Personalize, Customize and Extend Oracle E-Business Suite User Interface

Gustavo Jimenez, Sara Woodhull
Applications Technology Group
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Program Agenda

- Personalization, Extension and Customization
- Technology Choices
- Form Personalizations and Extensibility
- OAF Personalizations and Extensibility
- Oracle E-Business Suite SDK for Java
- Oracle E-Business Suite Extensions Using ADF
Increase Value from Applications
What’s New in Applications Technology

Results:
- Drive greater end user productivity
- Reduce cost of ownership
- Increase agility and lower integration costs
Release 12.1 Technology Stack: 3-Tier Logical Architecture

Client
- Java
- Windows
- Apple
- Mozilla
- Samsung

Application
- Oracle Fusion Middleware
- OC4J
- JSP
- BC4J
- UIX
- BI Publisher
- Forms

Database
- Oracle Database
- 10gR2 | 11g
- Global Single Data Model
- RAC & ASM

JDBC/SQL Net
HTTP/S
Web Listener
EBS Release 12.2 Technology Stack

Client
- Java
- Windows
- Mac
- Android

Application
- WebLogic Server
- WebLogic JSP
- BC4J
- UIX 11g
- BI Publisher
- Forms

Database
- Global Single Data Model
- RAC & ASM
- Edition-Based Redefinition

Oracle Fusion Middleware 11g
Oracle Database 11gR2
Configuration

- Oracle E-Business Suite provides flexible configuration options such as
  - Flexfields
  - Folders
Options for Personalization

• Personalization refers to using Oracle E-Business Suite personalization frameworks to modify UI
  – OA Framework
    • Administrator personalizations
    • User personalizations (search pages only)
  – Forms
Options for Extension

• Extension refers to building new components and integrating with Oracle E-Business Suite

• Extension technologies
  – BC4J Substitution to extend business logic (preferred)
  – OA Framework to build new pages, applications (preferred)
  – Oracle Forms to build new pages, applications
  – ADF to build extensions and new applications
  – Application Express (APEX)
  – mod_plsql for extensions (Release 11i only, not recommended)
Options for Customization

• Customization-in-place refers to modifying existing code and components "in place" (not recommended)
  – Modifying OAF controllers, Forms code, PL/SQL code or mod_plsql code not supported
  – Customizations-in-place will be overwritten by patches and upgrades

  – Customization standards include placing custom code in separate APPL_TOP directories, among other things
  – See Oracle E-Business Suite Developer's Guide
Choosing the Right Technology

• Personalization
  – Oracle Forms
  – Oracle Application Framework

• Extension
  – Oracle Forms
  – OA Framework
  – APEX and mod_plsql
  – ADF
Choosing the Right Technology

Personalization

• Use OA Framework or Forms personalization for:
  – Any UI changes (show/hide, re-order, etc.)

• Personalization
  – Non-invasive
  – Can be turned off if problems occur
  – Upgrades automatically if screen and objects exist in the target version

• Uses the same technology as what the application has been built on
Choosing the Right Technology

Extension

• Choose Forms or OA Framework to build screens if
  – You are adding functionality to an existing application with one or more new UI screens

• Choose OA Framework / BC4J extension and substitution mechanism if
  – Your existing OA Framework application requires changes to business logic
Choosing the Right Technology

New Applications

• Use OA Framework if your application needs to
  – Use Flexfields
  – Use E-Business Suite function security and data security
  – Have seamless session management with E-Business Suite applications
  – Have same look and feel as the E-Business Suite application
Choosing the Right Technology

New Applications

• Use ADF if your application needs to
  – Use the same standards-based Java development platform as Fusion applications
  – Have rich user interface capabilities that are specific to ADF
  – Support mobile devices via ADF Mobile
Choosing the Right Technology

New Applications

• Use APEX if you are building PL/SQL-based applications with simple template-based UIs
  – Requires PL/SQL skills
  – No Java required or allowed
  – Provides lightweight HTML-based UI
Choosing the Right Technology
Cost of Development and Maintenance

- New Applications
- Personalizations
- Extensions
- Customizations-in-place
Form Personalization
Form Personalization

- Allows you to make changes to a form without programming
- You can:
  - Change object properties such as title, required, and so on
  - Display messages to the user
  - Activate additional menu entries
  - Execute certain Forms built-ins such as database procedure call, ‘Do’ key, open form/URL
Accessing the Form Personalization UI
Form Personalizations UI: Condition

<table>
<thead>
<tr>
<th>Seq</th>
<th>Description</th>
<th>Level</th>
<th>Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Segregation of Duties Constraint - Enable trigger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Segregation of Duties Constraint - Disable Trigger</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Condition**

- **Trigger Event**: WHEN-NEW-ITEM-INSTANCE
- **Trigger Object**: USER_RESP.DESCRIPTION
- **Condition**: system.record_status = 'INSERT' and amrw_violation_pub.Check_Resp_Violations(
  user_resp.user_id, user_resp.responsibility_id) = 'Y'
- **Processing Mode**: Not in Enter-Query Mode
- **Context**
  - **Level**: Site
  - **Value**:
    - Site
      - Value

- Insert 'Get' Expression...
- Insert Item Value...
- Validate
- Apply Now
Form Personalizations UI: Actions

![Form Personalizations UI screenshot]

- Function Name: FND_FNDSCAUS
- Form Name: FNDSCAUS
- Debug Mode: Off

**Condition**

<table>
<thead>
<tr>
<th>Seq</th>
<th>Description</th>
<th>Level</th>
<th>Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Segregation of Duties Constraint - Enable trigger</td>
<td>Function</td>
<td>✔️</td>
</tr>
<tr>
<td>20</td>
<td>Segregation of Duties Constraint - Disable Trigger</td>
<td>Function</td>
<td></td>
</tr>
</tbody>
</table>

**Actions**

<table>
<thead>
<tr>
<th>Seq</th>
<th>Type</th>
<th>Description</th>
<th>Language</th>
<th>Enabled</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Property</td>
<td>Enable Trigger</td>
<td>America...</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Message</td>
<td>error message</td>
<td>America...</td>
<td></td>
</tr>
</tbody>
</table>

- Select By Text
- Object Type: Item
- Target Object: USER_RESP_RESPONSIBILITY_NAME
- Property Name: VALUE
- Get Value

Insert 'Get' Expression...  Insert Item Value...  Validate  Apply Now
Relationship to CUSTOM.PLL Library

• CUSTOM.PLL is a stub library Oracle ships that receives certain form events. Customers can freely add code to it.
  – Considered "extension" instead of "personalization"

• It is an Oracle Forms library, so you must use Oracle Developer to edit and generate it.
  – Code rather than metadata
Form Personalizations or CUSTOM.PLL Library?

- Form Personalizations and changes to the CUSTOM.PLL library co-exist
- CUSTOM.PLL can do more than Form Personalizations because it has complete access to PL/SQL and SQL
- Use Form Personalizations instead of CUSTOM.PLL whenever possible
  - Form Personalizations can handle the vast majority of your changes
OA Framework
Personalization and Extensibility
OA Framework Personalization

Overview

• Personalizations modify the user interface of a page
• Personalization documents are stored as XML files in the database
  – Part of the Metadata Services (MDS) repository
• Personalizations are layered on top of the base page at runtime
  – Base product pages are not changed
Personalization

Features

• Immediate, visual feedback of changes
• Patching the base page generally doesn’t affect the personalizations
• Available on all OA Framework components
• Translation support
• Utilities to move changes across instances
Personalization

Levels

• Administrator Personalization
  – Function
  – Location
  – Site
  – Organization
  – Responsibility

• End User Personalization
  – User Views

• Personalization at each layer is stored in its own XML document
Personalization

Administrator Personalizations

• Tailor text for labels, prompts, and tip messages
• Hide or show components
• Reorder components
• Restrict query results
• Add new items: fields, buttons, links, pick lists, images, regions, and so on
• Tailor graphs and charts
• Seed end-user views
Personalization

End User Personalizations

• Available on query regions only
  – Create and save a search
  – Tailor results table column titles
  – Hide/show results table columns
  – Reorder results table columns
  – Add data filters
  – Change sorting order

• A system administrator can seed user views and default a view
Extensibility

Overview

• Extend Oracle E-Business Suite if you want to:
  – Modify or extend business logic such as data validation
  – Build new pages
  – Change page flows
  – Build new business components
Extensibility

New Applications

• Build new OA Framework applications using OA Extension to JDeveloper 10g
  – JDeveloper 10g version customized for Application development

• Follow the OA Framework Developer’s Guide
  – Build the model – BC4J components
  – Build the view – OA Framework pages
  – Build the flow and event handling – controller classes
  – Seed functions, menus, responsibilities, etc.

• OA Framework extensions are tightly integrated with the Oracle E-Business Suite
Extensibility

Business Layer

• Extending only the model
• Can add or modify attributes and business logic
• Store modified objects as Substitutions
  – Base object is unchanged

Declarative Definitions

Base Business Object

Extends

Custom Object implements business logic extensions

Substitution:
oracle.apps.po.OrderBizObj = partner.oracle.apps.po.PartnerOrderBizObj
Personalization and Extensibility

Summary

• Model
  – Can extend
  – Infrastructure to build such extensions supported

• View
  – Can personalize and extend
  – Infrastructure to build such personalizations and extensions supported

• Controller
  – Can “customize”
  – Such “customizations” are not supported by Oracle
## Personalization Features in Release 12

### Release 12.0
- Personalization Document Manager
- Contextual Hierarchy Page
- Simple Page View on Hierarchy Page
- Support for EL Syntax
- Enhanced Configurable Page Personalization
- Enhanced Home Page Personalization
- Configurable Start Page

### Release 12.1
- Support for personalizing additional attributes
  - HGrid – control record size
  - Query – add search mappings
  - Flexfields – add flexfield reference field mappings
  - Text Input – control maximum length

### Release Post-12.1.3 (Roadmap)
- Add new items based on dynamically created view objects
- Extend personalization capability to more components and properties
- Support attaching PPR events and actions
- Support Undo Personalization
- Support Copy Personalization
- Support for Enhanced EL
Personalization Roadmap

Creating View Objects within Personalization UI

- Allow creation of view objects based on SQL queries
- Attach such view object and attributes to new items in personalizations for the same base page
Personalization Roadmap

Creating View Objects within Personalization UI
Personalization Roadmap

Support More Components

• Adding ability to create more types of components using personalization
  – header
  – messageComponentLayout
  – table and advancedTable
  – submitButton
  – resetButton
  – messageRichTextEditor
Personalization Roadmap

Support Partial Page Refresh Events

• Provide more interactivity through personalization

• Support planned for items that can trigger a PPR event
  – The Action Type property will be exposed for items that support PPR
  – The administrator can set the PPR event name and PPR event parameters for interacting with the controller
Personalization Roadmap

Support Undo Personalization

• Allows users to revert all administrator personalizations made for a given level and context value during a browser session
  – Helpful if a personalization has caused an error to occur upon returning to the base page from the personalization UI

• Access Undo Personalization from the Manage Levels page
Personalization Roadmap

Support Copy Personalization

• Copy personalizations from one context value at a given level to one or more context values at the same level
  – Avoids tedious repetition where the same personalizations are needed for different contexts such as multiple responsibilities
  – For example, copy personalizations for a page in the Manager Self-Service responsibility to the same page for the Employee Self-Service responsibility

• Access Copy Personalization from the Manage Levels page
# Personalization Roadmap

## Undo and Copy Personalization

![Oracle Personalization Roadmap](image)

### Manage Personalization Levels

Below is a list of personalization levels that have been defined for the page and/or region.

<table>
<thead>
<tr>
<th>Select Object</th>
<th>Extract Translations</th>
<th>Delete Personalizations</th>
<th>Activate</th>
<th>Deactivate</th>
<th>Upload Translations</th>
<th>Undo All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page: Framework Toolbox Tutorial: Labs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Select Personalization Level</th>
<th>Value</th>
<th>Last Updated</th>
<th>Activate</th>
<th>Translate</th>
<th>Copy</th>
<th>Undo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Framework Toolbox Labs Employees</td>
<td>23-September-2011</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>Education &amp; Research - Higher Education</td>
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<td></td>
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<tr>
<td>Location</td>
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<tr>
<td>Organization</td>
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<tr>
<td>Responsibility</td>
<td>OA Framework Toolbox Tutorial Labs</td>
<td>23-September-2011</td>
<td>Y</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APEX and mod_plsql
mod_plsql for Extensions

- mod_plsql technology provided bridge between PL/SQL and Web worlds
  - Developers coded PL/SQL to generate raw HTML
  - Requires individual developers to build their own security code against various types of attacks

- *Not recommended for any new extensions*

- Oracle Application Express (APEX) supersedes mod_plsql
Integrating APEX Applications with EBS

- APEX application pages launched from Oracle E-Business Suite home page, accessing Oracle E-Business Suite data
  - Create an Oracle Application Express application
  - Define Oracle E-Business Suite profile and functions
  - Link functions to menus and responsibility
  - Configure the Oracle Application Express login process
  - Define Oracle Application Express authorizations
Accessing EBS Data through APEX

• Completely standalone application accessing Oracle E-Business Suite data
• Set up APEX in separate schema of EBS APPS database
  – Create grants to APEX schema for desired database objects

• “Extending Oracle E-Business Suite Release 12 using Oracle Application Express (APEX) ”, Document 1306563.1
Oracle E-Business Suite SDK for Java
Oracle EBS SDK for Java

Overview

• Oracle E-Business Suite Software Development Kit for Java
  – Provides lightweight routines for Java EE applications that integrate with Oracle E-Business Suite including ADF
  – Intended for use on external application server
  – Provides features such as:
    • Standard data source (AppsDataSource)
    • Java Authentication and Authorization Service (JAAS)
    • Error logging
    • And more
Building ADF Applications for Use with EBS

- Write new Java EE applications with ADF, BPEL, AIA and deploy on external application server

- Configure AppsDataSource for access to Oracle E-Business Suite database
  - External server does not need APPS password
  - Database access is enabled through special user using AppsDataSource
Java Authentication and Authorization Service (JAAS)

- Configure external Java EE application to use users and roles already available in Oracle E-Business Suite for authentication and authorization
- Requires AppsDataSource
Extensions Using Oracle ADF
ADF: Next-Generation Development Framework
Oracle Application Development Framework

- Increase productivity & ease-of-use
  - Visual and declarative development
  - Takes care of the “plumbing” code
- Promote service oriented development
  - Re-usable business services
  - Composite applications development
- Standards-based
  - Choice of technology, deployment platform
- End-to-end coverage
  - MVC, security, customization
ADF Faces Rich Client Components

- Built in Ajax
- Skin-able
- Accessibility & internationalization
- The usual components plus:
  - Charts, Gantt, geo-map, pivot, calendars
- Built in advanced functionality:
  - Drag and drop framework
  - Dialog and pop-up framework
  - “Active Data” - Dashboards / push updates
  - Templating and declarative components
ADF Mobile Browser

• Delivers mobile-optimized user interface to mobile browsers
• Adjusts to device’s browser capabilities
Levels of Integration Between EBS and ADF

Integration with Oracle E-Business Suite can include:

- **Access to Oracle E-Business Suite data**
  - Using AppsDataSource with ADFBC
  - Using SOA Suite

- **Access to Oracle E-Business Suite stored procedures**
  - Using AppsDataSource

- **Navigation between ADF and OAF pages in UI**
  - Profile option contains application server node information
  - Register ADF pages as ADFX-type functions and put them in EBS menus or permission sets
  - Requires Release 12.1.3 of ATG
Integrating ADF Applications with EBS: New Release 12.1.3 Features

• Requirement: Launch an ADF UI seamlessly from the EBS home page or link from other OA Framework pages

• Release 12.1.3 of AOL (Patchset 8919491) provides:
  – External ADF server profile option, FND_EXTERNAL_ADF_URL
  – ADFX function type
Summary of Recommendations

• Keep customizations to a minimum
• Use OA Framework or Form Personalization wherever possible
• Use OA Framework for extensions or new applications wherever possible
• Use ADF or Apex based on your use case
References

• Form Personalizations are documented in My Oracle Support Notes 279034.1 (Release 11i) and 395117.1 (Release 12)
• “Extending Oracle E-Business Suite Release 12 using Oracle Application Express (APEX) ”, Document 1306563.1
• AppsDataSource, JAAS, and error logging already available in Patch 8571001
  – Documented in My Oracle Support Note 974949.1
  – Future versions will be documented in that note
Q&A
Hardware and Software
Engineered to Work Together