How To... Develop International JSF Applications

Applicable Releases:
SAP NetWeaver Composition Environment 7.1

Topic Area:
User Productivity
Development and Composition

Capability:
User Interface Technology
Java

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<table>
<thead>
<tr>
<th>Document Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>First official release of this guide</td>
</tr>
</tbody>
</table>
# Typographic Conventions

<table>
<thead>
<tr>
<th>Type Style</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example Text</strong></td>
<td>Words or characters quoted from the screen. These include field names, screen titles, pushbuttons labels, menu names, menu paths, and menu options. Cross-references to other documentation</td>
</tr>
<tr>
<td><strong>Example text</strong></td>
<td>Emphasized words or phrases in body text, graphic titles, and table titles</td>
</tr>
<tr>
<td><strong>Example text</strong></td>
<td>File and directory names and their paths, messages, names of variables and parameters, source text, and names of installation, upgrade and database tools</td>
</tr>
<tr>
<td><strong>Example text</strong></td>
<td>User entry texts. These are words or characters that you enter in the system exactly as they appear in the documentation</td>
</tr>
<tr>
<td><strong>&lt;Example text&gt;</strong></td>
<td>Variable user entry. Angle brackets indicate that you replace these words and characters with appropriate entries to make entries in the system</td>
</tr>
<tr>
<td><strong>EXAMPLE TEXT</strong></td>
<td>Keys on the keyboard, for example, F2 or ENTER</td>
</tr>
</tbody>
</table>

# Icons

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="caution_icon.png" alt="Caution" /></td>
<td>Caution</td>
</tr>
<tr>
<td><img src="note_icon.png" alt="Note or Important" /></td>
<td>Note or Important</td>
</tr>
<tr>
<td><img src="example_icon.png" alt="Example" /></td>
<td>Example</td>
</tr>
<tr>
<td><img src="tip_icon.png" alt="Recommendation or Tip" /></td>
<td>Recommendation or Tip</td>
</tr>
</tbody>
</table>
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1. Business Scenario

In the previous tutorial you created a JSF application that used standard and custom converters and validators to maintain the integrity of your model.

The following guide will show you how to organize the texts (messages, labels, titles) on your Product Offer application so it will meet the requirements of any specific geographic region of the world.

2. Background Information

JSF handles localization in the same way other Java Web-based applications handle it: using ResourceBundles. Resource bundles contain locale-specific objects. When your program needs a locale-specific resource, a String for example, your program can load it from the resource bundle that is appropriate for the current user’s locale. In this way, you can write program code that is largely independent of the user’s. Resource bundles contain key/value pairs. The keys uniquely identify a locale-specific object in the bundle.

JSF takes advantage of the user-configurable language information sent by a Web browser with each request to choose the best locale among the choices available to the application.

3. Prerequisites

The following is a list of all you need for developing JSF applications.

- AS Java 7.1 (CE 7.1 or NW 7.1)
- NWDS 7.1 (SP3 or higher with latest patch level).

**Note**

While this tutorial is geared towards the SAP AS Java (the build/deploy steps of the guide), it wouldn’t be hard to replace the build/deploy portions with similar steps for any other Java EE 5 platform.

Knowledge

- You have a basic knowledge of Java Enterprise Edition
- You have acquired some basic experience with JSF applications, for example by working through the JSF tutorials (Create a Hello World Application using JavaServer Faces [Extern] and Create Your First JSF Application [Extern])
- You have successfully completed the Product Offer tutorial Part 2 (Custom Converters And Validators [extern])
4. Step-by-Step Procedure

In the following sections you will optimize the Product Offer tutorial Part 2 (Custom Converters And Validators [extern]) by collecting labels, titles and messages in a central location.

Before looking at the details of creating the resource bundle, it would be helpful to summarize the message strings that need to be collected:

<table>
<thead>
<tr>
<th>JSP Page</th>
<th>Message strings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Index.jsp</td>
<td>Product Offer title, Description label, Code label, Price label, Expiration Date label, In Stock label, Process button, Cancel button, Code Converter error message, Code Validator error messages</td>
</tr>
<tr>
<td>Result.jsp</td>
<td>Success message, Description label, Code label, Price label, Expiration Date label, In Stock label, Continue button</td>
</tr>
<tr>
<td>Canceled.jsp</td>
<td>Cancel message, Back button</td>
</tr>
</tbody>
</table>

The JSF framework is fully internationalized. However, when you developed your own components, in this case custom converters and validators, you must retrieve your error messages from a message bundle, so that your components have the same level of localizability that users expect from the JSF framework.

You will use this information to create a resource bundle file in the properties format with all the message strings. Then you will expose it to the Faces runtime and use it from the JSF views.

4.1 Tutorial Setup

1. Download the ZIP file 05_converterjsf_init.zip, which contains the initial JSF project for this tutorial. Save it in a local directory.

2. Unzip the contents and import the Development Components in the JDI workspace of the SAP NetWeaver Developer Studio as indicated in the Product Offer tutorial Part 2 (Custom Converters And Validators [extern])

4.2 Create the ResourceBundles

1. From the context menu of the com.sap.tutorial.jsf.conv.util package in the Java Resources: source folder, select New → Other…
2. In the popup window select General → File and click the Next button.

3. Enter messages.properties in the File Name field and click the Finish button.

**Note**

You can choose any directory path and file name, but you must use the extension .properties.
4. The following code shows the keys and values for the English version of the localized messages

```java
offer_title=Product Offer
description=Description
code=Code
price=Price
expiration_date=Expiration Date
in_stock=In Stock
process_button=Process
cancel_button=Cancel
success_title=Offer created successfully
continue_button=Continue
cancel_title=The transaction has been canceled
back_button=Back
invalidCodeCharacter=Code: Conversion error: Invalid character found.
invalidCodeCharacter_detail=Code: Conversion error: The code contains invalid characters.
invalidCodeFormat=Code: Validation error: Invalid code format.
invalidCodeFormat_detail=Code: Validation error: The code contains invalid format. It should be 'XYZ1234' or 'XYZ-1234'.
invalidCodeLength=Code: Validation error: Invalid length.
invalidCodeLength_detail=Code: Validation error: The code contains invalid format. Length allowed is 7 or 8.
```

5. Create the Spanish version of the localized messages. When you localize a bundle file, you need to add a locale suffix to the file name, that is, an underscore followed by the lower case, two-letter ISO-639 language code. To do this, create a new file called `messages_es.properties` and add the following code

```java
offer_title=Producto en Promoci\u00f3n
description=Descripci\u00f3n
code=C\u00f3digo
price=Precio
expiration_date=Fech\u00a9a de Explicaci\u00f3n
in_stock=En Almac\u00e9n
process_button=Procesar
cancel_button=Cancelar
```

Note

Special characters are encoded as \uxxxx escape sequences. To learn more about the Unicode characters you can visit [Unicode website](http://unicode.org).
success_title=Oferta creada exitosamente
continue_button=Continuar
cancel_title=La transacci\u00f3n ha sido cancelada
back_button=Regresar
invalidCodeCharacter=C\u00f3digo: Error de Converci\u00f3n: Caracter inv\u00e1lido.
invalidCodeCharacter_detail=C\u00f3digo: Error de Converci\u00f3n: El c\u00f3digo contienecaracteres inv\u00e1lidos.
invalidCodeFormat=C\u00f3digo: Error de Validaci\u00f3n: Formato inv\u00e1lido.
invalidCodeFormat_detail=C\u00f3digo: Error de Validaci\u00f3n: El c\u00f3digo contiene formato inv\u00e1lido. Formato permitido es 'XYZ1234' o 'XYZ-1234'.
invalidCodeLength=C\u00f3digo: Error de Validaci\u00f3n: Longitud inv\u00e1lida.
invalidCodeLength_detail=C\u00f3digo: Error de Validaci\u00f3n: El c\u00f3digo contiene longitud inv\u00e1lida. Longitud permitida es 7 u 8.

6. Save the changes you made

4.3 Get Error Messages from ResourceBundles

1. In the com.sap.tutorial.jsf.conv.util package you will find a Messages java class provided by Geary, David and Cay Horstmann. Core JavaServerTM Faces, 2nd ed. This class will help you to retrieve the error messages from a ResourceBundle by:

   a. Getting the locale:
      
      Locale locale = context.getViewRoot().getLocale();

   b. Getting the class loader needed to locate the resource bundle
      
      ClassLoader loader = thread.currentThread().getContextClassLoader();

   c. Getting the resource bundle
      
      bundle = ResourceBundle.getBundle(bundle1, locale, loader);

   d. Getting the message string from the resource bundle
      
      resource = bundle.getString(resourceId);

2. Open the CodeConverter class and use the Messages class to get the error messages from the ResourceBundle by changing the getAsObject method as follows:

   public Object getAsObject(FacesContext arg0, UIComponent arg1, String arg2) {
       int i = 0;
       boolean foundInvalidCharacter = false;
       if (arg2 == null){
return null;
}
arg2 = arg2.replace("-", "").trim();
StringBuilder builder = new StringBuilder(arg2);
while (i < builder.length() && !foundInvalidCharacter) {
    char ch = builder.charAt(i);
    if (Character.isLetter(ch) || Character.isDigit(ch))
        i++;
    else if (Character.isWhitespace(ch))
        builder.deleteCharAt(i);
    else {
        foundInvalidCharacter = true;
    }
}
if (foundInvalidCharacter) {
    FacesMessage message = Messages.getMessage(
        "com.sap.tutorial.jsf.conv.util.messages",
        "invalidCodeCharacter", null);
    message.setSeverity(FacesMessage.SEVERITY_ERROR);
    throw new ConverterException(message);
}
return builder.toString();
}

3. Open the CodeValidator class and use the Messages class to get the error messages from the ResourceBundle by changing the validate method as follows:

public void validate(FacesContext arg0, UIComponent arg1, Object arg2)
    throws ValidatorException {
    int i = 0;
    boolean foundError = false;
    FacesMessage message = new FacesMessage();

    String code = arg2.toString();
    code = code.replace("-", "").trim();
    StringBuilder builder = new StringBuilder(code);
    if (builder.length() == 7) {
        while (i < builder.length() && !foundError) {
...
char ch = builder.charAt(i);
if (Character.isLetter(ch) && i < 3)
    i++;
else if (Character.isDigit(ch) && i >= 3)
    i++;
else if (Character.isWhitespace(ch))
    builder.deleteCharAt(i);
else {
    foundError = true;
    message = Messages.getMessage(
            "com.sap.tutorial.jsf.conv.util.messages",
            "invalidCodeFormat", null);
    }
} else {
    foundError = true;
    message = Messages.getMessage(
            "com.sap.tutorial.jsf.conv.util.messages",
            "invalidCodeLength", null);
    }
if (foundError) {
    message.setSeverity(FacesMessage.SEVERITY_ERROR);
    throw new ValidatorException(message);
    }
}

4. Save the changes

4.4 Set Locale and Expose the ResourceBundles

It is important to define the default locale and supported locales in order for Faces to find the right
Local instance for the user. This is done in the <application> tag of the faces-config.xml file.

1. Open the faces-config.xml file, go to the Other tab
2. In the Locale Config section, add en (english) and es (spanish)
3. The following XML code will be added in the Source tab

```xml
<application>
  <locale-config>
    <default-locale>en</default-locale>
    <supported-locale>es</supported-locale>
  </locale-config>
</application>
```

4. To make available the ResourceBundle to the Application, in the Source tab of the `faces-config.xml` file, add the following XML code between the `<application>`... `</application>` tags.

```xml
<application>
  ...
  <resource-bundle>
    <base-name>
      com.sap.tutorial.jsf.conv.util.messages
    </base-name>
    <var>msgs</var>
  </resource-bundle>
</application>
```

**Important**

Now the messages in the `bundle` are accessible through a map variable with the name `msgs`. The other way to expose the ResourceBundle is adding the `f:loadbundle` element to each JSF page that needs access to the bundle. The `resource-bundle` element is more efficient that the `f:loadBundle` action because the bundle is created
once for the application. However it is a JSF1.2 feature. To make your application compatible with JSF 1.1, you must use \texttt{f:loadBundle}

5. Save your changes

\section*{4.5 Modify the JSP Pages}

1. In the index.jsp page replace the \textit{value} property in the following UI elements:

<table>
<thead>
<tr>
<th>UI element</th>
<th>Value property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Offer</td>
<td>\texttt{#{msgs.offer_title}}</td>
</tr>
<tr>
<td>Description</td>
<td>\texttt{#{msgs.description}}</td>
</tr>
<tr>
<td>Code</td>
<td>\texttt{#{msgs.code}}</td>
</tr>
<tr>
<td>Price</td>
<td>\texttt{#{msgs.price}}</td>
</tr>
<tr>
<td>Expiration Date</td>
<td>\texttt{#{msgs.expiration_date}}</td>
</tr>
<tr>
<td>In Stock</td>
<td>\texttt{#{msgs.in_stock}}</td>
</tr>
<tr>
<td>Process</td>
<td>\texttt{#{msgs.process_button}}</td>
</tr>
<tr>
<td>Cancel</td>
<td>\texttt{#{msgs.cancel_button}}</td>
</tr>
</tbody>
</table>

2. In the index.jsp page replace the \textit{label} property in the following UI elements:

<table>
<thead>
<tr>
<th>UI element</th>
<th>Label property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>\texttt{#{msgs.description}}</td>
</tr>
<tr>
<td>Code</td>
<td>\texttt{#{msgs.code}}</td>
</tr>
<tr>
<td>Price</td>
<td>\texttt{#{msgs.price}}</td>
</tr>
<tr>
<td>Expiration Date</td>
<td>\texttt{#{msgs.expiration_date}}</td>
</tr>
<tr>
<td>In Stock</td>
<td>\texttt{#{msgs.in_stock}}</td>
</tr>
</tbody>
</table>
3. In the `result.jsp` page replace the `value` property in the following UI elements:

<table>
<thead>
<tr>
<th>UI element</th>
<th>Value property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offer created</td>
<td>outputText #{msgs.success_title}</td>
</tr>
<tr>
<td>successfully</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>outputText #{msgs.description}</td>
</tr>
<tr>
<td>Code</td>
<td>outputText #{msgs.code}</td>
</tr>
<tr>
<td>Price</td>
<td>outputText #{msgs.price}</td>
</tr>
<tr>
<td>Expiration Date</td>
<td>outputText #{msgs.expiration_date}</td>
</tr>
<tr>
<td>In Stock</td>
<td>outputText #{msgs.in_stock}</td>
</tr>
<tr>
<td>Process</td>
<td>commandButton #{msgs.continue_button}</td>
</tr>
</tbody>
</table>
1. In the result.jsp page replace the value property in the following UI elements:

<table>
<thead>
<tr>
<th>UI element</th>
<th>Value property</th>
</tr>
</thead>
<tbody>
<tr>
<td>The transaction has been canceled</td>
<td>#{msgs.cancel_title}</td>
</tr>
<tr>
<td>outputText</td>
<td></td>
</tr>
<tr>
<td>Process commandButton</td>
<td>#{msgs.back_button}</td>
</tr>
</tbody>
</table>
2. Save your changes

4.6 Build, Deploy and Run your application

3. Build and deploy the application.

4. Run the application using the simplified URL:
   http://<servername>:<httpport>/converterjsf/faces/index.jsp

5. Results:
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Product Offer - Windows Internet Explorer

Description: Validation Error: Value is required.
Code: Validation Error: Value is required.
Price: Validation Error: Value is less than allowable minimum of '1'
Expiration Date: Validation Error: Value is less than allowable minimum of '10'

Producto en Promoción

Descripción: Error de Validación: Valor es necesario.
Código: Error de Validación: Valor es necesario.
Precio: Error de Validación: Valor es menos de valor de mínimo permitido: '1'.
Fecha de Expiración: Error de Validación: Valor es menos de valor de mínimo permitido: '10'.

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www.sdn.sap.com/irj/sdn/howtoguides