



WebSphere<sup>®</sup> software



## Business Process Integration in WebSphere Portal

*Presenting the right tasks to the right people at the right time through  
WebSpherePortal according to trackable, auditable business processes*

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## Abstract

In an on demand business environment, efficient interaction of customers, employees and suppliers is key to success: businesses need to enable all parties involved in their business processes to participate and collaborate in a well coordinated fashion. Human tasks within these business processes, e.g. filling in forms, approving requests, or fulfilling orders, need to be presented to the right people at the right time in a way that allows them to process their tasks timely and efficiently without having to know details of the underlying business processes.

This need is addressed by Business Process Integration in WebSphere® Portal, providing all the applications and forms needed by a user, with a consistent look and feel, accessible anytime from a variety of devices, guiding each user to work on the right tasks at the right time. In this paper, we explain IBM's vision for effective business process integration in WebSphere Portal and describe how business processes, collaboration, forms handling, application integration, and document management capabilities can be combined to increase employee productivity and companies' efficiency and speed in executing their business processes.

## Introduction

Business processes make a big difference for companies in enabling organizational efficiency and timely and controlled reaction on customer requests to improve customer satisfaction and save costs. Companies running their operation according to efficient, optimized processes will gain a competitive advantage over businesses running less efficient processes and thus being less responsive to customers and more expensive.

Having efficient business processes in place is not enough, though. A key factor to successfully leveraging business processes to their full potential is to surface them effectively to all customers, employees, suppliers or other participants in a company's business – it is essential to always **present the right tasks to the right people at the right time** so that they can react and process their tasks timely and efficiently.

Through an enterprise portal based on the WebSphere Portal 5.1, companies can achieve this objective: Through the new Business Process Integration functions in WebSphere Portal, employees, customers, suppliers and other stakeholders connected as users to the enterprise portal via personal computers, production floor terminals, automated voice response systems, PDAs, or other technologies will be presented with exactly the particular human tasks they should perform when it is time to perform them - users thus will not have to know the overall business they participate in to do their work nor be distracted by a multitude of function and data that is irrelevant to their particular tasks.

### ***Step 1: Formalizing and Automating Business Processes***

Today, many corporations still have a variety of manual processes defined on paper and to a large extent rely on people to determine and execute tasks in the right sequence and complete documents created in the course of those processes based on rules and procedures they have to learn before they can be productive. The transition of activities from employee to employee often occurs informally, through e-mail, phone calls, or traditional mail. Monitoring of these informal processes is a very time consuming activity for managers, e.g. requiring making calls to ask for the status of work. If an employee forgets to perform a task or is on vacation or mail or documents get lost, it may not even be realized at all until the result is actually needed or a dissatisfied customer complains.

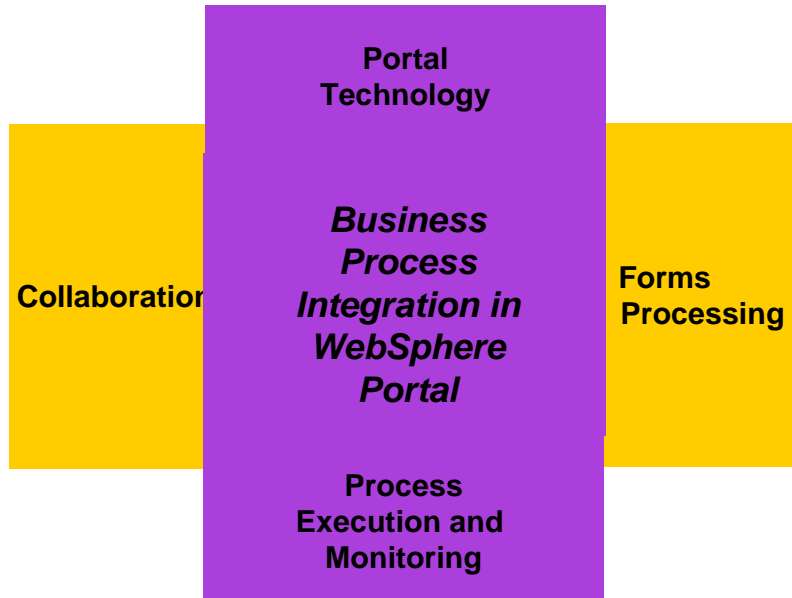
Obviously, executing business processes in such a manual fashion not supported, guided, enforced and controlled through an IT system has severe disadvantages: In many cases, significant time is spent by employees just to find out which processes to work on, when and how to execute the process steps, and what forms to use. Even once employees have become familiar to a company's processes, executing such manual processes is quite error prone, hard to monitor and often causes inefficiencies or failure execute correctly, e.g. causing customer requests to be ignored, orders to be lost, invoices not to be filed, etc. Absence of people due to illness or vacation can heavily disrupt operation since mail or e-mail concerning process activities can pile up quickly without automatic delegation and routing to people who are present. After a process is executed in such an environment, it is very hard to find out any details or audit its

execution later on, since critical parts of the processes execution may have been performed informally via communication over e-mail, mail or phone calls which are transient in nature. These problems have been the reason for companies to which processes and their correct execution are essential to formalize their processes and introduce business process management systems to assure correct execution and enable monitoring and auditing of these processes.

### ***Step 2: Connecting Users to Business Processes through a Portal***

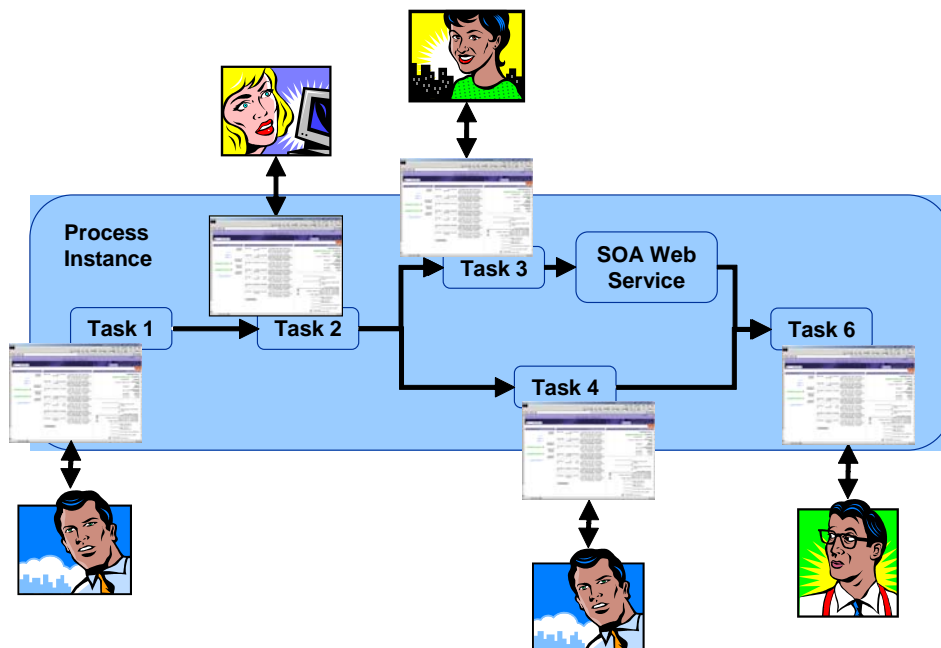
Once a company has well defined processes and a business process management system for their controlled, reliable execution in place, tasks will be assigned to employees automatically, their execution will be monitored and tracked, and tasks that are forgotten or delayed can be identified, escalated and followed up on. However, the challenge remains to present all employees, at the office or traveling, with their pending tasks in a way that lets them work on them efficiently, any time, any place. Often, many heterogeneous applications are loosely integrated with a business process management system running the actual business processes, using concepts such as execution agents launching applications like word processing applications, form editors, spreadsheets, and posting the finished documents when a task is finished. Frequently, the applications wired together this way are quite different and thus require significant learning effort from employees. Furthermore, they are often only usable on a personal computer but inaccessible for employees who are traveling and have no laptop available.

Business Process Integration in WebSphere Portal will address the issues listed above by providing effective, targeted presentation of tasks to users and allow users to work on those tasks, enabled through different channels for a variety of devices. This capability will allow internal and external portal users to create, participate in execution of, monitor, and manage business processes in a portal environment, without having to know details about the underlying processes. Through the combination of portal, business process execution and monitoring, collaboration, and document and forms processing technology, users will be able to participate in business processes supported through collaboration with other users who are involved and producing and processing related documents and forms.



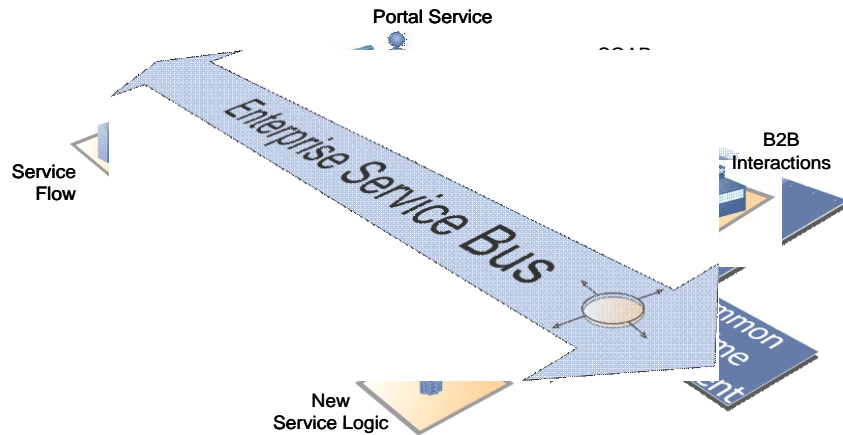
**Figure 1: Business Process Integration in WebSphere Portal - Aspects**

Business Process Integration in WebSphere Portal guides users to collaborate with other users or automated services within and across organizations by automatically displaying the right page for working on a task to the right users at the right time according to the business process definition on which it operates, see Figure 2.



**Figure 2: Users collaborating on a process through Business Process Integration in a portal**

In this scenario, a customer, an employee and a supplier are involved in execution of a business process, and one step in the business process uses an automated service. Such automated services may be integrated according to the Service Oriented Architecture (SOA) and be called via the Enterprise Service Bus, see Figure 3.



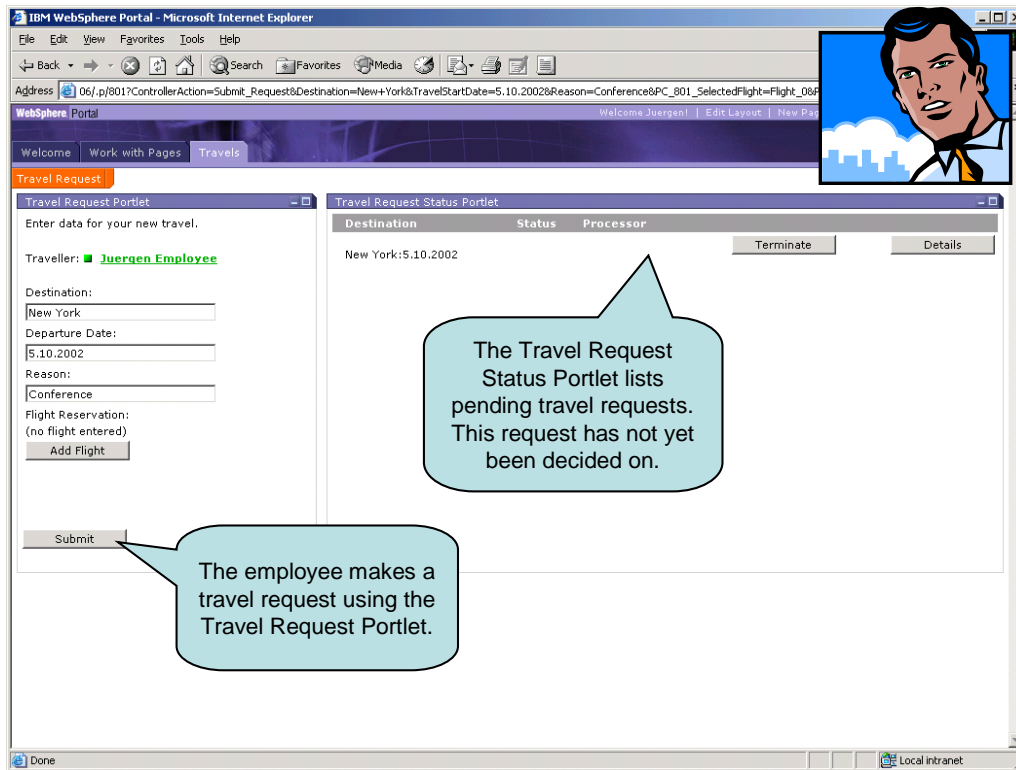
**Figure 3: The Enterprise Service Bus allows processes to call automated web services**

## **Scenarios for Business Process Integration in a Portal**

The following scenarios illustrate how a Business Process Integration in WebSphere Portal will work in practice. The travel request scenario gives an example of use of business process integration within a business and the car order scenario gives an example where it is used in a portal for customers, employees, and suppliers.

### **Scenario 1: Travel Request Scenario**

An employee of XYZ Corp wants to travel to New York for a conference. He uses a browser on his laptop and selects the travel page in the employee portal which has a required travel request form on the left and a status portlet on the right and makes his request by filling in the form. This results in a new travel request being added to the status portlet.



**Figure 4: An employee creates a travel request by filling in a form**

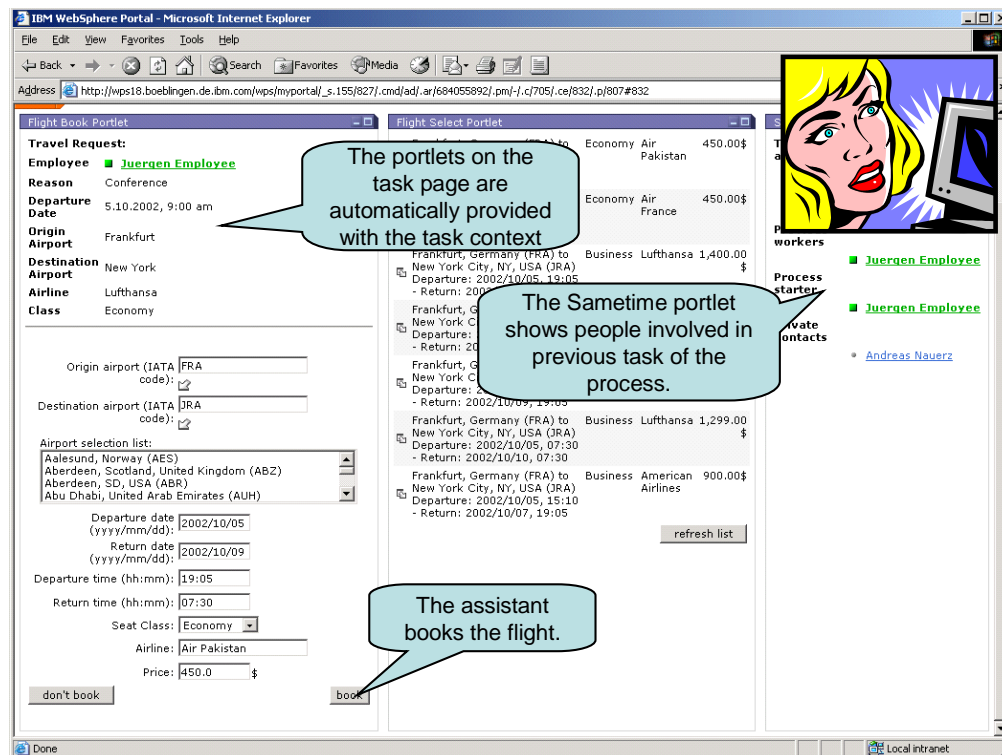
As a result of the travel request being submitted by the employee, his manager who is currently traveling receives message on his smart phone, with a link to a travel approval page in the portal. Using the smart phone, the manager reviews a short summary of the travel request and approves the travel through a simple approval form on the smart phone.



**Figure 5: The employee's manager approves the travel request from his smart phone**

Upon approval by the manager, the employee's administrative assistant who is browsing the portal sees an alert in the top navigation notifying her that a new task is pending. She clicks on the alert, the portal displays her current task list which now includes the new task to book the employee's travel. She clicks on the task and the portal automatically displays the right page which displays a travel booking form, flight

schedule and process aware chat portlet, which all have access to the data from the travel request: The flight schedule portlet shows flights to New York, the destination the employee had entered and the process aware chat portlet shows the employee and the manager who have been involved in the travel request process so far. The assistant selects a flight that seems convenient for the employee and clicks on the employee's sametime link to open a chat to confirm that this indeed suits his schedule, before selecting and booking the flight using the flight booking form. Upon selection of the flight, the portal's Click-to-Action inter portlet communication mechanisms transfer the data of the selected flight into the form to simplify and accelerate the task.

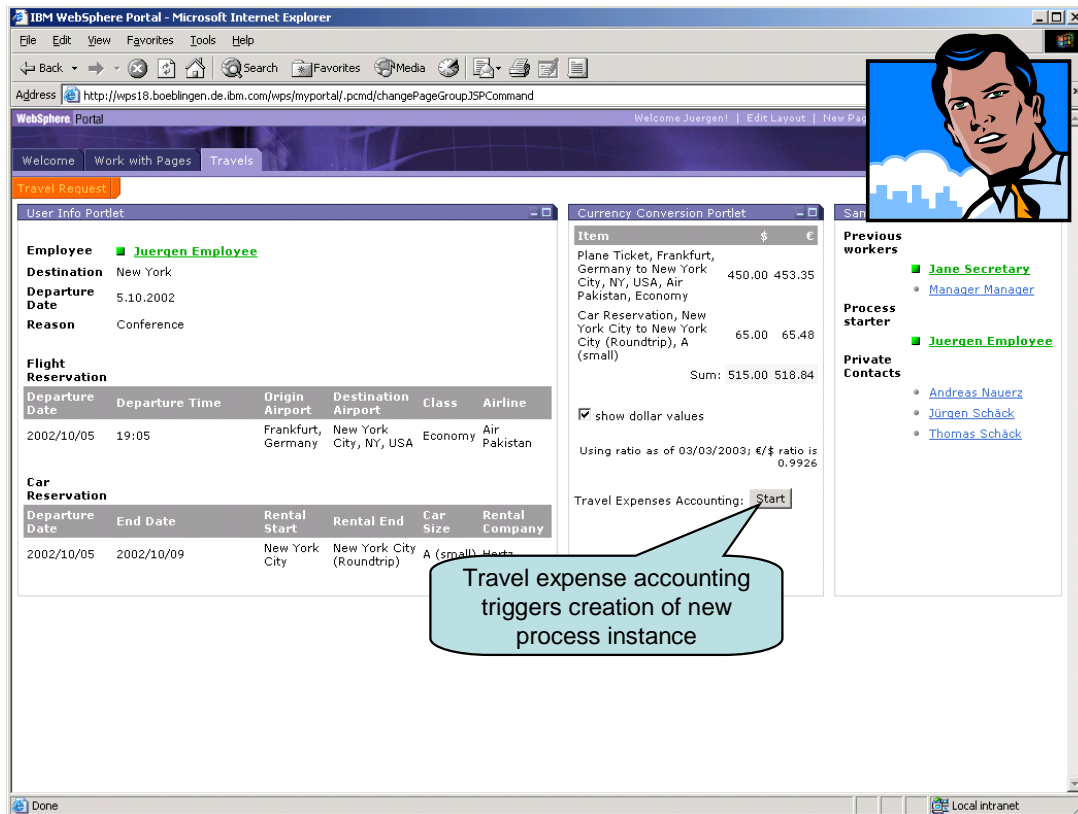


**Figure 6: The administrative assistant books the travel through an auto-filled form**

The employee returns to the travel page to review the status of the travel request and sees that the status now is "Approved and booked", so he can make his travel ...

When the employee returns, he needs to do the expense accounting for the travel. He again goes to the travel page and selects the status record for the travel to New York from which he just returned. The portal displays a page with all the accumulated info from the travel request and the booking done by the assistant, and offers expense accounting as an option. The employee selects expense accounting, which starts an expense accounting process initialized with all the relevant data from the travel request process which happened before.



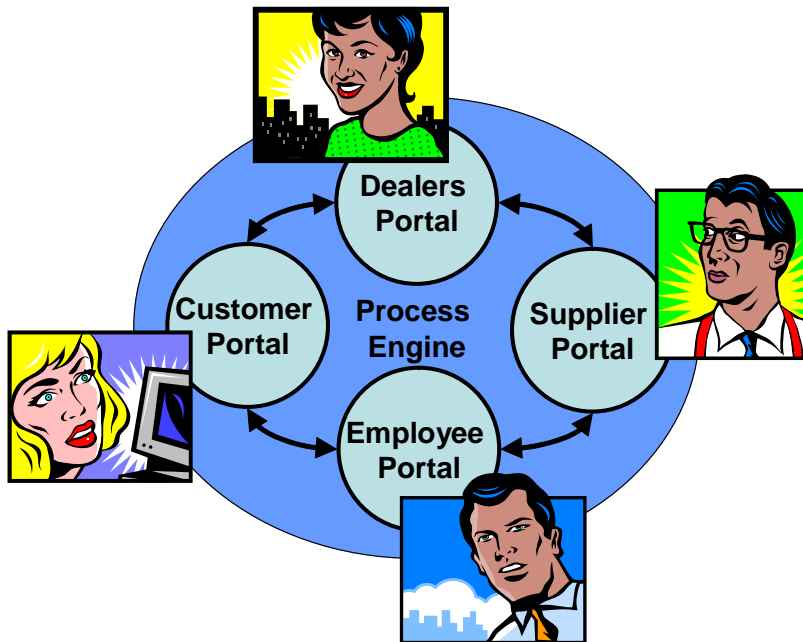


**Figure 7: The employee returns and accesses archived process data to start travel expense accounting**

In this example, the Business Process Integration in the portal assures that – without requiring knowledge of the process in which people actually participate – every individual can complete their tasks in the business process without learning effort. The portal always clearly indicates to each individual what tasks have to be done by them at a particular point in time and provides easy to use, self explaining tools portlets for those tasks. During execution of the business process all tasks may be monitored and after the business process has been completed, all relevant information is available in an auditable fashion.

## Scenario 2: Car Order Scenario

While in Scenario 1, the travel request process only affects people in the same company working with the same portal, Scenario 2 involves customers and employees of different companies and multiple portals. Lets assume a car manufacturer XYZ Corp., runs 4 portals, one for customers, one for employees, one for suppliers, and one for dealers. These four portals are connected to the same business process engine so that processes can involve any combination of customers and employees of the car manufacturer, the supplier and the dealer.



**Figure 8: Customers, Dealers, Employees, and Suppliers interacting via a Process Engine**

A customer of XYZ Corp. wants to order new tires for her car. She goes to [www.xyz.com](http://www.xyz.com), XYZ's customer portal and logs in. As a registered customer, she is presented a list of goods she has bought to date, in this case her car which she selects and orders tires for.

As a result of the order, an automated service is triggered which checks for availability of the tires she ordered. In this case, the tires are not on stock at a nearby XYZ dealer, and so the system decides to have one of XYZ's tire suppliers ship the tires to the dealer that is closest to the customer.

As a result of this, the next time the supplier's shipping agent on duty – who is a user of XYZ's supplier portal – accesses the system, he sees an alert notifying him of pending tasks. He clicks the alert and the supplier portal displays the current list of tasks, one of which is to ship tires to the dealer closest to the customer on behalf of XYZ Corp. The shipping agent clicks on the task and the portal displays a page with the order info which has been entered by the customer. The shipping agent at the supplier gets the tires, puts them into a container for delivery, and goes back to the PC to confirm preparing the shipment.

Now something unexpected happens – in the evening before shipment, cleaners move the container into a corner where it remains when the truck supposed to pick it up arrives the next day ... the tires are not delivered to the dealer where the customer is supposed to get them.

One day later, when the tires should already have arrived at the dealer, an employee of the car dealership gets the task to check for the tires and call the user to arrange a time to have the old tires replaced by the new ones at the dealership. The page displayed to him by the portal has a portlet with a "Confirm Delivery", "Confirm Customer

Appointment” and “Delivery Failed” button. When checking for the tires, the dealer’s employee realizes the tires have not yet been delivered and thus presses the “Delivery Failed” button instead of confirming delivery and making an appointment with the customer which would have been the normal course of action. The system traces back to the last person involved in the business process – the shipping agent – and notifies him that the delivery of the tires has failed and logs the issue in the supplier company’s issues log.

Since this time there is an issue that needs to be resolved quickly and can’t wait until the shipping agent looks into the supplier portal again, he is actively notified through an automated phone call, informed about the issue and must confirm that he will resolve it ASAP. The shipping agent searches for the missing tires, finds them, has them shipped via express and goes to the supplier portal which meanwhile shows an alert. He clicks on the alert which directly links to a page with the complaint info, where the supplier confirms that he considers the issue resolved now and enters the reason that caused the problem in a form.

As a result, the dealer’s task to check for the tires, call the customer and make an appointment to put the new tires on the car becomes active again. Since this time, the dealer has actually received the tires he calls the customer, makes the appointment and puts the tires on the car, which concludes the business process.

Notably, in this scenario, an XYZ Corp. customer, the tire supplier, and a dealer interacted with the business process through the customer portal, the supplier portal and the dealer portal respectively. Despite the mistake at the supplier, no employee of XYZ Corp had to get involved since the business process was set up so that the dealer had to detect the mistake when checking for availability of the tires before calling the customer. In the end, a successful shipment was made without any human interaction of XYZ Corp. employees.

## **The Technology behind the Scenes ...**

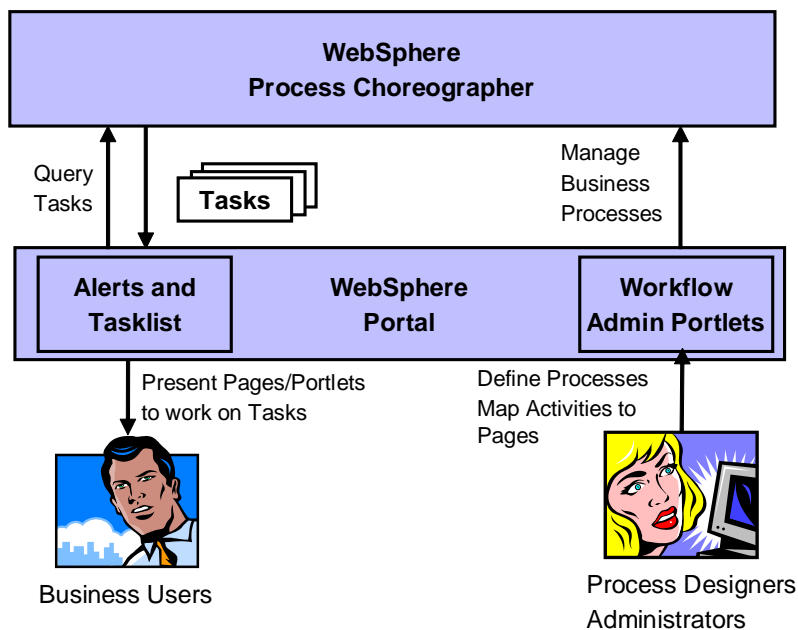
What makes the scenarios described above work ? First, there are business processes defined which orchestrate human and automated activities with checks and balances that do not only cover regular processing but also take care about potential errors and their recovery. The request made by the employee in the first scenario and the order made by the customer in the second scenario trigger instantiation and start of business process instances, initialized with the information that is needed by the respective business process. As a result of starting a business process instance, the process engine running the business process instance assigns the right tasks to the right users at the right time, and the portal displays the tasks and the right pages to work on the tasks to those users.

In scenario 1, the process is executed within the employee portal without a fault, as expected, but in scenario 2, a fault caused by humans happens during the execution of the business process. Beyond orchestration of activities, the process engine allows to track back to identify the reason for the fault based on the process status and automatically demands the right person to fix the problem and provides him or her with

the required information which is possible because all business process instance related information is always readily available.

### ***Business Process Integration Technology***

Business Process Integration in WebSphere Portal leverages WebSphere Process Choreographer, a component of the WBI Server Foundation which is the platform on which WebSphere Portal Enable and Extend are based. Portal users can initiate participate in business processes without actually knowing these processes, they interact with the business processes simply through alerts and task pages, as depicted in Figure 9.

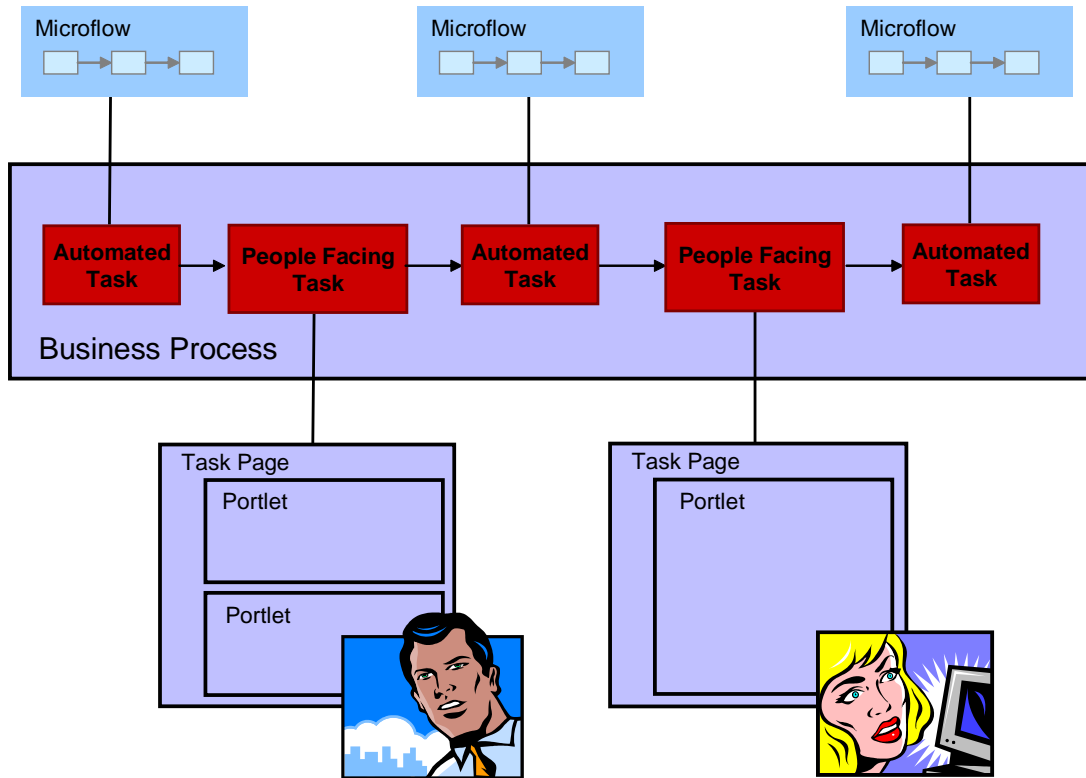


**Figure 9: Business Process Integration in WebSphere Portal**

Only process designers and administrators are dealing with the underlying processes directly and have to understand how they work; they can deploy and manage business processes using administration UIs which may also be presented through the portal.

### ***Surfacing Business Process Tasks in a Portal***

The portal becomes the presentation layer for business processes, allowing business users to efficiently work on tasks assigned to them by displaying the tasks for the current user and by providing the right pages for these tasks when a user selects a task. Figure 10 illustrates how this works:



**Figure 10: Interaction between users and processes**

The business process in this example consists of a sequence of automated and human tasks. The automated tasks are implemented as microflows which don't require any user interaction and therefore are not relevant to the portal, they just work silently in the background. When the business process reaches a human task which can be processed by a certain group of users, the task will trigger an alert and will appear in the personal task lists for these users. When one of the users claims the task, the portal looks up the associated page to work on the task and displays it dynamically to that user. When allocating the task to the user who now owns the task, the business process management system removes the task from all task lists of all other users. As soon as the user completes the previously claimed task, the process continues and executes automated tasks until again it reaches a human task, this time to be done by another user using a different task page.

## Task Notifications

Business Process Integration in WebSphere Portal can give users notifications linking directly to pages which provide all required functionality to work on tasks in one location, via a unified user interface, see Figure 11. If a user has one or more pending tasks, the portal displays an alert notification (1) to the user, e.g. in the portal's banner. When the user clicks on the notification, the portal displays the list of pending tasks (2) and lets the user select the next task to work on. When the user selects a task, the portal displays the task page (3) associated with that task so that the user can directly process the task within the portal.

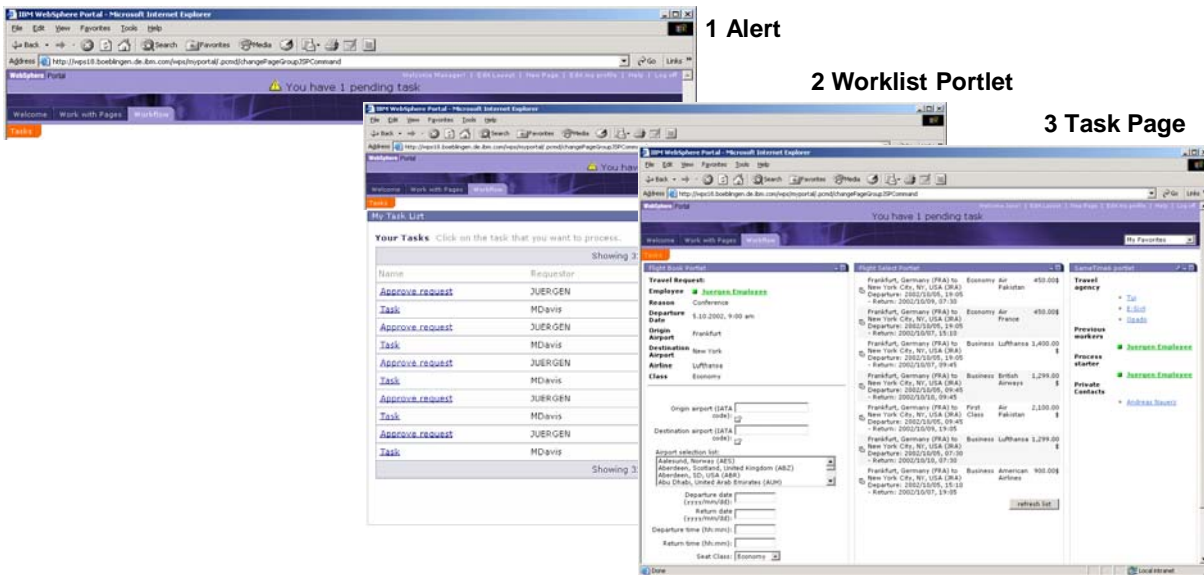
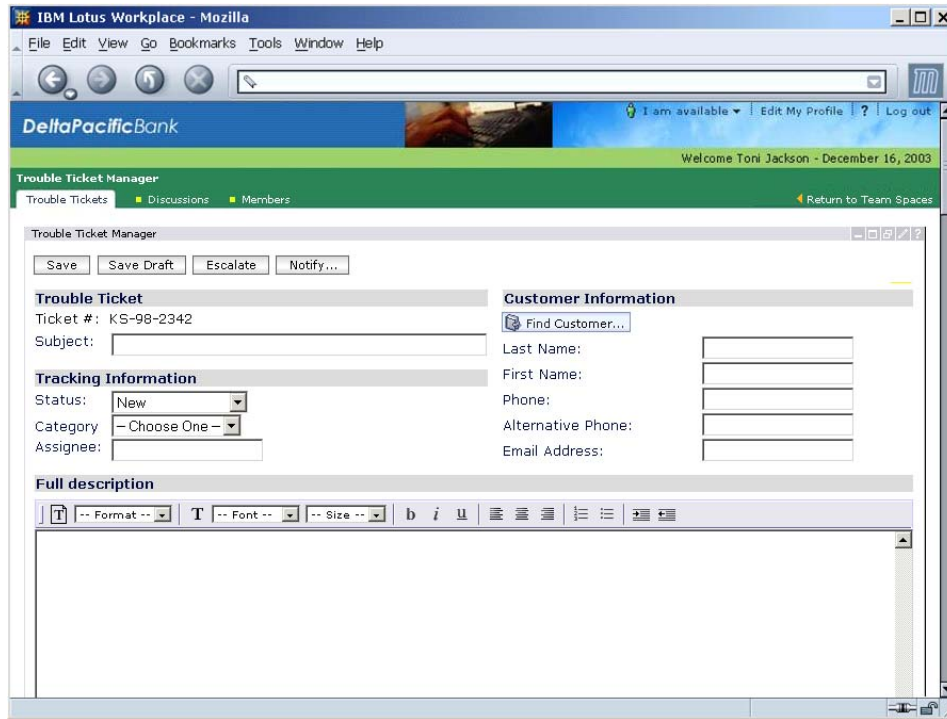


Figure 11: End User UI for Business Process Integration in WebSphere Portal

-In urgent cases, the portal might as well send an e-mail or other notification like SMS or Voice Call to allow for prompt reaction even if a user currently has no access to a PC.

## Forms Handling

A very typical task in a business process is filling in forms, e.g. for initiating a process by submitting a new request or for providing data that is needed in the course of processing a request. In the future, WebSphere Portal will allow using forms as a generic mechanism to process data gathering tasks or simple approval tasks and automatically display right forms for the tasks at hand, so that users don't have to know or search for the right forms to use for certain tasks.



**Figure 12: Forms Processing**

The forms to be used can be defined by business users in WebSphere Portal itself using the Forms Builder portlet, no special tooling outside the portal is required. Designing a form is done in four steps. First, the administrator or business user goes to the forms template library where he can create a new form from a form template. Then he can add new form elements from a rich palette of choices, e.g. input fields, rich text areas, date / time entries, selections, etc and customize these new form elements by specifying ids, labels, value types and instructional texts for supporting end userd in filling in the form. When finished, the new form is stored in WebSphere Portals Portal Document Manager and can be placed on any portal page, i.e. it can also be put on a task page.

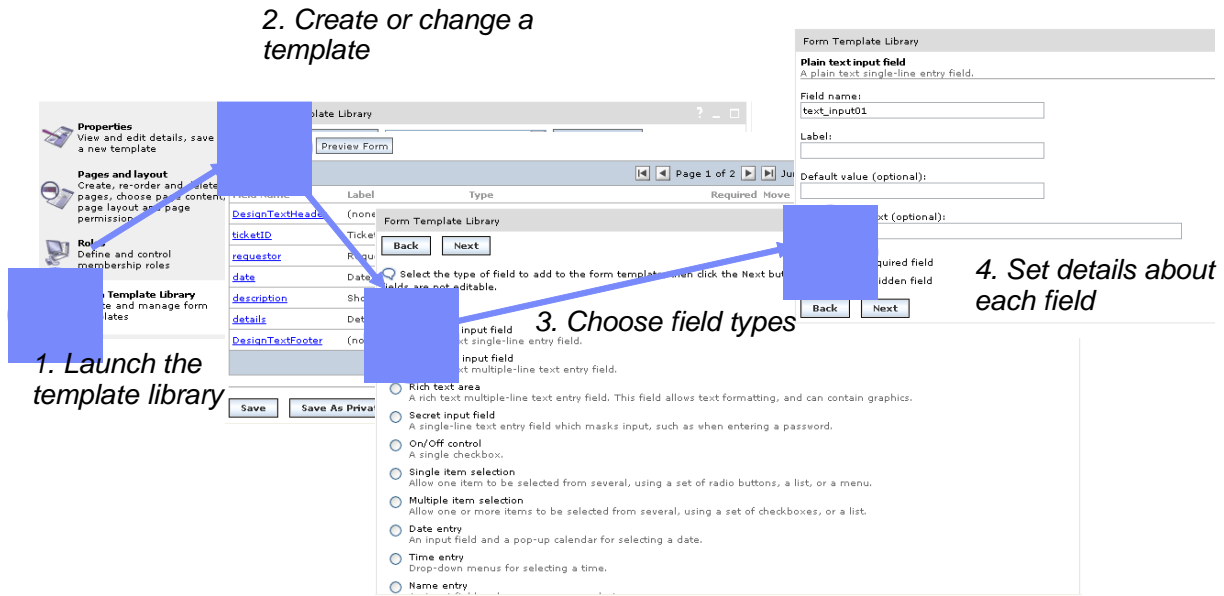


Figure 13: Forms Builder portlet in WebSphere Portal

## Collaboration

When performing non-trivial tasks, users will often require additional information to make decisions or get their work on certain tasks done for which they may have to ask the business process participants who worked on earlier tasks. To make this as simple as possible for user, in the future Business Process Integration in WebSphere Portal will present contacts determined based on the given task using knowledge discovery and people awareness and present those contacts as people aware links to make it as easy as possible to ask the right person.

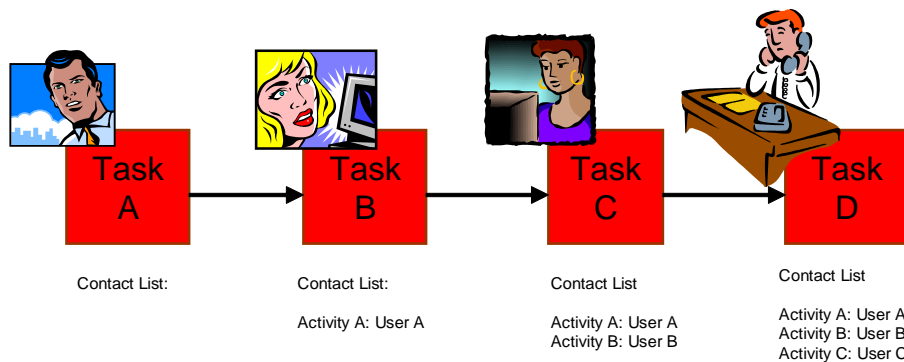


Figure 14: Incremental population of process instance context with users who participated

## Documents flowing with Processes

When multiple users are involved in a process, often documents need to be passed along and be completed during execution of the business process, potentially in many steps. Business Process Integration in WebSphere Portal in the future will allow attaching documents to process instances which may be global or scoped to specific



tasks in the process. These documents can be stored and versioned in the portal's document repository. As a result, when a process finishes, all the stages of the documents involved in the process are still available to enable later reviews and auditing.

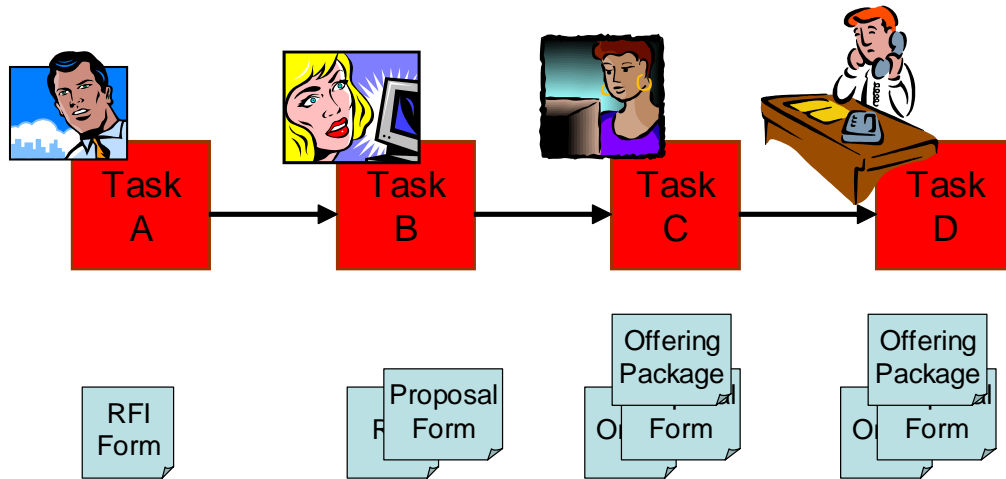


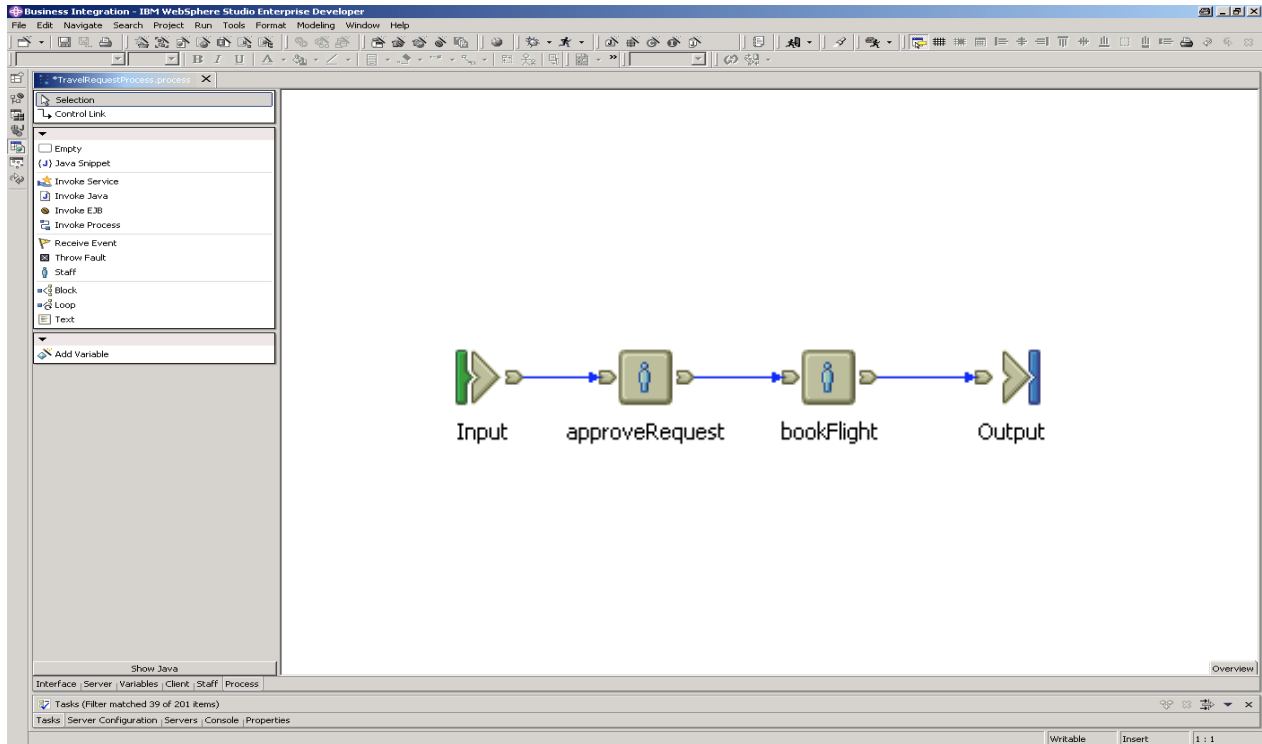
Figure 15: Incremental population of process instance context with users who participated

## Monitoring and Reporting

To assure that business processes are executed correctly and timely and to track the performance of employees participating in these processes, monitoring and reporting are essential. This is possible through the WBI administration user interfaces and in the future will also be possible through portlets that will allow entitled supervisors and managers to access these functions through the portal.

## Tooling

WebSphere Application Developer - Integration Edition (WSAD-IE, see [3]) allows defining business processes that leverage the full capabilities of the WebSphere Process Choreographer runtime included in WebSphere Portal. Business process designers can design business processes in a visual, interactive fashion and add Java code artifacts where needed. Once a complete business process with associated Java code artifacts has been developed and tested in WSAD-IE, the tool can export it as an EAR file containing a BPEL (Business Process Execution Language) definition of the business process for deployment on the portal system, using the admin functions of the underlying WebSphere Application Server on which WebSphere Portal is based.



**Figure 16: Defining a business process in WSAD-IE**

In addition to WSDA-IE, higher level tooling is available through WBI Modeler, which provides an easy-to-use process modeling tool for business managers and application developers to design and implement complex process workflows.

In the future, Business Process Integration in WebSphere Portal will also support business process definition by business users of the portal in a portal based tool without requiring using any special tools to be installed on their PCs.

## Conclusion

Business Process Integration in WebSphere Portal enables businesses to react quickly and reliably to customer requests and are the next logical step in making people collaborate more effectively and accelerate business processes within corporations as well as across corporations and their customers, partners and suppliers. Business Process Integration can significantly increase the On Demand readiness of businesses, allowing them to react more quickly, correctly and with high reliability to customer requests without requiring employees involved in these processes to go through an extensive education on heterogeneous applications - ***the Business Process Integration capability in WebSphere Portal provides seamless integration of business process, forms processing, collaboration technology and portal technology to present the right applications for the right tasks to the right people at the right time.***

**Additional Information and References:**

[1] WebSphere Portal:

<http://www.ibm.com/websphere/portal>

[2] WebSphere Business Integration:

<http://www.ibm.com/software/integration/>

[3] WebSphere Application Developer Integration Edition:

<http://www-306.ibm.com/software/integration/wsadie/>

[4] Business Process Execution Language for Web Services (BPEL4WS)

[http://www.oasis-open.org/committees/tc\\_home.php?wg\\_abbrev=wsbpel](http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wsbpel)



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