

R12 Implement Oracle Workflow

Volume 1 - Student Guide

D49191GC10

Edition 1.0

June 2007

D50533

ORACLE®

Copyright © 2007, Oracle. All rights reserved.

This document contains proprietary information and is protected by copyright and other intellectual property laws. You may copy and print this document solely for your own use in an Oracle training course. The document may not be modified or altered in any way. Except where your use constitutes "fair use" under copyright law, you may not use, share, download, upload, copy, print, display, perform, reproduce, publish, license, post, transmit, or distribute this document in whole or in part without the express authorization of Oracle.

The information contained in this document is subject to change without notice. If you find any problems in the document, please report them in writing to: Oracle University, 500 Oracle Parkway, Redwood Shores, California 94065 USA. This document is not warranted to be error-free.

If this documentation is delivered to the United States Government or anyone using the documentation on behalf of the United States Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS

The U.S. Government's rights to use, modify, reproduce, release, perform, display, or disclose these training materials are restricted by the terms of the applicable Oracle license agreement and/or the applicable U.S. Government contract.

Oracle, JD Edwards, PeopleSoft, and Siebel are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

Authors

Clara Jaeckel, Melody Yang

Technical Contributors and Reviewers

Leta Davis, Donna Johnson, Gary Lemmons, Michael Morrison, Georgia Price, Robert Wunderlich

This book was published using: *oracle*tutor****

Table of Contents

Introduction to Oracle Workflow	1-1
Introduction to Oracle Workflow	1-3
Objectives	1-4
Enabling E-Business	1-5
Inter-Enterprise Business Processes	1-6
Traditional Workflow	1-7
Workflow-Driven Business Processes	1-8
Sample Workflow Process	1-10
Event-Based Workflow	1-11
Subscription-Based Processing	1-12
System Integration with Oracle Workflow	1-13
Business Process-Based Integration	1-14
Supported System Integration Types	1-15
Designing Applications for Change	1-16
Designing Applications for Integration	1-19
Oracle Workflow in Oracle E-Business Suite	1-21
Guided Demonstration - Loading and Running a Workflow Process	1-22
Summary	1-24
Oracle Workflow Components	2-1
Oracle Workflow Components	2-3
Objectives	2-4
Oracle Workflow Architecture	2-5
Oracle Workflow Components	2-9
Workflow Engine	2-10
Workflow Processes	2-11
Supported Process Constructs	2-13
Oracle Workflow Builder	2-17
Business Event System Architecture	2-18
Business Event System Components	2-19
Advanced Queuing, an Enabling Technology	2-20
Oracle Database Communication Alternatives	2-21
Accessing Oracle Workflow Web Pages	2-23
Oracle Workflow Home Pages	2-24
Notification System	2-25
Worklist Web Pages	2-26
E-Mail Notifications	2-27
Directory Services	2-28
Status Monitor Web Pages	2-29
Workflow Definitions Loader	2-30
Workflow XML Loader	2-31
Workflow Manager	2-32
Service Components	2-33
Oracle Workflow Documentation	2-34
Review Questions	2-36
Summary	2-37
Planning a Workflow Process	3-1
Planning a Workflow Process	3-3
Objectives	3-4
Workflow Process Components	3-5
Oracle Workflow Builder	3-7
Standard Activities	3-8

Planning a Workflow Process.....	3-10
Activity Results and Lookup Types.....	3-13
Practice - Planning a Workflow Process.....	3-15
Solution – Planning a Workflow Process	3-16
Summary.....	3-17
Diagramming a Workflow Process	4-1
Diagramming a Workflow Process.....	4-3
Objectives.....	4-4
Creating a New Workflow Process.....	4-5
Creating a New Process from Top Down	4-6
Creating a New Process from Bottom Up	4-7
Diagramming a Process	4-8
Quick Start Wizard	4-9
Defining an Item Type.....	4-12
Defining a Process Activity	4-14
Diagramming a Process	4-16
Top-Down Design	4-17
Diagramming a Process	4-18
<Default> Transition	4-19
<Any> Transition	4-20
Editing a Transition	4-21
Self-Looping Transitions.....	4-23
Customizing an Activity Node	4-24
Show Label in Designer Menu Options.....	4-26
Display Modes.....	4-27
Verifying a Process Definition	4-28
Validation Performed by the Verify Command.....	4-29
Saving Process Definitions	4-31
Practice - Creating a Workflow Process	4-32
Solution – Creating a Workflow Process.....	4-33
Summary.....	4-35
Defining Item Type Attributes and Lookup Types.....	5-1
Defining Item Type Attributes and Lookup Types.....	5-3
Objectives.....	5-4
Defining Item Type Attributes.....	5-5
Attribute Data Types	5-7
Defining Item Type Attributes.....	5-9
URL Attributes	5-10
Form Attributes	5-13
Document Attributes.....	5-16
Deleting Item Attributes	5-19
Defining Lookup Types.....	5-20
Defining Lookup Codes.....	5-21
Practice - Defining Item Type Attributes.....	5-22
Solution – Defining Item Type Attributes	5-23
Summary.....	5-26
Defining Messages and Notification Activities	6-1
Defining Messages and Notification Activities	6-3
Objectives.....	6-4
Notification Activities	6-5
Defining a Message	6-6
Defining a Message Attribute.....	6-8
Defining a Respond Attribute.....	6-10
Defining a Message Result	6-11
Notification Details Web Page	6-12

HTML E-mail Notifications	6-13
Plain Text E-mail Notifications Using Templated Response	6-14
Plain Text E-mail Notifications Using Direct Response	6-15
Practice - Defining Messages	6-16
Solution – Defining Messages	6-17
Defining a Notification Activity	6-20
Standard Voting Activity	6-22
Defining a Notification Activity Node	6-23
Defining a Timeout for a Notification	6-24
Defining a Dynamic Priority for a Notification	6-25
Defining a Performer for a Notification	6-26
Special Message Attributes.....	6-27
Action History	6-34
Special Message Function	6-35
Embedding Oracle Application Framework Regions in Notifications	6-37
Practice - Defining Notification Activities	6-38
Solution – Defining Notification Activities	6-39
Summary.....	6-41
Testing and Monitoring Workflow Processes	7-1
Testing and Monitoring Workflow Processes.....	7-3
Objectives	7-4
Testing Workflow Processes	7-5
Administrator Monitor.....	7-8
Viewing Workflows in the Administrator Monitor	7-10
Viewing Activity History in the Administrator Monitor	7-12
Viewing a Status Diagram in the Administrator Monitor	7-13
Viewing Responses in the Administrator Monitor	7-15
Viewing Workflow Details in the Administrator Monitor.....	7-17
Viewing Error Information in the Administrator Monitor.....	7-18
Viewing Child Workflows in the Administrator Monitor	7-19
Self-Service Monitor	7-20
Viewing Workflows in the Self-Service Monitor	7-21
Viewing Notification History in the Self-Service Monitor.....	7-23
Viewing a Status Diagram in the Self-Service Monitor	7-24
Viewing Responses in the Self-Service Monitor	7-26
Viewing Error Information in the Self-Service Monitor	7-28
Practice - Running a Workflow Process	7-29
Solution – Running a Workflow Process.....	7-30
Summary.....	7-31
Viewing and Responding to Notifications.....	8-1
Viewing and Responding to Notifications.....	8-3
Objectives	8-4
Viewing Notifications from a Web Browser	8-5
Worklist Pages.....	8-6
Advanced Worklist	8-7
Notification Details.....	8-9
Reassigning Notifications.....	8-12
Requesting More Information.....	8-14
Certificate-Based Digital Signatures	8-15
Granting Worklist Access.....	8-17
Administrator Search for Notifications.....	8-21
Reviewing Electronic Signature Details	8-23
Personal Worklist	8-25
Simple Search for Notifications.....	8-27
Advanced Search for Notifications.....	8-28
Creating a Personal Worklist View	8-30

Practice - Responding to Notifications	8-32
Solution – Responding to Notifications	8-33
Viewing Notifications Through E-mail	8-34
E-mail Response Methods	8-36
HTML-Formatted E-mail Notifications	8-37
Plain Text E-mail Notifications Using Templated Response	8-39
Plain Text E-mail Notifications Using Direct Response	8-40
Viewing an E-mail Summary of Notifications	8-41
Vacation Rules	8-42
Maintaining Vacation Rules	8-43
Defining Vacation Rules	8-44
Practice - Modifying A Workflow Process	8-47
Solution – Modifying a Workflow Process	8-49
Summary	8-52
Worklist Flexfields.....	9-1
Worklist Flexfields	9-3
Objectives	9-4
Worklist Flexfields	9-5
Benefits of Worklist Flexfields.....	9-6
Defining a Specialized Worklist View Using Worklist Flexfields	9-7
Message Attributes in Worklist Flexfields Rules	9-8
How Worklist Flexfields Rules Operate	9-9
Phase Numbers	9-10
Customization Levels	9-11
Core Rules	9-12
Limit and User Rules	9-14
Combining Core, Limit, and User Rules	9-17
Worklist Flexfields Rules Example	9-18
Defining a Worklist Flexfields Rule: Entering General Properties	9-20
Defining a Worklist Flexfields Rule: Selecting Filter Criteria	9-22
Defining a Worklist Flexfields Rule: Selecting Message Attributes	9-23
Defining a Worklist Flexfields Rule: Mapping Attributes to Columns	9-25
Resolving Conflicts Between Worklist Flexfields Rules.....	9-27
Maintaining Worklist Flexfields Rules.....	9-28
Storing Message Attribute Values in Worklist Flexfields Columns	9-30
Performing a Worklist Flexfields Rule Simulation	9-31
Defining a Securing Function.....	9-34
Creating a Personalized View for the Personal Worklist.....	9-35
Restarting Oracle HTTP Server	9-37
Practice - Defining a Specialized Worklist View Using Worklist Flexfields	9-38
Solution – Defining a Specialized Worklist View Using Worklist Flexfields	9-41
Summary.....	9-45
Oracle Workflow Directory Service.....	10-1
Oracle Workflow Directory Service	10-3
Objectives	10-4
Oracle Workflow Directory Service	10-5
Predefined Directory Service.....	10-6
Directory Service Views.....	10-7
WF_USERS View	10-8
WF_ROLES View	10-11
WF_USER_ROLES View.....	10-13
WF_USER_ROLE_ASSIGNMENTS_V View	10-16
Local Directory Service Tables	10-18
Ad Hoc Users and Roles.....	10-20
Validating a Directory Service Data Model.....	10-21
Setting Workflow Preferences.....	10-22

Loading Roles.....	10-23
Summary.....	10-24
Defining Function Activities	11-1
Defining Function Activities	11-3
Objectives	11-4
Function Activities	11-5
Defining a Function Activity	11-6
Practice - Defining a Function Activity	11-8
Solution – Defining a Function Activity.....	11-10
External Function Activities	11-13
Assigning a Cost to a Function Activity.....	11-15
Practice - Branching on a Function Activity Result	11-16
Solution – Branching on a Function Activity Result	11-18
PL/SQL Procedures for Function Activities.....	11-21
Standard API for PL/SQL Procedures Called by Function Activities	11-22
Standard API Parameters.....	11-24
Function Activity Execution Modes.....	11-25
Standard API Resultout Parameter	11-27
Exception Handling	11-28
Exception Handling Example.....	11-29
Defining Activity Details.....	11-30
Error Handling.....	11-32
Looping	11-33
Defining an Activity Attribute.....	11-34
Setting Activity Attribute Values	11-35
Practice - Using the Standard Assign Activity.....	11-36
Solution – Using the Standard Assign Activity	11-38
Summary.....	11-44
Workflow Engine.....	12-1
Workflow Engine	12-3
Objectives	12-4
Overview of the Workflow Engine.....	12-5
Initiating a Workflow Process	12-7
Workflow Engine Processing	12-9
Activity Statuses	12-12
Calling the Workflow Engine.....	12-13
Background Engines.....	12-14
Stuck Processes	12-15
Timed Out Activities	12-16
Deferred Processing.....	12-17
Oracle Workflow APIs	12-19
Workflow Engine APIs	12-21
Workflow Engine Bulk APIs.....	12-28
Practice - Implementing Timeout Processing	12-29
Solution – Implementing Timeout Processing.....	12-30
Practice - Implementing Deferred Processing	12-33
Solution – Implementing Deferred Processing	12-34
Summary.....	12-36
Business Events.....	13-1
Business Events	13-3
Objectives	13-4
Business Events	13-5
Event Properties.....	13-6
Generate Functions	13-8
License Status for Events	13-10

Defining an Event.....	13-11
Event Groups.....	13-12
Defining an Event Group.....	13-13
Maintaining Events.....	13-14
Raising Events.....	13-16
Event Message Structure.....	13-18
Raising an Event Manually.....	13-19
Predefined Events.....	13-20
Practice - Defining an Event.....	13-21
Solution – Defining an Event.....	13-22
Practice - Raising an Event.....	13-24
Solution – Raising an Event.....	13-25
Summary.....	13-27
Event Subscriptions.....	14-1
Event Subscriptions.....	14-3
Objectives.....	14-4
Event Subscriptions.....	14-5
Event Manager Subscription Processing.....	14-6
Local Event Subscription Processing.....	14-7
External Event Subscription Processing.....	14-9
Subscription Properties.....	14-10
Subscription Actions.....	14-14
Subscription Actions: Sending an Event to a Workflow Process.....	14-15
Subscription Actions: Sending an Event to an Agent.....	14-17
Subscription Actions: Sending a Notification.....	14-19
Subscription Actions: Sending and Receiving Oracle XML Gateway Messages.....	14-21
Subscription Actions: Running a Custom Rule Function.....	14-22
Subscription Properties.....	14-25
License Status for Subscriptions.....	14-28
Deferred Subscription Processing.....	14-29
PL/SQL and Java Subscription Processing.....	14-31
Defining a Subscription.....	14-33
Maintaining Subscriptions.....	14-35
Predefined Subscriptions.....	14-36
Practice - Defining a Subscription.....	14-37
Solution – Defining a Subscription.....	14-39
Summary.....	14-44
Systems and Agents.....	15-1
Systems and Agents.....	15-3
Objectives.....	15-4
Systems.....	15-5
System Properties.....	15-6
Local System.....	15-7
External Systems.....	15-8
Defining a System.....	15-9
Maintaining Systems.....	15-10
Agents.....	15-12
Standard Agents.....	15-14
Agent Properties.....	15-16
Custom Queue Handlers.....	15-21
Agents on External Systems.....	15-22
Defining an Agent.....	15-24
Agent Groups.....	15-26
Defining an Agent Group.....	15-27
Maintaining Agents.....	15-28
External System Registration.....	15-29

Retrieving System Identifier Information	15-31
Registering Systems	15-33
Review Questions	15-36
Summary.....	15-38
Defining Event Activities.....	16-1
Defining Event Activities	16-3
Objectives	16-4
Event Activities	16-5
Event-Based Workflow Processes	16-6
Event Activity Actions	16-7
Receive Event Activities	16-8
Receive Event Activities: Event Filter.....	16-9
Receive Event Activities: Sending an Event to One Process.....	16-10
Receive Event Activities: Sending an Event to Multiple Processes	16-12
Receive Event Activities: Receiving an Event	16-13
Raise Event Activities	16-15
Send Event Activities	16-16
Defining an Event Activity	16-17
Event Details	16-19
Defining Event Details: Receive	16-20
Defining Event Details: Raise	16-21
Defining Event Details: Send	16-23
Example: Order Processing	16-25
Standard Activities	16-26
Practice - Defining Event Activities	16-27
Solution – Defining Event Activities.....	16-29
Summary.....	16-38
Business Event System APIs	17-1
Business Event System APIs	17-3
Objectives	17-4
Business Event System datatypes	17-5
Event Message Structure	17-6
Agent Structure.....	17-10
Parameter List Structure	17-12
Parameter Structure	17-13
Raising Events Programmatically.....	17-15
Event Data Generate Functions	17-22
Standard API for PL/SQL Event Data Generate Functions	17-23
Standard API for Java Event Data Generate Functions	17-24
Queue Handlers	17-27
Standard APIs for PL/SQL Queue Handlers	17-28
Standard APIs for Java Queue Handlers.....	17-29
Subscription Rule Functions.....	17-31
Standard API for PL/SQL Subscription Rule Functions	17-32
Standard API for Java Subscription Rule Functions.....	17-34
Predefined Subscription Rule Functions.....	17-36
Event APIs.....	17-38
Event Function APIs.....	17-40
Adding a Correlation ID to an Event Message	17-41
Business Event System Cleanup API	17-43
Summary.....	17-44
Error Handling	18-1
Error Handling	18-3
Objectives	18-4
Error Handling for Workflow Processes	18-5

Default Error Process.....	18-7
Retry-only Process.....	18-9
Error Handling for Subscription Processing.....	18-11
Stop and Rollback Error Handling.....	18-13
Skip to Next Error Handling.....	18-15
Standard Error Agents.....	18-17
Error Handling Subscriptions.....	18-18
Warning Conditions in Subscription Processing.....	18-19
Unexpected Events.....	18-20
Default Event Error Process.....	18-21
Event Warnings.....	18-22
External Event Errors.....	18-23
Local Event Errors.....	18-24
Guided Demonstration - Error Handling.....	18-25
Summary.....	18-26
PL/SQL Documents.....	19-1
PL/SQL Documents.....	19-3
Objectives.....	19-4
PL/SQL Documents.....	19-5
Integrating PL/SQL Documents into Workflow Processes.....	19-6
Including PL/SQL Documents in Messages.....	19-8
Standard API for a PL/SQL Document.....	19-9
Standard API for a PL/SQL CLOB Document.....	19-11
Standard API for a PL/SQL BLOB Document.....	19-13
Practice - Using a PL/SQL Document Attribute.....	19-15
Solution – Using a PL/SQL Document Attribute.....	19-17
Summary.....	19-22
Post-Notification Functions.....	20-1
Post-Notification Functions.....	20-3
Objectives.....	20-4
PL/SQL Procedures for Notification Activities.....	20-5
Standard API for PL/SQL Procedures Called by Notification Activities.....	20-6
Post-Notification Function Execution Modes.....	20-9
Standard API Resultout Parameter for a Post-Notification Function.....	20-11
Post-Notification Function Context Information.....	20-12
Practice - Defining a Post-Notification Function.....	20-13
Solution – Defining a Post-Notification Function.....	20-15
Exception Handling.....	20-19
Summary.....	20-20
Forced Synchronous Processing.....	21-1
Forced Synchronous Processing.....	21-3
Objectives.....	21-4
Forced Synchronous Processes.....	21-5
Process Definition Restrictions.....	21-6
Summary.....	21-9
Selector/Callback Functions.....	22-1
Selector/Callback Functions.....	22-3
Objectives.....	22-4
Item Type Selector/Callback Functions.....	22-5
Defining a Selector/Callback Function for an Item Type.....	22-6
Standard API for a Selector/Callback Function.....	22-7
Standard API Parameters.....	22-9
Selector/Callback Function Commands.....	22-11
Practice - Defining a Selector Function.....	22-13
Solution – Defining a Selector Function.....	22-15

Summary.....	22-20
Master/Detail Coordination Activities.....	23-1
Master/Detail Coordination Activities.....	23-3
Objectives.....	23-4
Master/Detail Coordination Activities.....	23-5
Wait for Flow Activity.....	23-9
Continue Flow Activity.....	23-11
Master Process Example.....	23-12
Detail Process Example.....	23-13
Continue Flow Processing.....	23-14
Summary.....	23-15
Customizing Workflow Processes.....	24-1
Customizing Workflow Processes.....	24-3
Objectives.....	24-4
Customizing Workflow Processes.....	24-5
Access Protection.....	24-7
Access Levels.....	24-8
Setting the Access Level.....	24-10
Setting Protection and Customization Levels.....	24-11
Example of Access Protection.....	24-13
Unsupported Customizations.....	24-15
Workflow Definitions Loader.....	24-16
Preserving Customizations.....	24-17
Summary.....	24-18
Workflow Loaders.....	25-1
Workflow Loaders.....	25-3
Objectives.....	25-4
Workflow Definitions Loader.....	25-5
Workflow XML Loader.....	25-7
Summary.....	25-11
Specialized Workflow Monitoring.....	26-1
Specialized Workflow Monitoring.....	26-3
Objectives.....	26-4
Assigning Specialized Workflow Monitoring Privileges.....	26-5
Granting Restricted Access to Workflow Monitoring Data.....	26-7
Granting Restricted Access Based on Item Types.....	26-8
Granting Restricted Access Based on Functional Criteria.....	26-9
Granting Permissions for Administrative Actions.....	26-11
Guided Demonstration - Setting Up Specialized Workflow Monitoring.....	26-12
Summary.....	26-15
Setting Up Oracle Workflow.....	27-1
Setting Up Oracle Workflow.....	27-3
Objectives.....	27-4
Required Setup Steps.....	27-5
Step 1 Setting Global Workflow Preferences.....	27-6
Step 2 Setting Up an Oracle Workflow Directory Service.....	27-9
Step 3 Running Background Engines.....	27-13
Step 4 Configuring the Business Event System.....	27-16
Step 4 Event Message Communication.....	27-17
Step 4 Setting Up Database Links and Queues.....	27-18
Step 4 Checking Database Parameters.....	27-19
Step 4 Scheduling Agent Listeners.....	27-20
Step 4 Scheduling Propagation.....	27-23
Guided Demonstration - Scheduling Agent Listeners and Propagation.....	27-27

Step 4 Synchronizing License Statuses	27-29
Step 4 Cleaning Up the WF_CONTROL Queue	27-30
Step 4 Tuning Performance	27-31
Step 4 Specifying the BPEL Server	27-33
Optional Setup Steps	27-34
Optional Step 1 Partitioning Workflow Tables	27-36
Optional Step 2 Setting Up Additional Languages	27-38
Optional Step 3 Implementing Notification Mailers	27-40
Optional Step 4 Customizing Message Templates	27-43
Optional Step 5 Adding Worklist Functions to User Responsibilities	27-46
Optional Step 6 Setting the Notification Reassign Mode	27-48
Optional Step 7 Setting Up Notification Handling Options	27-49
Optional Step 8 Setting Up for Electronic Signatures	27-51
Optional Step 9 Customizing the Workflow Web Page Logo	27-53
Optional Step 10 Adding Custom Icons	27-54
Version Compatibility	27-55
Review Questions	27-56
Summary	27-58
Managing Service Components	28-1
Managing Service Components	28-3
Objectives	28-4
Oracle Workflow Manager	28-5
Service Components	28-6
Service Component Containers	28-7
Service Component Types	28-8
Accessing Service Components in Oracle Workflow Manager	28-9
Managing Service Components	28-10
Service Component Container Logs	28-12
Service Component Startup Modes	28-13
Agent Listeners	28-14
Agent Listener Configuration Wizards	28-17
Notification Mailers	28-20
Outbound Notification Mailer Processing	28-21
Inbound Notification Mailer Processing	28-23
Notification Mailer Setup	28-25
Connecting to Mail Servers Through SSL	28-27
Notification Mailer Basic Configuration	28-28
Notification Mailer Advanced Configuration	28-30
Component Details for Notification Mailers	28-37
Notification Mailer Throughput	28-39
Guided Demonstration - Service Components	28-40
Handling Notification Mailer Errors	28-42
Summary	28-43
Managing System Status and Throughput	29-1
Managing System Status and Throughput	29-3
Objectives	29-4
Workflow System Status	29-5
Workflow Status in Oracle Applications Manager	29-7
Oracle Workflow Administration	29-9
Work Items	29-10
Oracle Workflow Administration	29-15
Purging Workflow Data	29-16
Completed Work Items	29-21
Workflow Purge APIs	29-24
Oracle Workflow Administration	29-25
Background Engines	29-26

Oracle Workflow Administration	29-29
Control Queue Cleanup	29-30
Oracle Workflow Administration	29-32
Queue Propagation	29-33
Oracle Workflow Administration	29-34
Agent Activity	29-35
Searching Messages on an Agent	29-36
Guided Demonstration - System Status and Throughput.....	29-37
Summary.....	29-40
Sample Solutions.....	30-1
Sample Solutions	30-3
Overview	30-4
Vacation Proposal Process Sketch.....	30-5
wfvacxx.html	30-6
wfvacxxc.sql.....	30-7
wfvacxxs.sql	30-9
wfvacxxb.sql.....	30-14
wfvacxxd.sql.....	30-28
wfslectxx.sql.....	30-30

