

SAP Solution in Detail
SAP Interactive Forms by Adobe



SAP® INTERACTIVE FORMS BY ADOBE

THE BEST-RUN BUSINESSES RUN SAP™



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EXECUTIVE SUMMARY

Today, a growing number of users within and beyond the enterprise firewall interact with enterprise applications – such as enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM) – to facilitate key business processes. Often, these interactions are via paper-based forms, such as purchase orders, travel requisitions, customer orders, and expense reports. But paper-based forms are error-prone, quickly outdated, frequently redundant, and often require manual data entry that leads to inaccurate data. To overcome the drawbacks of paper-based forms, many enterprises have implemented online, or Web-based, forms using HTML. However, HTML forms have several limitations of their own: they are difficult to print, cannot be handled offline, and more often than not have a different look and feel than paper-based forms, engendering confusion and mistakes.

Given the proliferation of new business processes and the need to integrate an expanding population of users into these processes, Adobe and SAP have partnered to create a solution that allows

enterprises to develop interactive forms that are integrated with business processes – quickly and easily. The joint solution, called the SAP® Interactive Forms software by Adobe, integrates interactive PDF-based forms with business processes that are supported by Web-based SAP applications developed and deployed using the Web Dynpro development environment framework.¹

With SAP Interactive Forms software, personnel change requests, cost center change requests, internal requisitions, and online recruiting forms can be used to interact directly with business processes. The solution provides a bridge between the highly structured transaction data stored in enterprise applications and the unstructured, document-based information and processes that exist inside and outside the enterprise firewall. With this direct interaction, enterprises can improve communication and collaboration, increase data accuracy, reduce operational costs, and ensure the implementation of best practices.

1. In the SAP NetWeaver® platform, SAP Interactive Forms supports the Web Dynpro for Java and Web Dynpro for ABAP™ programming language frameworks.

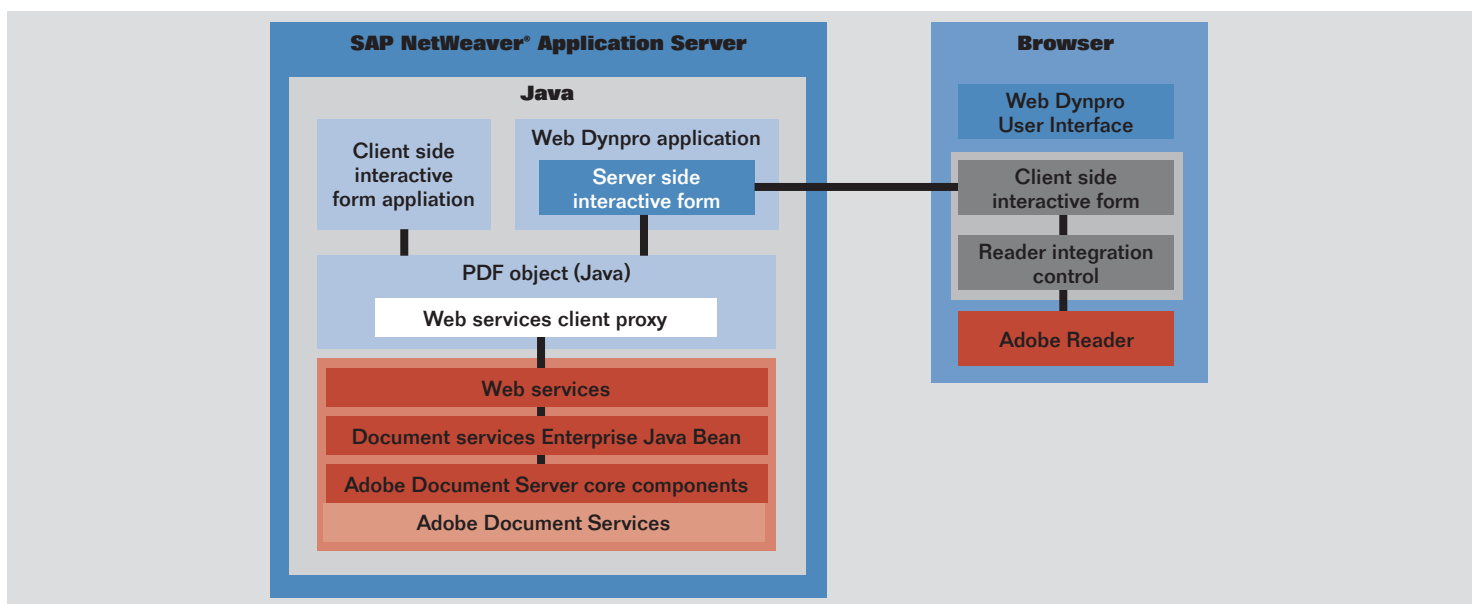


Figure 1: SAP® Interactive Forms Architecture – Runtime

SOLUTION OVERVIEW

Through a combination of Adobe and SAP technologies, SAP Interactive Forms allows enterprises to eliminate redundant and inaccurate data and improve the speed with which they can respond to customer needs and changing business requirements. End users access interactive PDF forms directly from Web Dynpro. The forms can be prepopulated with information stored in the SAP application based on the user's role in the business process. End users can then add supplementary information or update existing information directly in the interactive form – online or offline.

After the user enters data into the form, the data can be validated for appropriate format, using client- or server-side validation. Also, calculations – such as current interest rate or overtime premiums – can be made using Web services or direct application programming interface (API) connections with Web Dynpro. When the user submits the interactive PDF form back to the SAP application, the data is automatically transferred from the form to the SAP application using XML.

Fully integrated into the SAP NetWeaver® 2004 platform,² SAP Interactive Forms enables developers to:

- Design templates and create interactive forms in the SAP NetWeaver Developer Studio tool or the ABAP™ programming language workbench using Adobe LiveCycle Designer software
- Integrate SAP Interactive Forms with any SAP application
- Distribute interactive forms from within SAP applications to users for a multitude of business processes, including ERP, CRM, and SCM

SAP® Interactive Forms software by Adobe is supported on the following server operating systems:

- Microsoft Windows 2000 Server/Windows Server 2003
- Sun Solaris
- HP-UX
- IBM AIX
- Red Hat Linux/Intel
- SUSE LINUX/Intel

SAP Interactive Forms is based on the following technology components from SAP:

- SAP NetWeaver Application Server (SAP NetWeaver AS) component – Includes a Java 2 Platform, Enterprise Edition (J2EE) engine that contains the Web Dynpro runtime, including a server-side, interactive form user interface element for executing Web Dynpro with SAP Interactive Forms. SAP NetWeaver AS also contains SAP NetWeaver Developer Studio, an Eclipse-based development environment for Java that enables the creation of Web Dynpro applications containing SAP Interactive Forms. SAP Interactive Forms is integrated with SAP NetWeaver Developer Studio.
- PDF object – An encapsulated object that presents an API for Adobe Document Services calls. This API is offered for both Java and ABAP.

2. SAP Interactive Forms is available as part of SAP NetWeaver (through SAP NetWeaver AS 6.40). ABAP-based data in SAP R/3® software can be accessed from Web Dynpro using technologies such as the SAP Java Connector and Adaptive RFC.

SAP Interactive Forms includes the following Adobe technology components:

- Adobe LiveCycle Designer – A design-time environment for creating interactive forms in an easy-to-use, drag-and-drop manner. Adobe LiveCycle Designer is fully integrated with two proven SAP development environments: SAP NetWeaver Developer Studio for the development of Java-based SAP applications, and ABAP workbench for the development of SAP applications using the ABAP programming language.
- Adobe Document Services – A set of runtime services, deployed on the SAP NetWeaver AS, that:
 - Convert XML form templates (created using Adobe LiveCycle Designer) to PDF and various print formats
 - Set Adobe Reader rights to enable users to annotate forms, save them locally, and include digital signatures for authentication using the free and ubiquitous Adobe Reader software
 - Extract data from SAP applications into SAP Interactive Forms and transfer form data back into SAP applications using XML
 - Support certification of form templates to ensure the authenticity and integrity of the form template
 - Enable encryption to ensure the confidentiality and privacy of the form³
- Adobe Reader⁴ – The universal reader is all that is needed by end users to display SAP Interactive Forms at runtime. Forms created using SAP Interactive Forms are displayed either in a browser using the Adobe Reader plug-in or by the stand-alone Adobe Reader.

3. Available in the next release of SAP NetWeaver.

4. Requires Adobe Reader 6.0.2 or higher.

DESIGNING, CREATING, AND DEPLOYING INTERACTIVE FORMS IN WEB DYNPRO

SAP Interactive Forms allows enterprises to reduce the time required to design, manage, and maintain extended forms-based processes using standards-based, easy-to-use form design and deployment tools. Rather than invest in expensive, time-consuming custom JavaServer Pages development, enterprises can use Adobe LiveCycle Designer – embedded within SAP NetWeaver Developer Studio – to design and create interactive PDF-based forms that are integrated with Web Dynpro. The solution enables developers to create interactive online and offline forms to support new business scenarios.

Online Forms

In an online form scenario, the user maintains a connection to the SAP application – for example, through a company portal. The form is filled out by the user and submitted to the server in the same online session. The form may also include some prefilled information based on the recipient’s name, role in the organization, title, and so forth. Here is how an online form scenario functions:

- Triggered by an end user working in Web Dynpro, Adobe Document Services generates an interactive form and populates it with relevant application data.
- The interactive form is displayed using the Adobe Reader plug-in during execution of Web Dynpro in a browser.
- Web Dynpro receives the displayed data or completed PDF document, the Adobe Document Services extracts the data from the PDF file, and the application writes the user-entered data to the back-end system.

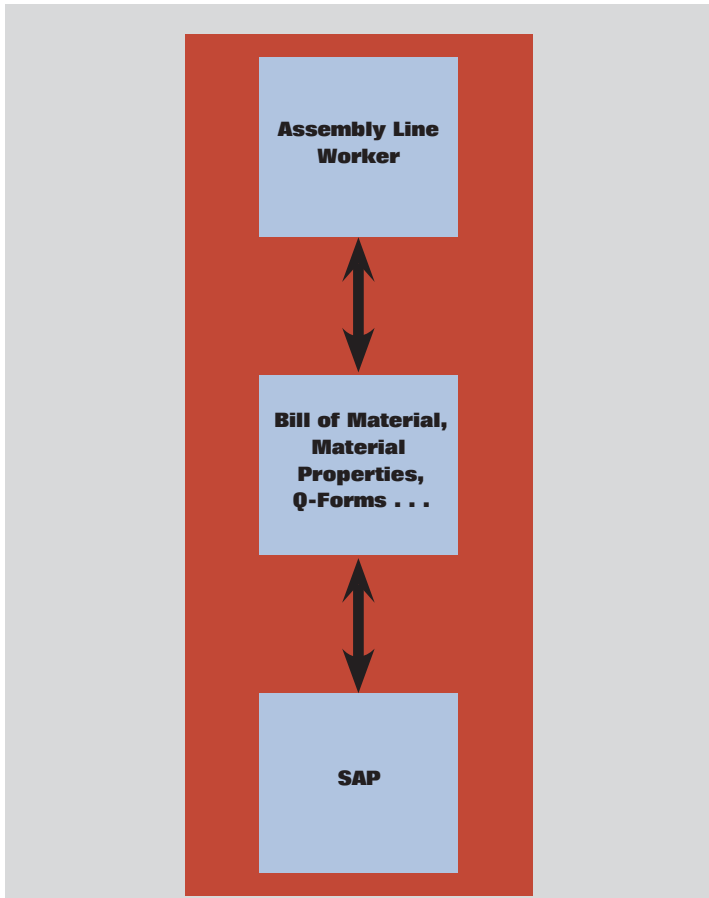


Figure 2: Online Forms Example

Offline Forms

In an offline form scenario, the user may download and save the interactive PDF form for later data entry and submission. Here is an example of an offline form scenario using upload/download functions:

- The user downloads an interactive form from a Web site to a local hard drive.
- The form is displayed locally using Adobe Reader.
- The user can make changes to the interactive form using Adobe Reader.
- The user then uploads the interactive form from the local file system to the Web site.

Alternatively, an interactive form can be sent to a user via e-mail from a Java application using the Java Mail API or from an ABAP-based application using the SAP business communication service. Upon receipt of the e-mail, the user saves the form attachment to the hard drive and fills it in. Then the user either uploads the form using Web Dynpro, as described previously, or submits the form to the application via e-mail using the *E-mail Submit* button included in the form.

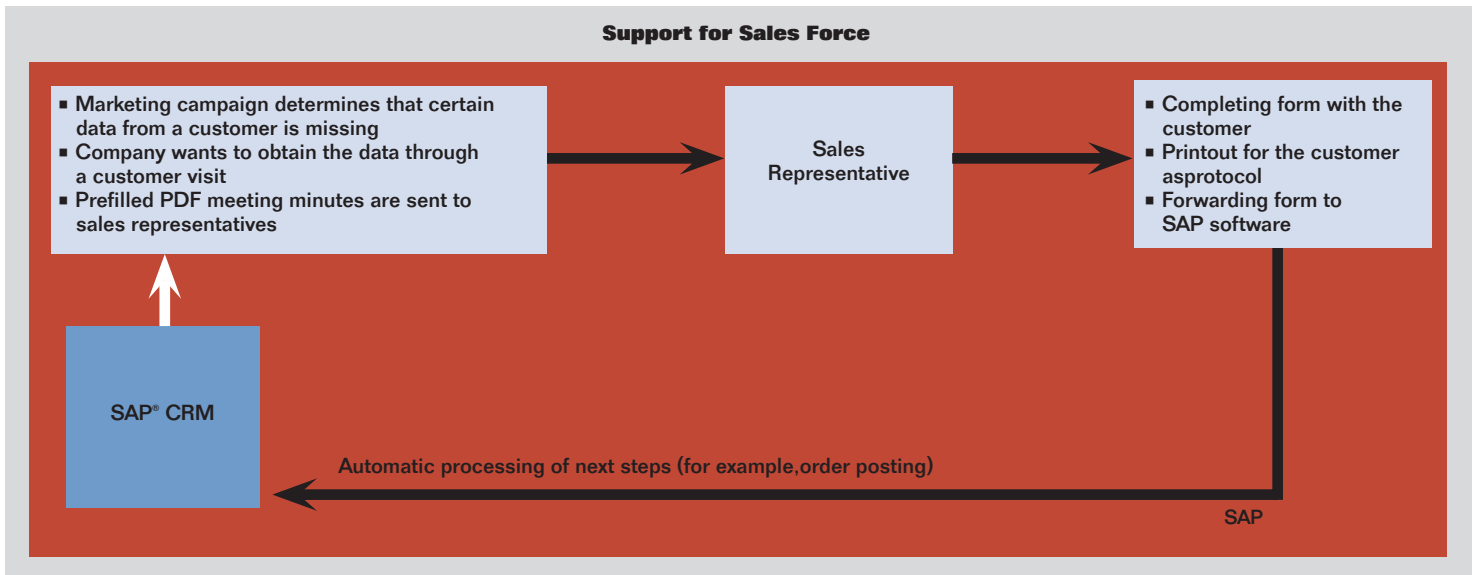


Figure 3: Offline Forms Example

DOCUMENT GENERATION

You can create high-quality, multichannel output (print, fax, and e-mail) with SAP Interactive Forms. Because of its superior output capabilities, SAP Interactive Forms can also be used for forms that require no direct interaction with the user. For example, business processes using forms that are entirely prefilled by an application and then distributed to recipients – such as customer fulfillment or payroll reports – can benefit from the easy-to-read paper-like attributes of SAP Interactive Forms.

Here is how document generation functions:

- Based on the data received via the business logic (ABAP or Java application) and a form template, Adobe Document Services merge the forms and their data (in PDF, PostScript, printer control language, or Zebra programming language formats). The form can then be e-mailed, printed, or faxed to employees, partners, or customers.
- Outgoing forms can be archived in PDF format for future use.
- Using J2EE, developers can e-mail generated forms. Using ABAP, developers can e-mail and fax generated forms with the SAP business communication service. Forms can also be printed using the spool.

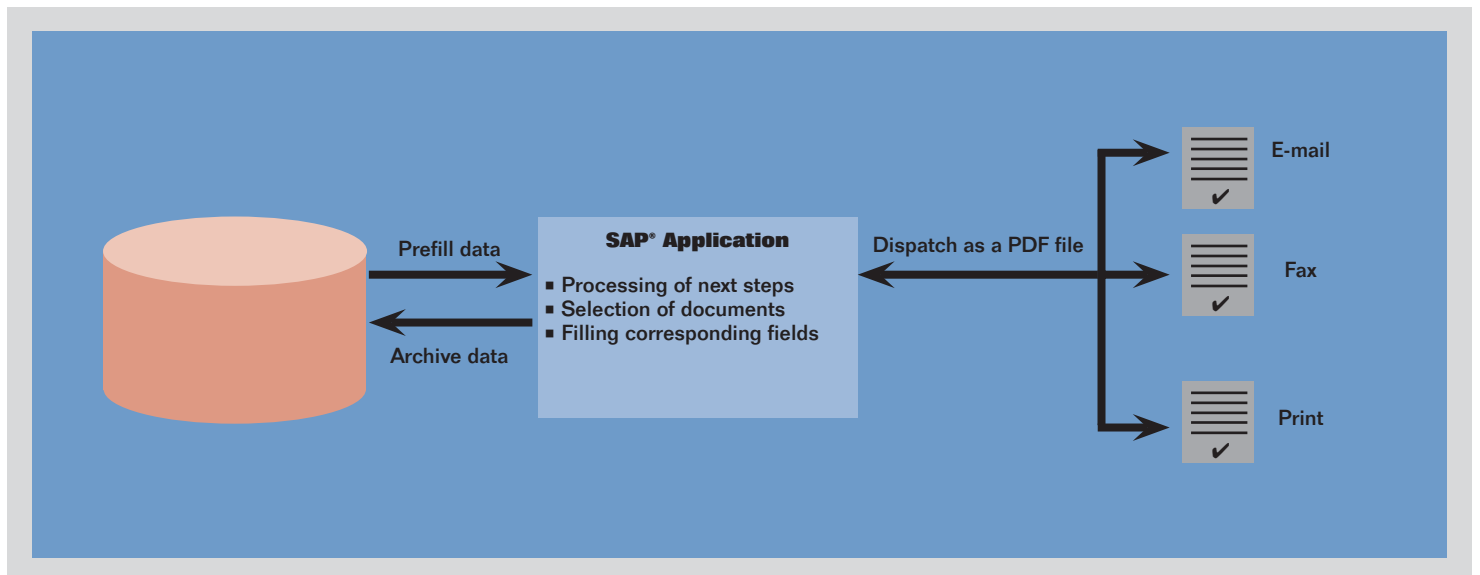


Figure 4: Document Generation Example

CREATING A SIMPLE INTERACTIVE FORM USING WEB DYNPRO

This section describes the step-by-step procedures involved in creating a simple interactive form within Web Dynpro.

Defining the Form Elements

The following steps refer to Figure 5:

1. Within the SAP NetWeaver Developer Studio/Web Dynpro perspective, drag and drop the *Interactive Form* element onto the *Layout* pane.
2. Select the *Interactive Form* element in the *Outline* pane.
3. Set form properties, such as:
 - *dataSource* – Specifies the source of the data to be used in the interactive form and encapsulates the data displayed in the form at runtime. The path to the context node providing the data must also be specified. The structure of the context node, which is referenced by the *dataSource* property, is also displayed in the *Data View* tab of Adobe LiveCycle Designer. The corresponding context attributes of this node can be bound to Adobe LiveCycle Designer layout elements defined in the form.
 - *updateDataInPdf* – Enables automatic entry of a data value. *UpdateDataInPDF* is used to update a PDF document with the data provided by the data source or to create a new PDF document from the data source and the form template if no PDF document exists.
 - *pdfSource* – Defines the path of the context element that contains the PDF document. This property must be bound to a context attribute of the type binary. This property allows a developer to access the binary file and download it to the local hard disk or read and send the data to a backend.
 - *templateSource* – Specifies the unique name of the form template. The name is automatically generated when the *Interactive Form* user interface element is inserted into the view.

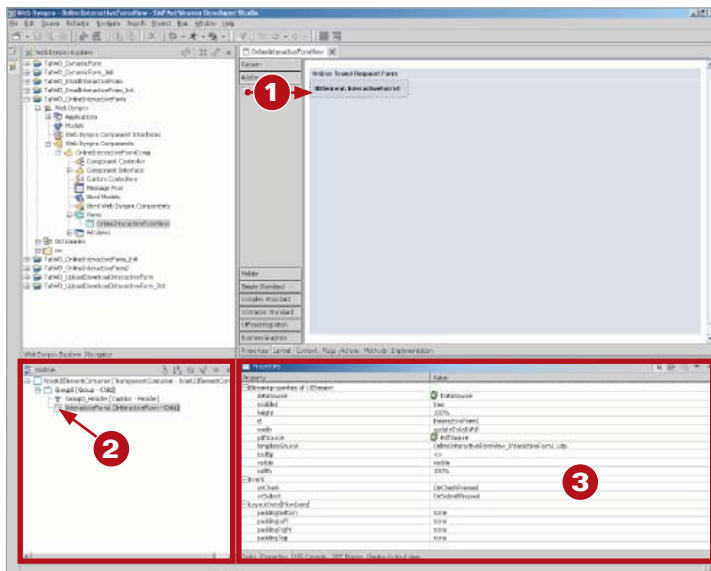


Figure 5: Defining the Form Elements

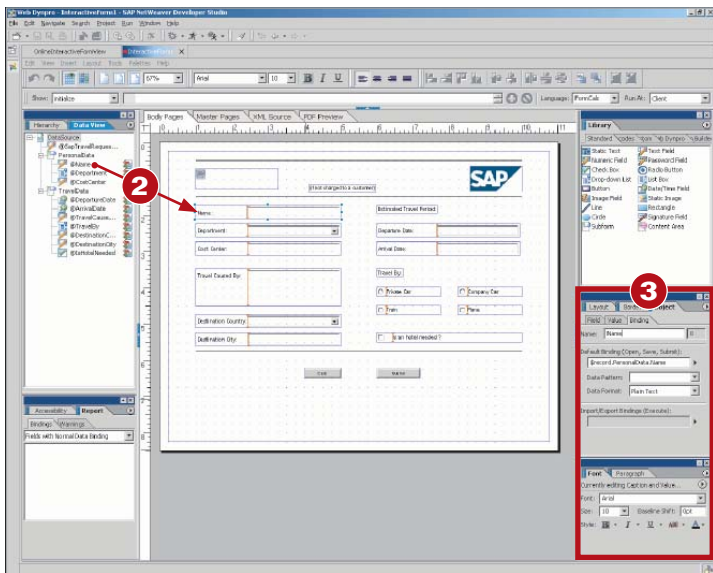


Figure 6: Form Layout and Binding to the Context

Form Layout and Binding to the Context

The following steps refer to Figure 6:

1. Double-click the *Interactive Form* element to launch Adobe LiveCycle Designer.
2. Drag and drop context elements from the *Data View* pane to the *Body Pages* pane in Adobe LiveCycle Designer. A text field representation of *Name* appears on the *Body Pages* pane.
3. Set properties, such as marking caption text or defining data patterns, in the *Object* tab and set fonts in the *Font* tab.

Note: The binding can be checked and changed in the *Object* tab. After the first step, *Default Binding* is set automatically to the corresponding context node *\$record.PersonalData.Name*, but it is also possible to add binding manually.

Integrating Drop-Down Lists

The following steps refer to Figure 7:

1. Drag and drop a *Value Help Drop-down List* element from the Web Dynpro *Library* tab to the *Body Pages* pane in Adobe LiveCycle Designer.
2. Drag and drop context elements from the *Data View* tab onto the *Value Help Drop-Down List* element. This action binds the layout element to the corresponding data source.
3. Set the properties of the drop-down list, such as the element caption or fonts.

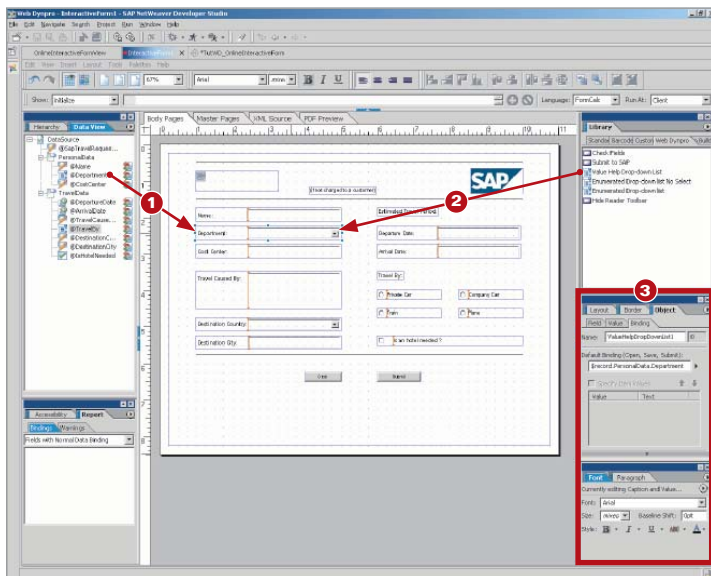


Figure 7: Integrating Drop-Down Lists

Note: SAP NetWeaver provides three different drop-down list elements in the Web Dynpro *Library* tab:

- *Value Help Drop-Down List* – Used when drop-down list items are not available at form creation. Values enumerated in this type of list are not stored in the form. Item lists can be added dynamically by data type modification.
- *Enumerated Drop-Down List* – Used when drop-down list items are available at form creation. Values enumerated in this type of list are stored in the form. The first list item is selected by default when the form is deployed.
- *Enumerated Drop-Down List (No Select)* – Also used when drop-down list items are available at form creation, but no list item is selected by default when the form is deployed.

Integrating Check and Submit Buttons

The following steps refer to Figures 8 through 11:

1. Drag and drop the *Check Fields* and the *Submit to SAP* elements from the Web Dynpro *Library* tab to the *Body Pages* pane in Adobe LiveCycle Designer.
2. Switch to the corresponding Web Dynpro view and create two new actions named *CheckPressed* and *SubmitPressed* on the *Action* tab. The corresponding event handlers *onActionCheckPressed* and *onActionSubmitPressed* are generated.
3. Click the *Layout* tab, select the *Interactive Form* element in the *Outline* pane, and switch to the *Properties* tab. Select the *Check-Pressed* action for the *onCheck* event and the *SubmitPressed* action for the *onSubmit* event.
4. Add the Java code in the corresponding event handlers. You can implement code for server-side checking of the data in the form (*CheckPressed*) or server-side processing of the data (*SubmitPressed*).

Web Dynpro, including the interactive form, can now be deployed.

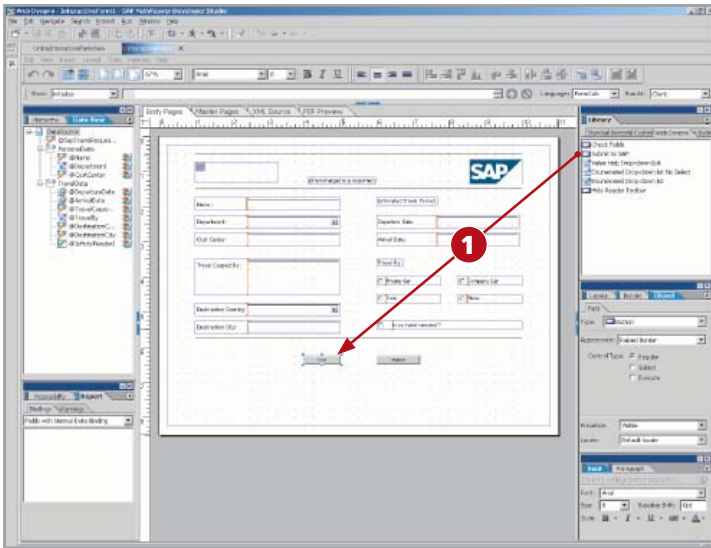


Figure 8: Integrating Check and Submit Buttons

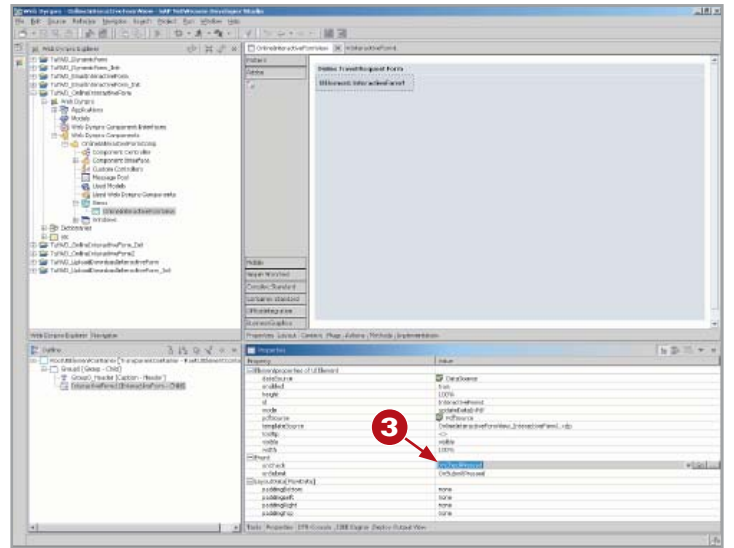


Figure 10: Integrating Check and Submit Buttons

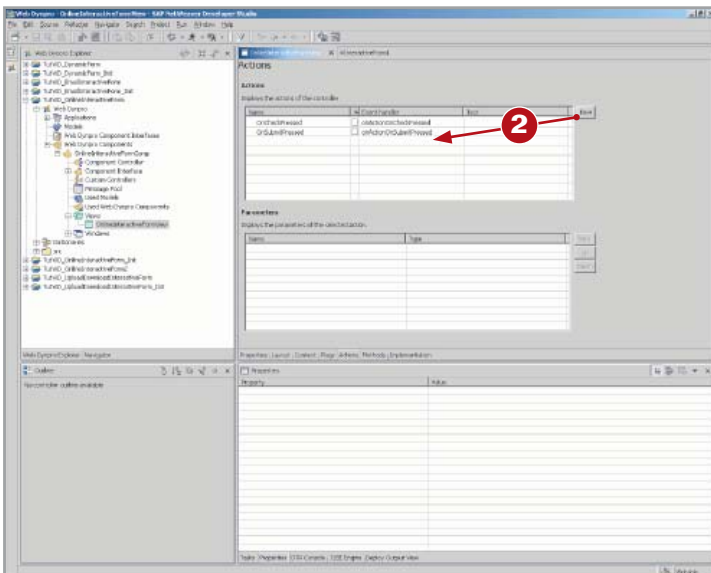


Figure 9: Integrating Check and Submit Buttons

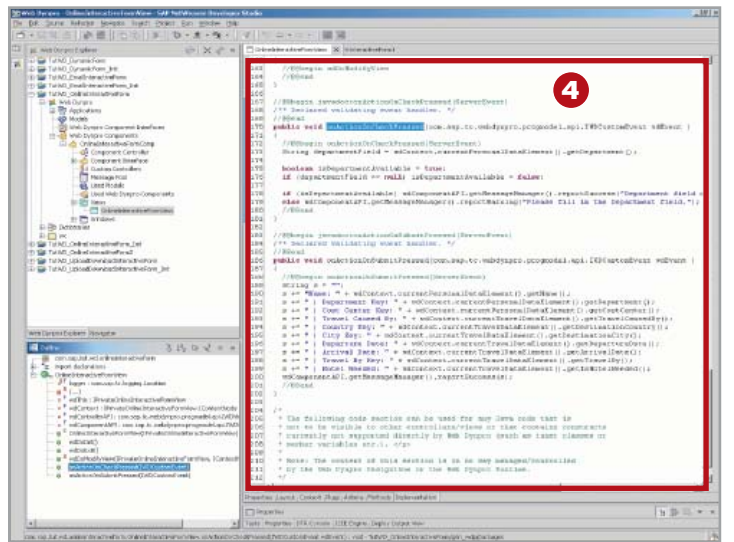


Figure 11: Integrating Check and Submit Buttons

INTERNET SERVICE REQUEST AND SAP GUIDED PROCEDURES

To help SAP application experts create interactive forms within SAP applications, the SAP ERP application includes an ABAP-based framework called Internet Service Request (ISR). The framework guides form designers in creating a consistent look and feel for all interactive forms by blending form management, business logic, and workflow management in a consistent, logical manner. Using SAP Interactive Forms with ISR, you can include interactive forms in Java-based Web Dynpro, while the business workflow and related events run in the ABAP stack.

Another Java-based SAP workflow tool that allows use of SAP Interactive Forms for data capture and exchange is called Guided Procedures. Guided Procedures enables users to create forms using Adobe LiveCycle Designer and to design the form workflow using a browser-based workflow configuration interface. Both Java and ABAP back ends can be used, and both online and offline forms scenarios are supported.

INTERACTIVE FORMS DEPLOYMENT SCENARIOS

Here are three deployment scenarios that illustrate how SAP Interactive Forms can be integrated with business processes.

Enterprise Resource Planning Scenario

A supervisor on the shop floor of a large manufacturer needs to order additional parts and materials so that the company can meet an unexpectedly large customer order. Traditionally, the supervisor would find the appropriate paper-based purchase requisition form, fill it in by hand, sign it, and send it to the next level of management for approval and fulfillment by in-house mail.

Using SAP Interactive Forms, the same supervisor – already logged in to the SAP NetWeaver Portal component through SAP ERP – accesses the required purchase requisition form on the company portal and displays it in PDF format on his or her Web browser (see Figure 12). Upon display, the form is prefilled with the supervisor’s relevant information, such as name, location, and cost center, based on user login.

While remaining logged in to the SAP NetWeaver Portal, the supervisor then enters the required information on the purchase requisition form. When finished, the supervisor submits the form back to the system by clicking the *Submit* button in the form. The data is saved to the application database, and the corresponding workflow moves the process to the next step.

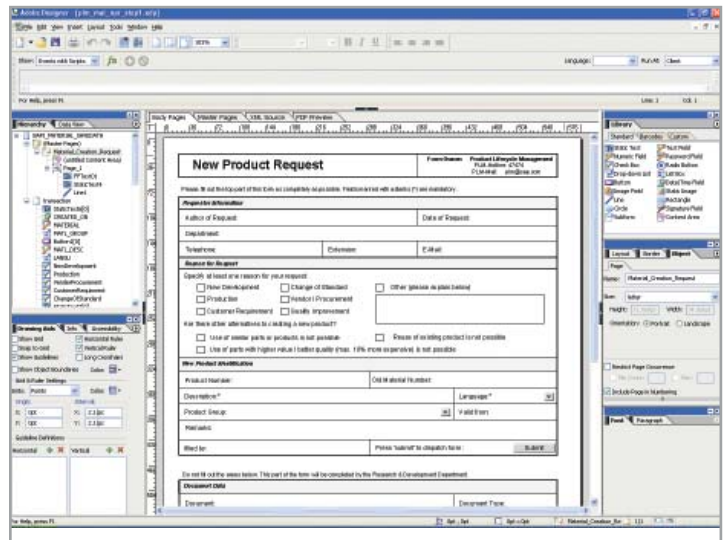


Figure 12: New Product Request Form

Customer Relationship Management Scenario

A company running a marketing campaign from its SAP Customer Relationship Management (SAP CRM) application realizes that certain data for an important customer is missing. The company sends a sales representative on a customer visit to obtain the data. Triggered by SAP CRM, the existing relevant customer data is prefilled in the corresponding form, which also contains fields for entering the missing data (see Figure 13). The form is automatically e-mailed to the responsible sales representative before his or her scheduled customer visit. The sales representative saves it to his or her laptop's hard drive for later use.

Upon arriving at the customer's site, the salesperson and the customer work together to complete the form. While still at the customer's location, the salesperson prints out the completed form for the customer's records using the print capabilities of Adobe Reader. Then, the sales representative forwards the completed form to SAP CRM, either by using the *E-mail Submit* button or by uploading the form to the corresponding site in the internal company portal upon returning to the office.

SAP CRM receives the data entered by the sales representative, processes it, and automatically triggers the next step in the business process.

Product	Subject	Conditions	Complaints	Comment
Types	Delivery		Delayed	
	Quality			

Comp. Product	Competes with	Price	Comment
Tasac	Tasac	1.83	

Product	Quantity	Discount	Price	Comment
---------	----------	----------	-------	---------

Potential	Phase	Function	Delivery Date	Comment
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Due Date	Call for Data	Responsible	Category	Comment
	Contract		Internal Workflow	
			Internal Workflow	
			Internal Workflow	

Figure 13: Sales Report Form

Using SAP® Interactive Forms by Adobe, you can do the following:

- Exchange data with people and systems via real-time information capture in form-based processes
- Create powerful XML-based forms without leaving the integrated SAP® environment
- Offer online and offline access – anytime, anywhere – with ubiquitous Adobe Reader client software
- Enable users to participate in form-based business processes that are intuitive
- Create forms that maintain visual integrity and fidelity
- Maintain process familiarity to help promote high user adoption
- Share information with greater control over form security inside and outside the firewall
- Comply with regulatory requirements related to forms and form-based processes
- Build interactive electronic forms
- Reduce form design, development, and maintenance costs with Adobe LiveCycle Designer seamlessly integrated in the ABAP™ programming language workbench and the SAP NetWeaver® Developer Studio tool
- Create sophisticated forms with a point-and-click visual design tool
- Support the Web Dynpro development environment, so developers can include interactive PDF forms in intuitive Web applications
- Allow nontechnical users to easily create forms, reducing the need for custom programming skills
- Provide universal access to forms
- Reduce IT complexity and costs with Adobe Reader for client-side viewing and filling of forms
- Enable users inside and outside the firewall to complete forms online and offline, and participate in key business processes without buying additional software

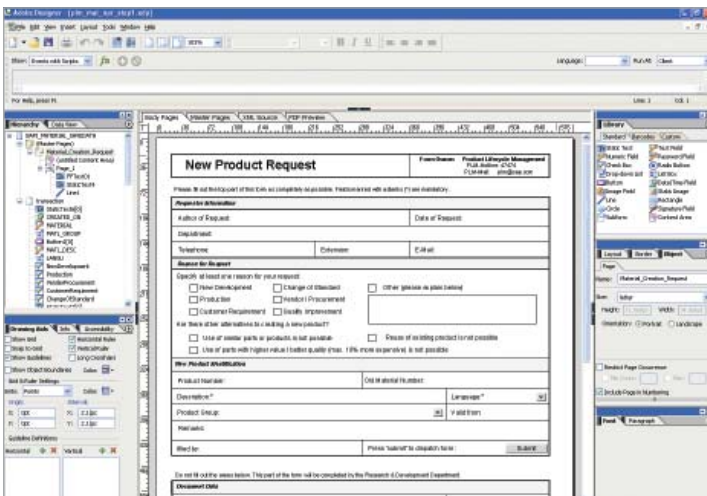


Figure 14: Travel Request Form

Human Resources Management Scenario

An employee wants to fill out a travel request form for an upcoming customer visit. Using SAP Interactive Forms, the employee logs into the internal company portal, accesses the travel request form, and opens it in his or her browser using the Adobe Reader plug-in (see Figure 14). The employee can complete the form either online or offline. If working online, while connected to SAP ERP, the employee fills in the form, which has been prepopulated with specific travel guidelines based on the employee's role and location. The employee then submits the form to the SAP software for approval or routing to the next step in the business process.

Alternatively, if the employee chooses to complete the form offline, he or she can save the form to the hard drive, fill in the form at a later time, and either submit the form to the SAP software or e-mail the form to continue to the next step in the business process.

CONCLUSION

SAP Interactive Forms allows developers to create interactive forms that are integrated with business processes. Developers can design, implement, and distribute – and users can access and manipulate – SAP Interactive Forms from within or outside of SAP applications. Acting as a bridge between highly structured transaction data stored in SAP applications, such as SAP ERP and SAP CRM, and unstructured form-based information and processes, SAP Interactive Forms enables enterprises to improve data accuracy, eliminate redundant data and forms, and reduce operational costs. Deploying SAP Interactive Forms ultimately improves the speed with which enterprises can respond to changing customer needs and business objectives.

For more information on SAP Interactive Forms and how it can help your business, contact your SAP representative or visit our Web site at www.sap.com.

www.sap.com/contactsap