Human-centric BPM in WebSphere –
Introduction, Capabilities and Usage Patterns
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General Flow

- Introduction: SOA and BPM
- Human-centric BPM with WebSphere
- Advanced Human-centric BPM Scenarios
- Summary and Outlook
General Flow

Introduction: SOA and BPM

Human-centric BPM with WebSphere

Advanced Human-centric BPM Scenarios

Summary and Outlook
The Basics: What is SOA?

Service Requestor  

Bind 

Service Provider  

Find  

Publish 

Service Registry
SOA Definition

**SOA as an Architectural Framework**

A *service-oriented architecture (SOA)* is an architectural framework that takes everyday business applications and breaks them down into individual business functions called services.

An SOA lets you build, deploy and integrate these services **independent of applications** and the computing platforms on which they run.

**Business strategy analysis**

Component Business Modeling
Provides a way to link strategy to Operational model

**Business process optimization**

Business Process Management models, simulates, analyzes and continuously redesigns business processes

Implement designed processes with SOA

**SOA architectural framework**

SOA infrastructure orchestrates business processes and mediates service providers

**Focus on “What makes you special”**
Open Standards are Fundamental for SOA & BPM
IBM Continues to Lead Advancements in SOA-Based Open Standards

Web Services & Web Service Interoperability
- Interface, Policy
- Reliable Messaging
- Security (Trust, Secure Conversation)
- Transactions (Atomic, Business Activity)
- Web Services Profiles

Service Management
- Notification
- Distributed Management

Composition
- Service Data Objects (SDO)
- Service Component Architecture (SCA)

Web 2.0 Innovations

Open Document & XForms

Authoring
- Java, C++, BPEL, PHP, ...

Industry Standards
- ACORD, SWIFT, FIX, EDI, XBRL, SIP, ...

Business Process Management
- BPEL, BPEL4People, BPEL-SPE, BPELJ, BPMN

Service Management

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Service Management

Composition
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- Service Component Architecture (SCA)
Open Standards for Business Process Management

**Business Modeling**
- **BPMN 1.1**
  - Business Process Modeling Notation
- **BPMN 2.0**
  - Business Process Model and Notation

**IT Specification**
- **WS-BPEL 2.0**
  - Automatic workflows
- **BPEL4People, WS-HumanTask**
  - Human workflows and tasks
- **BPEL-SPE**
  - Subprocesses

**Infrastructure**
- **SCA**
  - Service Components
- **SCA-BPEL**
  - BPEL integration into SCA

- BPMN 1.1 final January 2008
- BPMN 2.0 submitted May 2009, finalization task force in progress
- WS-BPEL 2.0 adopted April 2007
- BPEL4People, WS-HT in progress
- BPEL-SPE whitepaper published

- OASIS SCA V1.1 in Public Review
- Compliance Tests under construction

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WebSphere Human-centric BPM Evolution

1Q/2002:
WAS Enterprise Edition 4.1
On workstation platforms
- Process engine based on FDML
- Microflows only

1Q/2003:
WAS Enterprise Edition 5.0
On workstation platforms
- Process engine based on FDML
- Microflows
- Long-running processes
- Human workflows!

1Q/2004:
WBI Server Foundation 5.1
On workstation platforms
- BPEL enabled process engine
2Q/2004 on z/OS

2Q/2008:
WPS 6.1.2
- The biggest "service pack" ever 😊

4Q/2008:
WPS 6.2

2Q/2009:
WPS 6.2 FeP

4Q/2009:
WPS 7.0

3Q/2005:
WebSphere Process Server 6.0
Consolidated BPM Runtime
- Based on SCA
- Human Tasks as re-usable components

4Q/2006:
WPS 6.0.2

4Q/2007:
WPS 6.1

4Q/2008:
WPS 6.2

2Q/2009:
WPS 6.2

2010: more to come...

2010:
more to come...

WebSphere Human-centric BPM Evolution
General Flow

Introduction: SOA and BPM

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Summary and Outlook
BPM from IBM Empowers You To Embrace Change and Continuously Optimize Your Business

Model and Simulate

Rapidly Deploy and Change

Continuously Optimize

End-to-End Processes

Monitor, Predict and Act
BPM from IBM provides comprehensive, role-based capabilities to deliver value across enterprise.

BPM Drives Alignment of Business and IT for Continuous Process Optimization.
BPM from IBM Empowers You To Embrace Change and Continuously Optimize Your Business

Model and Simulate

Rapidly Deploy and Change

Monitor, Predict and Act

IBM BPM Suite products and services bring additional BPM value
WebSphere BPM Modeling Tools Portfolio

- All IBM Software Development platform products install in a consistent and extendable way within the ‘platform’
  - First Product installs the ‘platform’ as well as its own product-specific ‘installable units’
- Role-based tool approach, experienced as single integrated “desktop” IDE
- Reuse of RAD and Eclipse components (‘installable units’) is baked into the design
BPM from IBM Empowers You To Embrace Change and Continuously Optimize Your Business

Model and Simulate

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IBM BPM Suite products and services bring additional BPM value
Elements of WebSphere Process Server
Supports all aspects of process integration

Service Components
- Business Processes
- Human Tasks
  = Human Workflow

Supporting Services
- Mediation Flows (ESB)
- Data Maps
- Relationships
- Dynamic Service Selection
- Business Calendars

SOA Core
- Service Component Architecture
- Business Objects
- Common Event Infrastructure

WebSphere Application Server ND* (J2EE Runtime)

*WPS for z/OS includes WAS for z/OS
Interaction Patterns with Human Tasks

To-do Task

Collaboration Task

Invocation Task

Web service

Task Web Service Interface

Task Participant Interface

Task Originator Interface

Web service

create
start
notify

Web service

invoke
return

invoke
return

query
claim
complete

query
claim
complete

query
claim
complete

Human Task Manager
Supporting all aspects of human interaction

- Full integration of human workflow into SOA
- Rich task assignment capabilities
  - Assign work using flexible people queries
  - Federate multiple organization directories
  - Ability for dynamic task assignment
  - Re-direct work to substitutes in case of absence
- Support for managing time constraints
  - Multi-level escalation with e-mail based notification to involve additional people or services when the progress of a human task falls behind the modeled expectations
  - Task may become overdue or obsolete after a certain amount of time, handled by Human Task Manager – marks task as overdue or activates expiration processing
- Support for ad-hoc human collaboration
  - Create human tasks on-the-fly, extend pre-defined process models dynamically
  - Follow-up of manual Tasks
Assigning People to Human Tasks based on Virtual Member Manager (VMM)

- Human Task Manager
- WebSphere Security (Federated Repositories user registry)

Virtual Member Manager

- Property extension
- Federation

- Look-aside Repository
- LDAP repository adapter
- Custom repository adapter
- DB repository adapter
- File repository adapter

- Look-aside DB
- LDAP 1
- LDAP n
- Custom
- VMM DB
- File
Assigning People to Human Tasks
People resolution, substitution, post-processing

Virtual Member Manager

People Resolution → Substitution → Staff Query Post-Processor

Human Task Manager

Approval Task

Potential Owners

Business User
Assigning People to Human Tasks
People resolution, substitution, post-processing

Virtual Member Manager

Human Task Manager

People Resolution ➔ Substitution ➔ Staff Query Post-Processor

Potential Owners

Approval Task
Assigning People to Human Tasks
People resolution, substitution, post-processing

Human Task Manager

Virtual Member Manager

People Resolution → Substitution

Business User

Approval Task

Potential Owners

 Eddie

 Virtual Member Manager

 Gerhard Pfau, IBM Senior Technical Staff Member
Human Task Manager SPIs and Plug-in interfaces

Human Task Manager

- API Event Handler Plug-in Interface
- Notification Event Handler Plug-in Interface
- Staff Query Post Processing Plug-in Interface

- Plug-in implementation that manages task owner access to task-related documents
- Plug-in implementation that sends an SMS to the business administrator of the task
- Plug-in implementation that checks task data and determines if a complete operation should be allowed
- Plug-in implementation that un-claims escalated tasks
- Plug-in implementation that removes users with a high utilization rate
Collaborate and act through role-based spaces in a unified user interface for BPM

Business spaces powered by WebSphere

Facilitate collaboration across the BPM lifecycle and enable the business users with the “art of the possible”.

Enable the rapid creation of the end user experience together with the business solution, exploiting the full BPM portfolio.
Get immediate out-of-the-box experience and faster time-to-value

Compose user interfaces from rich set of widgets

Jump start with templates for common use cases

Role-based business space templates span the entire suite and multiple products … all based on the iWidget specification
Business Spaces powered by WebSphere

Architecture at a Glance

- Spaces
- Pages
- Widgets

BPM REST Platform

- REST API: WebSphere Process Server
- REST API: WebSphere Publishing Server
- REST API: WebSphere Business Monitor
- REST API: WebSphere Business Fabric
- REST API: WebSphere Enterprise Service Bus

- Common UI infrastructure shipped with BPM products
- Web Browser based rich internet application (RIA)
- Views built using mashup technology that integrate on the glass
- A user interface that’s customizable by business users
- Widgets backed by REST access to runtimes
Business Space for Human Workflow

*Tabular view and pagination based on Query Tables*

- **Tabular** view of task list incl. business data
- **Jump** to an arbitrary page of the task list

![Tabular view of task list with business data and pagination](image)
Exploitation of Business Calendars

Introduction

- Calendars are used with processes and human tasks to calculate durations
  - For example, to calculate the duration a process should wait in a wait activity, the duration it takes for a human task to become overdue, or the duration until an escalation fires

- WebSphere provides a built-in calendar service that manages contiguous time

- Business applications require that time be specified in a way that takes into account business constraints, such as hours of operation, or holidays.
  - For example, a modeler would like to be able to specify that a human task be escalated if not claimed within 4 business hours, or that a human task becomes due after 4 business days.

- Business Calendars are calendars that manage non-contiguous time
Business Calendars

Human Task Example

[Diagram showing a business calendar interface with options for selecting time intervals and managing availability for 2008, including options for first occurrence and repeat daily settings.]
Business Calendars
Managing Business Calendars

- Business Calendar widget allows users to work with business calendars
  - List calendars accessible to currently logged in user
  - Create, Read, Update, Delete calendar entries (assumes proper authorization)
  - View calendar details

Benefits
- Work with Business Calendars from within Business Space
- More flexibility: Update definition of time slots at runtime
Human Task History

Example – Task Information Widget in Business Space

Business User

Task information

Submit  Save  Actions

ImageTypeSub  Approval

Additional Information

bman1 requests your approval
Owner  bman1
Start date  9/30/08 6:38 PM
Status  accepted
Priority  5

History

<table>
<thead>
<tr>
<th>State</th>
<th>Name</th>
<th>Timestamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task created</td>
<td>bdaniel</td>
<td>9/30/08 5:58 PM</td>
</tr>
<tr>
<td>Task started</td>
<td>bdaniel</td>
<td>9/30/08 5:58 PM</td>
</tr>
<tr>
<td>Task accepted</td>
<td>dedwards</td>
<td>9/30/08 5:58 PM</td>
</tr>
<tr>
<td>Task returned</td>
<td>dedwards</td>
<td>9/30/08 6:38 PM</td>
</tr>
<tr>
<td>Task accepted</td>
<td>gpfau</td>
<td>9/30/08 6:38 PM</td>
</tr>
<tr>
<td>Task result modified</td>
<td>gpfau</td>
<td>9/30/08 6:39 PM</td>
</tr>
</tbody>
</table>
Human Task History

Example – Task History in Human Workflow Diagram

- Business User

Check the contract details for customer ‘Roger Smith’ and indicate whether the customer can request a cancellation of the contract at this time.

<table>
<thead>
<tr>
<th>State</th>
<th>Name</th>
<th>Timestamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task created</td>
<td>bdaniel</td>
<td>May 1, 2009 11:08:41 PM</td>
</tr>
<tr>
<td>Task started</td>
<td>bdaniel</td>
<td>May 1, 2009 11:08:41 PM</td>
</tr>
<tr>
<td>Task accepted</td>
<td>bdaniel</td>
<td>May 1, 2009 11:09:31 PM</td>
</tr>
<tr>
<td>Task result modified</td>
<td>bdaniel</td>
<td>May 1, 2009 11:10:48 PM</td>
</tr>
<tr>
<td>Task transfered to</td>
<td>bdaniel</td>
<td>May 1, 2009 11:11:09 PM</td>
</tr>
</tbody>
</table>
Human Task Escalation

Example

Task READY for humans to work on
(Task created in inbox of potential owners)

4 hrs after task was made ready
Send escalation eMail to first line manager

4 hrs after first line manager escalation
Send e-mail to second line manager
Human Task Escalation
Customizable e-mail Notification

Subject: The task 'TravelApproval' has been escalated
From: taskmanager.emailservice@htm.companydomain
Date: 6:44 PM
To: Gerhard.Pfau@ibm.com

The task 'TravelApproval' (task id 'TKI:a01b0109.2f657cfd.e33b67f6.d2d30016') has been escalated because the expected state 'Claimed' has not been reached within the expected time of 2 hours.

Traveler name: John Doe
Travel date: 2008/07/24
Travel destination: Hawaii
Estimated travel costs: € 3000

The task is assigned to the following approvers:
‘Doug, Ron, Melinda, Mary’

Escalation Details
Task Details
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Continuously Optimize

End-to-End Processes

Sales
Operations
Partners
Finance

Monitor, Predict and Act

IBM BPM Suite products and services bring additional BPM value
Understand, Improve Business Operations with BAM

Measuring Processes Allows You to Establish “As-Is” Baseline

It’s difficult to improve process performance if you don’t know how your business is currently performing

- Measure transaction volumes and work queues to identify “as-is” state
- Set goals and KPI’s based on operational or departmental objectives
- Continuously monitor KPIs and modify as necessary to achieve desired goals
General Flow

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Advanced Human-centric BPM Scenarios

Summary and Outlook
Case Handling is a paradigm that provides flexible business process support for knowledge workers, adding support for business scenarios with the following characteristics:

- Exceptions make the rule.
- Business users are domain experts and they know what they are doing! A case handling infrastructure has to support them to get the job done, providing guidance without being too constraining.
- While business process navigation is based on the modeled control-flow, the business scenarios demand:
  - the ability for dynamic changes including the ability to skip or redo one or many human activities
  - support for adding human activities on the fly

Dynamic Human Workflows enable Case Handling and other advanced human workflow scenarios.
Dynamic Human Workflows a.k.a. Case Handling

Example Scenario – Healthcare Case Process

Legend:
- Human Step
- Automatic Step

Appendix Removal Task

- Gather Patient Data
- Copy Patient Record into Case Folder
- Has 1st class health plan?
  - No
  - Yes
  - Assign Physician
  - Allocate Room and Bed
- Assign Chief Physician
- Blood test
- X-Ray
- Examination pre Surgery
- Allocate Operating Room
- Surgery
- De-Allocate Room and Bed
- De-Assign Physician
- De-Allocate Operating Room
- Examination
- Dismiss patient
- Appendix Removal Case Process
Dynamic Human Workflows a.k.a. Case Handling

Dynamicity Support for Business Users – Skip & Redo

Skipping Activities

Redoing Activities
Dynamic Human Workflows a.k.a. Case Handling
Ad-hoc Creation of Sub-tasks
Dynamic Human Workflows a.k.a. Case Handling
Folder and Attachments
Dynamic Human Workflows a.k.a. Case Handling
Programmatically adding attachments to the case folder

- You can pre-populate a case folder with attachments by providing the URL of the attachment plus corresponding meta data in the `<attachmentInfo>` element using the following scheme:

```xml
<attachment>
  <attachmentInfo>
    <name>Cancellation letter</name>
    <accessType>URL</accessType>
    <contentType>image/jpeg</contentType>
    <contentCategory>MIME</contentCategory>
    <attachedAt>2009-10-16T09:05:32Z</attachedAt>
    <attachedBy>gerhard</attachedBy>
  </attachmentInfo>
  <value xsi:type="xsd:string">
    http://example.com/scannedDocs/G1F2E3D4C5.jpg
  </value>
</attachment>
```
Dynamic Human Workflows a.k.a. Case Handling

Programmatically adding attachments to the case folder

- Example BO for a Case Folder Attachment

- Assignment logic
Parallel Routing Tasks
Model Parallel Approval and Voting Scenarios more easily

- Assigned to a group of users
- Each user sees the task on their group task list
- One of them chooses to work on the task and eventually completes it

- Assigned to a group of users
- A subtask is created automatically for each person in that group in parallel
- The result of the task is produced by aggregating the subtask’s results
- An optional completion function allows to preemptively complete the task
The IBM Extreme Blue™ program

Building a Smarter Planet

Extreme Blue Project 4
Context- and Situation-aware Human Workflows
General Flow

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Summary

- "BPM enabled by SOA" is the latest incarnation of IBM’s workflow and business process management technology

- WebSphere delivers "BPM enabled by SOA" and provides rich support for Human-centric BPM, SOA-based and grounded on open standards
  - Earlier releases already provide support for business critical functions like escalation, substitution, and sophisticated people assignment
  - Substantial enhancements have been added lately, like the new out-of-the-box business user client, exploitation of business calendars, improved performance and consumability, and the support for dynamic business processes a.k.a. case handling and parallel routing

- WebSphere Process Server addresses the complete spectrum – from lightweight, fully automated, straight-through processes over traditional human workflows to collaborative, dynamic business processes

- Want to learn more about the Dynamic Human Workflow and Case Handling capabilities in WebSphere Process Server?

- Download the recently published white paper “Dynamic Human Workflows – Introduction and Best Practices” here for free:

References and Further Readings

- **Business Process Choreographer Online Documentation**
  - Online documentation: WPS 6.2 – InfoCenter Entry page
  - Online documentation: WPS 6.2 – Task Concepts
  - Online documentation: WPS 6.2 – Process Concepts

- **General Information on Business Process Choreographer**
  - Business Process Management Samples & Tutorials
  - BPC 6.1 Concepts and Architecture
  - BPC 6.1 Programming Model
  - Business Process Choreographer on developerWorks
    http://www7b.boulder.ibm.com/wsdd/zones/was/wpc.html

- **Other Interesting Papers**
  - Business process choreography in WebSphere: Combining the power of BPEL and J2EE
  - IBM Systems Journal Issue on Service Oriented Architecture

- **Performance**
  - Query Table Builder support pack PA71
  - Whitepaper: WPS 6.1 - Performance Tuning Automatic Business Processes for Production Scenarios with DB2
  - Technote: Improving the performance of complex BPC API queries on DB2
    http://www.ibm.com/support/docview.wss?uid=swg21299450

- **Standards**
  - Standard: Web Services Business Process Execution Language Version 2.0
    http://docs.oasis-open.org/wsbpel/2.0/OS/wsbpel-v2.0-OS.pdf
  - Specification: WS-BPEL Extension for People
  - Specification: WS-BPEL 2.0 Extensions for Sub-Processes
  - Specification: BPELJ: BPEL for Java technology

- **Versioning**
  - White paper: Versioning business processes and human tasks in WebSphere Process Server

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http://publib.boulder.ibm.com/bpcsamp/
Learning More about WebSphere BPM

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- Overview, Big Picture and New Functions
- Installation and Migration
- Programming for Service Oriented Architecture
- Monitoring SOA Integration Applications
- Supporting Services for Service Applications
- Enterprise Service Bus Application Components
- Integration with enterprise applications using WebSphere Adapters
- Unit Testing Service Components
- System Administration
- Clustering
- Building integration applications – end-to-end scenario
