



IBM Software Group

# WebSphere Process Server V6 WebSphere Integration Developer V6

## *Human tasks overview*



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This presentation will focus on the Human Tasks feature of WebSphere® Process Server and WebSphere Integration Developer.



## Human interaction in integration applications

- Human interaction is key to many business integration applications
  - ▶ Human input or review required
    - Manager must approve/reject employee travel request
  - ▶ Amount of automation is limited
    - Document review or translation, visual inspection of property damage
  - ▶ Error or exception situations must be handled
    - Flight unavailable, credit card check failed, loan amount too high
  
- Many challenges with adding human interaction
  - ▶ How are the correct people involved?
  - ▶ How to provide robust capabilities such as claim, transfer, complete, notify, expire and escalate?
  - ▶ How can human interaction be implemented in a flexible manner to allow for changes in the business?



When integrating different types of applications in an enterprise due to merging of departments, an acquisition of another company, or for any reason, some processes require human interaction. For example, sometimes a manager's approval is required for a travel request or purchase order. A document review is another example of a process where human interaction is required. Error situations can also require human interaction in order to be resolved. However, introducing human interaction can present some unique challenges in terms of application development and integration. Many times the business user is not technically savvy, requiring more time spent on creating a friendlier user interface and not on how to fit the human interaction into the integration application. The task must also be assigned to the correct people and a means for people to claim work items must be provided. A notification strategy and function is often necessary to alert users about a task or escalate the urgency of the task. Finally, in the anticipation of changes in the business, constructing the human interaction in a way which allows for flexibility and easy change can be difficult. The time spent on human interaction can become a major portion of the time spent on integration, shifting focus from the real business problems that must be solved.

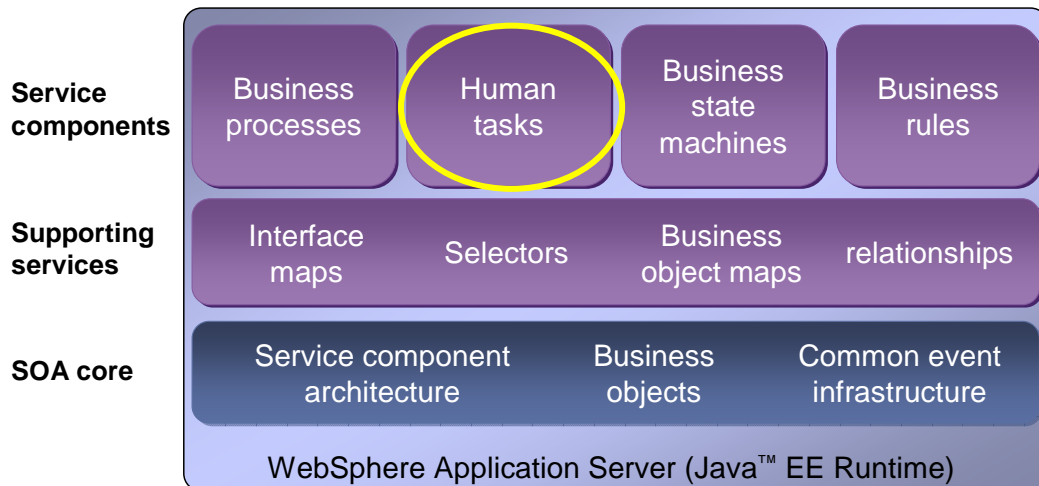
## Overview of human task support

- Use human tasks within business integration applications following a service-oriented approach, either independently or within BPEL business processes
- Create and start tasks for different individuals registered in LDAP, local OS, or custom user registries
- Specify different levels of authority for tasks
- Transfer and suspend tasks
- Priority and due date attributes available on tasks
- Enable expiration, escalation and notification
- Build custom Web interfaces for tasks



The human task support in WebSphere Process Server and WebSphere Integration Developer solves many of the difficult problems with introducing human interaction into integration applications. Human tasks can be created as independent, separate service components outside of a BPEL process. This allows the human task to become a reusable task without the requirement of BPEL when the features of a business process are not needed. The tight integration of human interaction within a BPEL process is still supported for implementing more complicated business processes. Different user registries can be used as a source of information about who should receive tasks, and different levels of authority can be specified, limiting access to tasks. Tasks can be transferred from one person to another. This can be done manually, or automatically when a person notifies the system of their absence. There is support that allows you to suspend work items and resume them at a later time. You will also find support for priority and due date attributes available for tracking work items. Other capabilities include expiration, configuration of escalation chains based on expirations, and notifications. You can also create custom Web interfaces for working with tasks.

## Fitting into WebSphere Process Server



Support for human tasks builds upon support for Service Oriented Architecture or SOA core components and is a separate component from business process support, allowing it to be used outside of a BPEL process. Because it is built upon the core capabilities, it is an SCA component and will use Business Objects in terms of the information a person will work with in the task. Human tasks can also be monitored using the Common Event Infrastructure that is also part of that SOA core set of components.

## Different type of human tasks

- Different type of human tasks available for different integration situations

- ▶ To-do task



- Service creates a work item for human interaction (WS-BPEL)

- ▶ Invocation task

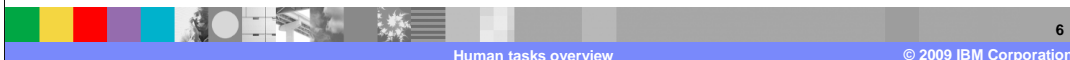


- Human interaction invokes a service (business state machine for example)

- ▶ Collaboration task



- Human interaction invokes a service which creates a work item for another human

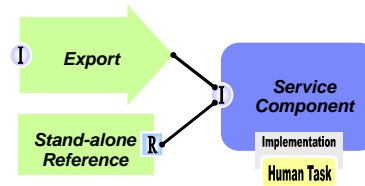


There are several types of human tasks which can be used in WebSphere Process Server. The type of human task that you use depends on your integration situation and how you want human interaction to be introduced or used within your application. A To-do task can be used when an application or system is going to assign work to an individual. This is very similar to the Staff Activity supported in business processes in WebSphere Business Integration Server Foundation V5.1 where you have an automated work flow process and at some point you assign work to an individual. After the person completes the task, control returns to the work flow and processing continues. An Invocation task can be used when a person is going to assign work to some type of application or system. When the task is complete, a response is returned providing a record of the task and the completion status. This can be used when you are calling a business state machine and updating the state. It might also be used to initiate a BPEL process where you are starting a business process. A human initiates the process and the machine or service called is a BPEL process. The service can also be any SCA component. The final type is a Collaboration task where there is no SCA invocation going out or coming into the task, but you can still take advantage of the human task manager and other escalation and notification capabilities. Using this type of task, a human task can be defined which allows a person to generate work items for specific individuals and use escalation and notification support. For example, an application can be created where a manager can generate work items for his/her department. After tasks are completed, the manager can view the results for each task. Note that the terms associated with the different types of tasks changed in WebSphere Process Server V6.1. Before V6.1, a To-do task was called a Participating task, an Invocation task was called an Originating task, and a Collaboration task was called a Purely human task. The terms were changed to be more business user friendly.

## Fitting into SCA programming model

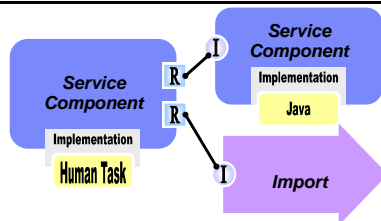
- To-do task

- ▶ Interface invoked through SCA, JMS, Web service, or Java



- Invocation task

- ▶ Reference wired to either a service component or import (not both)



- Collaboration task

- ▶ No interfaces or references



Human task support is built on the SOA core components of SCA and Business Objects. With this architecture, human tasks follow a consistent programming, and more specifically, packaging model along with other service components. For the different human tasks, the bindings for the interfaces must be generated and any references resolved. For a To-do task, which is invoked by another service or application, the bindings for the interface of the task must be generated. The different choices are SCA, JMS, or Web service which allows different clients to use the human task support. For pure Java clients, a stand-alone reference can be created and invoked through a WSDL or Java port-type. A To-do task has no references to resolve as the implementation is a “person”. For Invocation tasks which are started by a person, there is no interface which needs a binding generated. Instead, a reference must be resolved to the service or application which will perform the task. The reference can be to another component in the module or to an Import component which is bound to another service component through an SCA binding, a Web service, or a message queue using JMS. For a Collaboration task, because you have humans calling or starting the task and a human completing the task, there is no interface binding to generate or references to be resolved. Because a Collaboration task is running in WebSphere Process Server, it still must follow the packaging model and be packaged as a service component.

## Human tasks and business processes

- Business process can have tight integration with human tasks
  - ▶ Human task activity “in-lined” into business process
- Business process provides a context which can be used between different human tasks and activities to support more robust situations
  - ▶ Multiple levels of approval (first line and second line managers)
  - ▶ Separation of roles (“4-eyes” principle)
- Architectural decision on how tightly coupled human interaction is with a business process
  - ▶ In-lined tasks provide more capabilities, but are less flexible.

### Business Process Instance Context

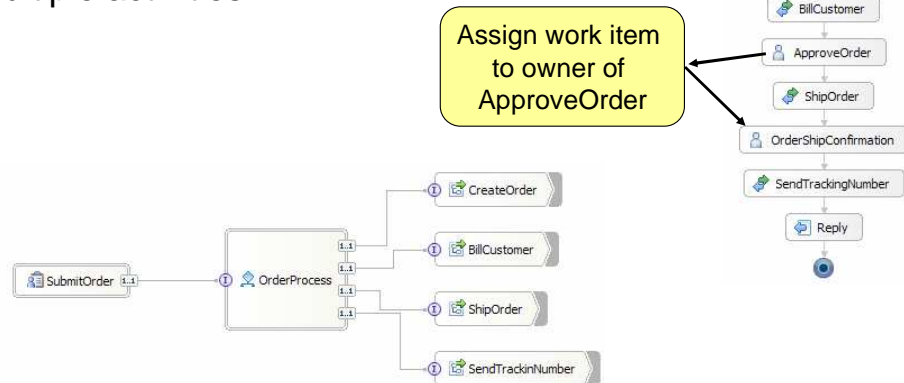


Human tasks can also be used directly inside a business process, which is identical to the support provided in WebSphere Business Integration Server Foundation V5.1. Human tasks inside business processes are not separate service components and therefore do not need to be resolved through a reference. Instead, a human task inside a business process is implicitly wired into the business process and is known as an “in-line” human task. This tight integration provides the support for more robust solutions involving human tasks. Business processes have a context that is created for each instance. This context contains the state of the business process, such as which activities have completed and who has performed an activity. This information can be used by different human tasks in the business process to create different types of situations. You might want the same person to perform multiple operations, multiple levels of approval or multiple approvals in a group (otherwise known as separation of roles or the “4-eyes” principle). For example, a business process might be used to track the completion of filling and shipping a customer order. In this business process, there are two human tasks, one for approving the order contents and another task for confirming the order is shipped. In order for the same person to be assigned both tasks (that is, approving the order and confirming the order), the owner of the first task must be used for the second task. The business process context contains this information and can be used to ensure that the same person handles both tasks. The question of whether to use a human task in-line within a business process or to use a human task that is a separate service component comes down to a decision between functionality or flexibility. In-line human tasks offer more robust features. However, they are difficult to change since they are part of the business process. Separate service component human tasks are more limited in functionality since they do not have access to the business process context. However, they can be updated easily since they are independent components.



## Using “in-line” human tasks

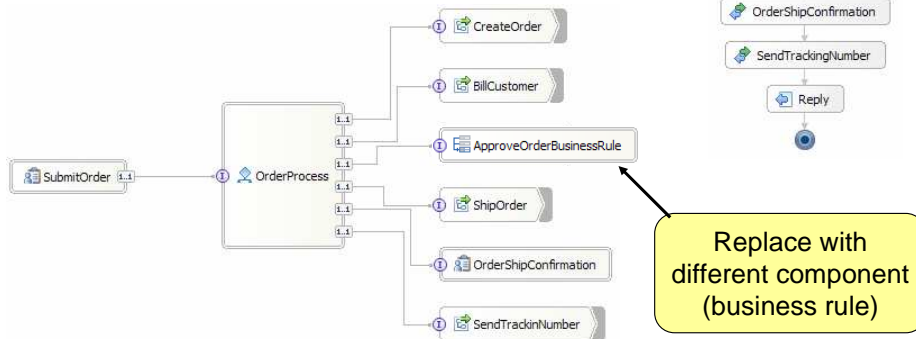
- “in-line” tasks require no additional wiring
- Context information can be used between multiple activities



To further emphasize the differences in this important concept, consider the assembly of a business process which has an in-line task. At assembly time there is no reference to be resolved for the in-line human task. Unlike the invoke activities of the business process which have references that must be resolved, the human tasks, named “ApproveOrder” and “OrderShipConfirmation”, do not. The human tasks are already implicitly wired into the business process. With the human tasks inside the business process, they can take advantage of the business process context and the same individual can be assigned to perform both tasks. While this does provide robust functionality, it is more difficult to update the tasks since they are really a part of the business process.

## Using human tasks as components

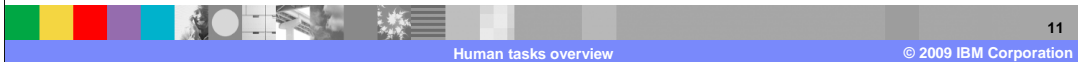
- Human tasks described as components can be wired into business processes
- Allows for components to be changed more easily



If the human tasks in the order process are replaced with invoke activities, the assembly of the business process changes. The references for the invoke activities must now be resolved. The references can be wired to human task components in the same module, or they can be wired to import components which are bound to human task components in another module. With the human tasks outside the business process, the reference can be easily updated to point to another service component such as a business rule rather than a human task. This implementation provides a great deal of flexibility. However, the two tasks do not automatically share information which would allow you to easily perform things such as assigning the tasks to the same person.

## Section

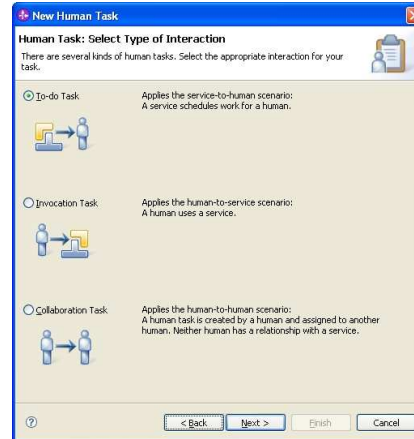
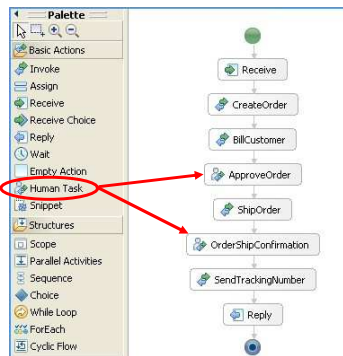
# ***Developing and administering human tasks***



This section will briefly cover the development and administration of human tasks.

## Creating human tasks

- Specialized wizard for creating to-do, invocation, and collaboration tasks
  - ▶ Directly uses SCA and business objects



- Special activity for adding an in-line human task to a WS-BPEL business process
  - ▶ More capabilities than invoking a to-do task

There are two ways to create a human task. The first is to use a specialized wizard provided by WebSphere Integration Developer for creating human tasks. All three types of human tasks can be created using this wizard. When you create human tasks using the wizard, you are creating a service component that is separate from a business process. If you want to create a human task that is directly used in a business process, the business process editor of WebSphere Integration Developer provides a special activity type. The icon is available along with the other types of activities and can be dragged from the palette onto the editor canvas. These are known as in-line human tasks. Although they appear as a special type of activity in the business process editor, the definition of an in-line human task is actually a to-do task that is implicitly wired into the business process with no SCA assembly necessary.

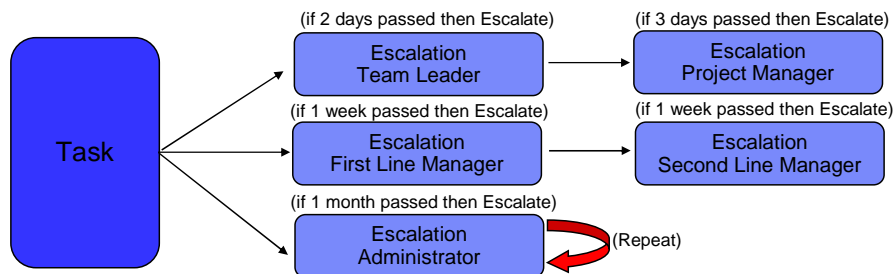
## Human task editor

- General properties
  - ▶ People directory
  - ▶ Restrict transfer
  - ▶ Task duration
  - ▶ Substitution policy
- Permission settings
  - ▶ Specify criteria and parameters for roles
- User interface
  - ▶ Business Space, Lotus® Forms, Portlets, BPC explorer
- Escalations and notifications

When you create a task, whether it is a to-do, invocation, collaboration, or in-line task in your BPEL process, you use the human task editor. Clicking the button at the top of the editor will display general settings in the “Properties” view. Details such as the duration for the task, starting priority, and JNDI name of the people directory can be specified here. You can also specify the substitution policy to be applied to the task when the task owner becomes absent. Choices include “No substitution”, “Replace absent users with their substitutes” and “Prefer present users” (when originally assigning the task to a person). There is also a calendar setting that can be specified, which is used to track the durations for escalations. In the second section, you can specify permissions for individuals on the work items for the task. There is a variety of permissions to select from and they will vary depending on the task. Most tasks have administrator, potential owner, editor, and reader as available permissions. For each permission, a criteria and group of parameters is specified to indicate the individuals to be assigned the appropriate role. The user interface section allows you to specify custom JSP or JSF files that you have created for working with these items and displaying them in the BPC explorer. You can also specify settings for any generated Lotus Forms or Portal clients in this section. The escalations settings section allows for different escalation chains to be specified based on the state of the task.

## Escalation support

- Escalation can be set on tasks (to-do, invocation, collaboration and in-line) for different states of the task
- Single or multiple chains of escalations can be defined
- Time and state of task are checked before escalation
- Used to create notifications for overdue tasks
  - ▶ Work items, e-mails, custom programmatic events



Escalation support recognizes that a human task passes through various states as it progresses towards completion. At each of these states, you can specify an escalation chain to begin. When the specified duration expires for an escalation, a check is performed to determine if the appropriate state has been met. If the appropriate state has not been met, a notification is performed and the escalation chain can continue on for another duration. If the appropriate state has still not been met after that duration, another notification will occur. The example shown here consists of a human task with three escalation chains. The first chain checks to see if the task is completed after two days. If it is not, it is escalated to the team leader and notification is performed. The next check is performed three days after the first duration expires, or five days after task creation. If the task has not completed, the task is escalated to the project manager. The second escalation chain starts at the same time as the first escalation chain and performs a check after one week. If the task has not completed, it is escalated to the first line manager. Another check is performed one week after the first duration expires, or two full weeks after task creation, and if the task has not completed it is escalated to the second line manager. The third chain can also run in parallel and check for completion after one month. If the task has not completed, the administrator is notified. This escalation can also be set up to repeat multiple times (once per month).

## Setting escalations and notifications

- Assignment of escalation notification uses criteria and parameter format
- Notification occurs if the condition has not been met
- If duration exceeded and state not reached, then escalate

The screenshot displays the 'Escalation' configuration window in the IBM BPM Human Tasks Overview. The window is divided into several sections:

- Escalation States:** A diagram at the top shows the task lifecycle: Ready (with sub-states: Team Leader, Project Manager, First Line Manager, Second Line Manager) → Claimed → Subtask started.
- Properties Panel:**
  - Description:** Escalation
  - Details:** People assignment criteria: Users by user ID
  - Assign People:** Assigns users, given their user ID. Supported by default. Use this to assign users, without checking for user ID. Do not use this for the EscalationReceivers role, in case.
  - Environment:** Global Event Settings
  - Event Monitor:** Global Event Settings
- Configuration Fields:**
  - Expected task state:** Ended
  - Escalate after:** 2 Days 0 Hours 0 Minutes 0 Seconds
  - Notification type:** Work item
  - E-mail message:** (with Edit... and Remove buttons)
- Table:**

Name	Value
UserID *	jsmith
AlternativeID1	
AlternativeID2	

The bottom of the slide features a blue bar with the text 'Human tasks overview' and '© 2009 IBM Corporation'.

Shown at the top of the slide is the lower part of the human task editor, where you can set up escalations. You can see the various states, indicating when a chain of escalation should begin. As soon as a human task is created, it enters the ready state and timers begin for the escalation chains specified for the ready state. When the human task is claimed, timers will start for any escalation chains that begin at the time the task is claimed. The third state occurs if any sub tasks are created, and escalation chains can be created there as well. As is shown on the slide for the ready state, you can set up multiple escalation chains that run in parallel. You can perform various types of escalations. These include assigning a work item to a person, such as a project manager or team leader, sending an e-mail to a person or group, or invoking an event handler to send an SMS or text message. You can also increase the priority when that escalation occurs. If a work item or e-mail notification is used, the person or group of people who should receive notification is set using the same assignment criteria and parameter style used to establish the original permissions of the task.

## Administering human tasks with BPC Explorer

- BPC Explorer provides basic human task administration
  - ▶ View tasks and escalations
  - ▶ Claim, complete, transfer, suspend or resume tasks
  - ▶ Manage absence and substitution settings
  - ▶ Located at <http://localhost:9080/bpc> or <https://localhost:9443/bpc>
- Built with reusable JavaServer Faces (JSF) components
  - Starting point for customized clients

The screenshot displays the BPC Explorer web application. The main area shows a table of tasks with columns for Priority, Task Name, State, Kind, Owner, Originator, Escalated, Suspended, and Activated. The tasks listed include 'Check claim', 'Report a claim', and 'Invocation Task' in various states like 'Claimed', 'Ready', 'Inactive', and 'Finished'.

Priority	Task Name	State	Kind	Owner	Originator	Escalated	Suspended	Activated
3	Check claim	Claimed	To-do Task	buser1	brmst1	no	no	4/11/08 8:53:08 PM
5	Report a claim	Inactive	Invocation Task	buser1	buser1	no	no	
5	Report a claim	Inactive	Invocation Task	buser1	buser1	no	no	
5	Check claim	Ready	To-do Task	buser1	buser1	no	no	4/10/08 6:31:43 PM
5	Check claim	Claimed	To-do Task	buser1	buser1	no	no	4/10/08 6:26:13 PM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/10/08 6:26:10 PM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/17/08 2:07:48 PM
5	Check claim	Ready	To-do Task	buser1	buser1	no	no	4/11/08 8:50:36 PM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/11/08 8:50:33 PM
5	Check claim	Claimed	To-do Task	buser1	buser1	no	no	4/11/08 1:01:24 AM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/11/08 1:01:22 AM
5	Check claim	Ready	To-do Task	buser1	buser1	no	no	4/11/08 12:14:23 AM
5	Check claim	Ready	To-do Task	buser1	buser1	no	no	4/11/08 12:14:15 AM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/10/08 12:49:18 AM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/9/08 11:36:47 PM
5	Check claim	Ready	To-do Task	buser1	buser1	no	no	4/9/08 10:49:17 PM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/8/08 8:35:03 PM
5	Check claim	Ready	To-do Task	buser1	buser1	no	no	4/8/08 12:59:39 PM
5	Report a claim	Finished	Invocation Task	buser1	buser1	no	no	4/6/08 5:57:46 PM

Items found: 31 Items selected: 0 Page 1 of 2 Goto Page: 1 Items per page: 20

Human tasks overview

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WebSphere Process Server provides the BPC Explorer as a client application for administering business processes and human tasks. It allows you to perform basic functions such as viewing, claiming, completing, transferring, suspending and resuming human tasks. If the definition of a human task specifies a different JSP to be used to display the human task in the administrative client, it is used whenever the BPC Explorer needs to display the task. The BPC Explorer is built using JSF components with a set of tag libraries that you can use to build your own custom clients. In order to modify the interface of the BPC Explorer, you will have to work with your own copy of the application.



## Section

# *Summary*

This section of the presentation provides a summary of what you have learned.

## Summary

- Human tasks use service-oriented design to easily integrate into business applications
- Human tasks allow for the involvement of people in Web service based applications
- Tight integration with WS-BPEL business process provides support for more robust scenarios
- Capabilities for escalations, notifications, priorities, due dates and absence



In summary, the human task support fits nicely within the service oriented architecture since it is built upon SCA, and makes use of business objects. With this human task support, you can easily involve people in Web service based business integration applications. You can make human tasks available as separate reusable service components and very quickly and easily wire those into your integration applications in a flexible manner. In addition, there is an option for much more tight integration with the WS-BPEL business processes, allowing you to implement more robust scenarios. Finally, there are capabilities related to escalation, notifications, priorities, due dates and absence, all of which provide functions needed by most business integration applications involving human interaction.

## Feedback

### Your feedback is valuable

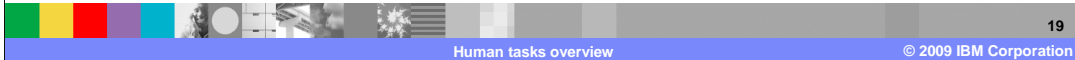
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