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

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quovera

utoug utah oracle users group

Survey

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

Agenda

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

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

Later Today

11:30 – Web Application Security

2:00 – ADF Bindings

On the Positive Side...

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

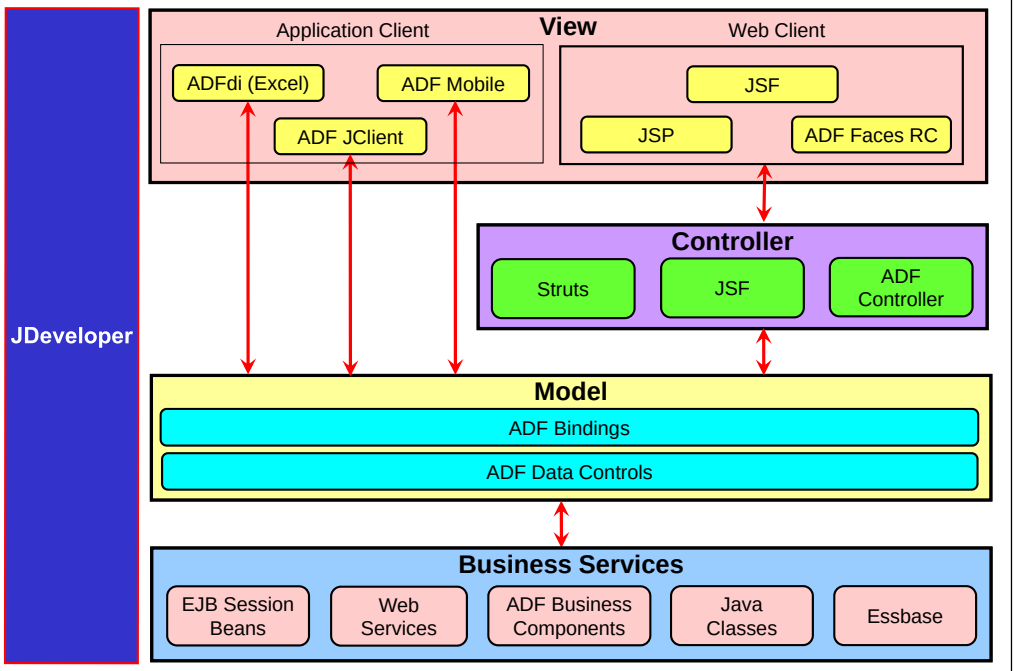
Si nous ne trouvons pas des choses
agréables, nous trouverons du
moins des choses nouvelles.

—Voltaire (1694-1778), *Candide*

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 10*g*
  - 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?

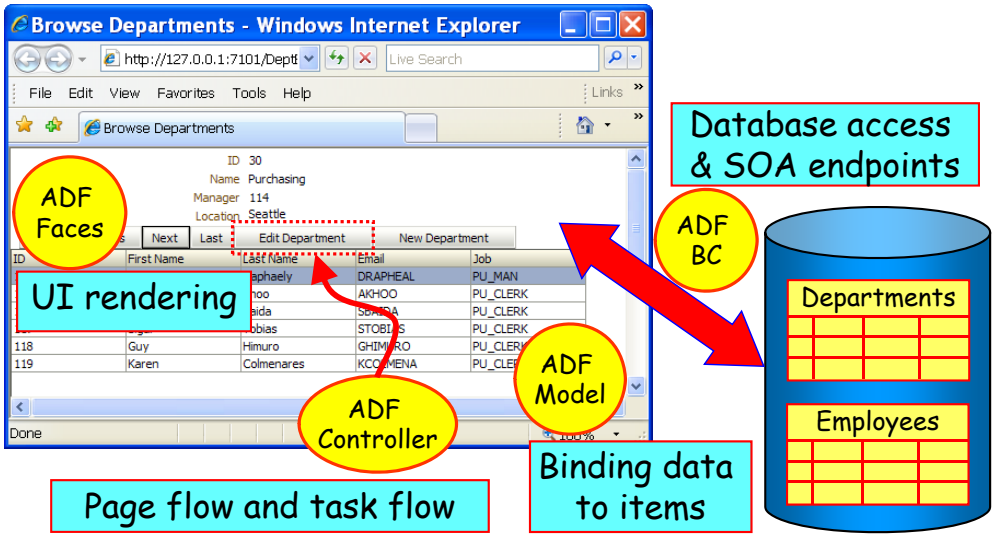
- Fusion **Applications**
  - New business applications suite (in production)
- Fusion **Middleware**
  - Tools for building and running the applications (and your custom apps)
- Fusion **Architecture**
  - How to assemble various technologies to build FA
  - How to connect FM pieces

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?



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- 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*

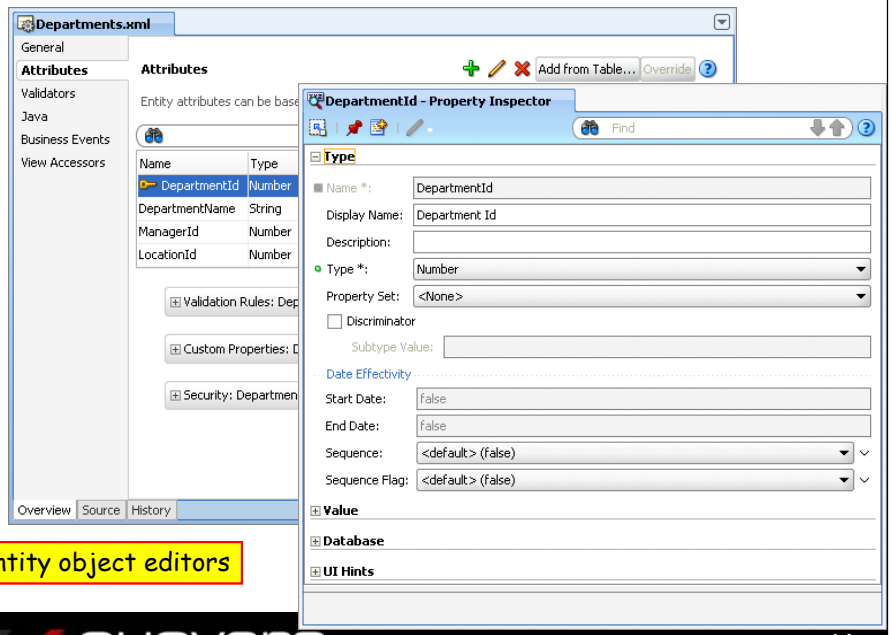
ADF Business Components

- ADF BC: an option in the Business Services layer of ADF
- Persistence: storing data in a database
- O/R mapping: Translates relational database thingies 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

```
<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">
  ...
```

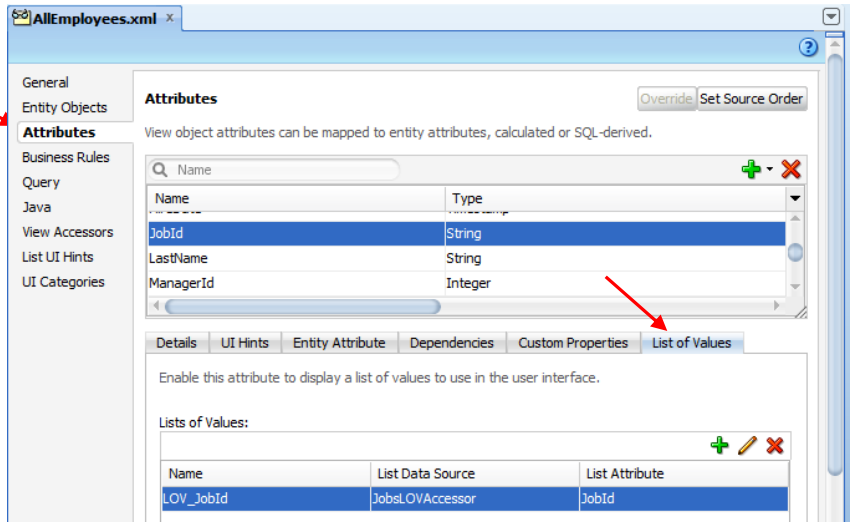
View Attribute = Column in query

```
<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"
 ...
```

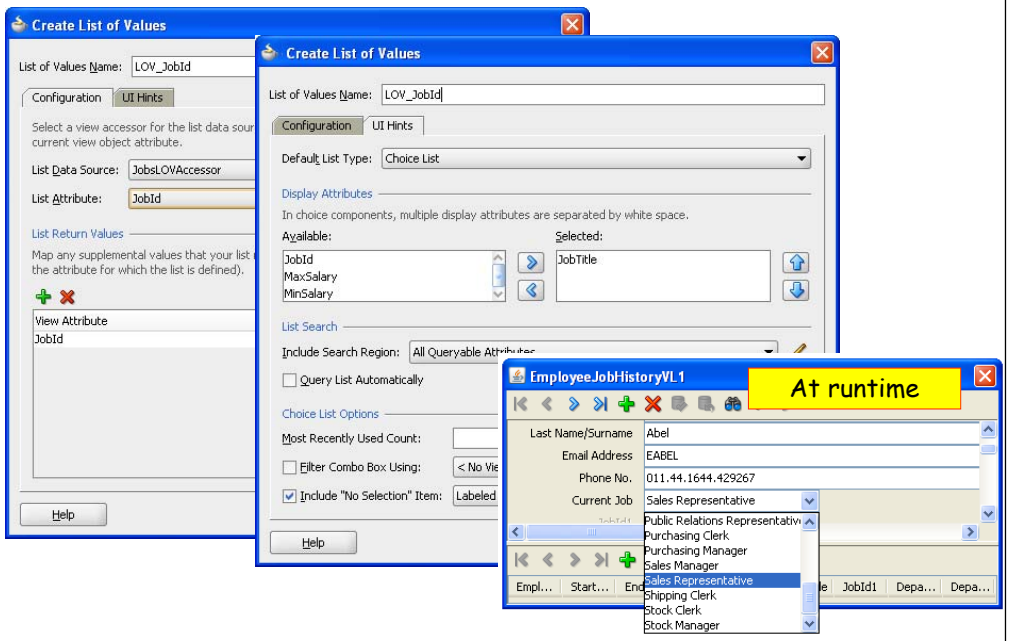

List-of-Values (LOV)

- Defined for an view object attribute
- Associate a query (view object) with the attribute
- Set up is declarative
  - Start in the view object editor
- UI code will display this attribute specially
  - Pulldown list item loaded with values
  - Popup list-of-values dialog

VO Editor – LOV Subtab



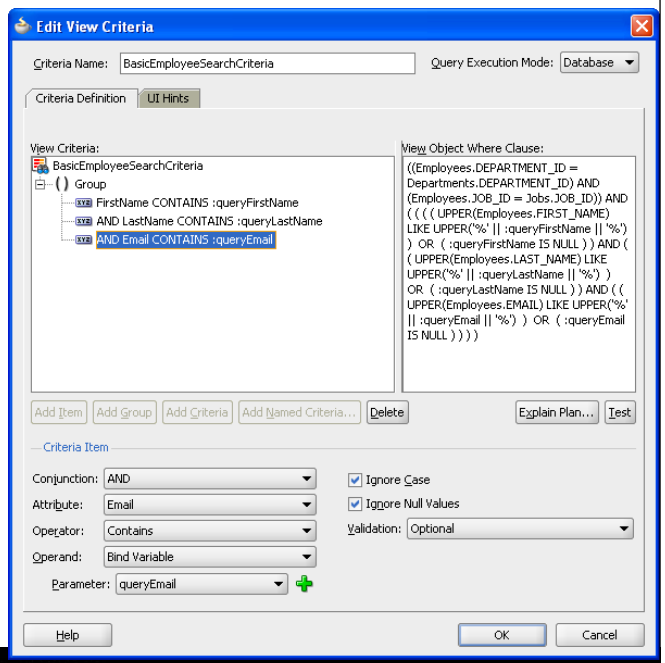
Create List of Values



View Criteria

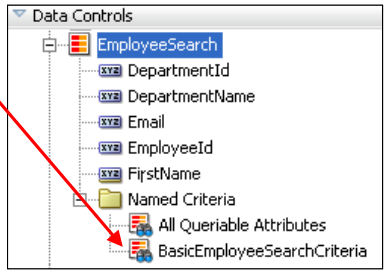
- Used for queries
- View Object Editor's Query page
  - View Criteria section
- View Criteria dialog
  - Define the WHERE clause declaratively

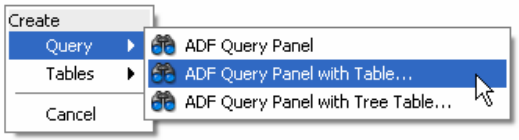
Declarative is the only method allowed.



View Criteria in the DCP

- Data Controls panel lists the defined criteria
- You can drag and drop a view criteria onto a JSF page

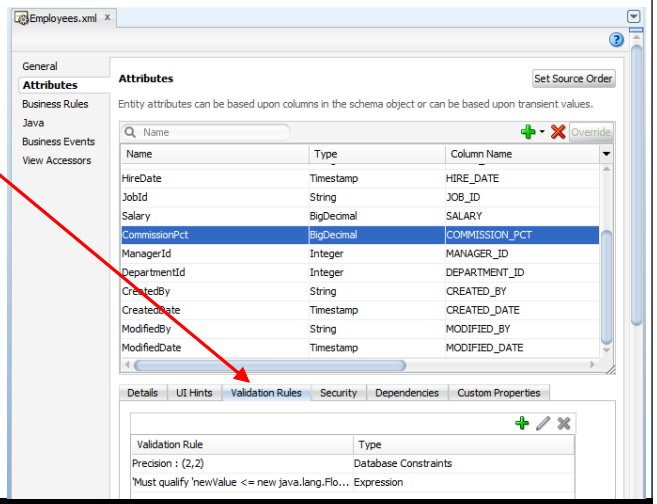




- Components are added for each attribute in the view criteria

Declarative Validation Rules

- Simple rules written on the entity object
- Method 1
  - Attributes tab
  - Validation Rules subtab
- Method 2
  - Business Rules tab
  - Attribute or entity level

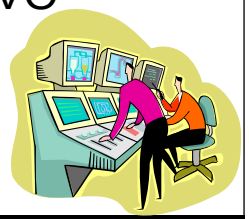


Declarative Validation Benefits

- Quick validation on the app server side
- No Java coding!
- Add a friendlier message for ADF BC-level errors (e.g., length)
- Messages stored in a message bundle file that you can internationalize
- All UIs built from the entity object will contain the same validation
  - Like a trigger in the database
- You need to decide where to place business rules code

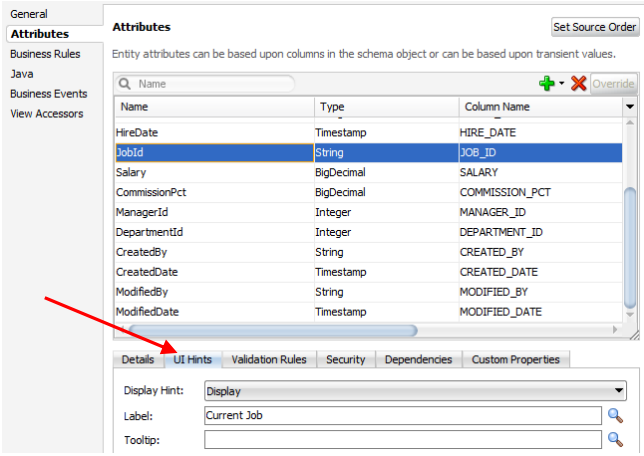
UI Hints

- A.k.a., *control hints*
- UI definitions stored in the entity object or view object definitions
  - Universal to all UIs created from those EOs or VOs
  - Provides consistency
  - "Set it and forget it"
- Can put the hints on either EO or VO
  - Rule of thumb: use the entity object UI hints whenever possible
  - Override on view object level if needed



Setting UI Hints

- In Entity Object editor, select attribute and click the UI Hints tab in the Property Inspector
- **OR** View Object editor Attributes tab, UI Hints subtab



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  - ADF Model
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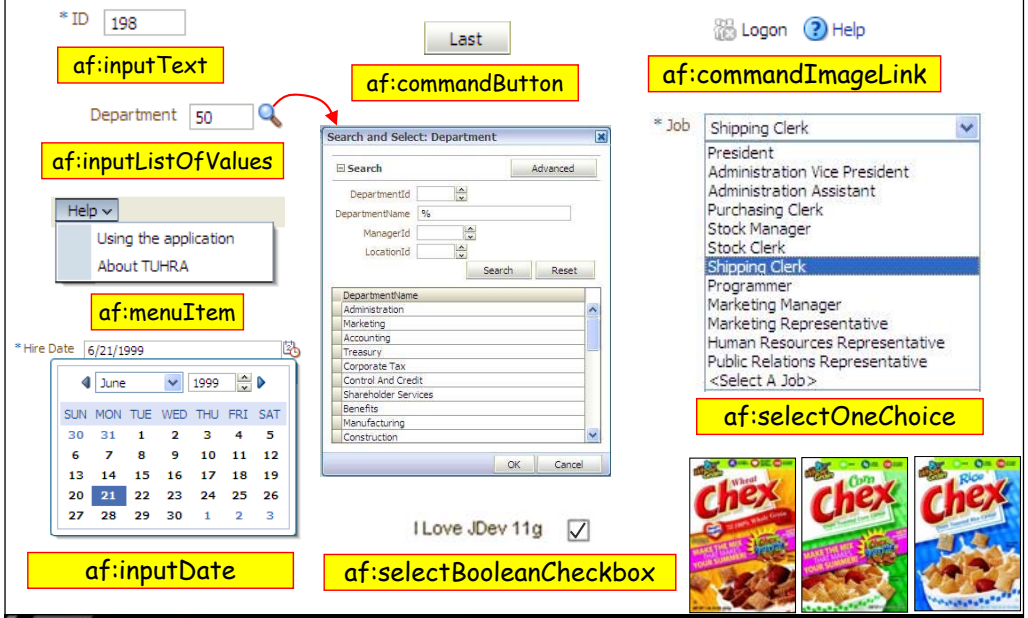
ADF Faces Rich Client Overview

- 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

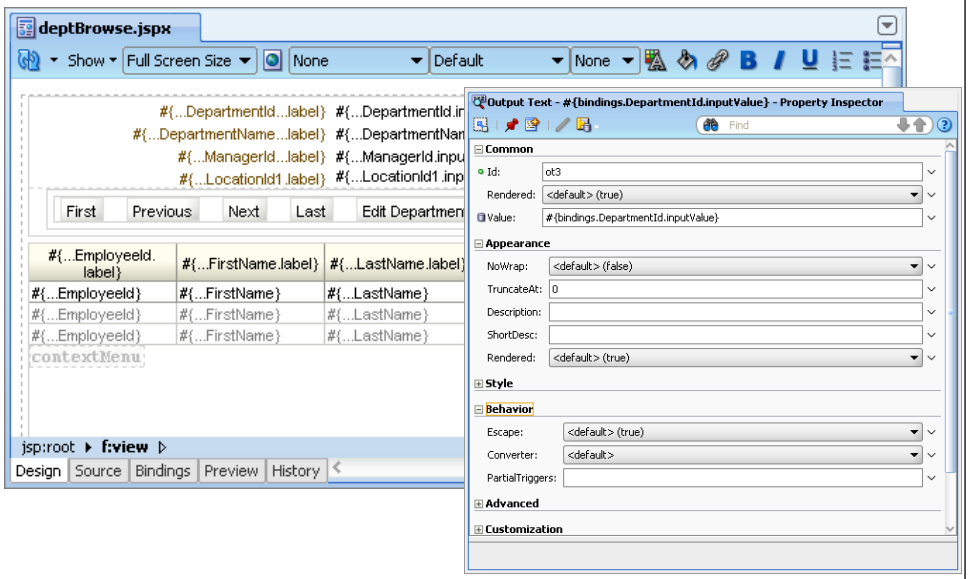
ADF Faces RC Features

- 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



Sample ADF Faces Development



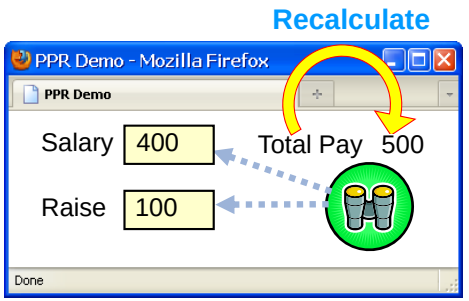
ADF Faces JSF Snippet

```
<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}"/>
```


AJAX in ADF Faces RC

- **A**synchronous **J**avaScript **a**nd **X**ML
- **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 Interactions – Total Pay



Id	Salary
Value	#{bindings.Salary.inputValue}
AutoSubmit	true

Id	Raise
Value	#{bindings.Raise.inputValue}
AutoSubmit	true

Id	TotalPay
Value	#{bindings.Salary.inputValue + bindings.Raise.inputValue}
AutoSubmit	false
partialTriggers	Salary Raise

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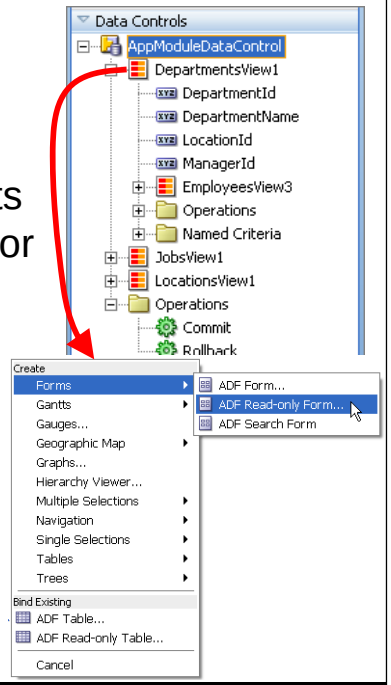
ADF Model

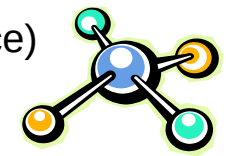
- ADF Data Controls
  - Provides list of components or groups of components for a node in the data model
  - "Drop as" options
- ADF Bindings
  - Prebuilt connection from the ADF BC to the UI
  - Drag and drop action above does the work



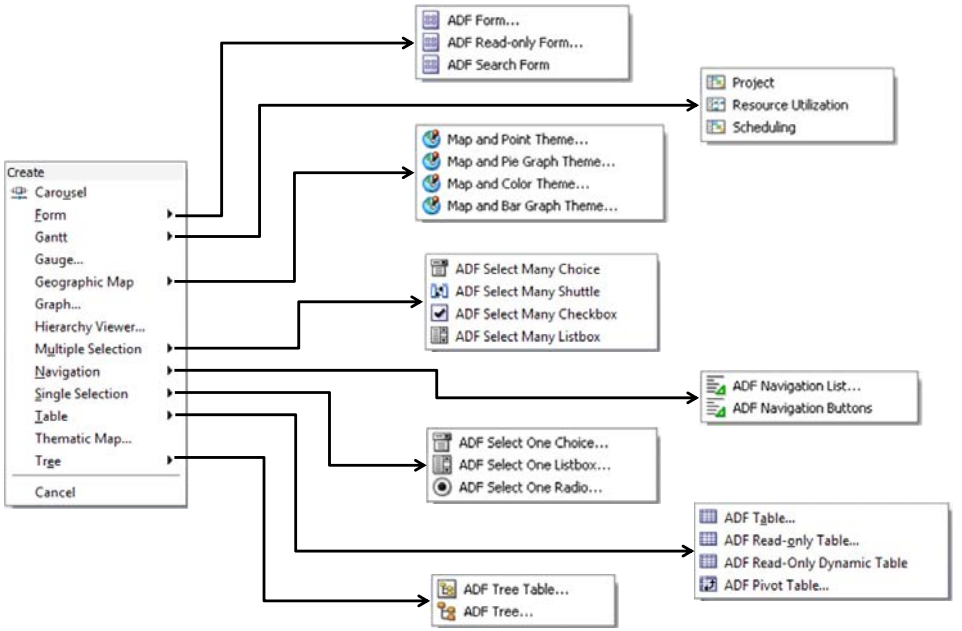
ADF Data Controls

- 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



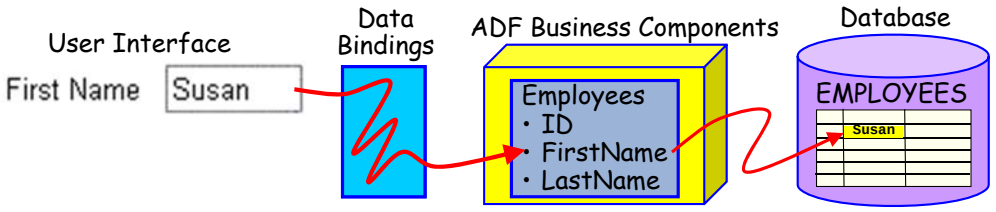
Collection "Drop As" Options



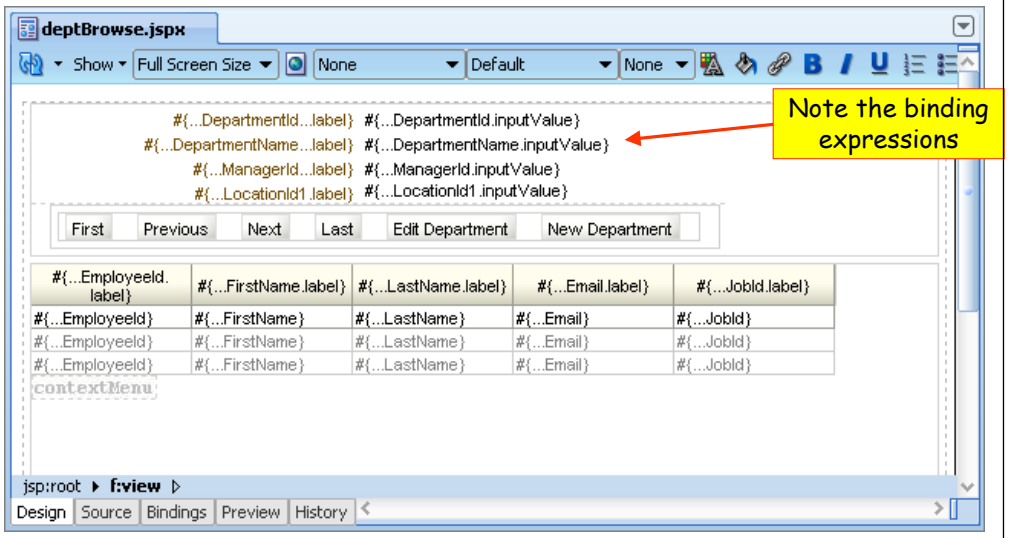
ADF Bindings

More about bindings in the 2 PM session

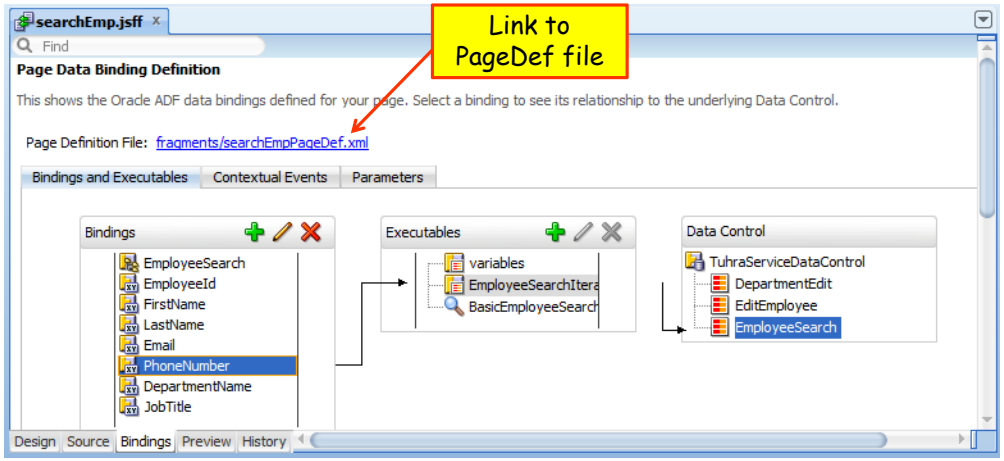
- Association of a business service data element or action with a UI component
  - Relatively automatic in Oracle Forms
  - Definitely not automatic in native Java EE
- Binding normally takes a lot of coding
  - One-off solution is not the answer
  - Need a framework to assist



Drop As Examples: Form and Table



Editing Bindings



Binding Code

JSF Page Snippet

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

Bindings (PageDef) Snippet

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

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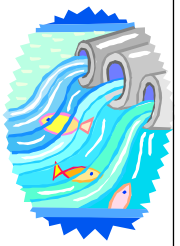
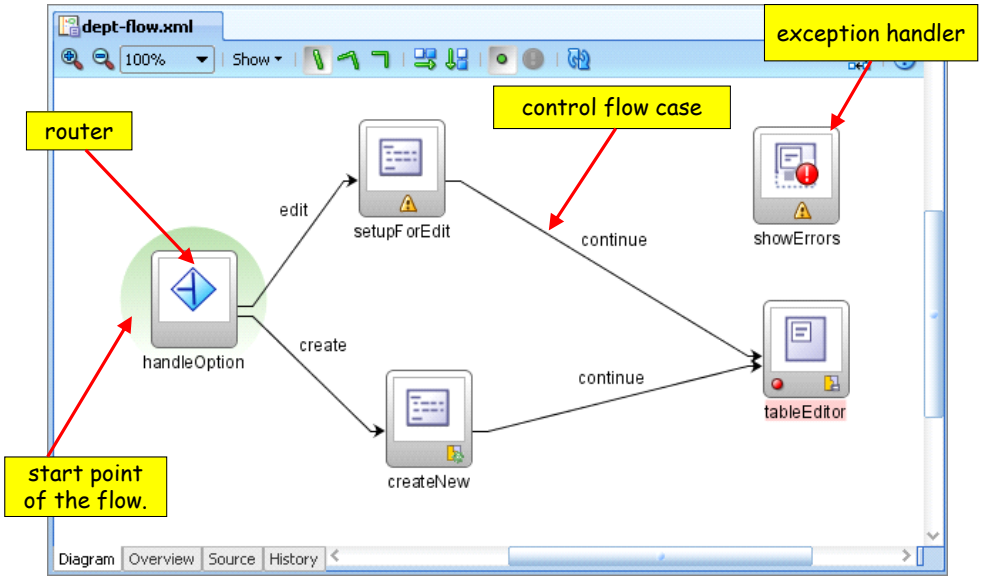
ADF Controller (ADFc)

- 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



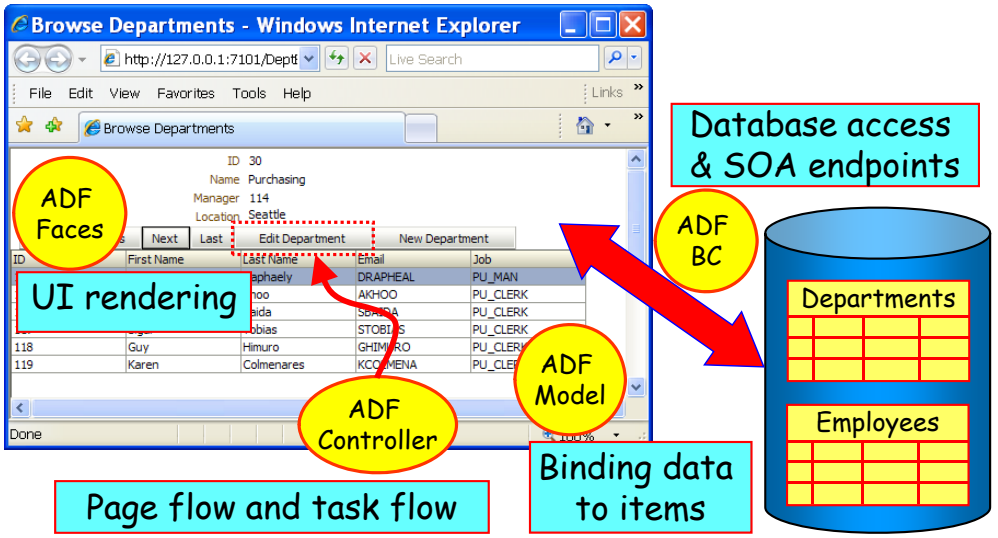
Sample ADF Controller Code

```
<task-flow-definition id="dept-flow">
<default-activity>deptBrowse</default-activity>
<view id="deptBrowse">
  <page>/deptBrowse.jspx</page>
</view>
<view id="deptEdit">
  <page>/deptEdit.jspx</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>
```

From

To

Summary: ADF Core Technologies



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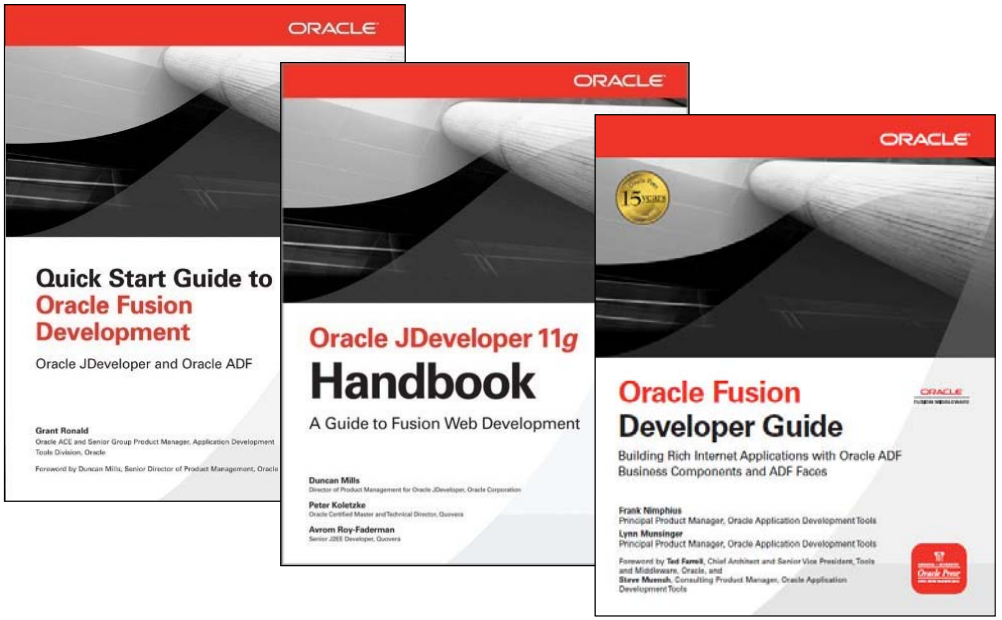
Which Languages Do You Use?

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



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 uses the "Fusion Technology Stack" and ADF to build 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

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

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- **Founded in 1995 as Millennia Vision Corp.**
- **Profitable without outside funding**
- **Consultants each have 10+ years industry experience**
- **Strong High-Tech industry background**
- **200+ clients/300+ projects**
- **JDeveloper Partner**
- **More technical white papers and presentations on the web site**