

ADF On-Ramp: What You Need to Know to Use the ADF Fusion Technology Stack



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Survey

- Job responsibilities?
 - DBA, developer
- Languages?
 - PL/SQL
 - Java
 - Other
- Tools?
 - Developer Forms/Reports
 - JDeveloper
 - Eclipse, NetBeans
 - Other



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2

Agenda

- What is ADF and Fusion?
- ADF core technologies
- Required languages

Slides and white paper will
be available on the OOW
and Quovera websites.

Thurs

12:00 - Achieving the Perfect
Layout with Oracle ADF
Faces Rich Client



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3

On the Positive Side...

If we do not find
anything pleasant, at least
we shall find something new.

Si nous ne trouvons pas des choses
agréables, nous trouverons du
moins des choses nouvelles.

—Voltaire (1694-1778), *Candide*

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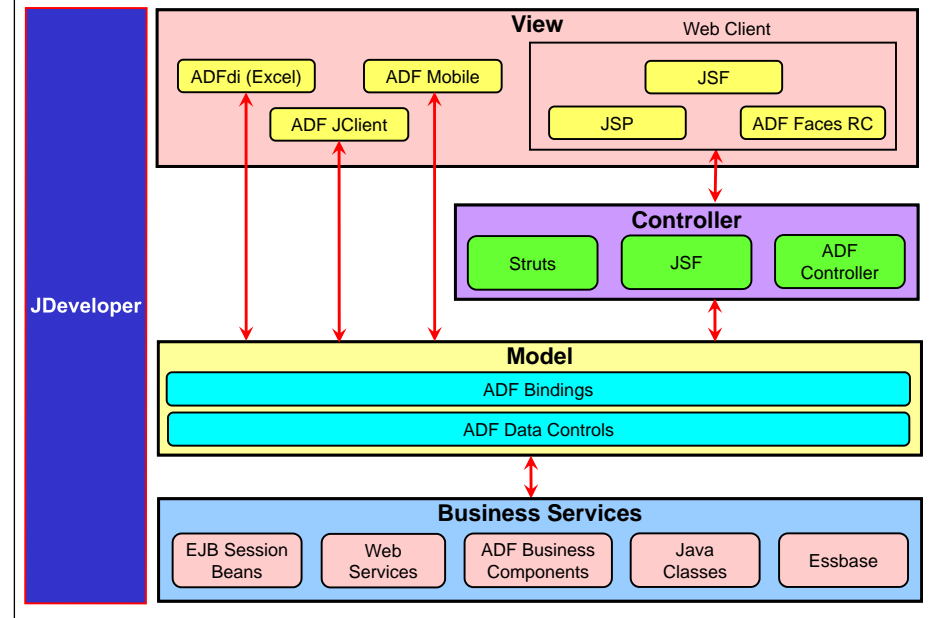
4

Oracle Application Development Framework (ADF)

- A *framework* is a prebuilt service for solving a particular problem – like access to the database
 - Code libraries and standards support the framework
 - Implements code reuse and best practices
 - An architecture with code libraries
- ADF is a *meta-framework*
 - A wrapper for other frameworks
 - Available starting in JDeveloper 10g
 - Provides a consistent developer experience
- Pre-ADF available in OAF
 - Oracle Application Framework (UIX/MVC)
- Based on Model-View-Controller Java EE design pattern



ADF Architecture



What is *Oracle Fusion*?

- Fusion **Applications**
 - New business applications suite (in production)
- Fusion **Middleware**
 - Tools for building and running the applications (and your custom apps)
- Fusion **Architecture**
 - How to assemble various technologies to build FA
 - How to connect FM pieces



Which ADF Technologies to Use?

- *Core technology stack* used to create Fusion Applications is:
 - ADF Business Components
 - ADF Faces Rich Client
 - ADF Model
 - ADF Controller
- Other *high-level technologies* or strategies also used
 - SOA, ESB, Business Rules, WebCenter, BPM, BPA, BAM
 - Need to consider those, too, at the architectural level

but OOS



Where Do The Fusion Technologies End Up?

ADF Faces

UI rendering

ADF Controller

ADF Model

ADF BC

Database access & SOA endpoints

Page flow and task flow

Binding data to items

Departments

Employees

QUOVERA 9

Sample Page Flow

Browse Departments - Windows Internet Explorer

Edit Department - Windows Internet Explorer

QUOVERA 10

Agenda

- What is ADF and Fusion?

- ADF core technologies

- ADF BC
- ADF Faces
- ADF Model
- ADF Controller

- Required languages



The World View

In this best of all possible worlds ...
everything is for the best.

Dans ce meilleur des mondes possibles ...
 tout est au mieux.

—Voltaire (1694-1778), *Candide*

ADF Business Components

- ADF BC: an option in the Business Services layer of ADF
- Persistence: storing data in a database
- O/R mapping: Translates relational database things to object-oriented (Java) whatsits
- Handles JDBC mechanics
 - Creates SQL and handles results
- Primarily declarative
 - XML source code to define the use of framework classes



More About ADF BC

- Various component types
 - View objects: define queries
 - Entity objects: define insert-update-delete (“DML”)
 - View links: view object relationships
 - Associations: entity object links
 - Application modules: Define the data models and the database transaction
- It does not create user interfaces



Sample ADF BC Development

Entity object editors

View Object Code

View Object = SELECT statement

View Attribute = Column in query

```
<ViewObject
xmlns="http://xmlns.oracle.com/bc4j"
Name="AllEmployees"
Version="11.1.1.53.41"
SelectList="Employees.EMPLOYEE_ID,
Employees.FIRST_NAME,
Employees.LAST_NAME,
Employees.JOB_ID,
Employees.EMAIL,
Employees.HIRE_DATE,
Departments.DEPARTMENT_NAME,
Departments.DEPARTMENT_ID,
Departments.LOCATION_ID"
FromList="DEPARTMENTS Departments,
EMPLOYEES Employees"
Where="Departments.MANAGER_ID =
Employees.EMPLOYEE_ID"
BindingStyle="OracleName"
CustomQuery="false"
PageIterMode="Full"
UseGlueCode="false">
...
```

```
<Attribute
Name="EmployeeId"
IsNotNull="true"
Precision="6"
Scale="0"
ColumnName="EMPLOYEE_ID"
SQLType="NUMERIC"
Type="oracle.jbo.domain.Number"
ColumnType="NUMBER"
TableName="EMPLOYEES"
PrimaryKey="true">
<DesignTime>
<Attr Name="_DisplaySize"
Value="22"/>
</DesignTime>
</Attribute>
<Attribute
Name="FirstName"
Precision="20"
ColumnName="FIRST_NAME"
...
```

Agenda

- What is ADF and Fusion?

- ADF core technologies

ADF BC
ADF Faces
ADF Model
ADF Controller

- Required languages



ADF Faces Rich Client Overview

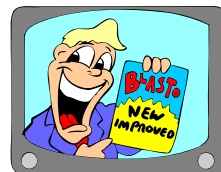
- Fits into the View layer of ADF
- Evolution:
 - ADF UIX → ADF Faces → Apache Trinidad
 - ADF Faces → ADF Faces RC
- Built on top of JSF APIs
- Deployable on any 1.2 implementation of JSF
- Support for pop-ups and dialogs
- ADF model support out-of-the-box
- Data Visualization Tools (DVT) components
 - Charts, Gantt, Pivot, Maps, Hierarchy

Really rich!



ADF Faces RC Features

- Solid development support in JDeveloper
- Changeable “skins”
 - Common look-and-feel characteristics
 - Skin editor in JDev 11.1.2
- Layout management features
- Extensive set of properties
 - Declarative access to application metadata
 - Properties can reference dynamic values using Expression Language
- Template support



Some Components

The screenshot shows a web application interface with several components highlighted by yellow boxes and labels:

- af:inputText**: A text input field for ID, containing the value 198.
- af:inputListOfValues**: A dropdown menu for Department, showing the value 50.
- af:menuItem**: A menu with items like 'Using the application' and 'About TUHRA'.
- af:inputDate**: A date picker showing June 1999.
- af:selectBooleanCheckbox**: A checkbox labeled 'I Love JDev 11g' which is checked.
- af:commandButton**: A button labeled 'Last'.
- af:commandImageLink**: A button with a search icon.
- af:selectOneChoice**: A dropdown menu for Job, showing 'Shipping Clerk' selected.

Other visible elements include a 'Search and Select: Department' dialog box, a calendar, and a 'Logon' link.

AJAX in ADF Faces RC

- Asynchronous JavaScript and XML
- **Partial Page Rendering (PPR)** in ADF Faces
 - “Declarative AJAX”
- Much AJAX in ADF Faces is transparent
 - Built into the components
 - Nothing special needs to be done
- You can setup non-default AJAX behavior using properties
 - *partialSubmit* – used by command items
 - *autoSubmit* – used by input items/lists, etc.
 - *partialTriggers* – all components, sets up the “viewer” (listener)



AJAX provides a cleaner user interface!



Sample ADF Faces Development

The screenshot shows the ADF Faces IDE with a JSP page named `deptBrowse.jspx` open. The page contains a table with columns for Employee ID, First Name, and Last Name. The Property Inspector on the right shows the configuration for the selected component, including properties like `Id`, `Rendered`, `Value`, `Appearance`, `Style`, `Behavior`, and `Advanced`.

ADF Faces JSF Snippet

```
<jsp:root xmlns:jsp="http://java.sun.com/JSP/Page" version="2.0"
  xmlns:f="http://java.sun.com/jsf/core"
  xmlns:af="http://xmlns.oracle.com/adf/faces/rich">
...
<af:panelStretchLayout styleClass="AFVisualRoot" topHeight="105px"
  bottomHeight="20px">
  <f:facet name="top">
    <af:panelBorderLayout>
      <f:facet name="start">
        <af:image source="/images/tuhra.gif" shortDesc="TUHRA Logo"/>
      </f:facet>
      <f:facet name="end">
        <af:panelGroupLayout layout="horizontal" halign="right"
          valign="bottom">
          <af:commandImageLink text="Logon" shortDesc="Logout from TUHRA"
            depressedIcon="/images/groupdisconnect_dwn.png"
            disabledIcon="/images/groupdisconnect_dis.png"
            hoverIcon="/images/groupdisconnect_ovr.png"
            icon="/images/groupdisconnect_ena.png"
            disabled="true"
            rendered="#{attrs.anonymous}"/>
          <af:commandImageLink text="Logoff" shortDesc="Logout from TUHRA"
            depressedIcon="/images/groupdisconnect_dwn.png"
            disabledIcon="/images/groupdisconnect_dis.png"
            hoverIcon="/images/groupdisconnect_ovr.png"
            icon="/images/groupdisconnect_ena.png"
            disabled="true"
            rendered="#{!attrs.anonymous}"/>
        </af:panelGroupLayout>
      </f:facet>
    </af:panelBorderLayout>
  </f:facet>
</af:panelStretchLayout>
```

Agenda

- What is ADF and Fusion?

• ADF core technologies

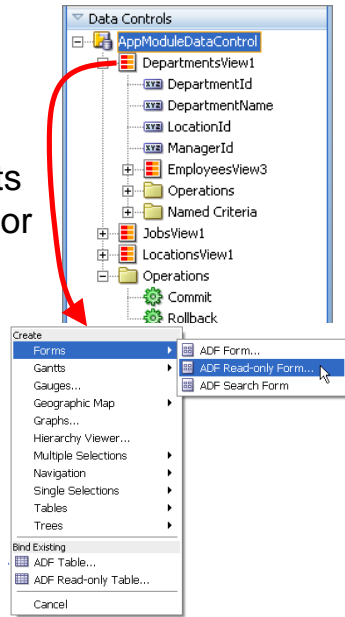
- ADF BC
- ADF Faces
- ADF Model
- ADF Controller

- Required languages



ADF Model

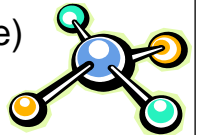
- ADF Data Controls
 - Provides list of components or groups of components for a node in the data model
 - “Drop as” options
- ADF Bindings
 - Prebuilt connection from the ADF BC to the UI
 - Drag and drop action above does the work



Data Controls Introduction

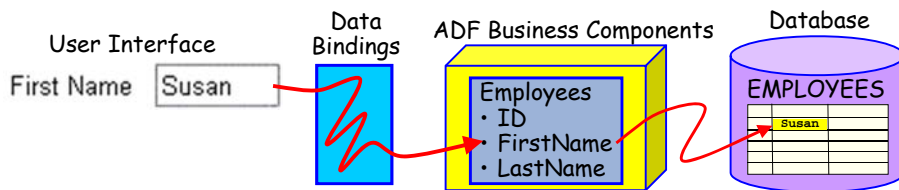
- Business Services abstraction
 - Makes Model components available to ViewController
 - Automatically created with ADF BC
 - Can be created for other business services
 - For non-ADF BC, defined in DataControls.cpx
- Provide list of “Drop as” options that create pre-bound components
 - Collection level (view object instance)
 - Attribute level (view attribute)

The Good News: You don't normally write data controls

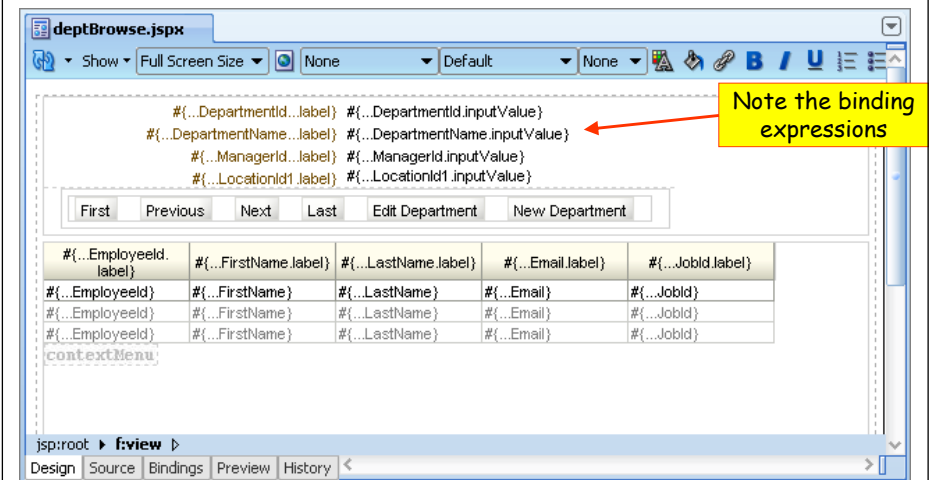


Bindings

- Association of a business service data element or action with a UI component
 - Relatively automatic in Oracle Forms
 - Definitely not automatic in native Java EE
- Binding normally takes a lot of coding
 - One-off solution is not the answer
 - Need a framework to assist



Drop As Examples: Form and Table



Note the binding expressions

Editing Bindings

searchEmp.jsff x

Find

Page Data Binding Definition

This shows the Oracle ADF data bindings defined for your page. Select a binding to see its relationship to the underlying Data Control.

Page Definition File: [fragments/searchEmpPageDef.xml](#)

Bindings and Executables Contextual Events Parameters

Bindings

- EmployeeSearch
- EmployeeId
- FirstName
- LastName
- Email
- PhoneNumber
- DepartmentName
- JobTitle

Executables

- variables
- EmployeeSearchIter
- BasicEmployeeSearch

Data Control

- TuuraServiceDataControl
- DepartmentEdit
- EditEmployee
- EmployeeSearch

Design Source Bindings Preview History

QUOVERA 29

Binding Code

In the JSF page file

```
<af:inputText value="#{bindings.DepartmentId.inputValue}"
              label="#{bindings.DepartmentId.hints.label}"
              required="#{bindings.DepartmentId.hints.mandatory}"
              columns="#{bindings.DepartmentId.hints.displayWidth}"
              maxLength="#{bindings.DepartmentId.hints.precision}"
              shortDesc="#{bindings.DepartmentId.hints.tooltip}"
              id="it1">
</af:inputText>
```

In the bindings PageDef file

```
<bindings>
  <attributeValues IterBinding="DepartmentsView1Iterator"
                  id="DepartmentId">
    <AttrNames>
      <Item Value="DepartmentId"/>
    </AttrNames>
  </attributeValues>
```

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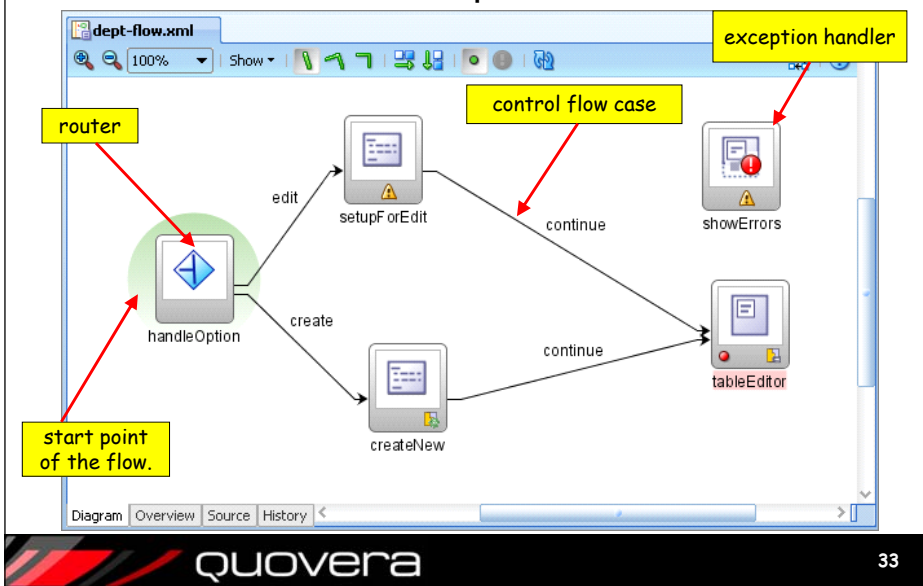


ADF Controller (ADFc)

- Extension to standard JSF Controller functionality
- Defines *task flows*
 - Logic and page fragment components
 - Embedded on the page in a region component
- Benefits
 - Page fragment re-use
 - Executing code in a logic-defined flow
 - “Task flow” not “page flow”
 - Security
 - Exception handling and transaction management
- Defined in a diagram
 - Like JSF but more components available



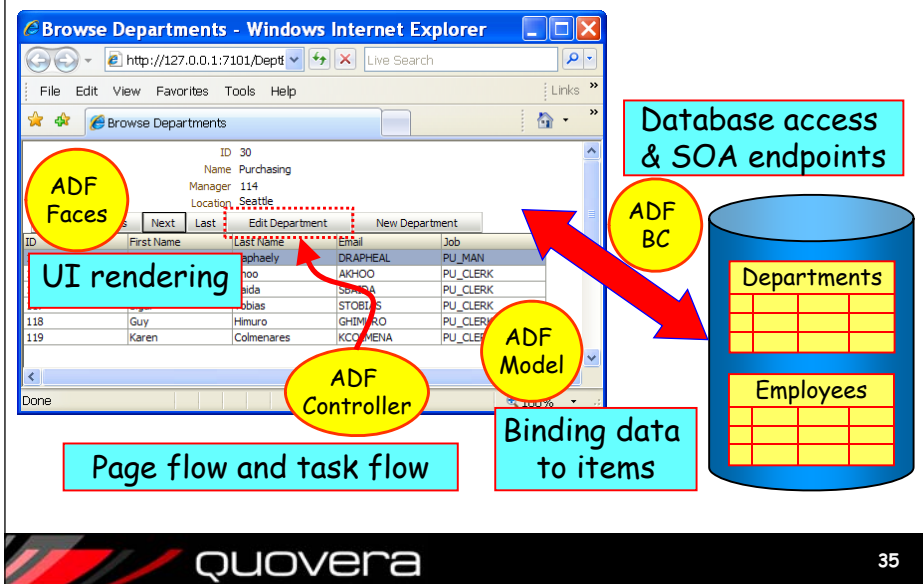
Sample ADF Controller Development



Sample ADF Controller Code

```
<task-flow-definition id="dept-flow">
<default-activity>deptBrowse</default-activity>
<view id="deptBrowse">
  <page>/deptBrowse.jsp</page>
</view>
<view id="deptEdit">
  <page>/deptEdit.jsp</page>
</view>
<control-flow-rule>
  <from-activity-id>deptBrowse</from-activity-id>
  <control-flow-case>
    <from-outcome>toEdit</from-outcome>
    <to-activity-id>deptEdit</to-activity-id>
  </control-flow-case>
</control-flow-rule>
<router id="checkForExplicitID">
  <case id="__6">
    <expression>#{!empty pageFlowScope.employeeId}
    </expression>
    <outcome>byId</outcome>
  </case>
  <default-outcome>currentUser</default-outcome>
</router>
<method-call id="queryEmployeeById">
  <method>#{bindings.queryEmployeeById.execute}</method>
  <outcome>
    <fixed-outcome>queryEmployeeById</fixed-outcome>
  </outcome>
</method-call>
</task-flow-definition>
```

Summary: ADF Core Technologies



Agenda

- What is ADF and Fusion?
- ADF core technologies
- Required languages



Which Languages Do You Use?

1. Java
 - All important programmatic code
 - Think “trigger code” as in Forms
2. XML
 - The components rely on XML
 - Property editors create it for you
3. JavaScript and Cascading Style Sheets
 - Add functionality to HTML pages
 - Usually the components do this work for you
4. Expression Language
 - Used in JSF binding properties
5. Groovy
 - ADF BC scripting



How Much of Each Do You Use?

Language (Use)	Level Needed	Primary Use
Java (frameworks such as ADF Faces)	Basic	Business components code for validation and special handling of model objects, as well as coding conditional page flow.
Java (extending framework features)	Expert	Supplementing or replacing functionality supplied by the framework. This requires research into the framework's capabilities and architecture.
XML	Basic	The JSF tags and the HTML renderer take care of the HTML for you. XML is used for JSF JSP files
JavaScript	Basic/None	Providing customized user interaction functionality, for example, special handling of a checkbox selection.
Cascading Style Sheets	Basic/None	For ensuring a consistent look and feel. If you use prebuilt look-and-feel templates, no CSS coding is needed.
Expression Language	Basic/Intermediate	Supplying data to components from properties or methods in the application.
Groovy	Basic	Expressions for ADF Business Components

Shameless Book Plugs

Quick Start Guide to Oracle Fusion Development
Oracle JDeveloper and Oracle ADF
Grant Ronald
Oracle AEC and Senior Group Product Manager, Application Development Tools Division, Oracle
Foreword by Duncan Mills, Senior Director of Product Management, Oracle

Oracle JDeveloper 11g Handbook
A Guide to Fusion Web Development
Raffle
Duncan Mills
Director of Product Management for Oracle JDeveloper, Oracle Corporation
Peter Kolaczka
Oracle Certified Master and Technical Director, Quavera
Avron Roy-Federman
Senior J2EE Developer, Quavera

Oracle Fusion Developer Guide
Building Rich Internet Applications with Oracle ADF Business Components and ADF Faces
Frank Nephilus
Principal Product Manager, Oracle Application Development Tools
Lynn Manning
Principal Product Manager, Oracle Application Development Tools
Foreword by Ted Farrell, Chief Architect and Senior Vice President, Tools and Middleware, Oracle, and Steve Muehle, Consulting Product Manager, Oracle Application Development Tools
17
Oracle Press
www.oracle.com/press

Final Voltaire Wisdom

The secret of being a bore is to tell everything.

Le secret d'ennuyer est celui de tout dire.

—Voltaire (1694-1778), *Sept Discours en Vers sur l'Homme*

Summary

- Fusion is Oracle's effort to merge application products and technologies
- Oracle is using the "Fusion Technology Stack" and ADF to build the next EBS – Fusion Applications
- ADF offers a consistent developer experience regardless of the technologies
- ADF Business Components provide access to the database and other data sources
- ADF Faces provide 150+, feature-rich item and container components for JSF JSP pages
- ADF Model connects ADF BC to ADF Faces
- ADF Controller manages page flow and task flow



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- Books co-authored with Dr. Paul Dorsey, Avrom Roy-Faderman, & Duncan Mills

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44