
Rediscover SAP Business Workflow and improve productivity across your SAP landscape

by Matt Christensen



Matt Christensen
Principal Consultant
Phoenix Endeavors, LLC

Matt Christensen has more than 10 years of experience combining analytical and technical skills to implement a broad set of SAP modules including SAP R/3, Business Information Warehouse, and Strategic Enterprise Management. He has used business workflow within each of these modules. Matt has been a regular contributor to SAP publications and conferences and has helped to align SAP functionality with business processes for more than 40 clients. You may reach him at matt.christensen@phxend.com.

Amidst the revolutionary new technology components of SAP NetWeaver 7.0 (formerly 2004s) are some familiar old friends. SAP Business Workflow is one such solution. It can be used to streamline operational processes, such as journal entry creation and approval, and enable important human resources to focus on value-added activities, such as data mining and analysis. It has proven its flexibility and reliability through many years of intensive utilization and continues to play a central role in SAP NetWeaver Process Integration (PI).¹

Although SAP Business Workflow has been an enterprise solution for many years, it has also continued to receive development attention and gain further integration capabilities as new versions of SAP NetWeaver are released. Despite its critical acclaim, SAP Business Workflow has been underutilized by a significant number of SAP customers. For these customers, now might be the right time to take another look at incorporating this functionality in their SAP solution toolbox.

This article illustrates the capabilities of workflow available in the latest SAP NetWeaver releases — and for the purposes of this article, examples are based on SAP NetWeaver 7.0. This article also identifies appropriate uses for workflow, explains basic concepts along with new technology, and provides you with the information required to get a running start implementing SAP Business Workflow within your organization.

First, I'll walk you through fundamental concepts and terminology that are central to workflow development. Then, I'll introduce relevant

¹ PI was formerly known as XI (SAP Exchange Infrastructure). PI now includes both XI and Business Workflow. Go to the SAP Service Marketplace at <http://service.sap.com/workflow> for details on how PI is broken into XI and Business Process Management, which includes Business Workflow.

examples of how you can use SAP Business Workflow in a typical SAP implementation. Next, I'll demonstrate how you can easily develop workflows using the latest toolsets and wizards. Finally, I'll outline some of the most important new technology advancements of recent SAP Business Workflow releases, such as working with ABAP Objects, flexible binding configuration, container technology, extended administrative toolbox utilities, and enhanced SAP Business Intelligence (BI) reports for SAP Business Workflow objects — just to name a few.

This article is intended to serve as a launching point for functional, technical, and management teams as they consider the alignment of system-based solutions with streamlined business processes. (See the note below for the prerequisites on which this article is based.)

Note!

SAP Business Workflow is available on any ABAP-based SAP system. This includes SAP R/3 versions as early as version 3.0 and all releases of SAP Business Intelligence (BI), Customer Relationship Management (CRM), Supply Chain Management (SCM), Strategic Enterprise Management (SEM), and Solution Manager. Although each of these systems has its own set of business processes, the technical implementation of SAP Business Workflow is identical. Just be sure that the basic workflow configuration is complete. Configuration transaction SWU3 provides an easy, step-by-step process for configuring all of the standard settings required to run workflow in an SAP system. Extensive documentation is included in the right-hand window as you move through the individual configuration steps.

SAP Business Workflow concept and terminology

In this section, I explain the underlying concept of SAP Business Workflow and then define the basic terms that comprise this SAP solution. The purpose of this section is to provide you with a foundation for understanding not only what SAP Business Workflow is, but also how it can play a critical role in the successful management and optimization of your system landscape.

Basic concept

SAP Business Workflow is conceptually easy to understand. An event occurs — either within or outside of the system — that requires subsequent action(s) to be taken. The system either completes these actions itself or facilitates their completion through notifications, reminders, and audit trails. A typical workflow may contain several actions, some of which are completed by users and others by the system. Some form of process flow logic usually connects these actions. Conditional logic (e.g., “If this is an intercompany sales order, then it is expedited”), user feedback (e.g., “Do you approve this vacation request?”), and looping (e.g., “Continue attempting to release the order until successful”) are common mechanisms used to create a smooth process out of individual activities. Every workflow must have an event that starts, or triggers, it.

For the purposes of this article, let's consider the need to create a new material master in your SAP ERP system. The demand for a new material master may be captured in an existing electronic format. Perhaps it is recorded in an electronic request form or the status of a proposed product is changed in an external engineering system. The external system passes this information to the SAP system from which a notification is sent to the material master team so it can create a new material number. The master data maintenance team in one plant may manually create the initial material number — after which the SAP system copies it from this base plant to every relevant plant in the system. Finally, the

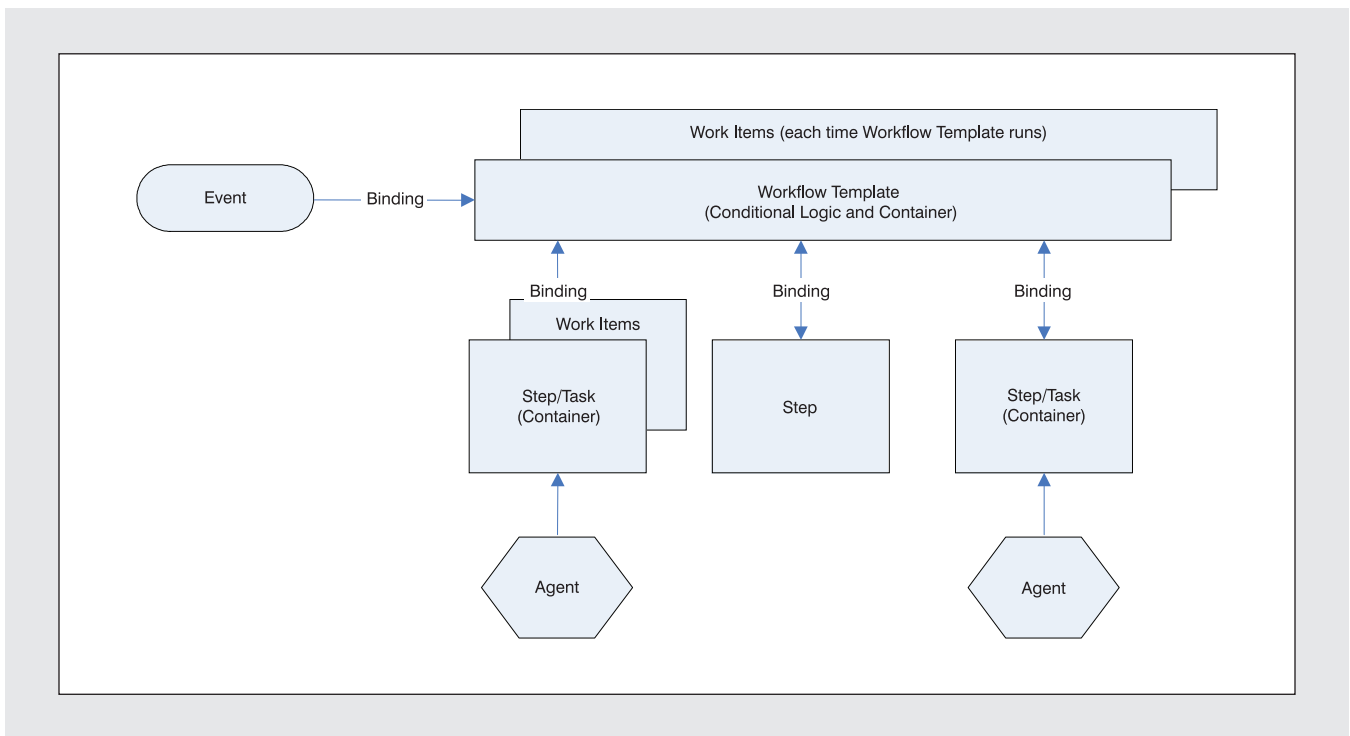


Figure 1 How SAP Business Workflow terms relate to one another

system sends a notification back to the external system and then to other departments in the company, if necessary, to complete the new material creation process.

Terminology

SAP Business Workflow contains a sizable number of new vocabulary words for even experienced SAP developers. Let's define this new terminology, using **Figure 1**, which provides a visualization of how these terms relate to one another:

- Event:** An action that initiates a follow-on process. A number of processes within SAP can automatically create an event, or you can write code to trigger an event based on an external activity. Events are often parameterized to capture key pieces of information for subsequent use in the workflow. For example, the newly created material might include a description, color, and material group. (We'll explore events shortly.)
- Step:** An individual action that needs to be completed in response to the event. Several basic types of steps can take place in a workflow, such as sending an email, requesting user feedback, or performing an activity (task).
- Task:** An activity (step type) that a user performs through an underlying function module or transaction. You can configure a task through a series of parameters and underlying ABAP code to provide opportunities for automating a process.
- Workflow template:** The combination of steps with conditional (process flow) logic. It is possible to run a single task in response to an event, but most value-added workflows require a series of processes to be completed based on user input. Workflows are often concluded with automated notifications distributed via email.
- Work item:** The representation of the workflow template or task each time it runs. A workflow template or task can be run hundreds or thousands of times, depending upon the frequency of the

event, so the system can automatically create a work item each time to track that specific instance. The work item is a valuable component of the overall audit trail, and it is invaluable during debugging.

- **Agent:** The entity that completes a task. Tasks do not complete themselves; you must assign an agent to complete each task within the workflow. The agent may be the system itself (my personal favorite because a user isn't responsible for the task), a single user, or a group of users. In the case of a group of users needing to take action, the work item serves as a work queue. Whoever processes the work item in the work queue first completes that task on behalf of the entire group. This can be an efficient way to manage a process that is typically backlogged within the organization.
- **Container:** A vehicle of communication that contains all of the valuable pieces of information that can be handed off between tasks to form a streamlined process. Visualize a container as an intra-office envelope. The event container in the example includes a description, color, and material group for a new material. This information must be handed off to the workflow template container. The workflow template container may then pass this information along to a task container whereby the material master team is sent a notification. Once the material master team has created the base material master, its number and base plant may be passed back from the task container to the workflow template container. The system handles all of these transfers and facilitates a smooth internal process. Work item containers are critical pieces of information for troubleshooting and auditing SAP Business Workflow.
- **Binding:** The way that the hand-off of information between a workflow template and task containers is defined. A binding is essentially mapping rules that direct a field within one container to populate a field within another container. Flexibility within bindings allows you to couple the same tasks together in many different processes. For example, you could create a sales order and a credit memo

to satisfy different business processes by passing unique parameter values along to the same task.

Now let's look at the situations in which you may want to apply SAP Business Workflow to automate and streamline a process.

Where to apply an SAP Business Workflow solution

Although there is tremendous value to be gained through the implementation of SAP Business Workflow solutions, finding the first problem to attack is often the biggest challenge. After you have found success in a single process and recognize the ease with which solutions can be constructed, you will quickly discover new places to apply this toolset. I believe in building in-house talent around SAP Business Workflow because it has so many potential usage areas, and the solutions may require ongoing enhancement as business processes change.

A process that can be enabled through a workflow has several characteristics. The process must be repeatable. It should be either well documented or thoroughly understood. Mundane or error-prone processes are especially tempting candidates, and they are most likely to draw praise from business users because their lives will noticeably improve through work reduction or better quality of data. Time-sensitive processes or those that involve many participants can benefit greatly from the use of SAP Business Workflow as a communication facilitation toolset. Users can customize reminders and escalation within the workflow so tasks are less likely to be shuffled to the bottom of an email inbox or ignored completely. In the case of multiple-participant tasks, the system immediately passes the notification to the next step. If there are multiple possible agents for a given task, the notification sits in all of their inboxes until the first person available grabs it. This is more efficient than pre-assigning the task to a single user who may be pulled away from his or her personal queue for some reason (e.g., business travel or personal time).

On the other hand, processes that constantly fluctuate or require a great deal of creativity would be difficult to capture in a systematic process flow and are therefore not good workflow candidates.

Example workflow solutions

You can enable many processes through SAP Business Workflow. Here are a few examples, which I think may spur thoughts for potential applications within your organization:

- A simple notification process is a terrific starting point for using workflow. There is often a need to perform manual tasks every time a new piece of master data is created in your SAP system. For example, after a new cost center is created, it may require a change to the monthly reporting package. The creation of the new cost center can be an event that triggers a single email task. The SAP system would be the agent in this case, and a mailing list could be maintained specifying the current list of recipients. In this scenario, the container would capture the cost center number and name so they could be specified in the email text. A single work item would record the task of sending an email to the mailing list.
- Automatic extension of master data across organization units is another simple, yet valuable, process to enable through workflow. Many organizations have multiple plants or sales organizations for tax or legal purposes. Yet, they may sell the same products from any of these business units. Rather than requiring the master data team to manually create the same material multiple times, you can set up a workflow to automatically copy the master record from the initial location to all other locations. Creation of the initial master record is the event. The system as an agent performs a series of tasks to create the additional master records.
- You can facilitate a document or master data approval through a workflow. There are two approaches to accomplish this task: pre-entry approval or post-entry audit. An example of pre-entry approval is the park-and-post concept in financial accounting. In this case, a user creates

a preliminary document that serves as the event. The event triggers an automatic notification that is sent to a supervisor (i.e., the agent) who can choose to approve or reject the document. This process involves a couple of steps — the first is a user decision, and the second step is either the document-posting task or a rejection. The posting or rejection task is actually completed by the system agent based on the user's decision. Further notification back to the originator could be another useful step in this workflow.

The post-entry audit approach can lead to more efficient processes when it is an acceptable approach. In this case, a user is allowed to create a transaction or master data record. This event triggers an automatic notification that is sent to a supervisor who has the authority to approve or reject the record. In this case, a rejection must reverse or delete the previously created record. The risk incurred by this approach is that the transaction or master data could have been used or reported in the interim between creation and rejection. It is difficult to delete master data after it has been used in transactions.

- You can use a workflow as a unique real-time interface or error-reprocessing mechanism. For example, a user enters a sales order or contract in the system that creates a new demand for a product that must receive immediate attention. Rather than running the entire material requirements planning (MRP) process more often to look for these exceptional situations in which operations must react quickly, a workflow could be created to run in particular scenarios. Perhaps the system triggers the event when a user enters a critical order type or high-priority customer.

In a similar fashion, you can replace traditional batch input sessions for error reprocessing of external interfaces with a workflow. The major limitation to batch input error reprocessing sessions is that the system creates them with a commitment to particular screen numbers and field names. External interfaces often rely on logic and mapping tables to determine how the transaction is entered. If the transaction fails

because of missing or incorrect entries in mapping tables, the existing transaction within the system cannot be reprocessed automatically. SAP Business Workflow can support a better process in which the encountered interface error creates an event along with container information that holds the inbound record. A responsible user receives immediate notification of this error, modifies the mapping tables, and then attempts to complete the original transaction as a new task. If it is successful, the user task disappears. If the system encounters further errors, it generates another user notification to prompt further corrective action.

There are certainly unlimited scenarios in which you can use workflow to improve transactional processing. The best candidates for your organization depend on system landscape, industry, and process maturity. Seek out well-documented processes that consume a high degree of monotonous user effort.

Now that I've outlined the basic concept of workflow along with a few examples, let's look at the ways in which a workflow can be started.

Starting a workflow

The most important consideration in workflow development is often the triggering event — the event that starts the workflow. Nothing is beyond reach once a workflow is underway, but everything hinges on getting it started in the right situation along with the necessary information to send it down the correct pathway. There are many ways to get a workflow started — often depending on the functional area in which the action is to be captured. For example, **Figure 2** shows the event creation menu for Set Up with Wizard, Change to HR Master Data, and Change documents. These are configuration areas you can use to configure events that may trigger a workflow. Each area of configuration has its own standard SAP menu path accessed via the menu path Tools → Business Workflow → Development → Definition tools.

You can use any of these configuration areas to create an event that can be linked to a workflow template or task. Most often these events are

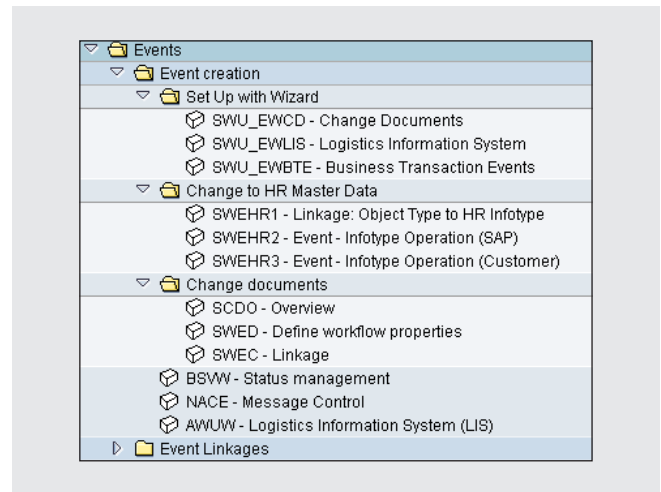


Figure 2 Event creation menu area

associated with business objects that are maintained in the Business Object Builder, which you access via transaction SWO1. SAP delivers a standard list of business objects along with corresponding events for each application, so you do not need to use these configuration transactions at all in many solutions. If you can find a standard business object with a suitable event and sufficient parameters, you can use it without enhancement to trigger a workflow. For example, you might use the standard accounting document object (as shown in **Figure 3**) to initiate an appropriate accounting workflow process.

When a standard business object event does not already exist, you can link a recognizable action in the system, such as change documents, to a business object event. The system generates the change documents when master data objects are modified. For example, every time a material master is created or changed, entries are made in tables CDHDR and CDPOS to record the user, the object key, and the changes that were made. You can link any of these objects to a business object event through transaction SWEC (as shown in **Figure 4**). For example, when a change document is generated for change object BELEG, the event CHANGED within business object type BKPF is triggered. You can also link these objects through the change document wizard transaction SWU_EWCD (**Figure 2**). An added benefit of using the change document wizard is

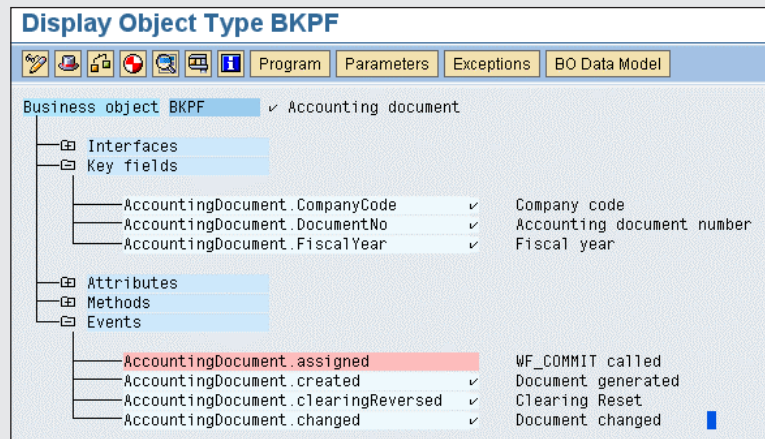


Figure 3 Standard business object with events

Dialog Structure		Events for Change Document						
▼ Events for Change Document		Change Do.	ObjectCate.	Business Obj. Type	Event	On Create	On Change	On Delete
Field Restrictions			BOR Object			☒	☐	☐
			BOR Object			☒	☐	☐
		AENNR	BOR Object	ECM	DELETED	☐	☐	☒
		ANLA	BOR Object	BUS1022	CHANGED	☐	☒	☐
		BELEG	BOR Object	BKPF	CHANGED	☐	☒	☐
		BELEGMASS	BOR Object	BSEG_MMIV	UNBLOCKED_QUANTITY	☐	☒	☐
		BELEGMASS	BOR Object	BSEG_MMIV	UNBLOCKED_PRICE	☐	☒	☐
		BELEGMASS	BOR Object	BSEG_MMIV	CHANGED	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	AP1	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	AP2	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	UPDATED	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	RA	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	APPROVED	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	EXECUTED	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	COMPLETED	☐	☒	☐
		DOCUMENT	BOR Object	YDRAW	INITIATED	☒	☐	☐
		DOCUMENT	BOR Object	YDRAW	REVIEWED	☐	☒	☐
		DOCUMENT	BOR Object	DRAW	STATUS_RA	☐	☒	☐

Figure 4 Change documents linked to business object events

being able to automatically create a new event within an existing business object. The alternative is to create the event through the Business Object Builder prior to linking it with a change document; however, the wizard is easier to use and you should use it whenever you can.

Other actions that can be linked in a similar manner include Logistics Information System (LIS) exceptions, status management changes, changes to Human Resources (HR) master data, and message output from the Sales and Distribution (SD) module.

```

data: container type table of SWCONT,
      creator   type SWW_OBJID.

* Workflow routines and objects
INCLUDE <CNTN01>

* Set value in workflow container
swc_set_element container 'DATE' sy-datum

* Establish initiator
move sy-uname to creator

* Launch workflow
CALL FUNCTION SWW_WI_START_SIMPLE
  EXPORTING
    creating      = creator
    task          = WS99900026
  TABLES
    wi_container = container

```

Figure 5 Sample code to start a workflow directly along with container entries

You can also trigger an event or even start a workflow directly through ABAP code, as shown in **Figure 5**. This option should be considered only when other routes prove unsuccessful because the cost of development and maintenance will be higher than that of standard approaches. This is often the method used when an inbound interface encounters errors that need to be reprocessed.

Now let's explore the development steps for building an SAP Business Workflow to better understand its capabilities.

Step-by-step production workflow example

A simple but effective example of creating a production workflow is the process of creating a new cost center. Each time a new cost center is created, it should be sent to a corporate controller for approval.

Depending on that feedback, the system deletes the cost center or sends an email to all users notifying them of the new cost center. Two major tasks are required to create this business workflow, but each of them is relatively simple:

- Creating the change document event
- Building the workflow template

Let's take a closer look at each of these tasks.

Creating the change document event

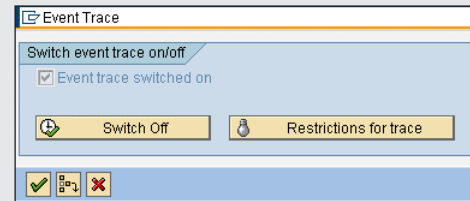
The first thing you need to do is create a change document event that will trigger the workflow. First, you need to find a viable event to trigger this workflow using transaction SWO1, as explained in the previous section. You'll find the standard object for a cost center (BUS0012) provided by SAP through the Business Object Builder. Unfortunately, this object only contains an event for when a cost center is changed, as shown in **Figure 6**. Therefore, you'll

Tip!

Prior to linking an event to a workflow template or task, you should always test whether it is triggering as expected and what key data is being collected. The easiest way to accomplish this test is through the Event Trace.

You activate and deactivate the Event Trace through transaction SWELS (see the first screenshot on the right). You can subsequently view the trace log using transaction SWEL (see the second screenshot on the right).

Don't leave this trace activated in a productive system because it can draw significant memory resources and slow transaction processing.



Object Type	Event	Current Date	Time	Name of Receiver Type
BUS2032	CREATED	11/17/2005	09:06:03	WS96000006
BUS2032	CREATED	11/17/2005	09:06:04	WS98000224
ECM	OPENED	11/17/2005	09:15:27	WS98000025
ECM	CREATED	11/17/2005	09:15:27	
BUS1001006	VIEWCREATED	11/17/2005	09:17:24	
BUS1001006	VIEWCREATED	11/17/2005	09:17:24	
BUS1001006	VIEWCREATED	11/17/2005	09:17:24	
BUS1001006	VIEWCREATED	11/17/2005	09:17:24	
BUS1001006	VIEWCREATED	11/17/2005	09:17:24	

have to “modify” the cost center object to include another event.²

Before proceeding, you need to check that change documents are being generated whenever a cost center is created. To test whether this is happening, create a cost center in a test system using transaction KS01, and then look for entries associated with your user name in table CDHDR — usually based on the date and time you created the new object. **Figure 7** on the next page shows that the test was successful — that is, a change document (KOSTL) was generated when a new cost center was created — which confirms that you can create a custom event linked to this change cost center object to trigger the workflow.

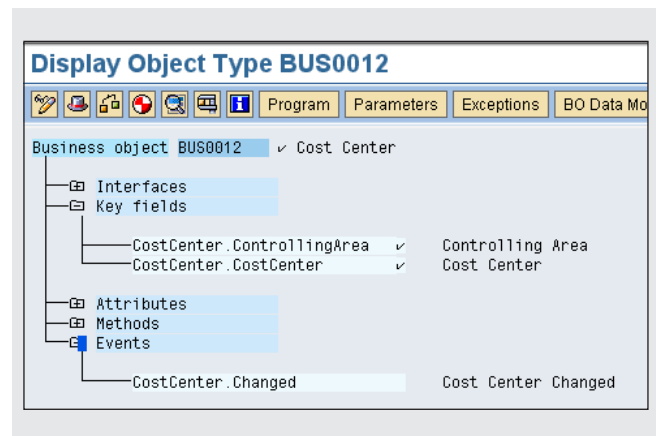
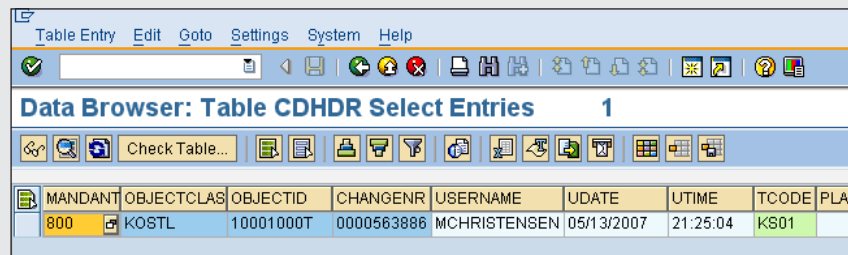


Figure 6 Standard cost center object with changed event only

Now you need to link the change event to a business object type event. Because you cannot directly modify the standard business object type, you'll create a new subtype that inherits the necessary attributes

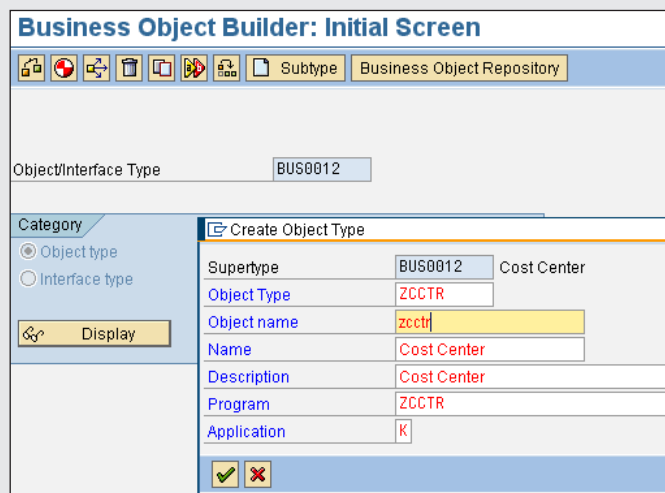
² As you'll learn momentarily, you cannot directly modify a standard business object. You will create a subtype that “inherits” the attributes of the original object and from there you can modify the new subtype to fit your business needs.



The screenshot shows the SAP Data Browser interface for table CDHDR. The title bar reads "Data Browser: Table CDHDR Select Entries 1". Below the title bar is a toolbar with various icons. The main area displays a table with the following data:

MANDANT	OBJECTCLAS	OBJECTID	CHANGENR	USERNAME	UDATE	UTIME	TCODE	PLA
800	KOSTL	10001000T	0000563886	MCHRISTENSEN	05/13/2007	21:25:04	KS01	

Figure 7 A change document is generated each time a cost center is created



The screenshot shows the "Business Object Builder: Initial Screen". The "Object/Interface Type" field is set to "BUS0012". The "Category" section has "Object type" selected. The "Create Object Type" section contains the following fields:

Supertype	BUS0012	Cost Center
Object Type	ZCCTR	
Object name	zcctr	
Name	Cost Center	
Description	Cost Center	
Program	ZCCTR	
Application	K	

At the bottom, there are checkmark and cross icons.

Figure 8 Creating a subtype of the standard cost center object

from the standard object using transaction SWO1. In the Business Object Builder screen, enter the object name from which you intend to inherit (BUS0012), click on the Subtype button to create the new subtype, and then enter the information that defines the subtype, as shown in **Figure 8**.

Next, you need to change the object status to “released” so the new object becomes available for use throughout the system. **Figure 9** shows the menu path you need to follow.

Link the change document to this subtype, and create a new event through the change document wizard transaction SWU_EWCD. To configure a business object type event to be triggered whenever a change document is created to record a new cost center, enter the business object type (e.g., ZCCTR). You can then either use an existing event by selecting the appropriate row in the Events table or create a new event by selecting the Extend object type with event check box, as shown in **Figure 10**. Then click on Continue.

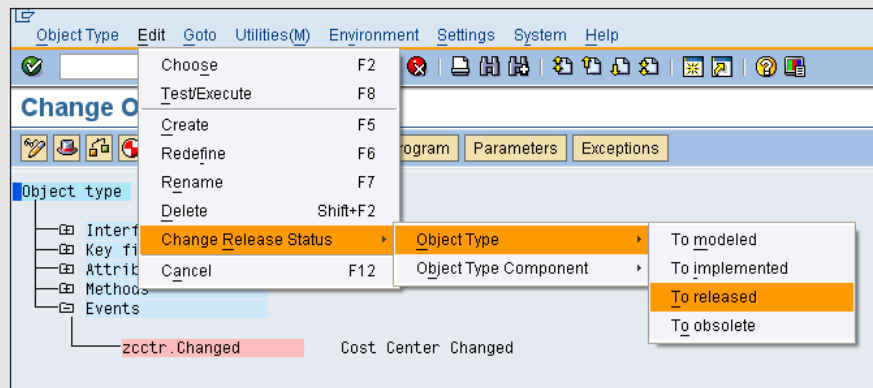


Figure 9 Releasing the new custom cost center subtype

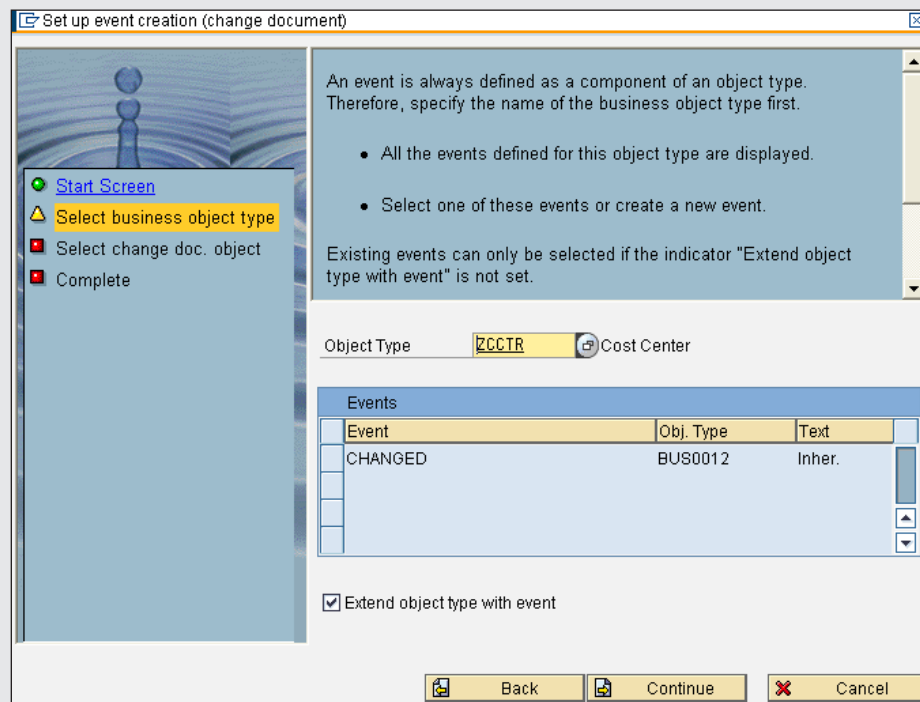


Figure 10 Specify the object type to link to change documents

To create a new event, enter a name (e.g., Created) and description (e.g., Created). As you can see in **Figure 11** on the next page, you can use the same text

for the name of the event and its description if the description closely resembles the action of the event. Click on Continue.

Set up event creation (change document)

Enter the ID, name and description of the new event. This event is created for the specified Business object types.

Choose **Continue** to continue processing.

Object Type ZCCTR **Cost Center**

Event Created

Name Created

Description Created

Navigation: Start Screen, Select business object type, **Create event**, Select change doc. object, Complete

Buttons: Back, Continue, Cancel

Figure 11 Provide a name and description for the new event

Set up event creation (change document)

Specify a change document object that is to be used for implementing the event creation.

Define whether the event is to be created when creating, changing or deleting, provided that the corresponding event is logged by the change document.

Choose **Continue** to continue the processing.

Change doc. object KOSTL

Object type ZCCTR **Cost Center**

Event CREATED

Date/time of event

☒ Event upon create

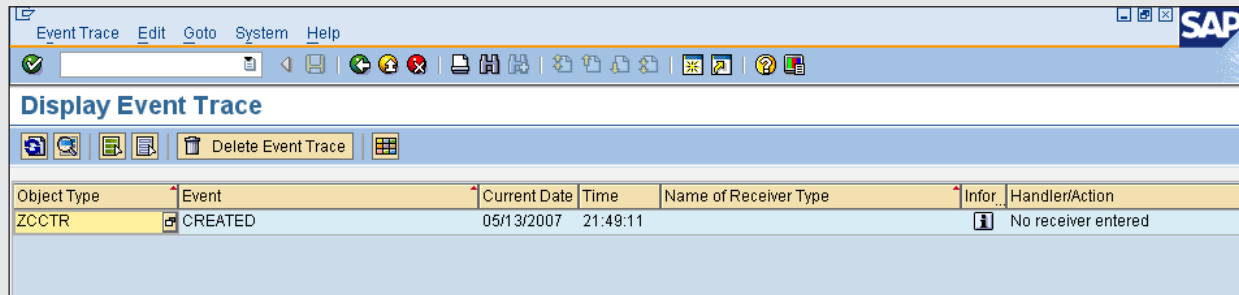
☐ Event upon change

☐ Event upon delete

Navigation: Start Screen, Select business object type, Create event, **Select change doc. object**, Complete

Buttons: Back, Continue, Cancel

Figure 12 Linking the change document to a business object event



The screenshot shows the SAP Event Trace window. The title bar includes 'Event Trace', 'Edit', 'Goto', 'System', and 'Help'. Below the title bar is a toolbar with various icons. The main area is titled 'Display Event Trace' and contains a table with the following data:

Object Type	Event	Current Date	Time	Name of Receiver Type	Infor...	Handler/Action
ZCCTR	CREATED	05/13/2007	21:49:11			No receiver entered

Figure 13 Event Trace showing newly created change document event being triggered

In the next screen, shown in **Figure 12**, enter the name of the change document object (i.e., KOSTL, found in the CDHDR table earlier), and specify the object type (in this case, ZCCTR) to link into our new event (CREATED). Make sure the Event upon create option is selected.

Once you have completed the configuration, you need to create one more cost center in the development environment. Use the Event Trace introduced earlier (see the tip on page 37) to ensure the event is triggered as anticipated. **Figure 13** shows the successful results of creating another cost center with the Event Trace activated. Now that you have created an event, you can move along to building the process logic for your workflow.

Note!

Business object types or ABAP classes are also required when workflow is used to reprocess inbound interface errors. In this case, you need to create a custom object type. If your inbound record contains many fields, it might be easiest to create a structure attribute within your custom object type. You will create a key separately, but this can minimize the amount of initial file parsing required and streamline future changes.

Building the workflow template

The SAP Business Workflow solution will require a workflow template rather than a single task because the cost center task consists of multiple steps connected through process logic. To create both the workflow template and tasks, use transaction PFTC_INS. You can find this and other workflow development transactions on the workflow development menu, as shown in **Figure 14**.

On the first screen is the Basic data tab. Here you maintain the technical name and descriptive name of

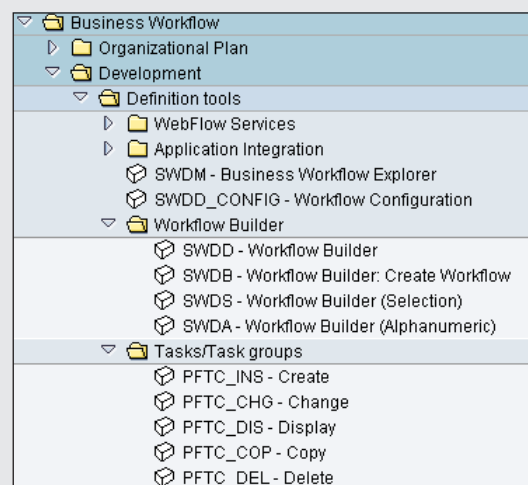


Figure 14 Workflow development menu

Workflow Template: Create

Workflow template: zcctr_new

Name: New Cost Center

Package: _____ Applicatn Component: _____

Basic data | Description | Container | Triggering events | SAPphone

Name: _____

Abbr.: zcctr_new

Name: New Cost Center

Release status: Released

Work Item Text

Work item text: _____

Workflow Definition

☐ Workflow definition

Figure 15 Maintaining the workflow template name and description

Workflow template: zcctr_new

Name: New Cost Center

Package: _____ Applicatn Component: _____

Basic data | Description | Container | Triggering events | SAPphone

Create Container Element

Element: CostCenter

Texts

Name: Cost Center

Short Descript.: Cost Center

D. Type | Properties | Initial Valu | Change Data

SelectionOfPredefinedTypes

☒ Object Type: BOR Object Type

ZCCTR

☐ ABAP Dict. Reference

Structure: _____

Field: _____

☐ ABAP Dict. Data Type

Type Name: _____

Figure 16 Creating a new entry for object type ZCCTR

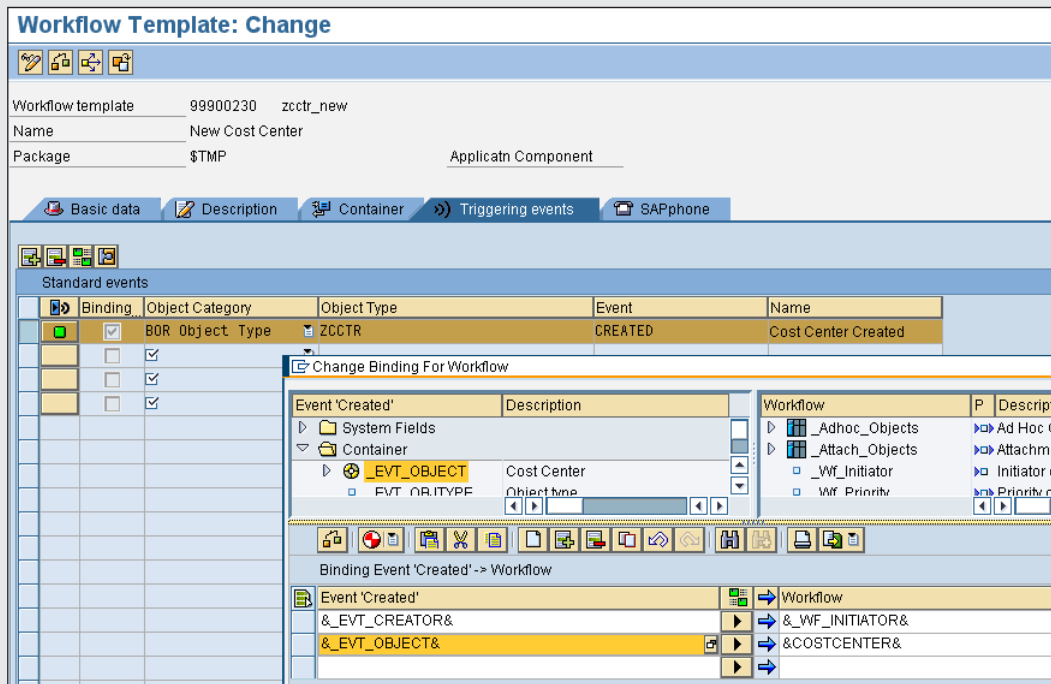


Figure 17 Binding an event to the workflow template

the workflow template. Enter “zcctr_new” in the Abbr. field and “New Cost Center” in the Name field, as shown in **Figure 15**.

Switch to the Container tab, and enter “CostCenter” in the Element field and “Cost Center” in the Name and Short Description fields to create a new entry of object type ZCCTR, which will enable you to subsequently retain the key values that are captured through the Cost Center Created event (see **Figure 16**).

The Triggering events tab is where you link the business object type event (Cost Center Created) to the workflow template. This causes the workflow to run when the event is triggered in the system. Switch to the Triggering events tab. In the Standard events section, to create a new entry for BOR object type ZCCTR event CREATED, highlight the trigger event row and click on the Binding check box, which displays the Change Binding For Workflow screen shown in **Figure 17**. To capture the cost center number from the business object event and map it

to the Cost Center object created on the Container tab, drag and drop the entries `_EVT_OBJECT` and `COSTCENTER` from the lists on the upper half of the binding screen to a corresponding row in the table on the lower half of the screen. This enables the inclusion of the cost center number and name in the email that you generate within your workflow.

Follow the menu path Additional data → Agent assignment → Maintain. Click on the Attributes button and select General Task to enable all users to trigger and work with this workflow template. If this step is not completed, the workflow will not function because no users will be authorized agents. Later you can return and specify a more defined group of authorized users if security is required around the solution.

Now that you have built the basic relationship between the triggering event and workflow template, you define the process that will take place within the workflow template. Switch back to the Basic data tab and click on the Workflow Builder button to access

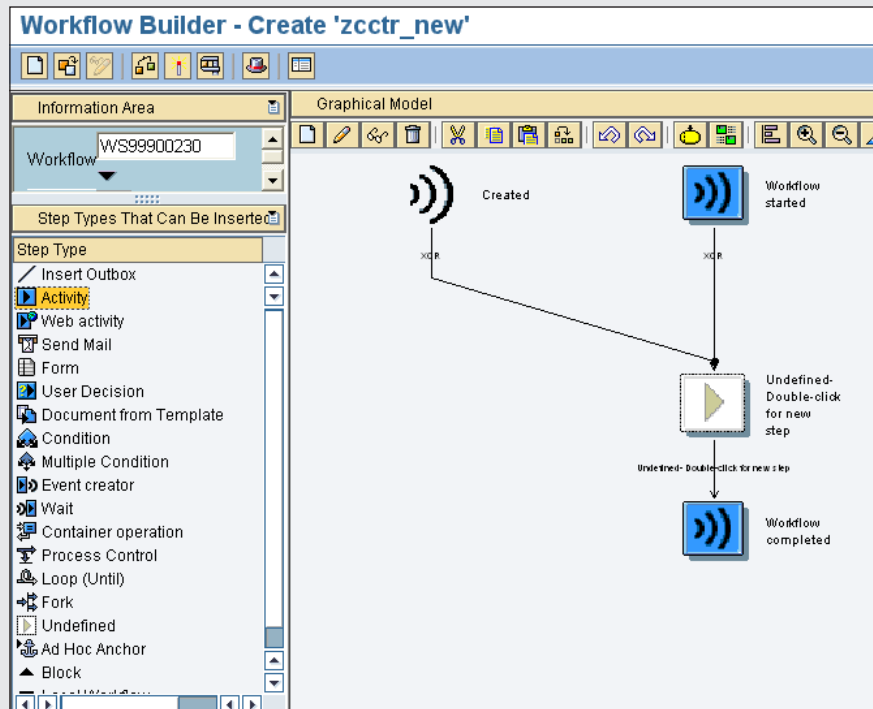


Figure 18 Initial graphical workflow screen

The screenshot shows the configuration for a 'User Decision' step. The title is 'Do you approve cost center &1 in company code &2?'. Parameters are defined for cost center and company code. The 'Agents' section shows the user 'MCHRISTENSEN'. The 'Decision Options' table lists 'REJECT' and 'ACCEPT' outcomes.

Decision Texts	Outcome Name
REJECT	REJECT
ACCEPT	ACCEPT

Figure 19 User decision step configuration

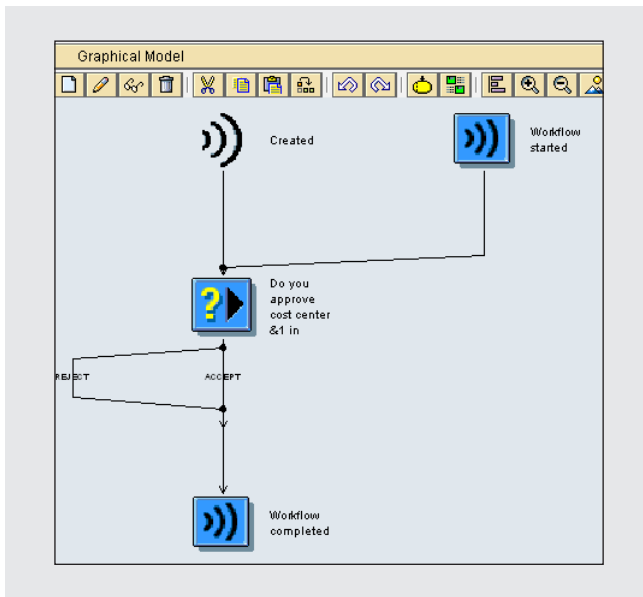


Figure 20 Workflow model with user decision step added

the graphical development environment, as shown in **Figure 18**. Here you drag and drop the step types from the list of available types on the left side of the screen onto the graphical model on the right.³

For my cost center example, you need to include a user decision step type. This step will ask whether the cost center should be rejected or retained. After you drag and drop the user decision icon onto the graphical workflow builder, a detailed screen, such as the one shown in **Figure 19**, appears. Here you specify the question that will prompt the agent for input, who will be the agent(s), and the options that can be selected. If you use placeholders, such as “&1,” “&2,” etc., to indicate variable parameters in the title, the SAP system will dynamically insert values from the workflow template container (which will hold the cost center number, name, etc.) directly into the question.

The Parameter fields have a search help assigned to them, so you can press F4 to display all of the possible field names in a tree format. Assign an agent

Figure 21 Activity step dialog

directly to a user name (MCHRISTENSEN). This is not a “best practice” because it is not very flexible in the event a user should change jobs or leave the organization, but it works well for initial testing.

Click on the check mark icon (✓) to return to the graphical model. As you can see in **Figure 20**, the system updates the initial graphical model to include the user decision step. As indicated by the user decision step workflow, the user will be presented with two choices — REJECT or ACCEPT — so the next task is to accommodate these two responses.

First, insert a task for deleting the cost center if it is rejected. Use the activity step type, which brings an individual task (i.e., a single unit of work) into the workflow template. Drag and drop the activity step type onto the line labeled REJECT. The activity step type dialog, shown in **Figure 21**, is displayed.

Here you want to find an existing task that can accomplish the cost center deletion task. Clicking on the search button for the Task field opens the Search and Find dialog for tasks (see **Figure 22** on the next page). Unfortunately, there is no existing task for this business object method, so you’ll need to create a new task. Close the dialog box.

To create a task for the activity step, call transaction PFTC_INS again. This time you’ll create a new object that is a standard task type. The configuration of a standard task for use within a workflow template is fairly straightforward and very similar to the

³ For comprehensive information on the Workflow Builder, go to the SAP Help Portal at <http://help.sap.com>, and following the menu path SAP NetWeaver → Application Platform → Business Services → SAP Business Workflow.

general configuration completed for the overall workflow template. Once you associate this new cost center deletion task with the ZCCTR business object type, the task automatically creates a container element

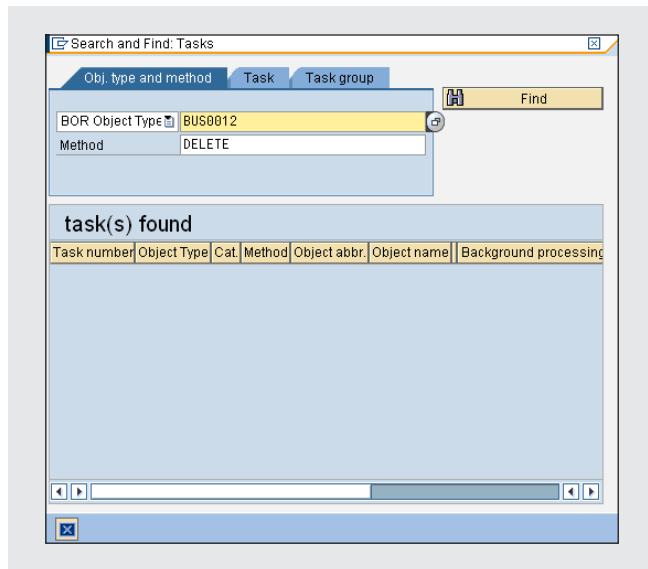


Figure 22 Search and Find dialog for existing tasks

named `_WI_OBJECT_ID` of type ZCCTR. This container element will be important for binding to the workflow template and passing the new cost center number into the method itself. It also enables you to enter parameterized work item text so you can see what cost center has been deleted when you view the workflow logs. Again, follow the menu path Additional data → Agent assignment → Maintain, click on the Attributes button, and set the General Task indicator to ensure this task will run without authorization issues. **Figure 23** shows the completed task definition. Note that this task was easy to create because the DELETE method was delivered along with the standard SAP system. You could have developed your own method and enabled it via the same task configuration.

Now that the delete cost center task is complete, you can return to creating the new workflow template and include this new task in the logical flow of the workflow template configuration. To begin, simply enter the standard task number that was generated through internal numbering when you created the task (e.g., 99900128) into the Task field

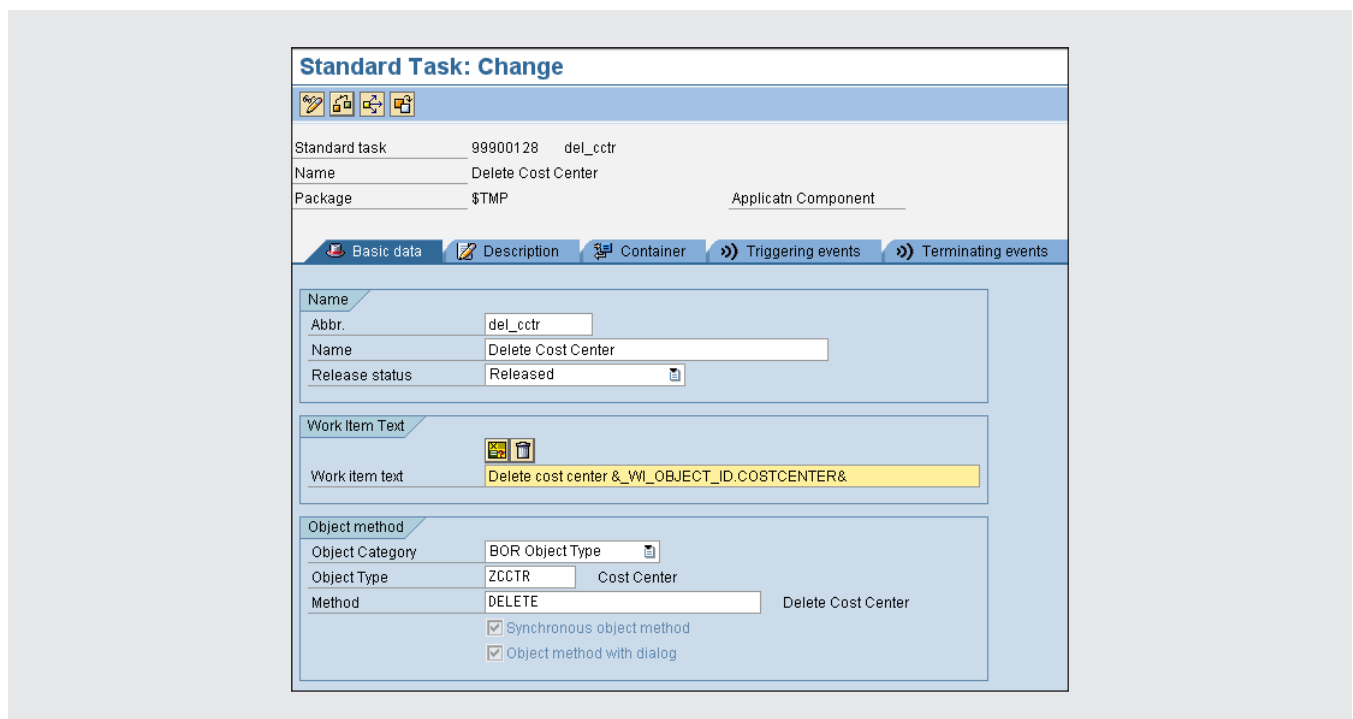


Figure 23 Defining the cost center deletion task

Note!

In this example I was able to use an existing business object type method. It is perfectly acceptable to create your own methods when a standard option does not exist. The typical approach is to create a function module and link it into a new method on the business object type definition. This function module should not contain any mandatory input parameters because they can cause the method to fail without a good error message. The example below shows sample code for attaching a function module or calling a transaction directly within a business object type method. Access this ABAP code through transaction SWO1 by selecting the method name and then clicking on the Program button.

```
BEGIN_METHOD DELETE CHANGING CONTAINER.
SET PARAMETER ID 'CAC' FIELD OBJECT-KEY-CONTROLLINGAREA.
SET PARAMETER ID 'KOS' FIELD OBJECT-KEY-COSTCENTER.
CALL TRANSACTION 'KS04' AND SKIP FIRST SCREEN.
END_METHOD
```

(or you can now search for it using the search help). Although binding should generate automatically, you can click on the Binding button to confirm the details. Note that this cost center deletion task is a dialog task and therefore requires that you assign an agent. If it were a background task, the generic workflow user would perform the activity in a background process. The distinction between dialog and background processing is driven by the settings on the Display Object Type dialog, as shown in **Figure 24**, and

subsequently the object method setting (DELETE) on the Basic data tab (**Figure 23**). You can view this method definition through the Business Object Builder by double-clicking on its name.

Next, you need to enter an agent. As you can see in **Figure 25**, I entered myself as the agent.

Finally, you want a notification to be generated if the cost center is approved. This time use the

Figure 24 Detailed settings behind business object type method

Figure 25 Complete task step definition

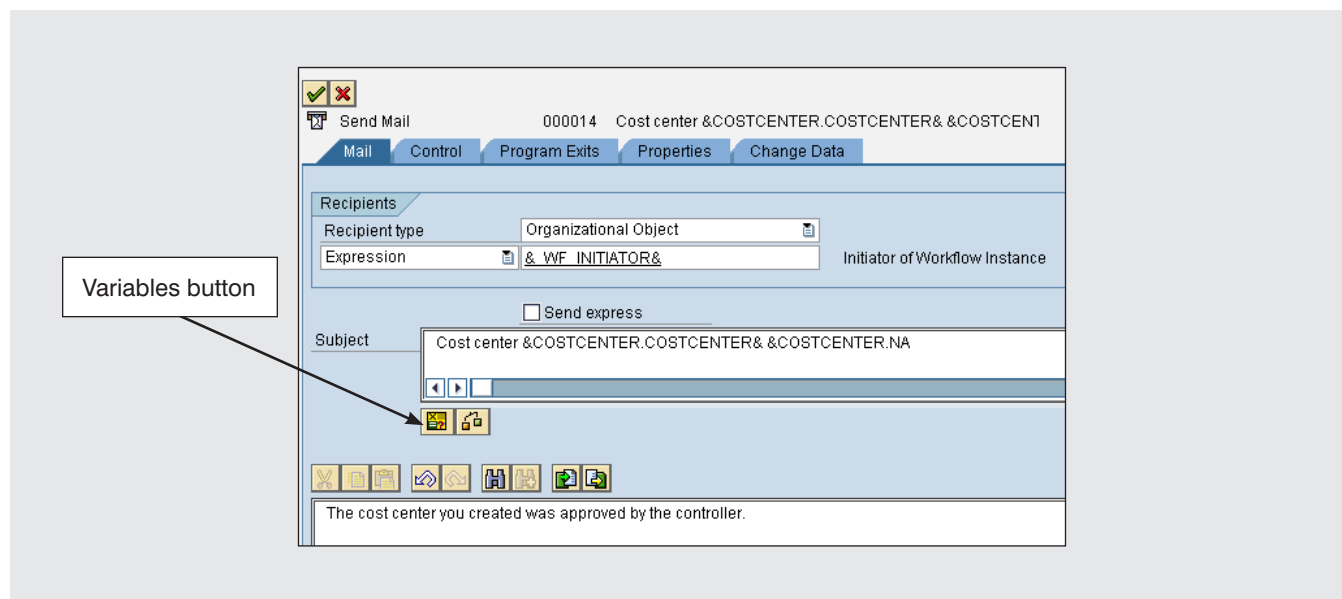


Figure 26 Send mail step type configuration

send mail step type. Drag and drop the send mail step onto the ACCEPT line in the graphical workflow model. Specify the recipients along with the message text. Again, you can parameterize the message. To include the cost center number and name, click on the Variables button, and then choose the appropriate elements from the COSTCENTER container element. As shown in **Figure 26**, the notification will only be sent to the original cost center creator because the `&_WF_INITIATOR&` container element was originally populated when you bound the Cost Center Created event to your workflow template. To select this agent, press F4 and select it from a list of available container elements. Alternately, you could maintain a mailing list or organizational unit within HR as the mailing list.

This completes the basic configuration of the workflow template. Many different configuration options are available at every level within the workflow template builder. These options can prove useful, but are not required when building a simple workflow, like the one in this article.

Note!

Rather than creating many cost centers in the test environment, you may just want to use transaction SWUE to create an event manually. You need to specify the business object type and existing valid key field values, but this avoids creating extraneous master or transactional data. This transaction has the added value of showing you any workflow templates that are triggered successfully.

Test run

Now that the initial configuration of the workflow template is complete, you should run a series of tests against the workflow template to make sure that it works as intended. If you are dealing with complex trigger points and need to trace the resulting activities through the system, you should activate the Event Trace. Because this is a simple workflow, you won't need to activate it.

Figure 27 Work item analysis

To initiate a test scenario, you need to create a new cost center manually and then use the work item analysis report (transaction SWI2_FREQ) to view the resulting work items, as shown in **Figure 27**. This report is a very powerful tool because it allows you to search for runtime instances of tasks or workflow templates by type, date, and name. In this case, you are in a development environment, so you can limit your search results by date and leave the type selection wide open.

The resulting list shows that a single work item was found (see **Figure 28**). Drilling down into the (Sub)workflow work item displays a detailed view of it. From there you can click on the Log button (🔍) to view the current status, steps completed, agent assignment, container contents, and many other pieces of information critical to testing and troubleshooting workflow solutions. The workflow log is shown in **Figure 29**.

Task	Task text	Work Item Type	Number
WS99900230	New Cost Center	(Sub)workflow	1
			1

Figure 28 Work item analysis results

Workflow and task	Details	Graphic	Agent	Status	Result	Date	Time
New Cost Center				In Process	Workflow started	05/14/2...	14:13:...
Do you approve cost center 1000V in company code 1000?				Ready		05/14/2...	14:13:...

Figure 29 Detailed work item log

The screenshot shows the 'Decision Step in Workflow' window. At the top is a menu bar with 'Decision', 'Edit', 'Goto', 'System', and 'Help'. Below the menu is a toolbar with various icons. The main title is 'Decision Step in Workflow'. Below the title are two buttons: 'Workflow' and 'Create'. The central question is 'Do you approve cost center 1000V in company code 1000?'. Below this question is a section titled 'Choose one of the following alternatives' with three options: 'REJECT', 'ACCEPT', and 'Cancel and keep work item in inbox'. At the bottom, there are two columns: 'Description' and 'Objects and attachments'. The 'Description' column contains text explaining the decision step and the 'Cancel' option. The 'Objects and attachments' column shows 'No attachments or objects'.

Decision Step in Workflow

Workflow Create

Do you approve cost center 1000V in company code 1000?

Choose one of the following alternatives

REJECT

ACCEPT

Cancel and keep work item in inbox

Description

Choose one of the decision options given. This completes the processing of this step.

Before you make a decision, you can display the attachments and objects which have been attached to the user decision. You can also create your own attachments.

If you choose **Cancel**, the user decision remains in your inbox for processing.

Objects and attachments

No attachments or objects

Figure 30 User decision task

The screenshot shows the 'Delete Cost Center: Initial Screen' window. At the top is a menu bar with 'Cost Center List', 'Edit', 'Goto', 'Extras', 'Environment', 'System', and 'Help'. Below the menu is a toolbar with various icons. The main title is 'Delete Cost Center: Initial Screen'. Below the title is a section titled 'Cost center' with a radio button and a text field containing '1000V'. Below this is a section titled 'Parameters' with a 'Valid From' field containing '01/01/2000' and a 'to' field containing '12/31/9999'. At the bottom is a section titled 'Processing' with two checkboxes: 'Background Processing' and 'Test Run'.

Delete Cost Center: Initial Screen

Cost center 1000V

Parameters

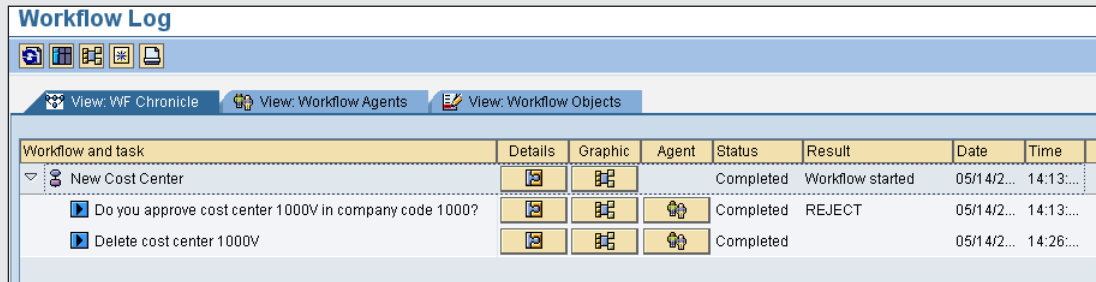
Valid From 01/01/2000 to 12/31/9999

Processing

☐ Background Processing

☐ Test Run

Figure 31 Cost center deletion task



The screenshot shows the 'Workflow Log' window with three tabs: 'View: WF Chronicle', 'View: Workflow Agents', and 'View: Workflow Objects'. The 'View: WF Chronicle' tab is active, displaying a table of workflow tasks. The table has columns for 'Workflow and task', 'Details', 'Graphic', 'Agent', 'Status', 'Result', 'Date', and 'Time'. The first row shows a task 'New Cost Center' with status 'Completed' and result 'Workflow started'. The second row shows a decision task 'Do you approve cost center 1000V in company code 1000?' with status 'Completed' and result 'REJECT'. The third row shows a task 'Delete cost center 1000V' with status 'Completed'.

Workflow and task	Details	Graphic	Agent	Status	Result	Date	Time
New Cost Center				Completed	Workflow started	05/14/2...	14:13:...
Do you approve cost center 1000V in company code 1000?				Completed	REJECT	05/14/2...	14:13:...
Delete cost center 1000V				Completed		05/14/2...	14:26:...

Figure 32 Work item analysis of completed workflow template

Clicking on the question “Do you approve cost center 1000V in company code 1000?” displays the user decision task. Clicking on the execute button to run this decision step displays the screen shown in **Figure 30**.

Click on the REJECT option to display the initial screen for the Delete Cost Center transaction shown in **Figure 31**, along with appropriate parameters prepopulated from the workflow container. You can execute this transaction and then back out of it to return to the workflow log. The workflow in **Figure 32** shows the status of the workflow item

(Completed) and other information, such as the decisions (REJECT), dates, times, etc., associated with each step.

You should run another test scenario to ensure the system processes the ACCEPT option appropriately. After viewing the deletion transaction online, you should probably invest the time to create another method within the business object type ZCCTR that would attempt to run this task in background processing. If a bad return code were encountered by the system during the background attempt, you could continue to use the dialog task to provide an administrative user with visibility into this undesirable cost center so it can be blocked or deleted in some other manner.

Note!

You can integrate SAP Business Workflow with Microsoft Outlook, Lotus Notes, or SAP NetWeaver Portal to provide users with a friendly experience. For testing purposes, you can access the Business Workplace through transaction SBWP, which is a sufficient interface, but the ultimate solution may be most useful through a common inbox provided by these external toolsets. This enables users who are familiar with their email inbox to continue working in a single environment and avoids the risk of their forgetting to check their SAP queue for tasks that need to be processed.

SAP NetWeaver 2004 and higher enhancements

It is always a positive indicator to see continuous improvement within software as you consider putting it to use. Several new features in SAP Business Workflow have been made available as of SAP NetWeaver 2004. The following is a brief overview of the new features and how they can make workflow even easier to develop and use:

- You can use ABAP Objects using the Class Builder (SE24) in the same manner as business

objects previously deployed using the Business Object Builder (SWO1). ABAP Objects have the capability to contain events and methods, just like business object types, and benefit from a more robust development environment. Many of the configuration transactions, such as the workflow used to link a change document to an event, still rely on the use of business objects. As SAP continues to implement more of its standard code using classes, workflow developers will benefit significantly by being able to access these classes directly within workflow definitions. Within the Workflow Builder, you can choose the type of object you want to use, as shown in **Figure 33**. If you have object-oriented ABAP experts on your team, you should use ABAP classes whenever possible.

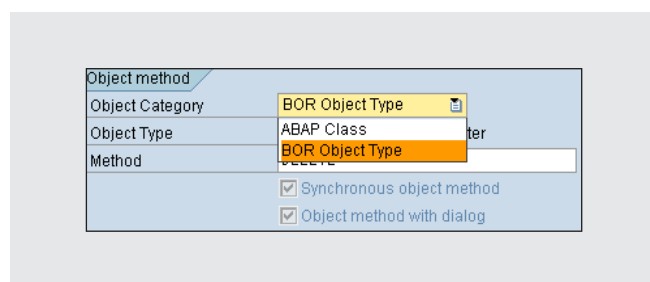


Figure 33 Object type options

- Further flexibility has been added to binding configuration. Within any binding screen, you can click on the Assign Value button (📄) to launch the dialog shown in **Figure 34**. Here you have the option of appending a new entry to an existing table when collecting error messages or log entries throughout the lifetime of a workflow template. You can also diffuse an error by selecting the Handle Errors as Warning check box to enable this option. Using these two new features will make it possible for you to handle error messages more effectively and efficiently throughout an overall workflow process.
- Container technology has been revised. It uses XML documents instead of traditional database table storage. This enhancement overcomes previous limitations on the types of data that could be held within a container. It is possible to reference ABAP Objects and complex structures, both of which are being used increasingly in recent releases of SAP applications (see **Figure 35** for options). A reduction in storage space requirements is also realized through this conversion as only populated fields consume storage space in the XML document format.
- The administrative toolbox has several new utility transactions. They are located in the menu path Tools → Business Workflow → Development → Administration → Workflow Runtime. For the list

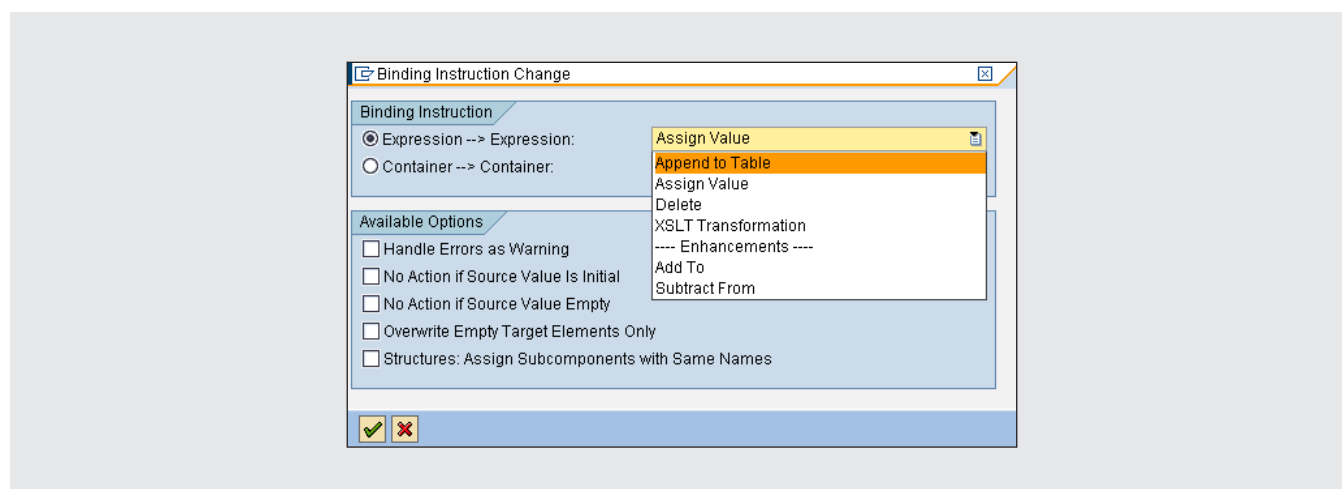


Figure 34 Advanced binding configuration options

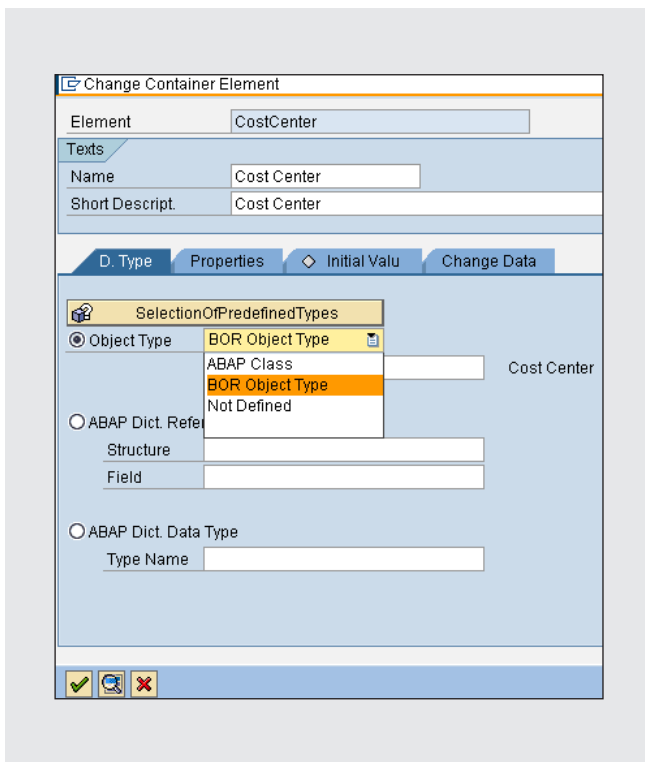


Figure 35 Extended options for container element definition

of options, see **Figure 36**. For example, you can use transaction SWI2_ADM2 to find any existing work items with deleted users. You can also use transaction SWI1_RULE to reapply agent

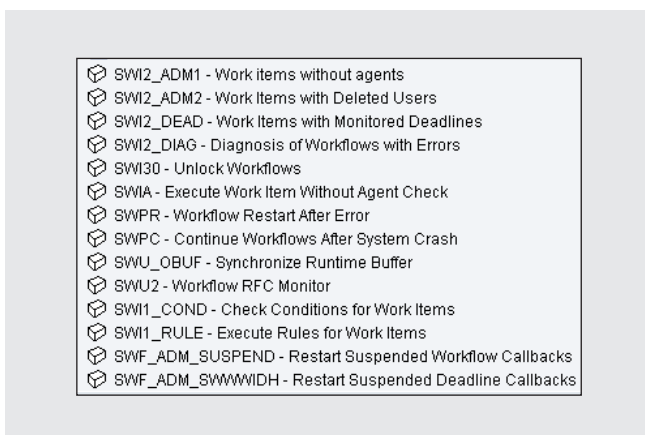


Figure 36 Workflow runtime utility transactions

determination rules⁴ to existing active work items. These and other new transactions will make workflow more responsive to the ongoing process changes that are inevitable in today's fast-paced business world.

- Standard content delivered with recent releases of SAP NetWeaver BI provides enhanced reporting of work items and alerts. This is in alignment with the overall SAP strategy of providing powerful analytic capabilities without extensive customization and development. This reporting will provide greater flexibility and performance than reporting previously based in the transactional SAP systems. For example, it will be possible to analyze which users have processed particular tasks most frequently. Having reporting available in BI also facilitates archival of old work items without losing the capability to report against that history. SAP NetWeaver BI continues to evolve in its ability to capture data in a near real-time manner and the standard data sources delivered for workflow are delta-enabled, therefore alleviating any concerns of data being aged when it becomes available for reporting in BI.

- Finally, further options for user interaction continue to become available with each new release of SAP NetWeaver. Extended notifications is a new concept that enables the system to send notifications to a user's common inbox, such as Microsoft Outlook or Lotus Notes, for processing. This is easier to implement than previous integration that required settings in the user's mail client to log into SAP and proactively check for assigned tasks. As the SAP system landscape becomes more complex, it is also advisable to consider implementing a Universal Worklist (UWL) through SAP NetWeaver Portal. The UWL allows users to see all their assigned tasks across multiple systems. This is especially important as business processes begin to cross over multiple SAP and non-SAP systems.

⁴ For information on rules, go to the SAP Help Portal at <http://help.sap.com>, and follow the menu path SAP NetWeaver → Application Platform → Business Services → SAP Business Workflow.

Conclusion

I hope this article has proven how easily workflow solutions can be implemented while providing a sense of how valuable and powerful they can be to a business environment. SAP Business Workflow is truly an underutilized application that should be part of the solution toolset at every company that uses

SAP. Look for high impact, easy-to-implement opportunities to apply this technology within your organization. As you realize success in these areas, further applications will become readily apparent and gain momentum of their own. Before long, you'll be developing standards to use SAP Business Workflow and looking for opportunities to apply its powerful functionality.