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Empowering Multi-tasking with an ADF UI Powerhouse

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Agenda

- Multi-tasking
  - Options with ADF applications
  - Using UIShell with dynamic tabs
  - Additional usability requirements
- UIShell with dynamic tabs implementation
- Implementing additional requirements

Multi-tasking options with ADF applications

- Start new browser instance
  - End user easily looses overview
- Open new browser tab within same browser instance
  - ADF tabs mixes with non-ADF tabs
  - ADF session shared accross tabs
- Open new tab within ADF application
  - Options to meet additional requirements

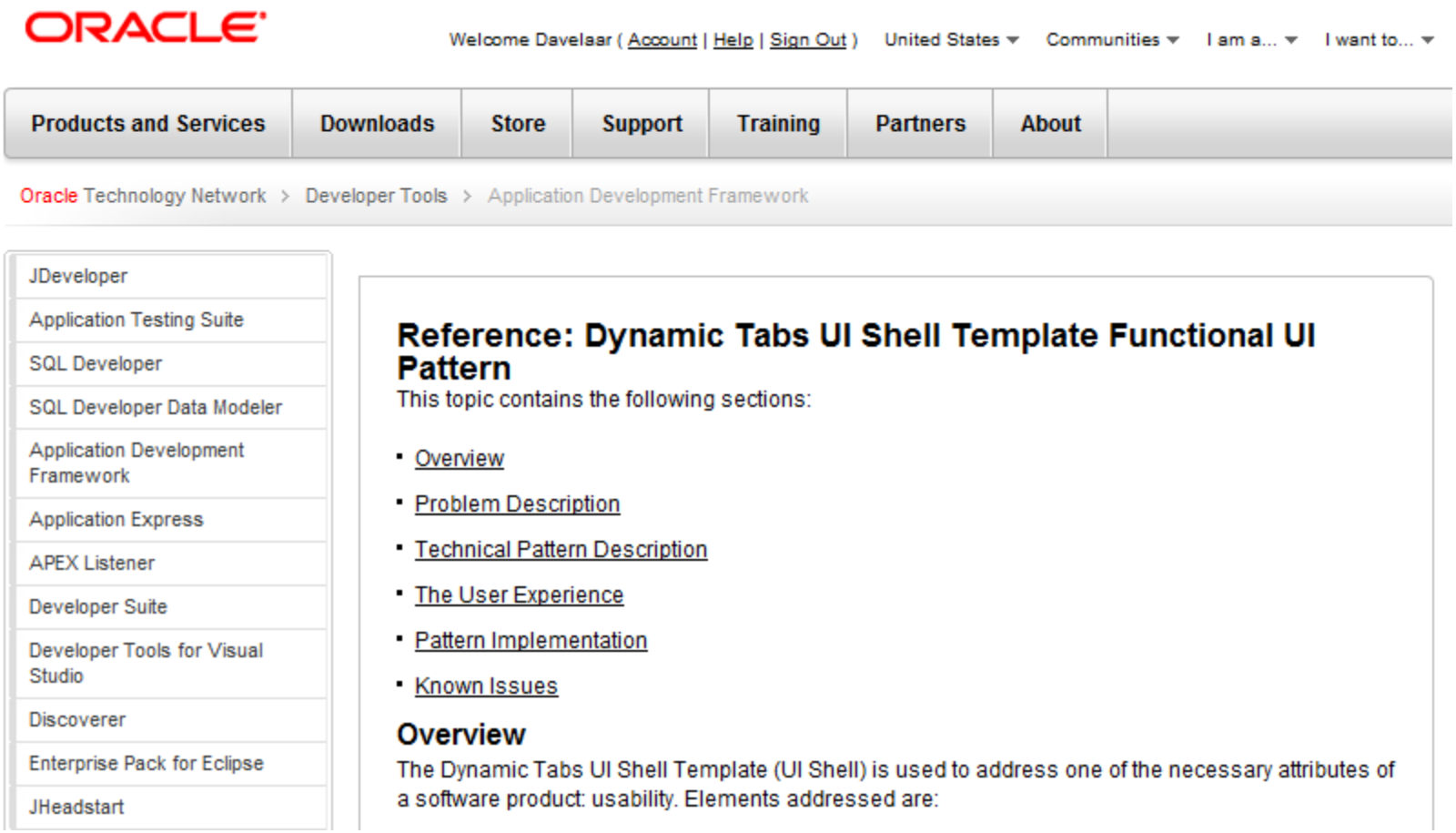
Multi-tasking and related usability requirements (1)

- Open new tab in various ways
  - Using the menu
  - Using global quick search
  - From within other tabs
  - Conditionally: check whether tab is already open
- Close tab in various ways
  - Use close tab icon on tab label
  - Use close tab button inside tab region
  - Auto-close when task is completed

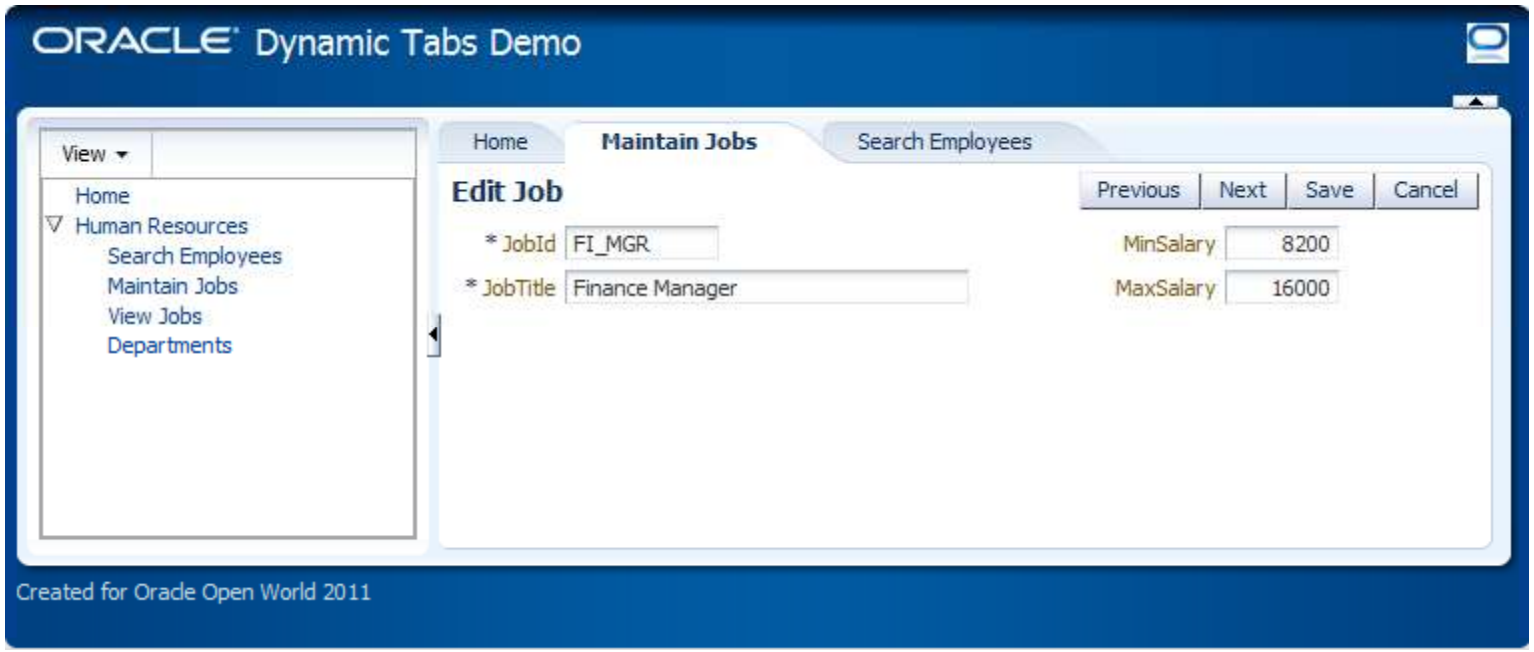
Multi-tasking and related usability requirements (2)

- Transaction handling
  - Tabs are independent tasks -> independent transactions
  - Visual indicator that tab contains pending changes
  - Warning when closing tab with pending changes
- Miscelleaneous
  - Update browser title based on selected tab
  - Initially displayed tabs
  - Prevent tabs from being closed manually
  - Set maximum number of open tabs
  - Update tab label based on current data inside tab

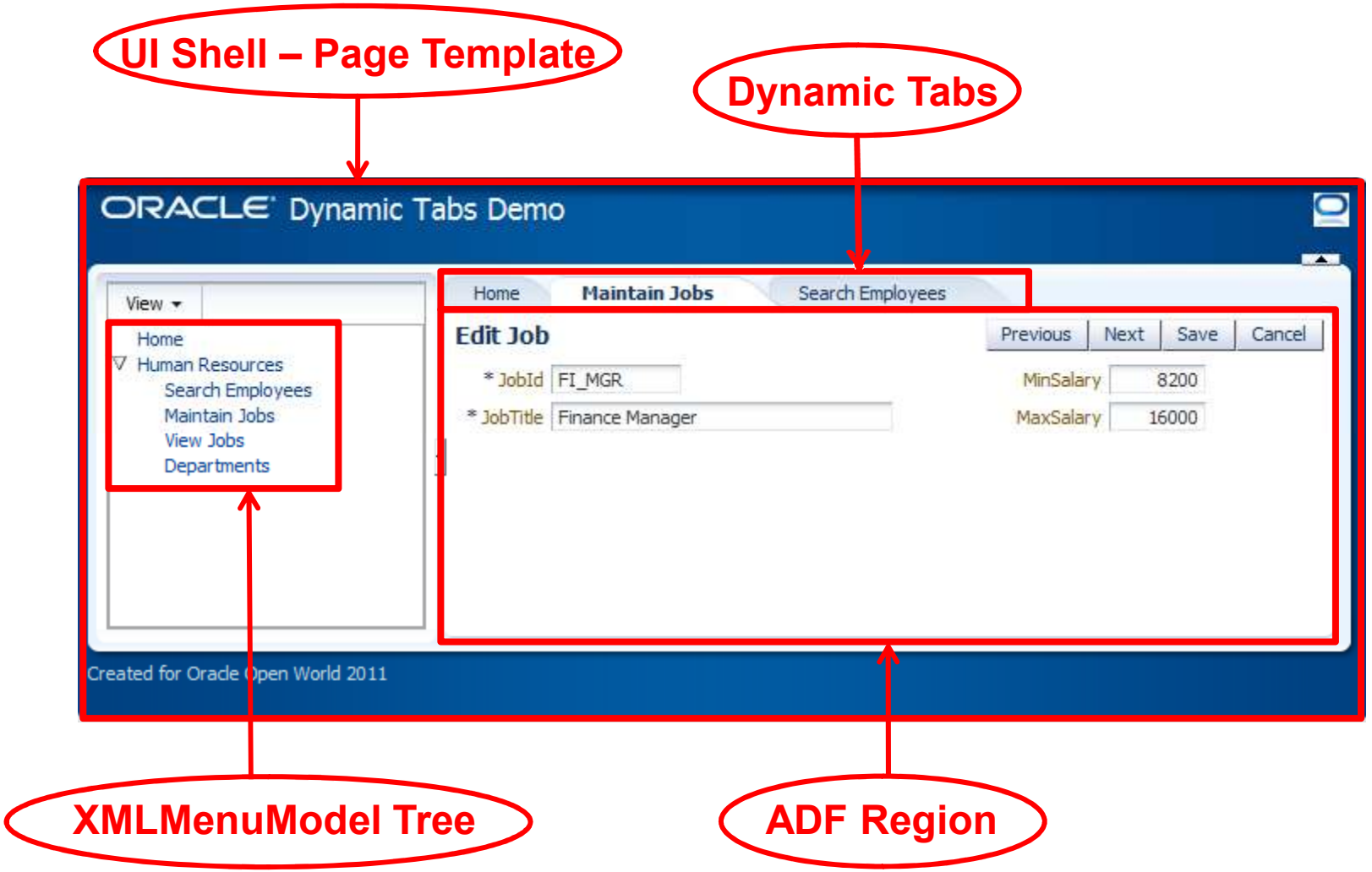
Dynamic Tabs UI Shell Functional UI Pattern



UIShell – Dynamic Tabs with Tree Menu



Dynamic Tabs with Tree Menu - Implementation



UIShell Page

```
<?xml version='1.0' encoding='UTF-8'?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http:
<f:view xmlns:f="http://java.sun.com/jsf/core"
        xmlns:af="http://xmlns.oracle.com/adf/faces/rich">
  <af:document title="UIShell" id="doc0">
    <af:form id="dataForm">
      <af:pageTemplate id="pt"
         viewId="/common/pageTemplates/DynamicTabsPageTemplate.jsf">
        <f:attribute name="menuModel" value="#{menuModel}"/>
      </af:pageTemplate>
    </af:form>
  </af:document>
</f:view>
```

Tree Menu – XMLMenuModel

```
<?xml version="1.0" encoding="UTF-8" ?>
<menu xmlns="http://myfaces.apache.org/trinidad/menu">
  <itemNode id="homeMI" label="Home" action="uishell:Home"
            focusViewId=""/>
  <groupNode id="hr" idref="empMI" label="Human Resources">
    <itemNode id="empMI" label="Search Employees"
              action="uishell:SearchEmployees" focusViewId=""/>
    <itemNode id="jobMI" label="Maintain Jobs"
              action="uishell:Jobs" focusViewId=""/>
    <itemNode id="jobMI" label="View Jobs"
              action="uishell:ViewJobs" focusViewId=""/>
    <itemNode id="depMI" label="Departments"
              action="uishell:Departments" focusViewId=""/>
  </groupNode>
</menu>
```

Tree Menu – MenuModel Managed Bean

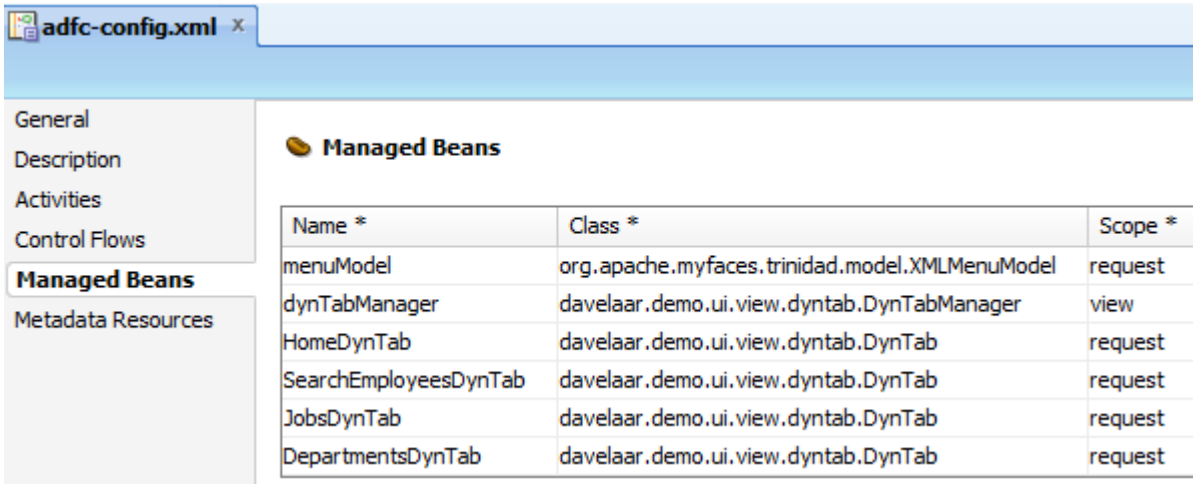
```
<managed-bean id="__3">
  <managed-bean-name>menuModel</managed-bean-name>
  <managed-bean-class>org.apache.myfaces.trinidad.model.XMLMenuModel
  </managed-bean-class>
  <managed-bean-scope>request</managed-bean-scope>
  <managed-property id="__4">
    <property-name>source</property-name>
    <value>/WEB-INF/menu.xml</value>
  </managed-property>
</managed-bean>
```

Dynamic Tabs Page Template – Tree Menu

```
<af:panelCollection id="pctree">
  <af:tree id="Menu1" var="menuItem" contentDelivery="immediate"
           value="#{attrs.menuModel}" summary="Menu Item">
    <f:facet name="nodeStamp">
      <af:group>
        <af:commandLink id="Item1" action="#{menuItem.doAction}"
                        textAndAccessKey="#{menuItem.label}"
                        partialSubmit="true"
                        immediate="true"
                        rendered="#{menuItem.focusViewId!=null an
        <af:outputText id="Item2" value="#{menuItem.label}"
                       rendered="#{menuItem.focusViewId==null and
      </af:group>
    </f:facet>
  </af:tree>
</af:panelCollection>
```

Adding and Selecting Dynamic Tabs

- Create DynTab class and managed beans
- Create DynTabManager class and managed bean
- Create custom TabsNavigationHandler
    - Hides complexity of adding/selecting tabs



Create DynTab class and managed beans

- DynTab class holds all info about a dynamic tab
  - Tab title
  - Tab unique identifier
  - Task flow ID
  - Task flow parameters (optional)
- For each menu item, a managed bean using DynTab class is defined

Maintain Jobs DynTab managed bean

```
<managed-bean id="__13">
  <managed-bean-name>JobsDynTab</managed-bean-name>
  <managed-bean-class>davelaar.demo.ui.view.dyntab.DynTab</managed-bean-class>
  <managed-bean-scope>request</managed-bean-scope>
  <managed-property>
    <property-name>title</property-name>
    <value>Maintain Jobs</value>
  </managed-property>
  <managed-property>
    <property-name>uniqueIdentifier</property-name>
    <value>Jobs</value>
  </managed-property>
  <managed-property>
    <property-name>taskFlowIdString</property-name>
    <value>/WEB-INF/jobs-tf.xml#jobs</value>
  </managed-property>
</managed-bean>
```

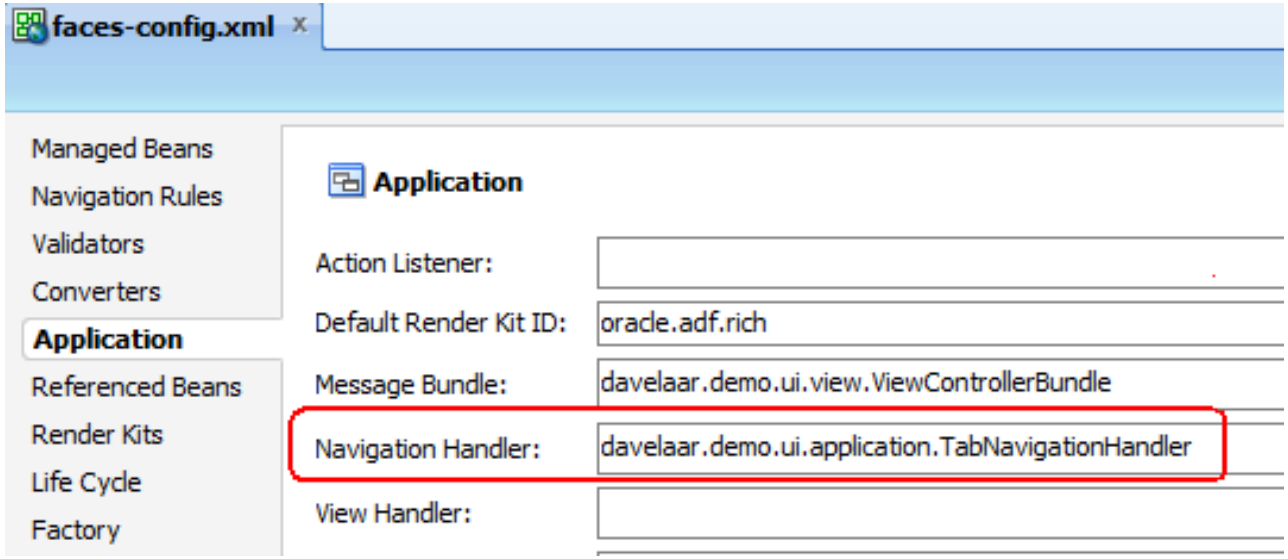
DynTabManager class and managed bean

- DynTabManager class controls tab behavior
  - Housekeeping of open tabs and current tab
  - Launch tab: add new or select existing tab
  - Remove tab
  - Mark current tab dirty

```
<managed-bean id="__49">
  <managed-bean-name>dynTabManager</managed-bean-name>
  <managed-bean-class>davelaar.demo.ui.view.dyntab.DynTabManager
  </managed-bean-class>
  <managed-bean-scope>view</managed-bean-scope>
  <managed-property>
    <property-name>maxNumberOfTabs</property-name>
    <property-class>java.lang.Integer</property-class>
    <value>10</value>
  </managed-property>
</managed-bean>
```

Navigating Using Dynamic Tabs

- Create custom TabNavigationHandler
  - configure in faces-config.xml
  - Provides standard JSF navigation through superclass
  - Allows setting adding/selecting dynamic tab: tab name specified after navigation outcome, separated by colon

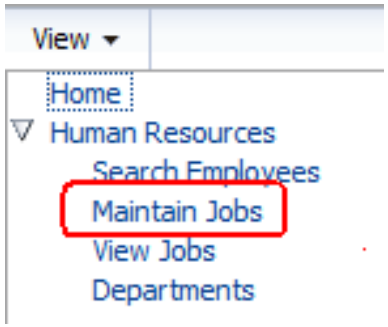


TabNavigationHandler

```
public void handleNavigation(FacesContext facesContext, String action, String outcome)
{
  sLog.info("handleNavigation action=" + action + ", outcome=" + outcome);
  if (outcome != null && outcome.indexOf(":")>-1)
  {
    int pos = outcome.indexOf(":");
    String shellAction = outcome.substring(0, pos);
    String tabName = outcome.substring(outcome.indexOf(":") + 1);
    sLog.info("Navigating to " + shellAction + ", opening dynamic tab " + tabName);

    // launch dyn tab
    DynTabManager.getCurrentInstance().launchTab(tabName);

    // navigate to uishell page if needed (usually not needed because only
    // page is UIShell page)
    super.handleNavigation(facesContext, action, shellAction);
  }
  else
  {
    super.handleNavigation(facesContext, action, outcome);
  }
}
```

Navigating Using Dynamic Tabs

- Action "`uishell:Jobs`"
  - navigates to UIShell.jsf page (if needed)
  - Call launchTab with tabName "Jobs" on DynTabManager
  - TaskFlowId and params picked up from JobsDynTab bean




```
<itemNode id="jobMI" label="Maintain Jobs"
          action="uishell:Jobs" focusViewId=""/>

<af:tree id="Menu1" var="menuItem" contentDelivery="immediate" v
         summary="Menu Item">
  <f:facet name="nodeStamp">
    <af:group>
      <af:commandLink id="Item1" action="#{menuItem.doAction}"
                      textAndAccessKey="#{menuItem.label}" parti
                      immediate="true"
                      rendered="#{menuItem.focusViewId!=null and
```

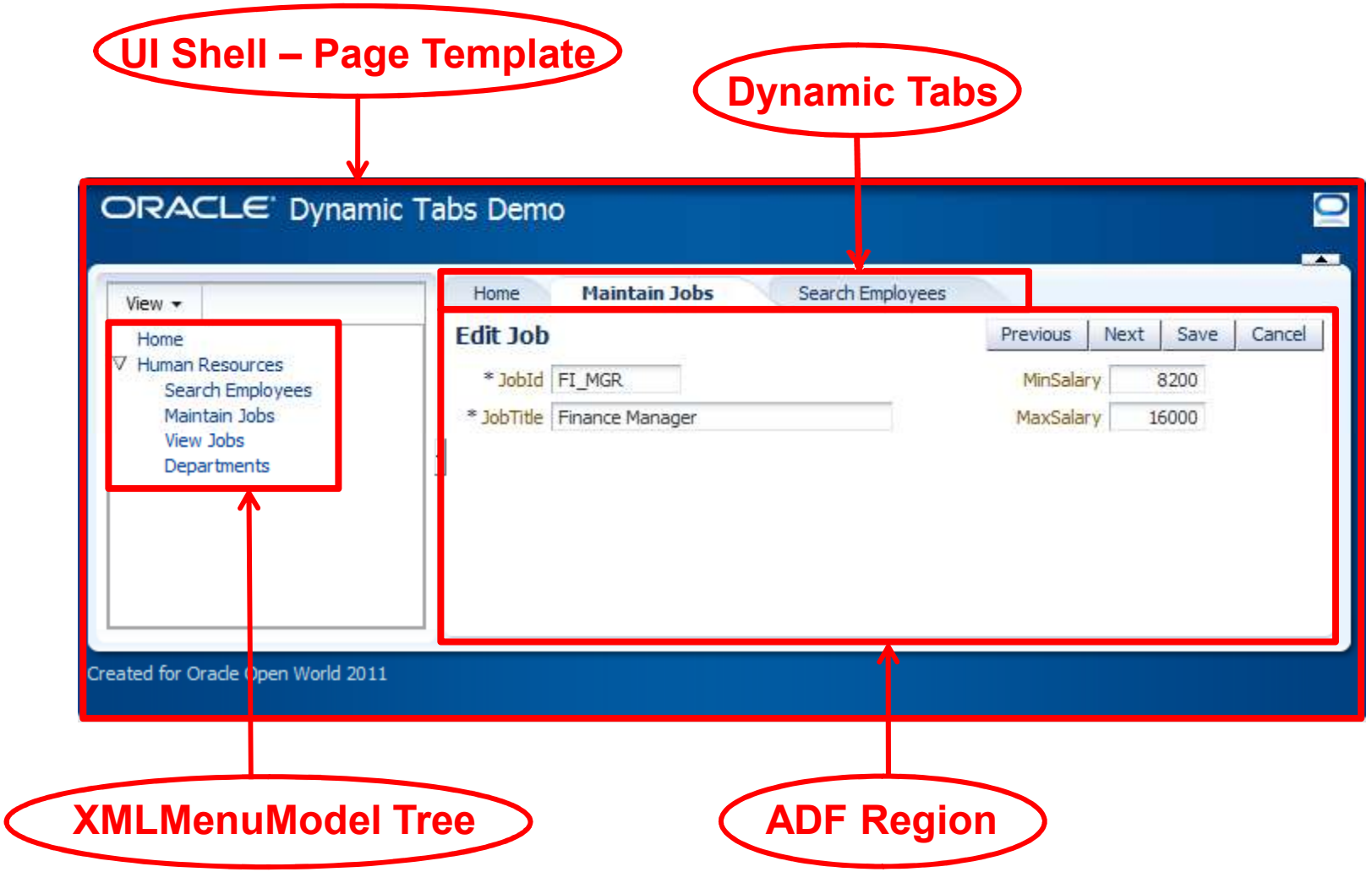
DynTabManager – Launch tab

```
public void launchTab(String tabName)
{
  DynTab tab = DynTab.getInstance(tabName);
  addOrSelectTab(tab);
}

public static DynTab getInstance(String tabName)
{
  String beanName = tabName + "DynTab";
  String expr = "#{" + beanName + "}";
  DynTab tab = (DynTab) JsfUtils.getExpressionValue(expr);
  return tab;
}

public void addOrSelectTab(DynTab tab)
{
  DynTab existingTab = getMatchingTab(tab);
  if (existingTab != null)
    setSelectedTab(existingTab);
  else
    addTab(tab);
}
```

DynTabManager – Add tab

```
public void addTab(DynTab tab)
{
  // Assign unique id that we use to link the DynTab with the
  // corresponding Taskflow
  tab.setId(createId());
  // add the new tab to the tab list and map
  tabList.add(tab);
  tabMap.put(tab.getId(), tab);
  setSelectedTabId(tab.getId());
  // Create taskflow binding attrs required by ADFm multiTaskFlow binding
  TaskFlowBindingAttributes tfAttr = new TaskFlowBindingAttributes();
  tfAttr.setId(tab.getId());
  tfAttr.setTaskFlowId(tab.getTaskFlowId());
  tfAttr.setRefreshCondition("ifNeeded");
  tfAttr.setParametersMap(tab.getParameterMapExpression());
  taskFlowBindingAttrsList.add(tfAttr);
  refreshTabsAndContentArea();
}
```

Dynamic Tabs with Tree Menu - Implementation



Dynamic Tabs Page Template – Dynamic Tabs

```
<af:panelSplitter orientation="horizontal" splitterPosition="200" id="pt_ps2">
  <f:facet name="first">
    <af:decorativeBox theme="default" styleClass="TabletPageContent" id="pt_db2">
      <f:facet name="center">
        <af:panelCollection id="pctree">
          <af:tree id="Menu1"  ... /f:facet> </af:tree>
        </af:panelCollection>
      </f:facet>
    </af:decorativeBox>
  </f:facet>
  <f:facet name="second">
    <af:declarativeComponent viewId="/common/declarativeComponents/DynamicTabs.jsff"
                             id="dyntdc"/>
  </f:facet>
</af:panelSplitter>
```

Dynamic Tabs Declarative Component

```
<af:panelTabbed id="ptb0" tabRemoval="all"
                binding="#{viewScope.dynTabManager.tabsNavigationPane}">
  <af:forEach var="tab" varStatus="vs"
              items="#{viewScope.dynTabManager.tabList}">
    <af:showDetailItem stretchChildren="first" id="sdi0"
                       textAndAccessKey="#{tab.title}"
                       disclosedTransient="true"
                       remove="#{tab.closeable ? 'inherit' : 'no'}"
                       disclosed="#{tab.id==viewScope.dynTabManager.selectedTabId}"
                       disclosureListener="#{viewScope.dynTabManager.selectTab}"
                       itemListener="#{viewScope.dynTabManager.removeTab}">
      <af:region value="#{bindings.multiRegion1.taskFlowBindings[tab.id].regionModel}"
                 id="r1"/>
      <f:attribute name="tabId" value="#{tab.id}"/>
    </af:showDetailItem>
  </af:forEach>
</af:panelTabbed>
```

UIShell Page Definition – MultiTaskFlow binding new in Jdev 11.1.2

```
<?xml version="1.0" encoding="UTF-8" ?>
<pageDefinition xmlns="http://xmlns.oracle.com/adfm/uimodel"
                id="UIShellDTPageDef"
                Package="davelaar.demo.ui.view.pageDefs">
  <parameters/>
  <executables>
    <variableIterator id="variables"/>
    <multiTaskFlow id="multiRegion1"
     taskFlowList="${viewScope.dynTabManager.taskFlowList}"
     activation="deferred" Refresh="ifNeeded"
     xmlns="http://xmlns.oracle.com/adf/controller/binding"/>
  </executables>
</pageDefinition>
```

JDev 11.1.1.x Implementation

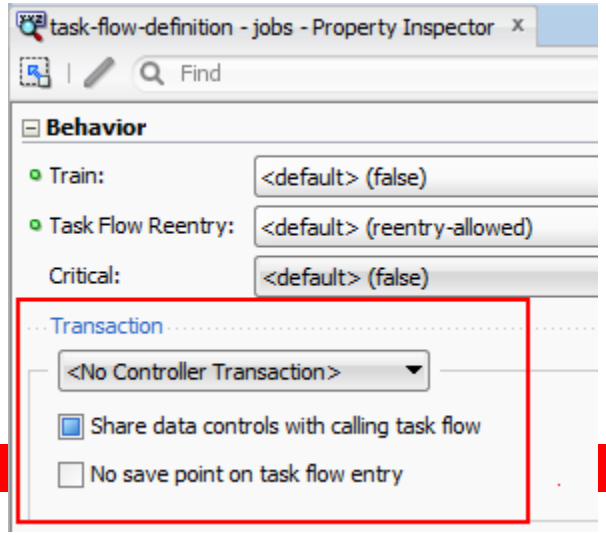
- No MultiRegion executable
- Cannot use af:region inside af:forEach tag
- Page Template Page Definition with 15 pre-defined taskflow bindings
- DynamicTabs declarative component defines 15 regions, only one rendered at a time

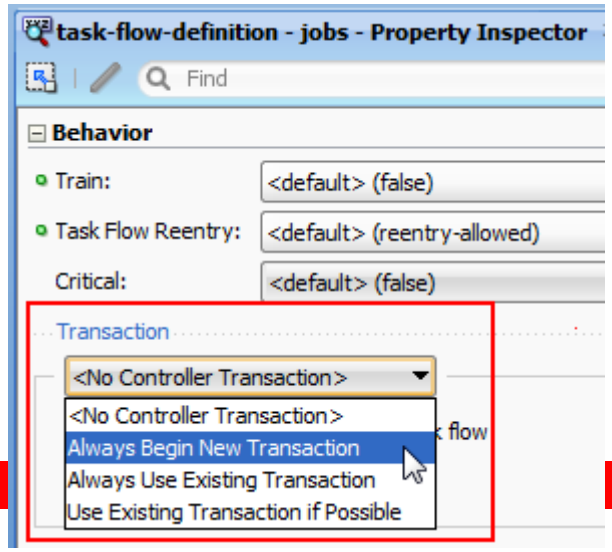
Implementing some Additional Requirements

- Tabs should have independent transactions
- Pending changes warning when closing tab
- Opening new tab from within other tab
- Opening new tab from global search
- Auto-closing a tab
- Initially displayed tabs
- Update browser window title

Data Control Scope and Transactions

- Data Control Scope
  - Shared: all TF's share same app module instance
  - Isolated: Each TF instance has own app module instance
- Transaction Scope
  - With isolated data control scope each TF has own transaction
  - With shared data control scope, transaction is shared by default, but can be changed using Transaction setting





Marking a Tab Dirty – Pending Changes Alert

- Pass DynTabManager as task flow parameter
- Create custom page controller class and implement refreshRegion method
- get the data control through binding container, check for changes and mark current tab dirty using DynTabManager
- Configure custom page controller class in page definition
- Show dialog when closing dirty tab
- Show dirty tab label in italics

Pass DynTabManager as Task Flow Parameter

```
<input-parameter-definition id="__6">
  <name>dynTabManager</name>
  <value>#{pageFlowScope.dynTabManager}</value>
  <class>davelaar.demo.ui.view.dyntab.DynTabManager</class>
</input-parameter-definition>
```

```
public void addTab(DynTab tab)
{
  // Assign unique id that we use to link the DynTab with the
  // corresponding Taskflow
  tab.setId(createId());
  // add the DynTabManager instance as taskflow parameter so the
  // taskflow itself can open new tabs, and close tabs.
  tab.getParameters().put("dynTabManager", this);
  ....
```

Custom Page Controller Class

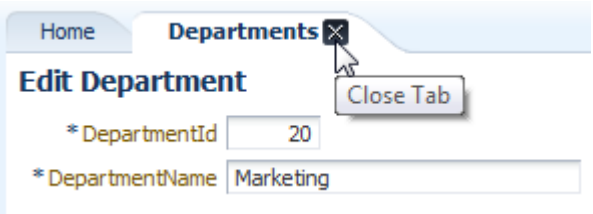
```
public class TabRegionController
  implements RegionController
{
  @Override
  public boolean refreshRegion(RegionContext rc)
  {
    int refreshFlag = rc.getRefreshFlag();
    rc.getRegionBinding().refresh(refreshFlag);
    setTabDirtyState(rc);
    return false;
  }
```

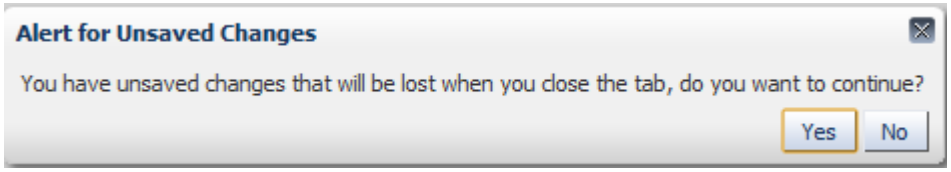
```
<?xml version="1.0" encoding="UTF-8" ?>
<pageDefinition xmlns="http://xmlns.oracle.com/adfm/uimodel"
      version="11.1.2.60.17" id="EditJobPageDef"
      Package="davelaar.demo.ui.view.pageDefs"
      ControllerClass="davelaar.demo.ui.controller.TabRegionController">
  <parameters/>
```

Custom Page Controller Class – setTabDirtyState

```
protected void setTabDirtyState(RegionContext rc)
{
  DynTabManager tabManager = DynTabManager.getCurrentInstance();
  if (tabManager!=null)
  {
    DCBindingContainer cont = (DCBindingContainer) rc.getRegionBinding();
    if (cont.getIterBindingList().size()>0)
    {
      DCIteratorBinding ib = null;
      for (Object iterBinding : cont.getIterBindingList())
      {
        DCIteratorBinding currentIb = (DCIteratorBinding)iterBinding;
        if (currentIb.getDataControl() != null)
        {
          ib = currentIb;
          break;
        }
      }
      if (ib != null && ib.isRefreshed())
      {
        boolean changes = ib.getDataControl().isTransactionDirty()
                          || ib.getDataControl().isTransactionModified();
        tabManager.markCurrentTabDirty(changes);
      }
    }
  }
}
```

Alert for Pending Changes






```
<af:showDetailItem stretchChildren="first" id="sdi0"
        textAndAccessKey="#{tab.title}"
        disclosedTransient="true"
        remove="#{tab.closeable ? 'inherit' : 'no'}"
        disclosed="#{tab.id==viewScope.dynTabManager.selectedTabId}"
        disclosureListener="#{viewScope.dynTabManager.selectTab}"
        itemListener="#{viewScope.dynTabManager.removeTab}">
  <af:region value="#{bindings.multiRegion1.taskFlowBindings[tab.id]
              id="r1"/>
  <f:attribute name="tabId" value="#{tab.id}"/>
</af:showDetailItem>
```

DynTabManager Remove Tab

```
public void removeTab(ItemEvent itemEvent)
{
  UIComponent component = itemEvent.getComponent();
  String tabId = String.valueOf(component.getAttributes().get("tabId"));
  DynTab tab = getTab(tabId);
  if (tab.isDirty())
  {
    RichClientUtils.getInstance().showPopup(getTabDirtyPopup(), null);
    return;
  }
  ....
```

```
<af:popup id="pt_tabdirty" clientComponent="true" contentDelivery="lazy"
          binding="#{viewScope.dynTabManager.tabDirtyPopup}">
  <af:dialog title="Alert for Unsaved Changes" type="yesNo" id="pt_d2"
             dialogListener="#{viewScope.dynTabManager.handleDirtyTabDialog}">
    <af:outputText value="You have unsaved changes that will be lost when
                          you close the tab, do you want to continue?"
                   id="pt_ot7"/>
  </af:dialog>
</af:popup>
```

Showing dirty tab label in italics

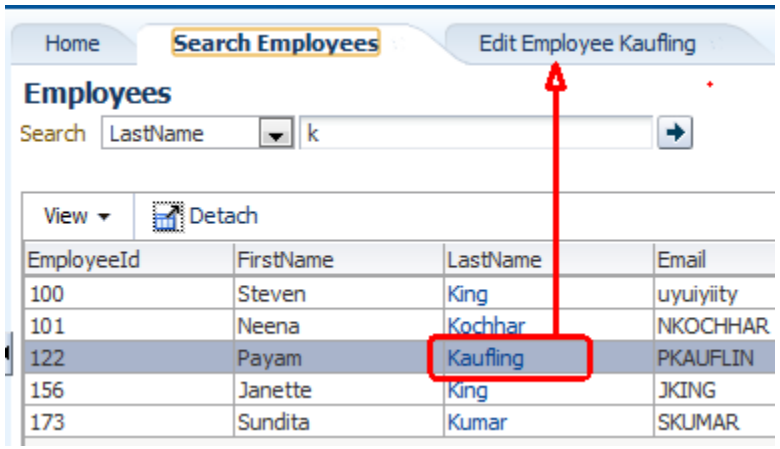
- Currently not possible to change styling of an individual tab within panelTabbed component (ER logged)
- Work around
  - Use navigation pane to render tabs
  - Use separate af:forEach loop to render the regions

Showing dirty tab label in italics

```
<af:navigationPane id="dynTabsPane"
    binding="#{viewScope.dynTabManager.tabsNavigationPane}"
    rendered="#{not empty viewScope.dynTabManager.selectedTabId}"
    value="#{viewScope.dynTabManager.tabMenuModel}" var="tab" itemRemoval="all">
  <f:facet name="nodeStamp">
    <af:commandNavigationItem id="tabIndex"
        actionListener="#{viewScope.dynTabManager.tabActivatedEvent}"
        inlineStyle="#{tab.dirty ? 'font-style: italic' : ''}"
        partialSubmit="true"
        textAndAccessKey="#{tab.title}" immediate="true"
        remove="#{tab.closeable ? 'inherit' : 'no'}"
        itemListener="#{viewScope.dynTabManager.removeTab}">
      <f:attribute name="tabId" value="#{tab.id}"/>
    </af:commandNavigationItem>
  </f:facet>
</af:navigationPane>
```

```
<af:forEach var="tf" varStatus="vs" items="#{bindings.multiRegion1.taskFlowBindingList}">
  <af:region value="#{tf.regionModel}" id="reg"
             rendered="#{tf.name==viewScope.dynTabManager.selectedTabId}"/>
</af:forEach>
```

Opening a Tab From Within Other Tab



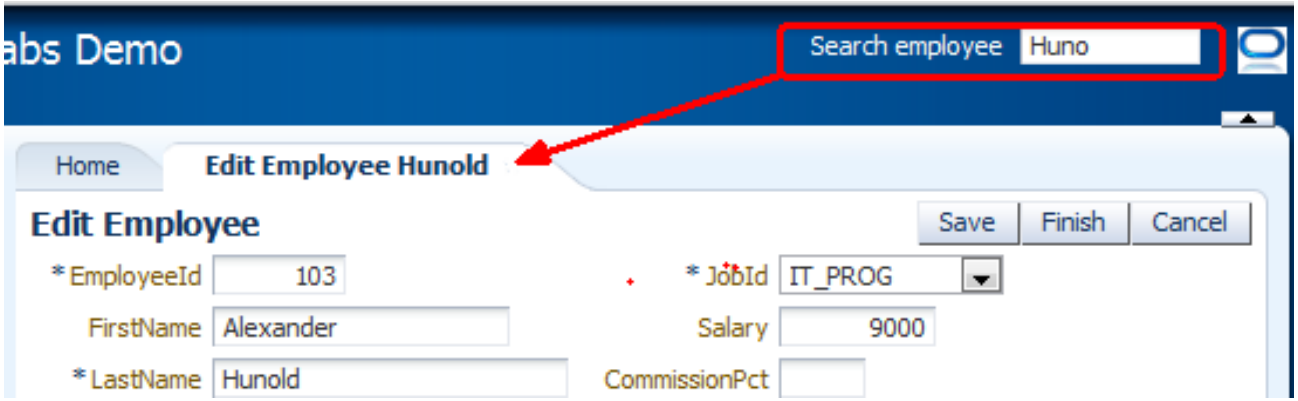
- Set up EditEmployee task flow for deeplinking
- Pass TabManager instance as task flow parameter
- Define Edit EmployeeDynTab managed bean inside “Search Employees” task flow
- Set commandLink action to “uishell:EditEmployee”
- Use setActionListener on commandLink to pass parameters

Opening a Tab From Within Other Tab

```
<af:commandLink id="ot3" text="#{row.LastName}"  action="uishell:EditEmployee">
  <af:setActionListener to="#{EditEmployeeDynTab.title}"
                        from="#{af:formatString('Edit Employee {0}',row.LastName)}" />
  <af:setActionListener to="#{EditEmployeeDynTab.uniqueIdentifier}"
                        from="#{row.EmployeeId}" />
  <af:setActionListener to="#{EditEmployeeDynTab.parameters['rowKeyValue']}"
                        from="#{row.EmployeeId}" />
</af:commandLink>
```

```
<managed-bean id="__8">
  <managed-bean-name>EditEmployeeDynTab</managed-bean-name>
  <managed-bean-class>davelaar.demo.ui.view.dyntab.DynTab</managed-bean-class>
  <managed-bean-scope>request</managed-bean-scope>
  <managed-property>
    <property-name>taskFlowIdString</property-name>
    <value>/WEB-INF/edit-employees-tf.xml#edit-employees</value>
  </managed-property>
</managed-bean>
```

Opening a Tab From Global Search



- Set up EditEmployee task flow for quick search query
- Set commandLink action to “uishell:EditEmployee”
- Use setActionListener on commandLink to pass parameters
- Use subform and default command to auto submit when tabbing out search field

Opening a Tab From Global Search

```
<af:subform id="pt_s1" defaultCommand="cb3">
  <af:panelGroupLayout id="pt_statWrp" layout="horizontal"
        halign="end" styleClass="AFBrandingBarItem">
    <f:facet name="separator">
      <af:spacer width="5" id="pt_s2"/>
    </f:facet>
    <af:inputText value="#{pageFlowScope.globalSearchString}"
                  columns="10" label="Search employee" id="pt_it1"/>
    <af:commandButton id="cb3" text="Go" action="uishell:EditEmployee"
          visible="false">
      <af:setActionListener to="#{EditEmployeeDynTab.parameters['searchString']}"
                            from="#{pageFlowScope.globalSearchString}"/>
      <af:setActionListener to="#{EditEmployeeDynTab.uniqueIdentifier}"
                            from="#{pageFlowScope.globalSearchString}"/>
    </af:commandButton>
    <af:statusIndicator id="pt_statInd"/>
  </af:panelGroupLayout>
</af:subform>
```

Auto-closing a tab


```
<af:commandButton actionListener="#{bindings.Commit.execute}"
                  text="Finish" id="cb5"
                  action="#{pageFlowScope.dynTabManager.removeCurrentTabForce}"/>
```

Initially Displayed Tabs

```
<managed-bean id="__49">
  <managed-bean-name id="__50">dynTabManager</managed-bean-name>
  <managed-bean-class id="__51">davelaar.demo.ui.view.dyntab.DynTabManager
  <managed-bean-scope id="__52">view</managed-bean-scope>
  <managed-property id="__66">
    <property-name id="__67">initialTabs</property-name>
    <property-class>java.util.List</property-class>
    <list-entries>
       <value>#{viewScope.HomeDynTab}</value>
    </list-entries>
  </managed-property>
</managed-bean>
```

```
@PostConstruct
public void init()
{
  // add tabs that should be initially displayed
  for (DynTab tab: initialTabs)
  {
    addTab(tab);
  }
}
```

Update browser window/tab title

- Add method to DynTabManager, called when selecting another tab.

```
public void updateDocumentTitle()
{
  if (isDoUpdateDocumentTitle())
  {
    String js = "AdfPage.PAGE.findComponent('" + getDocumentId()
                + "').setTitle('" + getDocumentTitle() + "')";
    RichClientUtils.getInstance().writeJavaScriptToClient(js);
  }
}
public String getDocumentTitle()
{
  String tabTitle = getSelectedTab() != null ?
                    getSelectedTab().getTitle(): "";
  return getDocumentTitlePrefix() + tabTitle;
}
```

Summary

- Use dynamic tabs with UIShell to support multi-tasking
- Set up infrastructure classes and beans to use ADF regions as dynamic tabs in UIShell
- Create custom tabs navigation handler to hide complexity for developers
- Think carefully about data control scope and transaction settings
- Create custom page controller for marking tab dirty
- Pass TabManager instance as task flow parameter for “inside-out” tab handling

Next steps

- Download sample applications for JDev 11.1.2 and 11.1.1.4 from JHeadstart blog
- Follow-on session
  - Building Highly Reuseable ADF Task Flows
    Wednesday 10.15-11.15
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