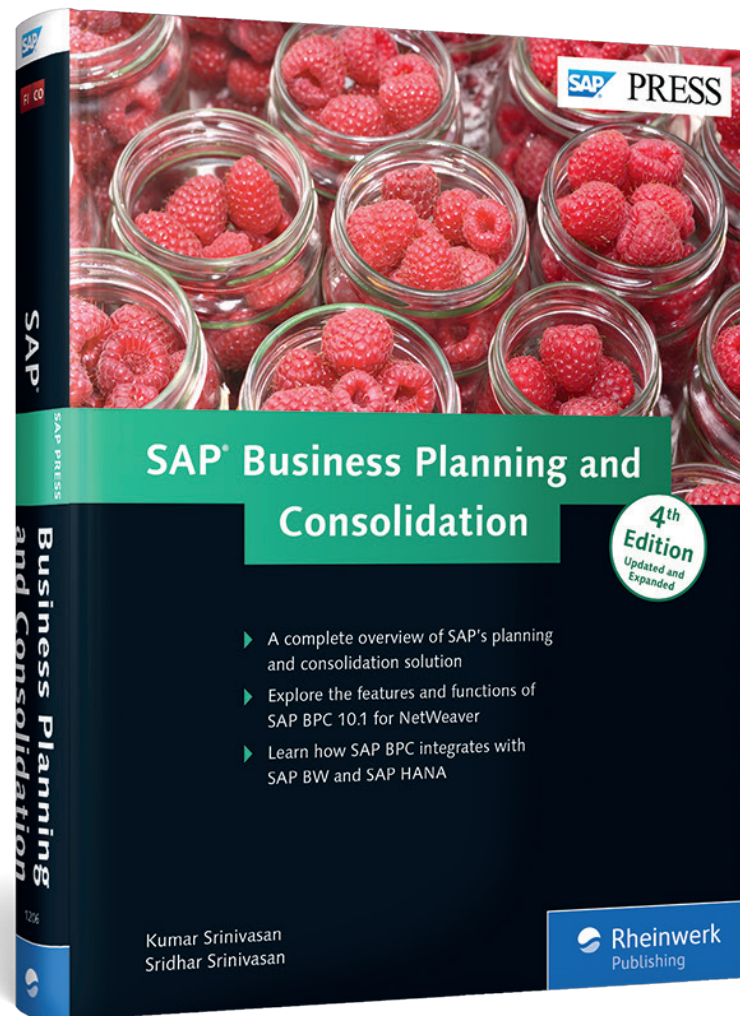
**X**

- XBRL Publishing, 34

---

**Y**

- Year-to-date (YTD), 203, 207



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