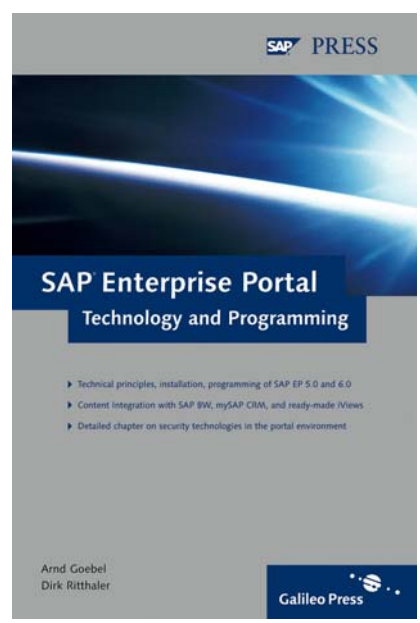
Arnd Goebel, Dirk Ritthaler

SAP Enterprise Portal



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Preface

Portal *[from Medieval Latin porta (city gate)]: the often imposing entrance to a church or cathedral. A portal provides access to the holy of holies.*

At first glance, the use of the term *portal* in information technology appears inappropriate. In the main sense of (IT) portals—the combination of Web content and applications—one could just as well speak of a center, much as one does of a call center. But portals are much more. They involve not only bundling information and applications, but also the targeted processing of decision-making documents so that employees, customers, and partners can make optimal decisions. Because such decisions require information from the *most holy* of IT systems, the term portal does not seem so inappropriate.

First, portals do more than use Web technologies to provide information and applications. They unify the information and applications so that users can work from an integrated interface. Portals also tailor information and applications so users don't have to expend considerable energy creating the configuration themselves. In addition, portals integrate structured and unstructured data from the Internet, a company's intranet, and other applications into the environment that is most conducive to supporting the users' productivity. Portals therefore help users to find, organize, and access information efficiently and effectively.

Secondly, portals build an integration platform for users; the actual technical components can hide behind the platform. A portal can partially fulfill user-oriented success factors for an application, such as *usability* and *look and feel*, and increase the acceptance of those applications that are critical to a company's success. This approach makes it much easier to exchange applications. Laborious product training and complicated installation procedures to heap the frontends of applications onto employees' personal computers are no longer needed. Even non-Web-enabled legacy applications can be integrated with a portal framework. And applications can be made available to customers, vendors, and partners instantly. Portals therefore can also lighten the load on administrators by reducing IT overhead.

Lastly, portals create consistent and context-sensitive access to Web services—the programming technology of the near future. In terms of tech-

nology, Web services consist of a structured, uniform, and content rich question–answer protocol that, by its very nature, does not include a user interface. A Java server page (JSP) or an active server page can be written quickly; however, if a Web service were to run alone in a Web browser, the page would have to handle all the context information and menu prompts itself. A portal also handles those tasks; it is the generic graphical user interface (GUI) of the future.

But the plug-and-play installation of portals is still at least several years away. The problem arises not because of the portals, but due to today's often extremely heterogeneous IT infrastructure. In the world of Web services, a portal installation consists primarily of configuration procedures. Today, however, various information and application sources must be adjusted to fit the portal, which can involve considerable effort. The critical precondition for a portal is that the company that wants to implement it can clearly identify *to whom* specific content should be displayed and *who* should make what decisions regarding IT support. That's why most portal projects are assembled with the discovery or rediscovery of company processes and structures. Technical, operative, and even social hurdles must be overcome.

This book takes a unique approach to these considerations. The authors demonstrate the various phases of a portal project and, based on their practical experience, show how to lead a portal project to a successful conclusion. Security is certainly an integral part of success: without appropriate security measures, a portal project poses an extremely high risk for the company—the risk of offering on a platter data worthy of protection to any Internet user interested in it. The authors address this concern thoroughly and offer several options to ensure the security of a portal.

Initially, portals were looked at with skeptical amusement. The benefits of portals were often questioned, especially after the hype related to e-business. But the changing basic IT architecture and Web services will make portals indispensable in the near future. This book contributes to the successful implementation of this important component of tomorrow's IT architecture.

Dr. Sachar Paulus
December 2004

7 Unifiers

The ability to link applications from various manufacturers seamlessly has always been a goal. Today, the exchange of data between applications is possible. But linking one application to another with Drag&Drop—thereby ensuring that the other application understands the information (Drag&Relate)—is relatively new.

SAP Enterprise Portal offers more than the integration of data from various sources and manufacturers. It also facilitates interaction and collaboration among these applications. In this manner, various applications integrated in and referenced by SAP EP can communicate and exchange information. However, applications cannot yet perform this task on their own. Components of SAP EP make the data understandable to each application and then make it available in the required format. The components that perform this task—and others—are the *unifiers* and the *unification servers*.

7.1 Unifiers and the Unification Server

The *unification server* is a component of SAP EP that allows companies to access systems and then enables these systems to interact. In short, it enables two similar or different systems to understand each other. The following example clarifies such an understanding.

Example

Imagine that a company uses SAP Business Information Warehouse (SAP BW), SAP Advanced Planner and Optimizer (SAP APO), SAP Materials Management (SAP MM), SAP Controlling (CO), and SAP Financial Accounting (FI). The HR department uses software from Baan while an Oracle database is used to store addresses. Additionally, a Siebel CRM system is in use. So far, the interplay among the applications has been extremely complex. The SAP systems could transmit data among themselves and understand each other easily. But data from the Oracle database had to be transferred to SAP R/3 manually with copy and paste. For a customer number from the Siebel CRM system, users had to find the correct description (the counterpart) in the R/3 system before they could call the transaction. For an analysis in SAP BW, users had to search for an employee's personnel number or cost center in the Baan system and transfer the data to the SAP system before they could trigger the analysis.

This example highlights the complex, error-prone, and repetitious tasks of employees in many departments. SAP Enterprise Portal and its unification server can help. A single back-end engine creates unification between enterprise applications and database applications. Data from the most varied of sources is linked at the metalevel of the database on this unified basis. The components that extract data from applications and databases and understand the logic behind the data are the so-called *unifiers*.

How unifiers work

As indicated in the previous example, if a customer number (KDNR, for example) is taken from the Siebel CRM system and transferred into SAP BW, the latter won't know the meaning of the number or field name at first. In SAP BW, the customer number is called CUSTOMER. However, if a unifier for Siebel and a unifier for SAP are used and both reside on the unification server, SAP BW can understand both the customer number and the business logic behind the Siebel data and also generate an easy to understand format for this information. SAP BW will start the report or application with the converted customer number parameter (KDNR) from the Siebel system and display it with the appropriate presentation elements. It can do so because the Siebel unifier understands the Siebel logic and the SAP unifier understands the SAP logic. The unification server links the logic of both sides at the database level and thus connects both sides.

Figure 7.1 shows the unification server with the various unifiers. The database unifier can address Oracle, DB2, SQL7, SQL 2000, Sybase, Informix, and Access databases. Application unifiers are available for SAP R/3, SAP BW (with SAP EP 5.0 SP5), and Oracle. A separate unification server (BDN) is available for Baan and can be ordered from Baan. The SAP unifier for SAP R/3 and the SAP unifier for SAP BW are part of the standard license for SAP EP. Use of the database unifier requires the *unification for EP* license.

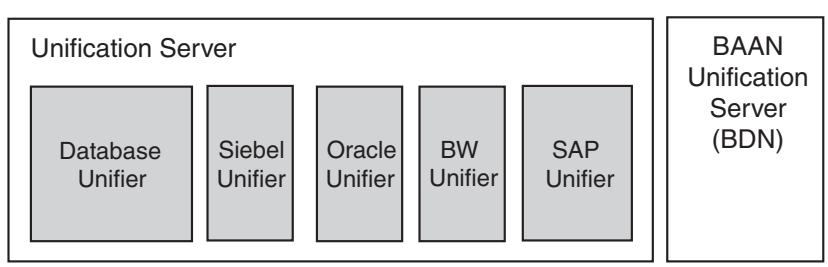

Figure 7.1 Unifiers and the Unification Server

7.2 Unification Server

The unification server is the basis for the unifiers (see Figure 7.2 for an overview).

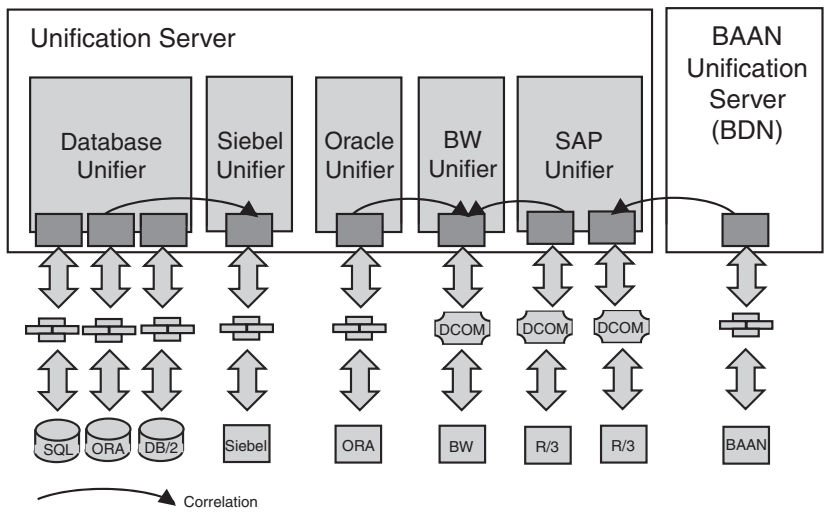

Figure 7.2 Overview of the Unification Server

The requirements for use of the unification server include the following:

- SAP Enterprise Portal SP4 > Patch 2
- Microsoft Windows Server 2000 SP2
- Microsoft FrontPage 2000 Server Extensions
- Microsoft SQL Server 2000 SP2
- Microsoft InterDev 6.0 SP4 (for iView modification)
- Microsoft Internet Explorer > 5.01 (SP1 for clients and SP2 for the server)
- MSXML 4.0

7.3 SAP Unifier for SAP R/3 and SAP BW

Requirements

Table 7.1 shows the requirements to use the SAP unifier for SAP R/3 and SAP BW.

SAP Unifier for SAP R/3	SAP Unifier for SAP BW
▶ Unification Server Version 5.0 SP4 Patch 3	▶ Unification Server Version 5.0 SP4 Patch 3
▶ SAP Enterprise Portal 5.0, at least SP4 Patch 2	▶ SAP Enterprise Portal 5.0, at least SP4 Patch 2
▶ SAP R/3 Release >= 4.0B	▶ SAP BW 3.0A with SP7 or BW 3.0B
▶ MS SQL Server 2000 SP2	▶ MS SQL Server 2000 SP2
▶ DCOM Version >= 4.6D	▶ DCOM Version >= 4.6D
▶ SAP R/3 must be configured for Drag&Relate and SSO	▶ BW must be configured for Drag&Relate and SSO
▶ WP Plug-In must be installed on SAP R/3 (for BOR Import)	▶ WP Plug-In must be installed on the BW system
▶ Web GUI: ITS or Win GUI: The SAP frontend must be installed on the client	▶ Win GUI: The SAP frontend (with the BW add-on) must be installed on the client (only to deploy queries)

Table 7.1 Technical Requirements for the SAP R/3 and SAP BW Unifiers

The Drag&Relate example provided at the end of Chapter 5 (see Figure 5.17) showed how to move the entry for *Motomarkt Stuttgart GmbH* or the sunglasses icon next to it into the iPanel entry for *Motomarkt Stuttgart GmbH* with **Drag&Relate Analysis · Display Customer**. It also showed the display of the customer data for *Motomarkt Stuttgart GmbH* in the SAP system—on the right side in the content area.

Transferring data with Drag&Relate

This scenario shows how easily you can transfer data from one system to another. Users don't have to remember the customer number or use copy and paste to transfer it from one system to another: the customer number is stored with the customer name—transparent to the user. Breaking down the customer name into the customer number and calling the transaction in the SAP system occur in the background. The transaction in the SAP system is simultaneously populated with the customer number, and the system then displays the customer data. The advantages of Drag&Relate—and the unifier—are obvious: reliable information is transferred, errors during entry are avoided, and the overall processing time for the user is significantly reduced.

Installation and configuration

To use the SAP unifiers (SAP R/3 and SAP BW), you must first install the SAP DCOM connector and the unification server. The particular SAP unifier is installed on that foundation. You must also maintain the *systems.xml* file for SAP BW and SAP R/3. Chapter 5 examined the configu-

ration of the system files. The system names must agree with the logical system names of SAP BW and SAP R/3 (MANCLNT907, for example). In addition to system specifications for SAP's Internet Transaction Server (ITS) or the SAP Web Application Server (Web AS) connection data, you must specify the unification server and port number

Note

The preceding material does not apply to SAP Enterprise Portal 6.0. Unification projects are controlled in SAP EP 6.0 with the portal content directory and are no longer integrated into the portal as a data source. The unification server no longer accesses user management in the portal (Lightweight Directory Access Portal, LDAP) directly; the portal itself controls user access to resources.

Listing 7.1 shows the entries in the *systems.xml* file (in addition to system integration) needed to use the unifiers.

```
<WebAccessPoints>
   <WebAccessPoint category="WAS">
      ...
   </WebAccessPoint>
   <WebAccessPoint category="DRS">
      <Protocol>HRNP</Protocol>
         <HostName>hostname:port</HostName>
   </WebAccessPoint>
</WebAccessPoints>
```

Listing 7.1 Excerpt from the systems.xml File

For each new project, you must create a new database instance on the SQL server before generating the project.

Creating a project

To create a project, start the unification server. You should see an entry for the project generator (SAP unifier) and a project generator entry for the database (see Figure 7.3).

For an SAP unifier project, double-click on the **Project Generator (SAP unifier)**. You'll be prompted to enter the server, the database you just created, the name of the SAP R/3 system, and the user for the SAP R/3 system. The project is then generated. You must configure user management for each project. To do so, you can access the data on the portal server, such as the LDAP server settings, and copy and paste it here.

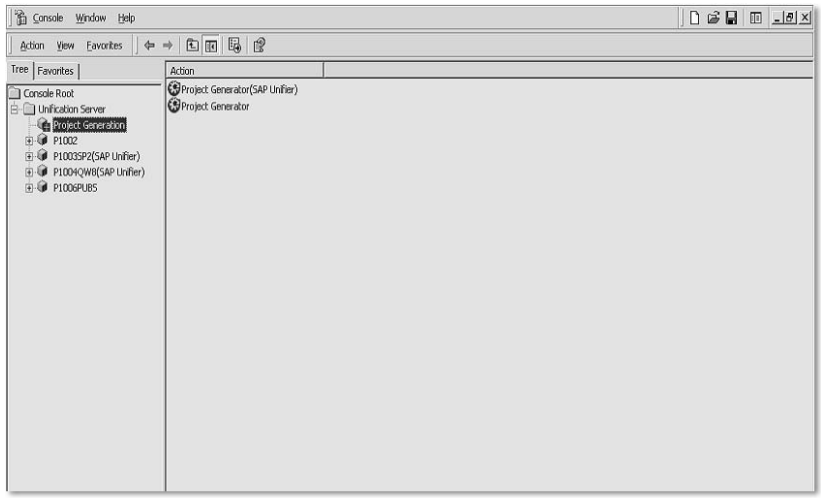

Figure 7.3 Unification Server with Entries for the Database and the SAP Unifier

Correlator wizard

You must then start the *correlator wizard* and configure it for the relationships among the projects. For example: the OBJECTKEY field of table OSOLD_TO is linked to the OBJECTKEY field of table KNA1. OBJECTKEY represents the *bridge* between the two projects. You can use the relationship editor to view or edit the relationships.

7.4 Database Unifier

The *database unifier* is delivered with the unification server. It offers the same functionality as other unifiers, but does so based on database tables and relations rather than business objects or BW InfoCubes. For that reason, the relationships here are one level deeper—at the database table level instead of business logic.

Installation

Currently, the unification server and the unifier are available only for Windows and the MS SQL server. Installation is simple and intuitive. You can decide whether you want to install the unification server on the same computer as the portal or on another, separate computer. If you plan to use unification intensively, we recommend that you install the server on a separate computer. Ensure that you recheck the system requirements and the required software before the installation. The *FrontPage server extensions* are elementary for Drag&Relate. It's easy to forget to install them or verify whether they're installed when errors occur. Therefore, make sure your computer meets the hardware and software technical requirements for installation of the unification server.

7.4.1 Project Generation

Once you have completed the installation, you can start generating a project. Every unification project (and the SAP unifiers associated with the project) requires a separate database. First create a new database. Follow menu path **Start · Programs · Microsoft SQL-Server · Enterprise Manager** to start the enterprise manager of the MS SQL server. Position the pointer on **Databases** and right-click to display the context menu. Select **New Database** and assign a database name, such as "MyFirstUnificationProject." Select **OK.** The database is created. You can now close the enterprise manager. Start the unifier management console via menu path **Start · Unification Server · Unifier Management Console**. Enter an administrator ID and password (admin/admin for the initial start). Select **Unification Server · Project Generation** and then **Project Generator** in the right pane. Select **Create project with content** (see Figure 7.4). Then, click **Next** and then, **Finish.**

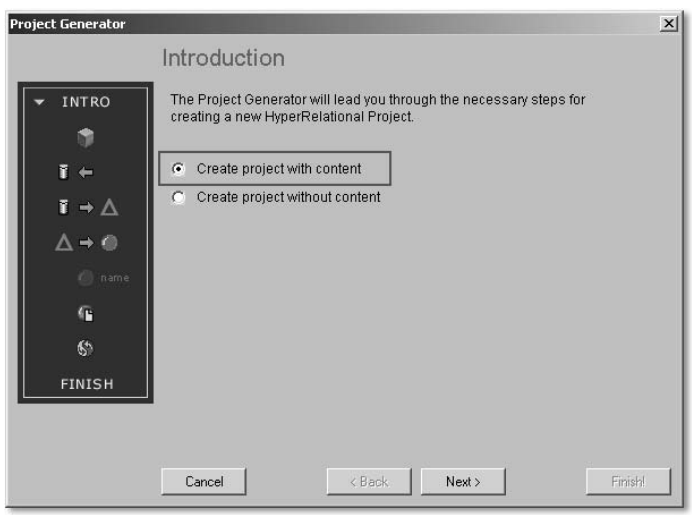

Figure 7.4 Creating a Project with Content

Authorizations

You are now prompted to enter the project name, the unifier project server, the port under which the project will run, the database server, the user and password, and the repository database (see Figure 7.5). Make sure that the user you enter for the database has the appropriate authorizations for it. If the user doesn't, you won't be allowed to select the database that you just created or will be refused access. If you need to modify the authorizations, you can do so in the enterprise manager of the MS SQL server.

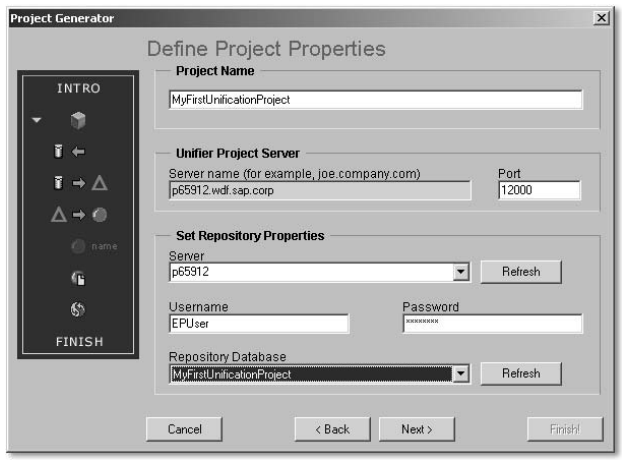

Figure 7.5 Project Settings

Because you are accessing an MS SQL database, in the next screen you select **HyperRelational OLE DB Provider for MS SQL Server** and the server that functions as the data source for the project (see Figure 7.6). You must then enter a user and password for this server. Because the database server is the same for the repository and the data source, you should enter the same user as you did before.

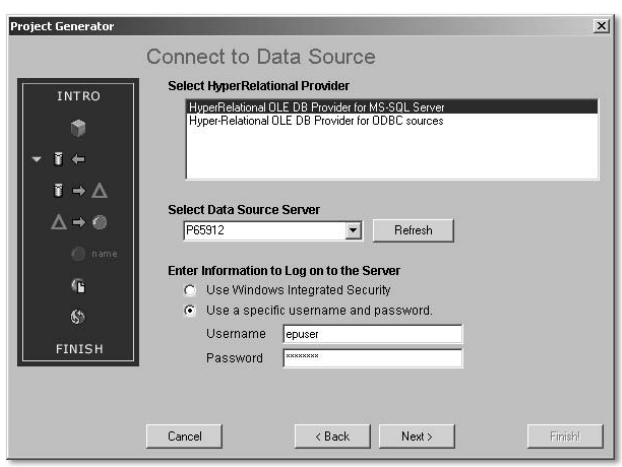

Figure 7.6 Establishing the Connection to the Data Source

Data objects

You now need the data objects that you'll use for the unifier project. For example, you can now select the Northwind database and all its tables by selecting **Northwind · dbo · TABLE** and then select **Add** to insert it into the right pane.

Now perform the same procedure for the presentation objects. You might have a smaller number of presentation objects because you might not want to display all the data that you will be working with. Templates are created only for the objects selected here.

Presentation objects

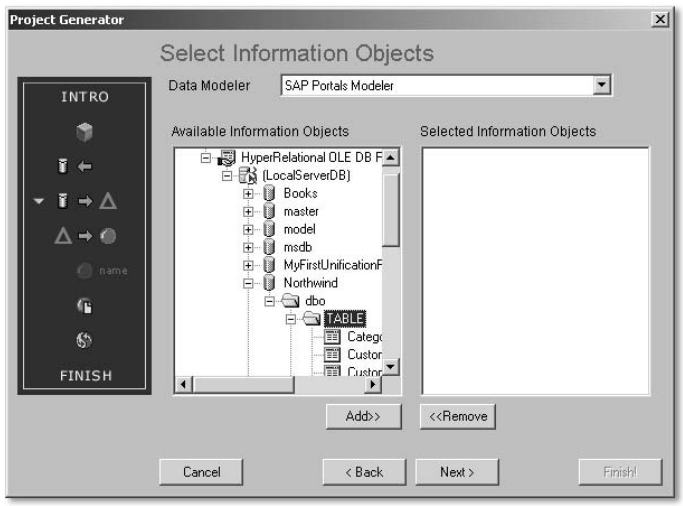

Figure 7.7 Selecting Data Objects

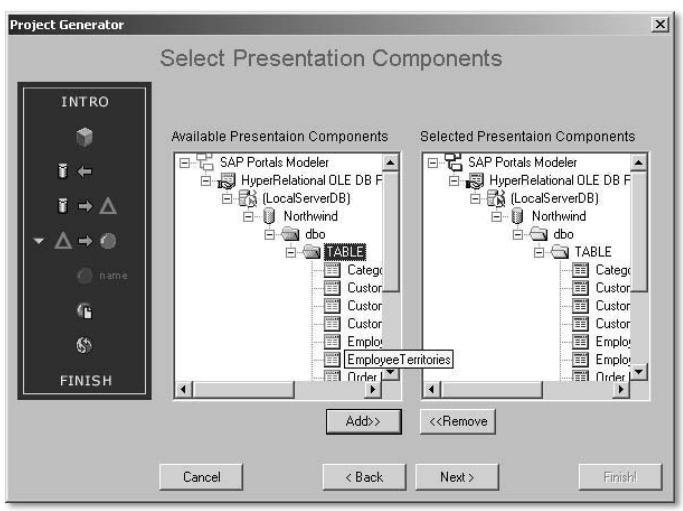

Figure 7.8 Presentation Components

Then select all the metatemplates that you want to use: Add, Find, Export in Excel, List Display, Update, and View, for example.

Metatemplates

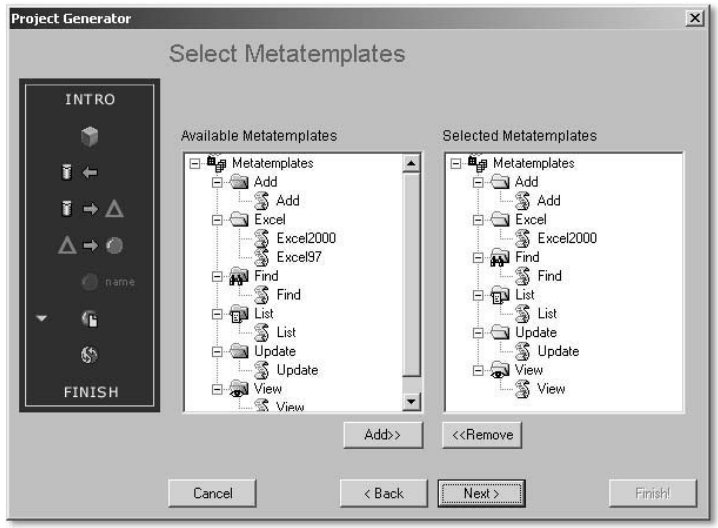

Figure 7.9 Metatemplates

Importing relationships

You are now asked whether you want to import database relationships. Select the default (recommended) option; otherwise, you'll have to set the relationships manually at some point later on. The generator performs this work for you. Confirm the next screen and allow the project to be generated. The progress display shows you the status of the process (see Figure 7.10).

Figure 7.10 Progress Display During Project Generation

7.4.2 User Management

If your project was generated successfully, it is available in the unification management console, where you can set authorizations and access rights, display components, and much more. Use **<Project_name> · User Management · Security & Configuration** to make settings for user management. This procedure is similar to the one for portal settings; you can use the same entries here that you used for the portal. If the portal and the unification server are installed on the same computer, the entries are already maintained because the default configuration of the portal is used. If you want to create a new configuration, you can modify the other settings, except for the general settings. You cannot do so with the default configuration. Check the settings and update them as needed.

According to this configuration, you have access to all users and roles, such as the LDAP directory service. You can now grant portal user roles or individual users access to database tables. You might have to start the MS IIS and the J2EE Engine.

7.4.3 iPanel Assignment

Select **<Project_name> · User Management · iPanel Editor**. You can now select the users and roles for which you want to grant access to individual tables (see Figure 7.11). Use the **Components** tab to drag the tables with Drag&Drop into the iPanel of the user or role. You can use the context menu to show or hide entries. Doing so is a good idea when you want to allow a user access to the same table multiple times with several roles. You can avoid double entries with **Hide**.

Selecting objects

You can now select individual tables, search for entries, display all entries, or move values of a row from one table to another with Drag&Relate. If a relationship exists, the corresponding data is displayed. As much as possible, you should select only those objects that you really need for project generation—information and presentation objects. Large databases can involve large volumes of data and therefore the project generation can be very time-consuming. The selection of all tables creates a template for each table.

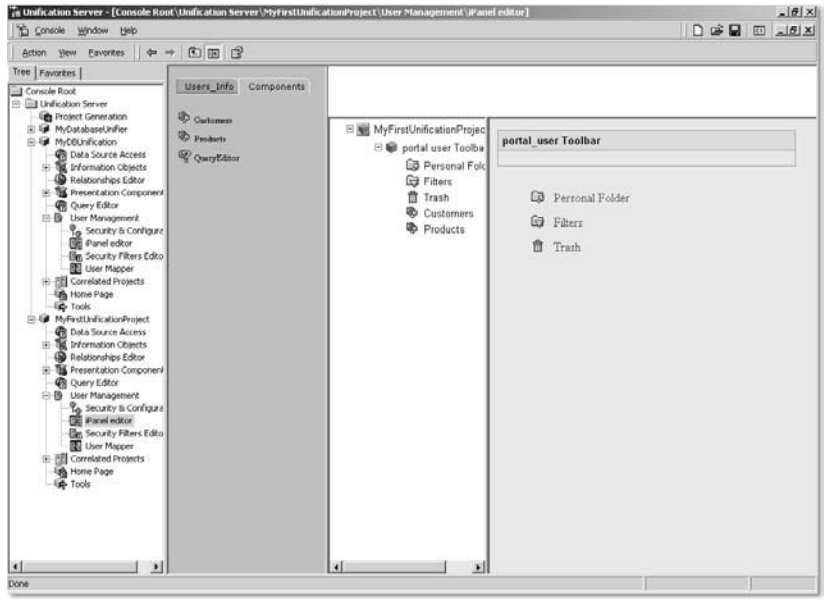

Figure 7.11 Assignment of Authorizations for Individual Tables in the iPanel

7.4.4 Editing Relationships

If you make the appropriate selections when installing it, the database unifier has accepted the relationships from the database. It also attempted to create relationships for relationships that don't exist between the entities. If the relationships don't meet your requirements, you can edit them. To do so, select the **Relationships Editor** in your project. It displays all the relationships among the individual entities (see Figure 7.12). To understand the meaning of the various colors, select the **color key**.

Editing relationships

Double-click on a file to edit the relationships by assigning various weights for specific relationships. If several paths or relationships between objects are created, you can assign *weights* to indicate your preferences for finding appropriate objects (the *shortest path*).

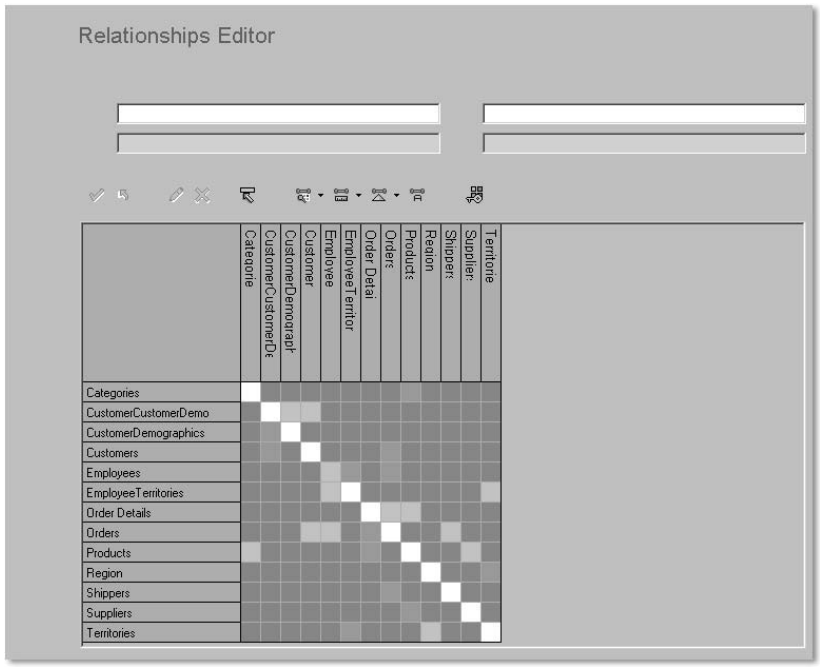

Figure 7.12 Relationships Editor

7.4.5 Integration of the Unifier with the Portal

You have now created a database unification project. User management is configured and you have assigned tables to users and roles. So far, you have been able to access your project only via the unification management console. To integrate the project with the portal, you must perform the following steps.

Creating a data source

Start your portal and log on with administrator rights. To access the unification project, you must first create a data source (see Figure 7.13). Select **System Configuration · Data Sources · New**. Enter a name, a description of the URL you want to use to address the unification project (the computer on which the unification server is running), and the port that you have assigned. You can take this information from the project settings in the **Unification Management Console**.

Keep the remaining settings as they are. They involve a unifier project and the user information should be used to log on. The Authentication Method is **Basic**, but the Authorization Level is **Automatic Synchronization**. Click on **Add** to create the data source.

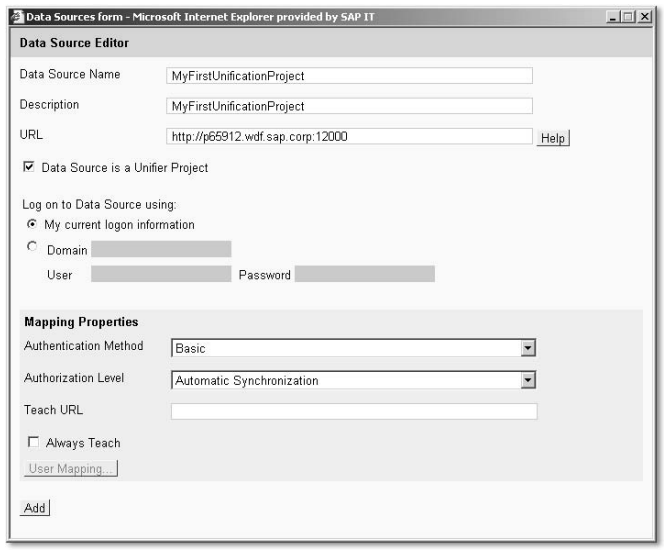

Figure 7.13 Creating a Data Source

iPanel Assignment

You must now assign the data source to the user's iPanel. Select **Portal Admin • iPanel Assignment.** Select the *portal_user* role to which you want to assign the unification project. The data sources are displayed. Check the appropriate data source and save your settings. Now close your browser and open it again. Log on as a portal user (not as admin/admin). The iPanel with the unification project is displayed. You can now select any data records and use Drag&Relate to move them into the iPanel.

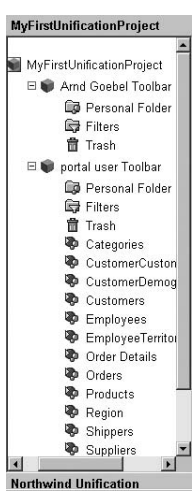

Figure 7.14 The Unification Project in the iPanel of the Portal

7.5 Internet Components

In addition to the unifiers, you have other options to realize Drag&Relate. Internet components enable the movement of information data from a unifier project into the form of an Internet site. You'll see an example of this in Chapter 8: package tracking for FedEx is defined as an iView, not as an Internet component. You could create an Internet component instead of the FedEx iView, which would allow pulling a tracking number from an SAP R/3 system and outputting the storage location of the package.

Example

We'll use another example to introduce Internet components. In top-level navigation, select **Content Admin · Internet components**. Create a new Internet component, such as **Map 24**. Select **URL editor** and **New**. A browser window opens; enter URL *http://www.us.map24.com/* in the window. Enter "Address" for the street, "Citycode" for the zip code, and "City" for the city into the Map24 form. Then select **Go**. Select **Add URL** in the address bar of the portal; **URL added** confirms the action. Now select **Close**. Enter an additional URL in the small portal window, the one you want to use as the standard URL: *http://www.us.map24.com/*. The Internet component is added to the iPanel later on. The standard URL is displayed when the user selects the entry. The other URL, the one that records parameters, is used when an entry is drawn over it with Drag&Relate.

Adjusting parameters

The parameters you entered in the form of Map24 are now being stored as fixed values. They will later be transferred as parameters of the table cell you indicate with Drag&Relate. To enable this function, select the URL with the parameters and then **Edit**. You now see the static parameters as currently set. In the second column, (Address, Citycode, and City) place a number (#) sign both in front of and behind each entry, so that Address becomes #Address#, Citycode becomes #Citycode#, and City becomes #City#. Now you must map the application's parameters to these parameters. Select the **Parameter** tab and select the data source that is to provide the data. You then select the unification project you have created. The main object is the **Customers** table. For Address, select the **Customers** table and the **Address** field. Proceed in the same manner for Citycode and City. Save your entries. You must also assign the Internet components to the iPanel. To assign roles, proceed here as you did with the unification project treated above. You can drag entries from the unification project displayed in the table to the Internet components. Map24 will then display the map of the appropriate address from your unification project in a Java applet in the portal.

You are now familiar with the usual unifiers and know the basics of how they function. However, due to the constraints of this section, we can present you with only the most important features. SAP offers special courses on unification and unifiers so that you can enhance your knowledge.

7.6 Enhancement for SAP Enterprise Portal 6.0

Unification technology has been enhanced in SAP Enterprise Portal 6.0. SAP Enterprise Portal 5.0 unifiers were linked directly to SAP EP 6.0 and their functionality expanded to support new processes in SAP EP 6.0, such as the user management engine and the portal content directory.

The user interface was also improved. SAP is currently working on the re-implementation of unifiers in Java. This effort will be completed when SAP NetWeaver '04 becomes generally available.

Figures 7.15 and 7.16 show the integration of unifiers in SAP Enterprise Portal 6.0.

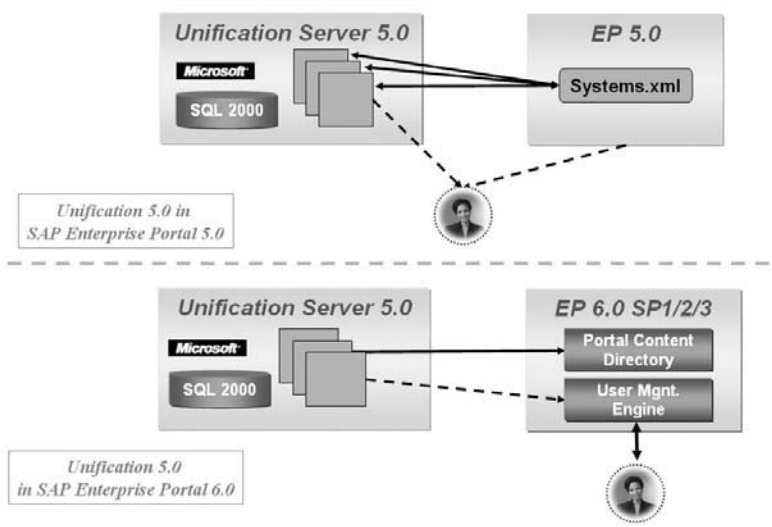

Figure 7.15 Modifications for Unification from SAP EP 5.0 to SAP EP 6.0

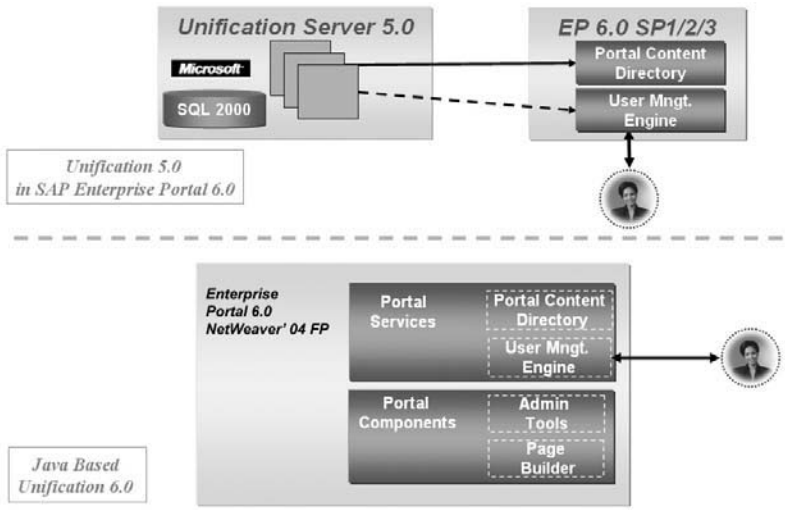

Figure 7.16 Modifications for Unification in SAP EP 6.0 (partly in planning)

8 iViews

iViews are an integral component of SAP Enterprise Portal. They contain applications and information that portal users need for their daily work.

SAP Enterprise Portal offers a wealth of functionalities that can integrate applications and display all types of information. In particular, applications can interact and communicate with each other. Simple user interaction executes transactions and updates the display in the portal. It gives portal users a hands-on ability to work with programs from various sources and makes working with the components completely transparent to the user. It now makes no difference whether an enterprise resource planning (ERP) system from SAP or a database from Oracle work behind an application. What's important is that the applications can communicate and create a completely transparent and seamless chain of worksteps.

Uniform interface

The greatest advantage of the portal is that it has only one interface that integrates all these applications. Users no longer have to deal with various menus or screens: all components look alike. The portal can have a uniform interface because it isn't required to integrate an application's complete frontend (SAP, Siebel, or Oracle). It only has to provide the most important excerpts or views of the required information. However, you can, of course, choose to integrate the complete GUI if necessary. But this approach is usually adopted only when no tailored version exists for a specific group of users (purchasing, for example), or an end user must function as a power user and access every single menu of a dynpro.

Whether it's a question of integrating views or a complete application, both scenarios involve integrating components in the portal. In the language of portals, the components are called *iViews*. iViews do more than just display information. They enable users to query information from the most varied sources according to their own search criteria, or establish settings in back-end systems that are linked to the iViews. The full range of iViews extends from the simple display of a Web site to the complex integration of an ERP system.

Example

Consider the following example. You create an order in SAP's Supplier Relationship Management's Enterprise Buyer Professional (SRM/EBP). The order triggers a purchase request in the backend (in SAP R/3). The

purchasing agent must now find an appropriate vendor and the product at the most attractive price. A material master might have to be created in the backend. If a bottleneck develops at the manufacturer, you're sure to call the purchasing agent eventually to ask why the product you ordered has not yet arrived.

Even this scenario makes it clear that a given process must access several different systems. Until now, the purchasing agent has had to deal with an SRM/EBP system with a Web frontend, an SAP GUI with access to the backend, several of the vendor's Web pages, and probably even the Web site of the transportation provider. Working with all these sources required having to toggle between various windows. The purchasing agent had to note the shopping cart number from one system—or even copy and paste the number so that the next system could process it—and then switch to yet another system.

Clearly, these activities are very time-consuming. That's where SAP Enterprise Portal can help. Its configuration for frequently used system and Web pages means that you never have to switch from one application window to another. You can access the material master, SRM/EBP, and the Web sites of the vendor and the transportation provider easily with the iPanel. You can use Drag&Relate to exchange information among applications. When applications exchange information, the purchasing agent sees the order in SAP Enterprise Buyer and the purchase request in the backend. The agent can easily call and create materials in the backend and then move to the vendor's Web site to select materials. When an order and an order confirmation already exist, the purchasing agent can enter the tracking number of the package at the transport provider's Internet site to determine whether the shipment is already on its way.

Figure 8.1 shows an example from FedEx. Drag&Relate has not yet been configured here. This iView is based on a page created with the iView catcher. Drag&Relate can be implemented with an Internet component that can receive data from an application or a database via a unifier.

Single sign-on

The big advantage here—over the simple display of information—is that portal users are authenticated automatically. They can access protected information without having to re-authenticate themselves. The technology used here is called single sign-on (SSO). Users' authentications are transferred in encrypted form with each query; other portals trust the querying portal and the users. It's easy to see how much time you can save with this functionality. Passwords are no longer forgotten; the infor-

mation that the applications exchange is reliable; and the danger of copying incorrect data is reduced, or, in some cases, almost completely eradicated.

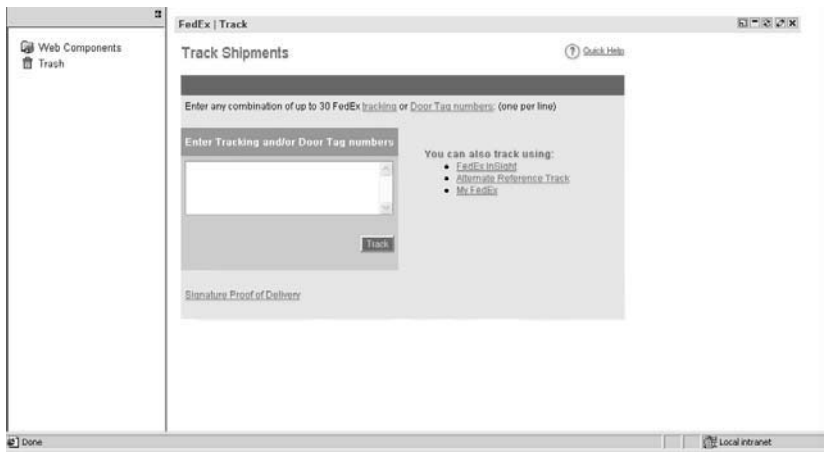

Figure 8.1 Tracking a Package with a Tracking Number

iView categories

iViews can be categorized. You can first differentiate iViews in terms of development languages. The term was originally developed by TopTier, a company whose development paralleled Microsoft. Consequently, most iViews were written in Visual Basic Script and then implemented as Active Server Pages (ASP) for the Internet. A specific dialect, which is now called SAPPortals XML, was also used. The dialect receives instructions that the portal processor interprets and then renders them accordingly. The dialect can be combined with Visual Basic Script as desired to allow dynamic queries.

An iView can also be created with Java—the powerful Internet language. Note another distinction between simple Java servlets and the more demanding Java Server Pages (JSPs) with Java beans. You can also create an iView with the iView Catcher, a tool delivered with the portal (SAP EP 5.0 only). You can use the tool to display sections of Web sites from the Internet, such as a column, in the portal.

You can also draw a distinction between ready-made iViews and those you create yourself. The iViewStudio (*http://www.iviewstudio.com*) offers portal operators many ready-made iViews delivered in business packages. The packages were created in view of a meaningful aggregation of services for specific groups of users. iViews are summarized in worksets, which, in turn, are summarized in business packages. Depending on the

assigned role, users can access specific pages that contain iViews from business packages, or iViews summarized in worksets that are themselves summarized in business packages. Figure 8.2 shows the types of iViews, differentiated according to programming language, specialization, and individualization.

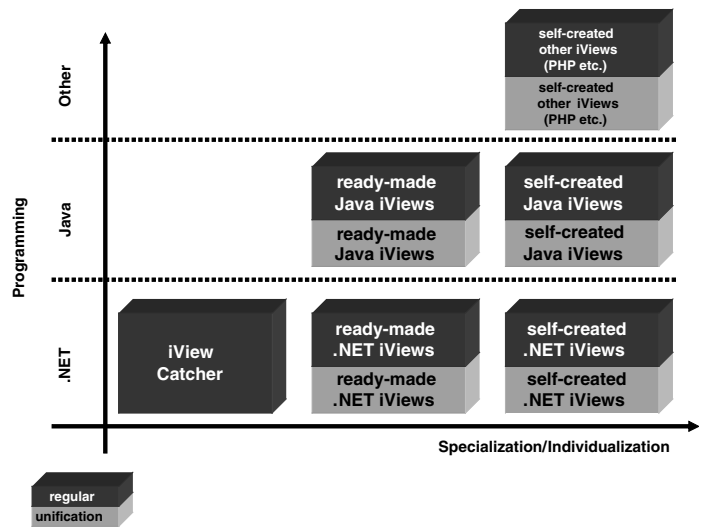

Figure 8.2 Differentiation of iViews

iViewStudio

With the iViewStudio (see Figure 8.3), SAP offers several ready-made business packages with iViews for the portal. This material allows quick and user-friendly integration of information, applications, and services in SAP EP.

In addition to ready-made content, the iViewStudio also provides you with tools that you need to create your own portal applications. After an introduction to the role concept and navigation in SAP Enterprise Portal, the following sections look at the differentiation of ready-made and self-created iViews. You'll become familiar with tools that you can use to create your own iViews and with the programming languages that you can use for development.

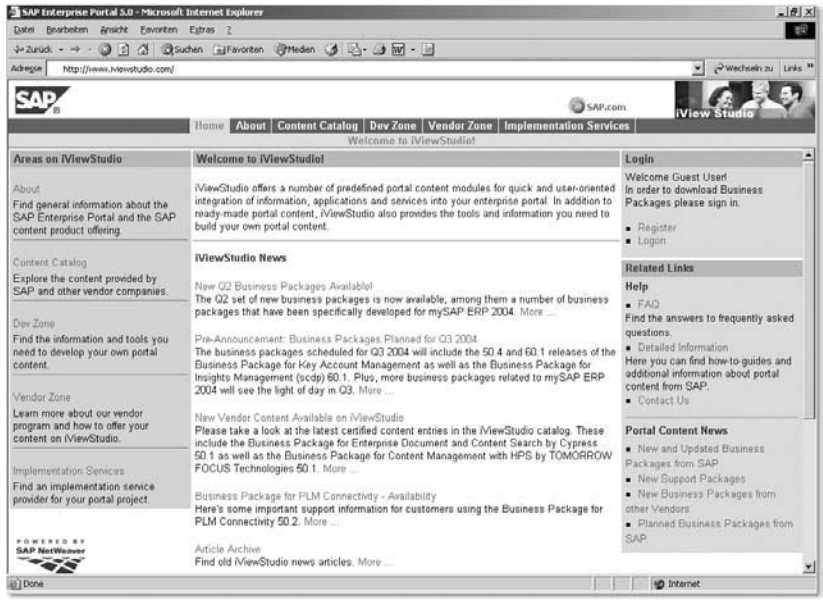

Figure 8.3 iViewStudio

8.1 Roles and Navigation in the Portal

Packages

In the following sections the term *packages* is often used. Packages are a collection of logically-related directories, also called folders or worksets, which are contained in iViews. An example clarifies this hierarchy best. A business package for the purchasing department can also contain subgroups (folders or worksets) for subordinate departments like order processing, order requests, and invoice verification. The worksets or folders logically belong to purchasing. But because not all groups of purchasing employees process all the procedures, we recommend that you subdivide the business process into smaller units. These folders or worksets can now be assigned to individual iViews. Figure 8.4 shows an example of a fictitious business package for purchasing. The package is not based on the SAP business package for purchasing; instead, it was created specifically for this example.

Limited view

Employees who have access to only one folder or one workset cannot access the entire *purchasing* business package: they have a limited view of the business package. These iViews are the smallest element of the portal. They form a meaningful unit only when they are summarized or combined into folders, worksets, or business packages, unless, of course, they fulfill individual tasks.

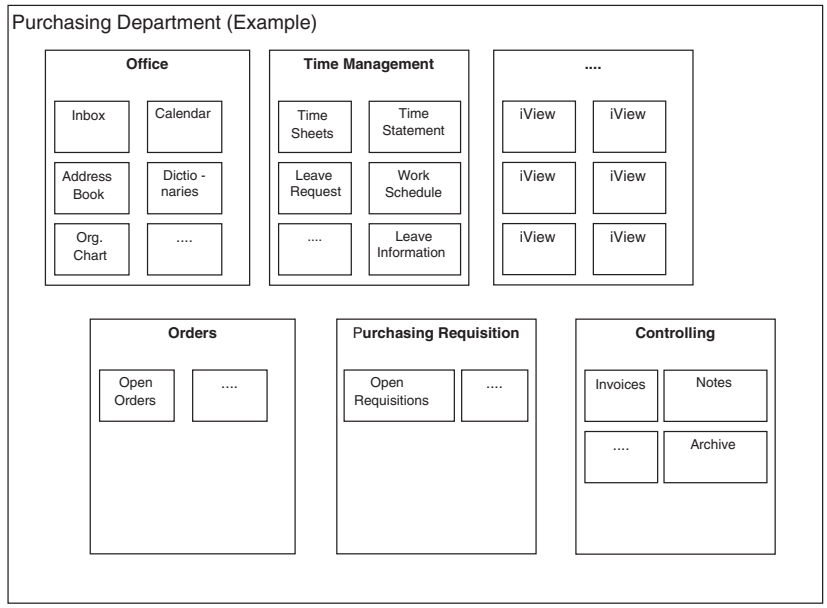

Figure 8.4 Example of a Business Package

Figure 8.5 clarifies the relationship between the terms page, folder, workset, channel, role, and external service. As you know from Chapter 3, you can integrate Yahoo! categories into the portal. iViews, external services, and Yahoo! categories access different data sources. Yahoo! categories and iViews can be combined on a page, but an external service, which is based on a Java iView, requires a full page for display.

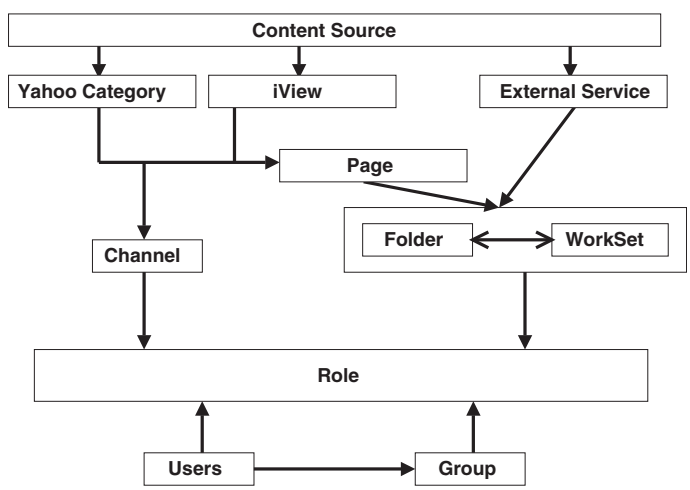

Figure 8.5 Portal Navigation and Role Hierarchy in SAP EP 5.0

Assignment options

Pages can be assigned to folders and worksets, which are then assigned to roles. The roles are then assigned to users or user groups. You can also assign individual iViews or Yahoo! categories to a channel and then assign the channel to a role. It's easy to understand that you have several options to assign iViews, Yahoo! categories, pages, folders, worksets, channels, or external services to users or groups of users with roles. Pages and channels offer various views of different combinations of iViews. You can use a channel to make iViews for which a user does not actually have access (because the iView is assigned to a folder and therefore to a role for which the user does not have authorization) that is visible to a user. The advantage is obvious. The smart assignment of iViews to folders and channels allows a user to see individual iViews without granting the user access to an entire folder or a workset. Similar to a matrix structure, such assignments produce a vertical and horizontal chart of assignments.

The hierarchy within roles enables both top-level and detailed navigation in the portal. Folders and worksets that belong to the highest level of role are called *entry points* of top-level navigation in the portal. Users can navigate in the portal with the entry points. The folders and worksets contain pages and external services (in SAP EP 5.0). Pages are components that can incorporate iViews. External services, such as SAP transactions, require either a full page or a new window to be displayed.

If you compare SAP EP 5.0 with SAP EP 6.0, you'll see that the assignment structure of objects is simpler in SAP EP 6.0, which no longer has external services and channels. One role can contain additional roles, worksets, pages, and iViews. One workset can contain additional worksets, pages, and iViews; a page can contain additional pages and iViews. An iView, however, cannot contain any other object: it represents the smallest unit in the portal.

Figure 8.6 shows an overview of portal navigation in SAP EP 6.0. Note that the folders don't represent the Portal Content Directory (PCD) object. Folders can be generated within a role or a workset to define a hierarchical structure of objects.

A delta link is generated for every object assignment in SAP EP 6.0. Every object in the PCD can be copied to one or more locations. Copying can occur in one of two ways: copy and paste, or copy and paste as a delta link. A simple copy does not restrict or limit the connection to the original object; a copy as a delta link retains the connection. When copying, users must have at least read authorization for the object. But, in any case, an

object can only be copied, even as a delta link: it cannot be edited. Only the copy itself can be edited locally.

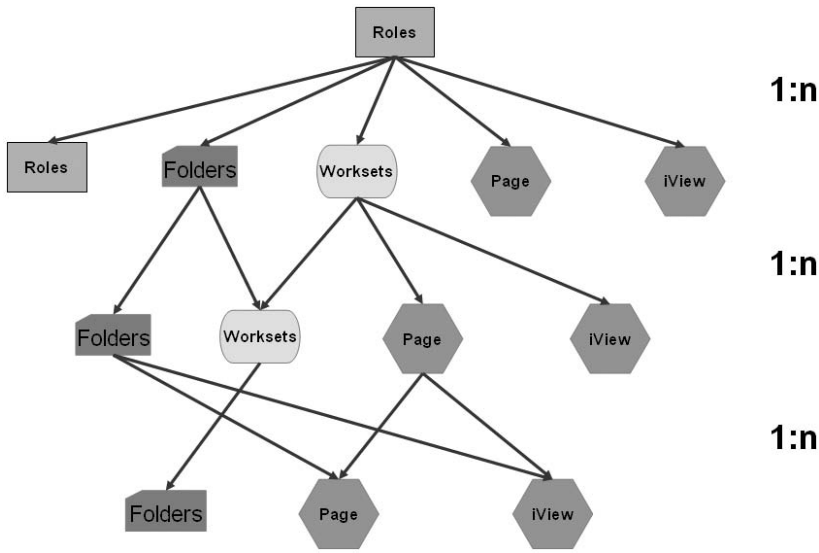

Figure 8.6 Portal Navigation and Role Hierarchy in SAP EP 6.0

Table 8.1 shows an overview of the terms discussed.

Content Component	Function
iView	Represents the smallest portal component for the display of information that might allow user interaction.
Master iView	Represents the standard metadata of the portal components.
Page	Incorporates and displays iViews.
Folder	Incorporates pages and external services.
Workset	Similar to folders, but designed only for grouping and creating hierarchies.
Channel (SAP EP 5.0)	Incorporates iViews and Yahoo! categories; allows partitioned access to business packages (e.g., to individual iViews and not to an entire package).

Table 8.1 Overview of Portal Components with Content

Content Component	Function
Role	Collection of information and services.
External Service (SAP EP 5.0)	Based on master iViews that display SAP transactions, Internet sites, or SAP BW applications. They populate the entire content area (a full page).

Table 8.1 Overview of Portal Components with Content (cont.)

8.2 Ready-Made iViews

Ready-made iViews are available for various uses. Business packages summarize most of these iViews. As shown in Figure 8.7, iViews can be divided into three groups: content for general users of the portal, content for a line manager, and content for a specialist.

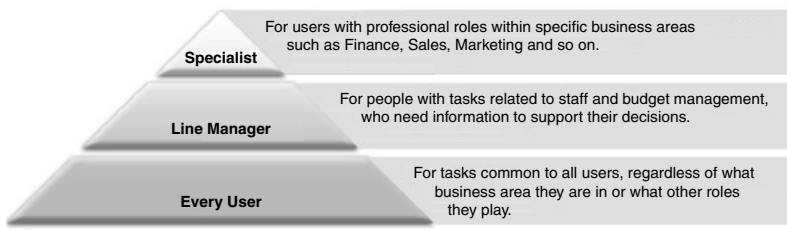

Figure 8.7 Categorization of Business Packages

Packages that all portal users can use, regardless of their role and function within a company, include the *portal user package*. It allows portal users quick and comfortable access to some fundamental services, such as the display of outstanding tasks, sending and receiving email, access to the employee address book, and access to personal or company information. Additional packages offer services to integrate *collaboration tools* that allow you to collaborate with coworkers on documents, drawings, and so on. These packages can integrate Microsoft Outlook as well as document and project management tools. Employee Self-Services (ESS) are also important: they enable users to submit requests for vacations or change their address or bank information. Other business packages are available for a line manager, a specialist, shipping agents, members of the board of directors, executive assistants to the board of directors or managers, managers, the company physician, quality managers, human resources personnel, employees in production planning and assembly, logistics specialists, property managers, marketing personnel, purchasing agents, service personnel, and many others.

Certified content

The iViewStudio divides the content and certification into three groups: content from SAP; external, certified content; and external, non-certified content. SAP partners can publish their own content and submit if for certification if they want. The iViewStudio enables users to search by function as well as by all industries—from the automobile industry to energy and telecommunications. Additional areas can also be classified within these industries and then assigned according to the position or role of a user. It enables searching by partner products and a free search by keyword to find the appropriate package. Users can download the free packages from the iViewStudio and add them to the portal with the import function. Cost-bearing packages are invoiced as appropriate. The packages also require a backend with additional functionalities that, of course, can be accessed only when such a system or application component (SAP BW, MM, PP, FI, CO, and so on) is being used.

The largest number of offerings is available for the standard area of industry solutions. The number of packages grows steadily and covers most user requirements. As is the case with SAP R/2 and SAP R/3, and many other SAP products, customers often request modifications and enhancements; it's almost impossible for standard software to satisfy all customer requirements. That's why you also have an option to develop your own components or have SAP Consulting or SAP partners develop them.

8.3 Self-Created iViews

The area of self-created iViews is quite comprehensive. Therefore, the following sections provide only a general overview of how you can create your own iViews. Chapter 9 addresses the development of iViews with the Java programming language.

You can create iViews in various ways. With the *iView Catcher*, you can display excerpts from Web sites in the portal. You can also create *.NET iViews*, or *Java iViews*. The type of iView and the manner of its creation determine how it will run in the portal. We examine these considerations in more detail in the following sections.

8.3.1 iView Catcher

The iView Catcher of SAP Enterprise Portal allows the integration of excerpts from Internet sites. Select **Content Admin · iViews** to arrive at the list of iViews and channels. Here you can select the creation of an iView with the iView Catcher. Select **iView catcher** and **New iView**. You'll arrive at the editor for a new catcher iView. Enter the URL at **Browse** and

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