

OAF - Oracle Application Framework  
for EBS Release 12

Naming conventions .....	3
jdev.....	3
Package jdr_utils.....	4
Hello World - how to do it .....	5
Design.....	5
Deployment .....	7
Copy .class files to server.....	7
Upload necessary XML files from project to database. ....	8
Bounce apache and OC4J.....	8
Add form to your menu .....	8
Page error ? clear cache.....	9
<b>Building forms .....</b>	<b>9</b>
Sample form .....	9
General remarks .....	11
General remarks about database support.....	12
Traps for begginers.....	13
Drill down demo /Query demo.....	14
Simple Query.....	14
Adv query .....	14
Attachments.....	15
Way 1: .....	15
Way 2: .....	16
Standard tutorial shortcut .....	18
Non database form .....	18
Master-detail.....	19
How to refer to row .....	21
Preparing layout .....	22
Fundamentals .....	22
Single record layout .....	22
Menu.....	22
Grid layout.....	23
Tab layout.....	23
Hide/show region .....	23
Header .....	23
Global variables ( session variables).....	23
Dialogbox .....	23
MessageBox (message box).....	23
MessageBox.....	24
Actions .....	25
When-button-pressed .....	25
Links.....	25
Way 1 – image & action type.....	25
Way 2 – see drill down demo in this document .....	26

Way 3- code in Controller - processFormRequest .....	27
Code snippets .....	28
Controller-application module-View object.....	28
Serializable .....	28
Set_where_clause .....	28
Dynamic create VO, read query result .....	28
Set_item_value, get_item_value .....	29
Get the value of a check box field in a page .....	29
Set_item_property, get_item_property.....	29
Way 1 – CO code .....	29
Way 2 – SPEL .....	30
Way3- bound values.....	32
Set focus .....	33
Open in new form.....	33
<i>Timely refresh of a OA Page</i> .....	33
code to attach js url programatically to a button/image bean.....	33
Validations .....	34
Simple example – dependences inside record.....	34
Advanced example – dependencies with database.....	35
Use a sequence value when saving a record in OA Framework .....	36
CO - Read only page .....	36
Hide a Button .....	37
Disable a Button .....	37
Loop Through Fetched Records in VO .....	37
PL/SQL from OAF.....	38
Fnd_value.profile from OAF.....	38
Breadcrumbs.....	38
Menu in OAF .....	39
<b>SQL from CO – shortcut .....</b>	<b>41</b>
<b>Create new button programatically .....</b>	<b>41</b>
<b>Sysdate .....</b>	<b>42</b>
<b>Integration.....</b>	<b>42</b>
Run Oracle Forms from OAF.....	42
Launch a Workflow from OAF.....	42
Call Concurrent Program from OA Framework .....	43
How to monitor the submitted concurrent request OA Framework.....	44
<b>Personalizations .....</b>	<b>44</b>
Poziom administratora.....	44
Poziom użytkownika .....	45
Wybór kontekstu personalizacji .....	45
<b>LOV .....</b>	<b>45</b>
Create LOV .....	45
Advanced: LOV with a custom query .....	46
Assign LOV to field .....	47
Assign LOV to field - personalization .....	51
Assign search region do result table.....	52
LOV – hierarchical (dependent LOVs).....	53
LOV – hierarchical – hide dependent LOV .....	54

LOV –clear dependent fields.....	54
Picklist (LOV) .....	54
<b>Typical Personalizations/Customizations .....</b>	<b>55</b>
Customization - How to add own column.....	56
1/ Modify View Object .....	56
1. copy VO from the server.....	56
2. make a descendant. Name: <CustomerName><oldName>.....	56
3. modify SQL, add attributes (sometimes attributes are added automatically sometimes not) .....	57
4. make substitution (= information that system should use our VO instead of standard VO) .....	57
5. Deploy changes on server .....	58
6. Review changes .....	59
2/ Add column – personalization .....	59
CO replacement.....	61
CO – how to add link dynamically.....	63
How to add your own region to the form .....	64
1/ Prepare the region in JDeveloper .....	64
2/ Pin the region to form using personalization .....	68
Region with combobox filter.....	68
Show/ Hide link depending on there is value in a field .....	70
<b>Logging in the OAF (debug, diagnostics).....</b>	<b>70</b>
Integrated debug .....	70
Local java debug .....	71
Using a button – code for a controller.....	71
In a Controller .....	72
To log bc4j objects in OAF .....	73
How To Generate A SQL Trace In OAF .....	73
debugging am.invokeMethod.....	74
<b>inne informacje .....</b>	<b>75</b>
Apps2fusion.com - great video presentation by anil passi.....	75
Fine help.....	75

## Naming convensions

Jesli dodajemy cokolwiek, np. klasy java, kontrolery, moduł aplikacyjny, widoki, na początku dodajemy kod klienta np. pzu.

### jdev

Programujemy w jdeveloper

  Istotna jest wersja narzedzia

  Do EBS 11 trzeba używać jdeveloper 9.

  Do EBS 12 trzeba używać jdeveloper 10.

Do jdev trzeba pobrać rozszerzenie: Oracle Application Extensions. How to do it:

1/ go to Oracle Metalink:

How to find the correct version of JDeveloper to use with eBusiness Suite 11i or Release 12.x [ID 416708.1]

2/ unzip file and configure jdev ( go to jdev documentation in .zip, in short: set env variable and .dbc file ).

Note: after downloading .dbc file erase from it "/" chars if any in connection string

Oaf forms consists of two elements:

- Layout (xml files)
- java code

Layout is kept in database- you can get it:

- using `jdr_utils.printDocument` ( parameter for this function is to be get from personalization form)
- XMLExporter java utility

Java code is kept in `$java_top` on the app server.

To see changes you must compile java code and bouce apache.

Architektura MVC (DB-entity object-view object-application module-OA controller)

MVC to standard otwarty, nie Oraclowy

Model = baza danych

View = strona

Controller = przepływ informacji

## Package `jdr_utils`

Strony są zapisane w bazie, mogą być na serwerze ale tylko jako kopia, tworzone przez nas dodawne są i do bazy i na serwer.

```
begin
  dbms_output.put_line('*START');
  jdr_utils.listcustomizations('/oracle/apps/per/irc/vacancy/webui/VacSrchPG');
  dbms_output.put_line('*STOP');
end;
```

– wyszukuje personalizacje z formatki. url pobieramy z formatki, z ekranu diagnostycznego.

```
exec jdr_utils.listDocuments('/oracle/apps/per/irc/vacancy/webui', true)
```

- podobna do `listcustomizations`, wyszukuje rekurencyjnie, nie podajemy nazwy strony, lecz ścieżkę.

`Jdr_utils.listContens ('/oracle/apps/fnd/messages/webui', true )` – rekurencyjnie wyszukuje wszystkie personalizacji z danej ścieżki

`Jdr_utils.PrintDocument` (to co zwróciły poprzednie funkcje) – za pomocą tego pobieramy XML odpowiadający stronie lub personalizacji.

```
exec
jdr_utils.DeleteDocument('/oracle/apps/eam/workorder/webui/customizations/site/0/EAM_EW_START_PAGE')
- kasuje personalizację
```

## Przenoszenie personalizacji

### 1. Za pomocą funkcji

XMLImporter - podajemy plik XML personalizacji. Którego formularza personalizacja dotyczy jest zapisane w tym pliku XML

XMLExporter

### 2. albo za pomocą funkcji w aplikacji

## Hello World - how to do it

### Design

You need to configure jdev and prepare form

See clear tutorials in jdeveloper:

Jdev configuration in short:

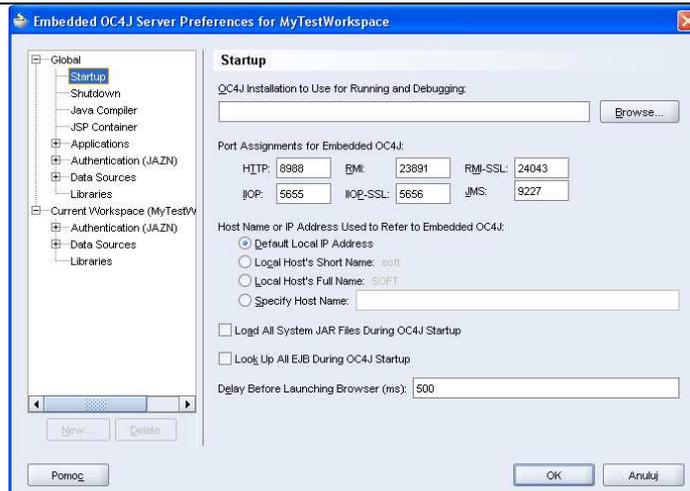
1. trzeba ustawić zmienną środowiskową: JDEV\_USER\_HOME na jdevhome np.  
D:\Install\oracle\jdeveloper\10.1.3.3\_with\_OAF\p9879989\_R12\_GENERIC\_12.1.3\jdevhome\jdev
2. skopiować pliki z \$JAVA\_TOP\ppl/apps/eam i \$JAVA\_TOP/oracle/apps/eam
3. pobrać plik .dbc
4. ustawić UTF-8 w JDEV
5. Copy java files from the server from \$JAVA\_TOP to jDevHome/myclasses
6. Runtime environment: Set credentials

Use this SQL to obtain the correct values:

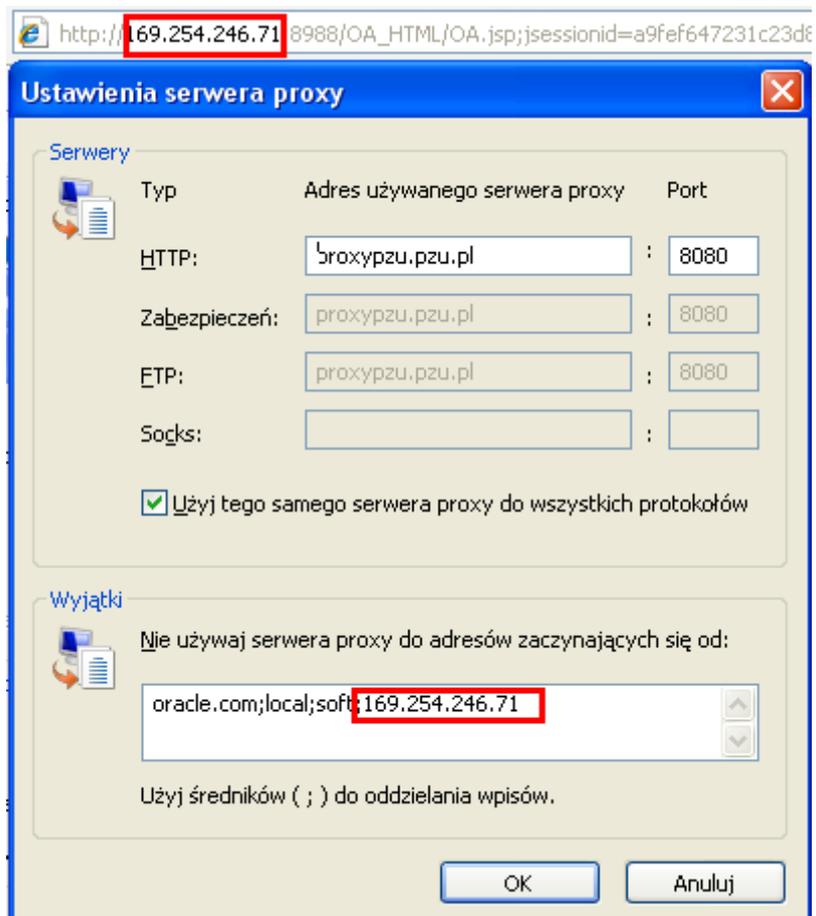
```
select (select APPLICATION_SHORT_NAME from fnd_application where APPLICATION_ID= r.application_id) APPLICATION
, RESPONSIBILITY_KEY
from fnd_responsibility r
where RESPONSIBILITY_id
in (select RESPONSIBILITY_ID from fnd_responsibility_tl where upper(RESPONSIBILITY_NAME) like upper('Administrator
systemu'))
```

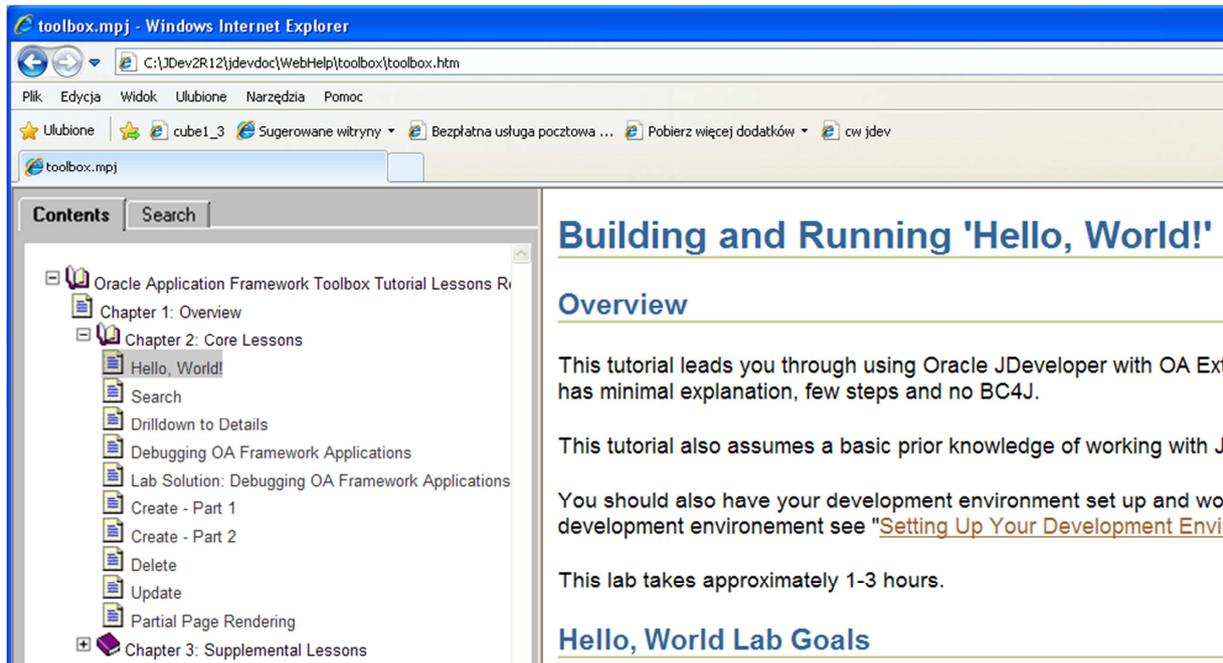


7. Runtime environment: Set “default local ID address” here:



If you are using proxy do this:



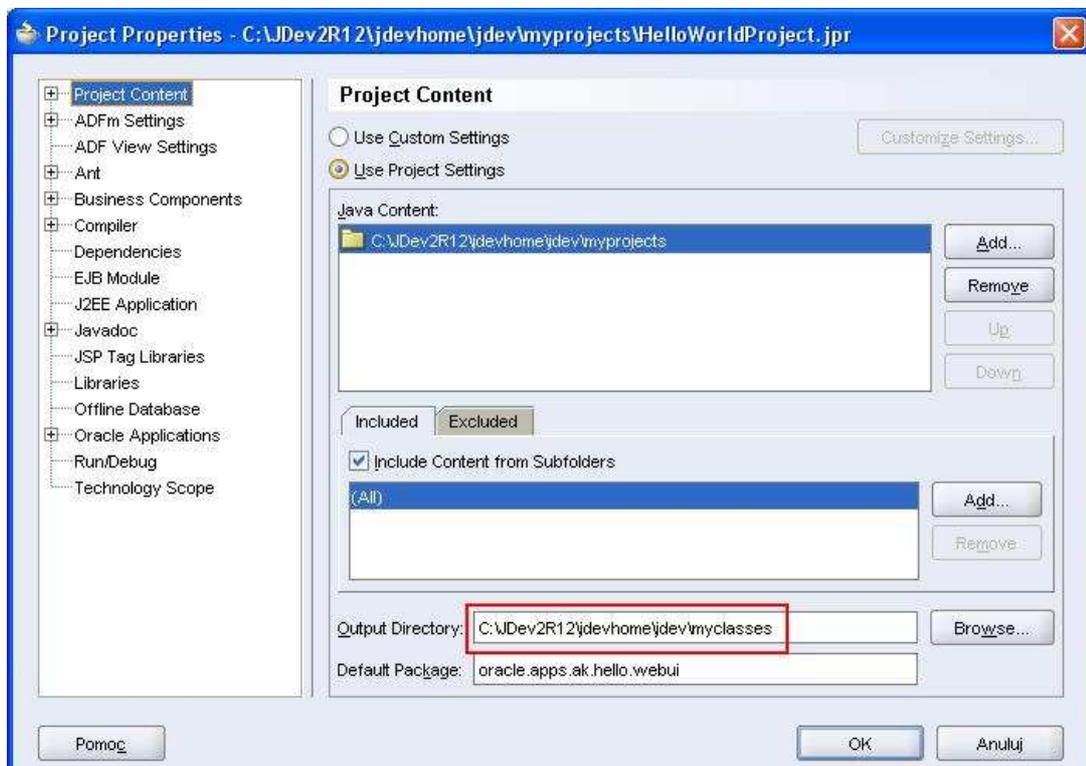


## Deployment

There is no one-button-click procedure. Do this:

### Copy XMLs (Pages, VOs, COs, AMs, ..) and .class files to the server

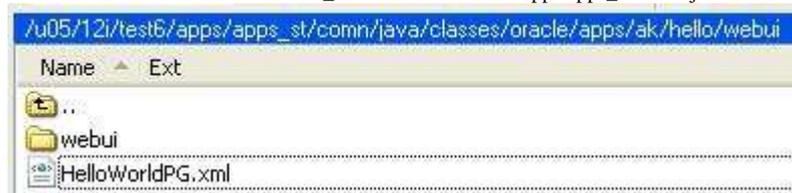
Copy exact catalog tree from myclasses to \$JAVA\_TOP on the server  
(all files: XMLs and .class files)



## Upload necessary XML layout files from project to database.

Use XMLImporter or "Administrator funkcji" responsibility, sheet "Personalizacje".

JAVA\_TOP = /u05/12i/test6/apps/apps\_st/comm/java/classes



```
[apptest6@lamignat-pl ~]$ java oracle.jrad.tools.xml.importer.XMLImporter $JAVA_TOP/oracle/apps/ak/hello/webui/HelloWorldPG.xml \  
> -username apps \  
> -password apps \  
> -rootdir $JAVA_TOP/ \  
> -rootPackage / \  
> -dbconnection "(description=(address_list=(address=(community=tcP.world)(protocol=tcP)(host=LAMIGNAT-PL.PL.ORACLE.COM)(port=1547))) (connect_data=(sid=TEST6)))" \  
Importing file "/u05/12i/test6/apps/apps_st/comm/java/classes/oracle/apps/ak/hello/webui/HelloWorldPG.xml" as "/oracle/apps/ak/hello/webui/HelloWorldPG". \  
Import completed.
```

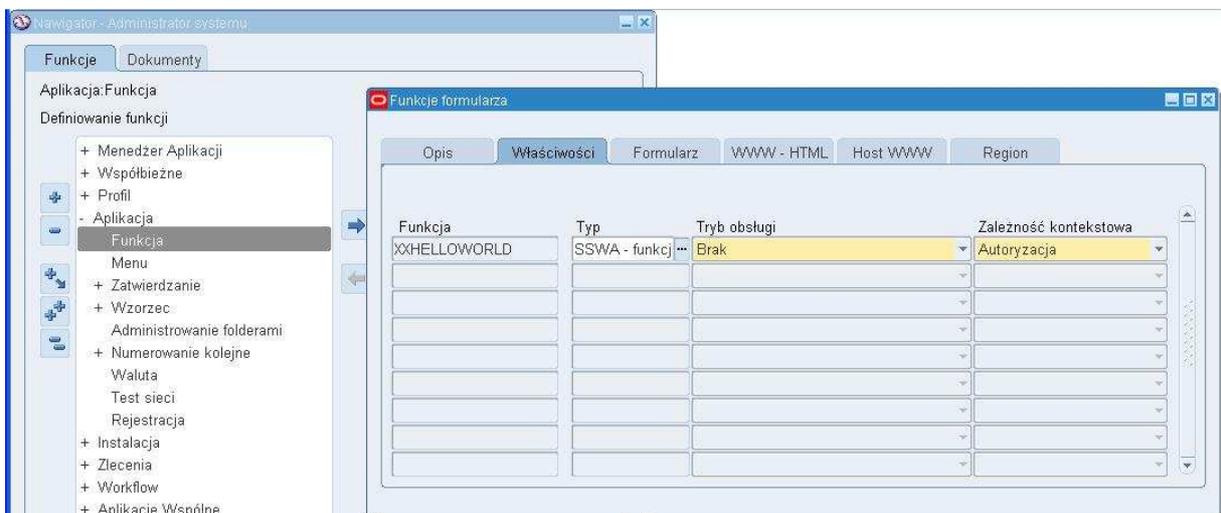
```
java oracle.jrad.tools.xml.importer.XMLImporter $JAVA_TOP/xxext/oracle/apps/xxext/move/webui/MovePG.xml \  
-username apps \  
-password apps \  
-rootdir $JAVA_TOP/ \  
-rootPackage / \  
-dbconnection "(description=(address_list=(address=(community=tcP.world)(protocol=tcP)(host=LAMIGNAT-PL.PL.ORACLE.COM)(port=1547))) (connect_data=(sid=TEST6)))"
```

## Bounce apache and OC4J

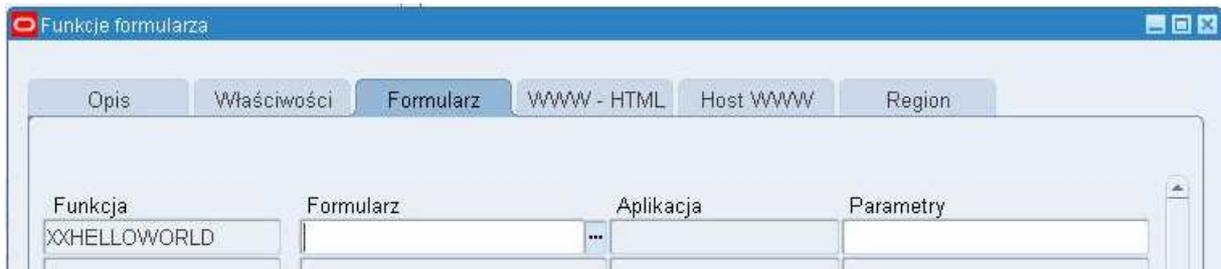
see r12\_oafscripts.sh

Ask other users for permission !

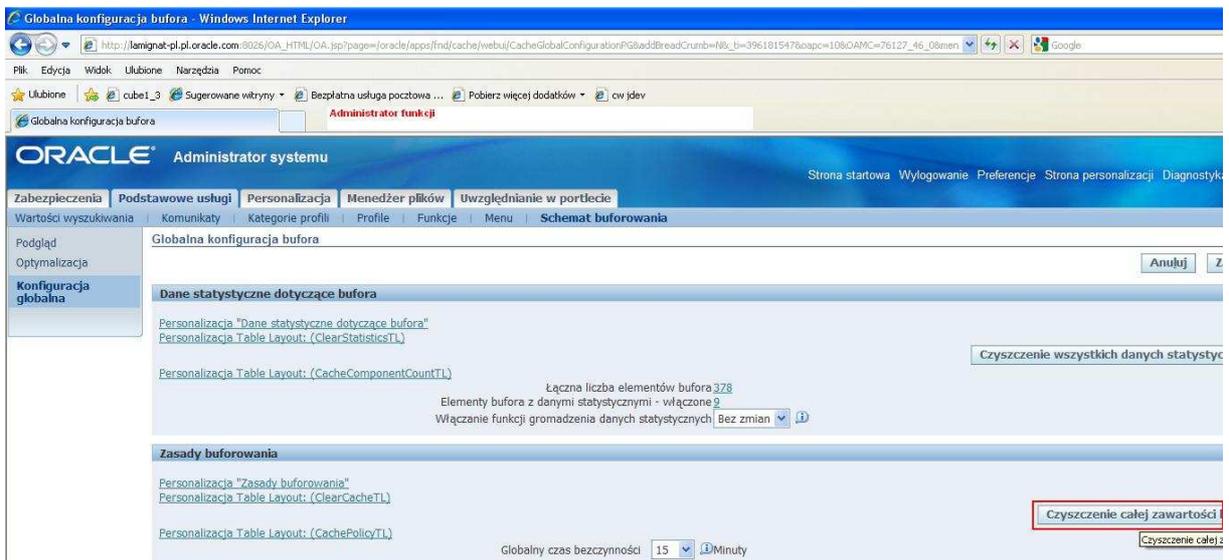
## Add form to your menu



Typ: SSWA - funkcja jsp



## Page error ? clear cache



## Building forms

### Sample form

Przeprowadzki - wyszukiwanie

Wyszukiwanie proste

Podczas wyszukiwania nie jest rozróżniana wielkość liter

Wyszukiwanie zaawansowane

Nr przeprowadzki

Data przeprowadzki

Status

Lokalizacja źródłowa

Lokalizacja docelowa

Projekt

Zadanie

Wykonaj Wyczyść

Nowa przeprowadzka

Nr przeprowadzki	Data przeprowadzki	Lokalizacja docelowa	Projekt	Zadanie
<a href="#">1692</a>	19-04-2012		40	1
<a href="#">1695</a>	26-04-2012			1
<a href="#">1797</a>	21-04-2012	test1-Jana Pawła II,24,,Warszawa,00-133,PL	49	1
<a href="#">1800</a>	20-04-2012	TEST2-Jana Pawła II,24,,Warszawa,00-133,PL		1
<a href="#">1800A</a>	19-04-2012	test1-Jana Pawła II,24,,Warszawa,00-133,PL	52	1
<a href="#">1845</a>	16-04-2012		40	1

Przeprowadzka

ORACLE® PZU - EAM - Administrator

Diagnostyka Strona startowa Wylogowanie Preferencje Strona personalizacji

Przeprowadzka

\* Wskazuje wymagane pole

Generowanie linii Specyfikacja Wczytanie Weryfikacja Anulowanie przeprowadzki Realizacja Anuluj

Dane podstawowe

Spółka OMM Status Wygenerowana specyfikacja

Numer przeprowadzki 1692 Jednostka organizacyjna

Opis

\* Data przeprowadzki 19-04-2012 \* Projekt 40

\* Numer zgłoszenia problemu 5167 \* Zadanie 1

Osoba kontaktowa

Lokalizacja źródłowa

Adres budynku B15ZC\_MATE34-Szczecin, Matejki 34

Kondygnacja

Pomieszczenie

Personalizacja Stack Layout: (Spacer)

Lokalizacja docelowa

Adres budynku

Załączniki Brak Dodaj...

Dodawanie załącznika

Typ załącznika Tekst

Tytuł

Kategoria Inne

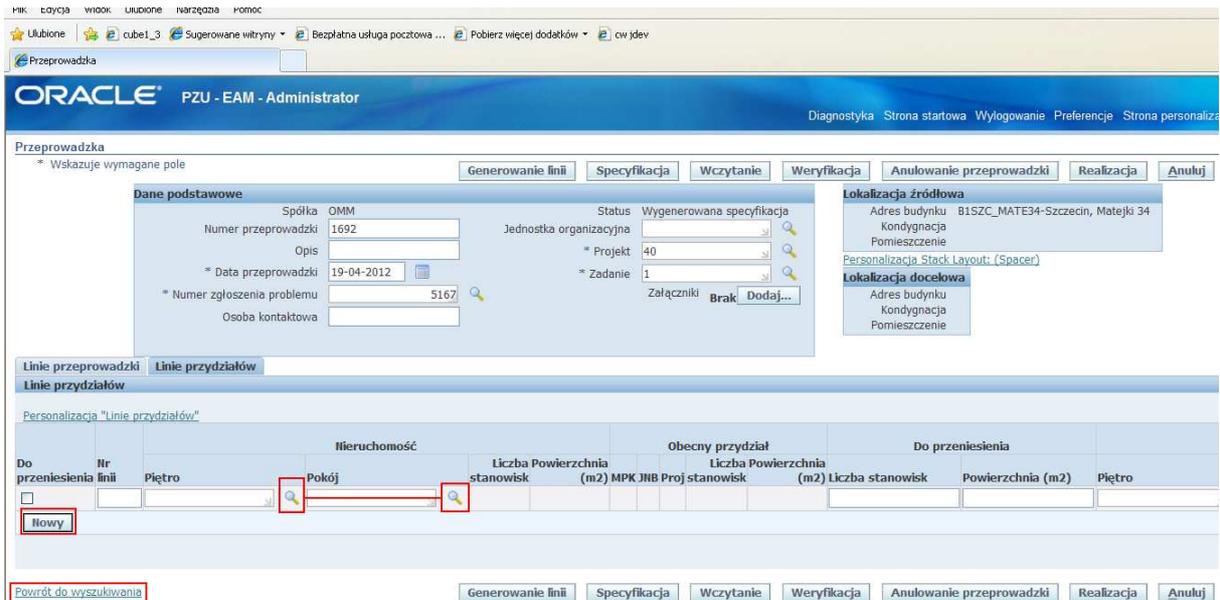
Tekst

Zapisywanie Dodawanie kolejnego Anulowanie

Linie przeprowadzki Linie przydziałów

Personalizacja "Linie przeprowadzki"

Do przeniesienia linii	Nr linii	Piętro	Pokój	Urządzenie	Numer ewidencyjny	MPK	INB	Proj	przeprowadzanej	Numer stanowiska	Gniazdo IT
<input type="checkbox"/>	1			Klimatyzator Daikin 1	EMKA0000012						
<input type="checkbox"/>	2			Platforma 3	EMKA0000010						
<input type="checkbox"/>	3			gaśnica GP-12z024	GAS025						



## General remarks

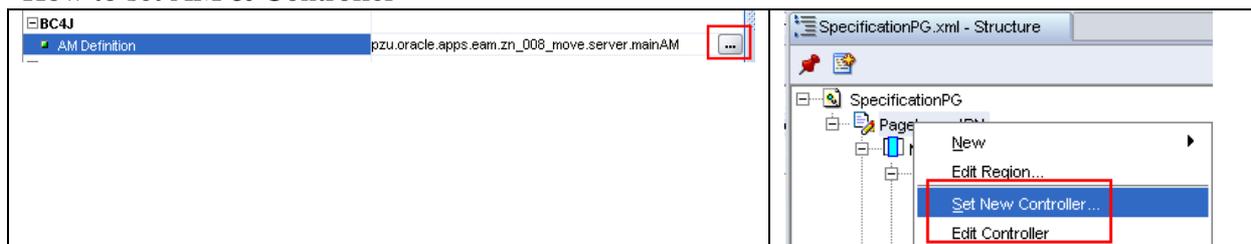
Top-level-region has to have reference to Application Module.  
 Top-level-region or any region on page can have controller code.

<b>General</b>	
ID	PageLayoutRN
Region Style	pageLayout
Extends	
Attribute Set	
Scope	Current Package [/pzu/oracle/apps/eam/zn_008_move/webu
Help Target Appl Short Name	
Help Target	
Comments	
Documentation Comment	[Enter Javadoc like developer documentation, delete this line.
<b>Functional</b>	
Controller Class	pzu.oracle.apps.eam.zn_008_move.webui.SpecificationCO
<b>BC4J</b>	
AM Definition	pzu.oracle.apps.eam.zn_008_move.server.mainAM

Controller has two methods:

- processRequest – which is called on before-form (you can control this layout)
- processFormRequest – on button-click, on-link-click.

How to set AM & Controller



Database table has to have standard EBS who columns. There is nothing to do, framework will populate it by default.

## General remarks about database support

This is a database framework. Each item can have reference to VO and its attribute. This framework will do for you insert/update/delete operations.

All you need is to initialize database state:

	Before (code in controller.processRequest)	After – apply button (code in controller.processFormRequest)	After – cancel button (code in controller.processFormRequest)
Inse rt	<pre>In controller:  OAApplcationModule am = pageContext.getApplicationModule(webBean); am.invokeMethod("createMove", null);  in am: public void createMove() {     OAViewObject vo = (OAViewObject)getXex008HeadersFullVO1(); int maxFetch = vo.getMaxFetchSize(); vo.setMaxFetchSize(0); vo.executeQuery(); vo.setMaxFetchSize( maxFetch ); Row row = vo.createRow(); vo.insertRow(row);  row.setAttribute("FileFormat", "IGNORE" );  row.setNewRowState(Row.STATUS_INITIALIZED ); } }</pre>	<pre>am.getTransaction().commit();  ???TransactionUnitHelper.endTransactionUnit(page Context, "MoveCreateTxn");  optionally reload page:  pageContext.forwardImmediately("OA.jsp?page=/p zu/oracle/apps/eam/zn_008_move/webui/MovePG &amp;MoveId="+moveId, null,  OAWebBeanConstants.KEEP_MENU_CONTEXT, null, null, true,  OAWebBeanConstants.ADD_BREAD_CRUMB_N O);</pre>	<pre>am.invokeMethod("rollbackMove");  ??? TransactionUnitHelper.endTransactionUnit(pageContext, "MoveCreateTxn");  Go to search page: pageContext.forwardImmediately("OA.jsp?page=/pzu/oracle/ap ps/eam/zn_008_move/webui/MoveSearchPG", null,  OAWebBeanConstants.KEEP_MENU_CONTEXT, null, null, true,  OAWebBeanConstants.ADD_BREAD_CRUMB_NO);</pre>
Up date	<pre>In controller:  OAApplcationModule am = pageContext.getApplicationModule(webBean);  TransactionUnitHelper.startTransactionUnit(pageCon text, "moveCreateTxn"); Serializable[] parameters = { MoveId }; am.invokeMethod("initDetails", parameters);  in am: public void initDetails(String MoveId) {     Xxex008HeadersFullVOImpl vo = getXex008HeadersFullVO1(); if (vo == null) {     MessageToken[] errTokens = { new MessageToken("OBJECT_NAME", "getXex008HeadersFullVO1" );     throw new OAEException("AK", "FWK_TBX_OBJECT_NOT_FOUND", errTokens); } vo.initQuery( MoveId ); vo.first(); }  In vo: public void initQuery(String MoveId) {     setWhereClause("MOVE_ID = :1"); setWhereClauseParams(null); // Always reset Number nMoveId = null; try {     nMoveId = new Number(MoveId); } catch (SQLException e) {     OAEException.wrapperException(e); } setWhereClauseParam(0, nMoveId ); executeQuery(); } // end initQuery()</pre>	Same an insert	Same an insert
Del ete	Co code You need checkbox column and button	<pre>W controlerz: else if (pageContext.getParameter("Delete") != null) {     am.invokeMethod("deleteSelectedCemliLines");  w am: public void deleteSelectedCemliLines() {     OAViewObjectImpl linesVO =</pre>	No code

		<pre> getCemliLinesVO(); Row lines[] = linesVO.getFilteredRows("Checked", "Y"); if (lines != null) for (int i = 0; i &lt; lines.length; i++) lines[i].remove(); } // END deleteSelectedCemliLines() </pre>	
--	--	--	--

**Tips:**

- Make the same screen to insert/update (you can set form in insert/update mode based on whether id is null or not)
- You need no code to refresh detail block on master-detail form. It will happen automatically. All you need is to build associations and VO-links

Don't be afraid of experimetantion- framework returns clear to understand run-time error messages.

Framework forces appropriate XML structure.

But be aware it some traps...

**Traps for begginers**

Anytime you can use Number, add this import (not standard Number), or else you will suffer from cast error.

```
import oracle.jbo.domain.Number;
```

**Syntax**

```
String a;
a=..
If a.equals("1") is correct
```

```
if (a=="1") ... is wrong !
```

Be aware that compiler will not inform you about syntax error.

**Syntax**

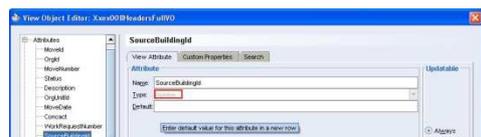
```
If (a==b) is correct
```

```
if (a=b) is wrong !
```

Be aware that compiler will not inform you about syntax error.

VO and page item Data types must always fit, or else you will obtain null value ( not cast error )

VO attriute is Number =>

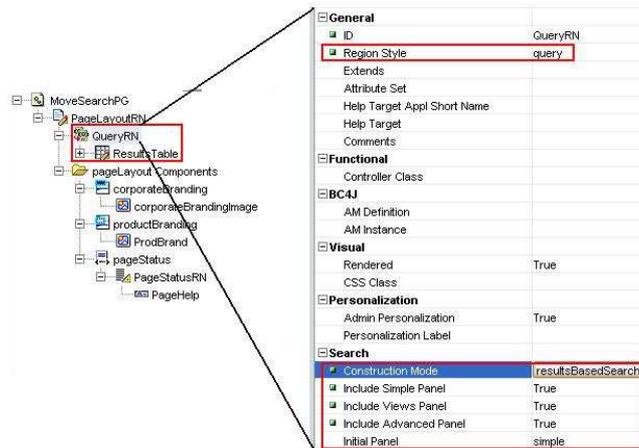


formValue has to be number



## Drill down demo /Query demo

### Simple Query



### Adv query

Idea:

Application module -< VO -< item

Destination URI property on search item table:

```
OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/webui/MoveDetailsPG&MoveId={@MoveId}&retainAM=Y&addBreadcrumb=Y
```

Controller code

```
import java.io.Serializable;

public void processRequest(OAPageContext pageContext, OAWebBean webBean)
{
    // Always call this first.
    super.processRequest(pageContext, webBean);

    // Get the employeeNumber parameter from the URL
    String MoveId;
    MoveId = pageContext.getParameter("MoveId");

    // Now we want to initialize the query for our single employee
    // with all of its details.
    OAApplicationModule am = pageContext.getApplicationModule(webBean);
    Serializable[] parameters = { MoveId };
    am.invokeMethod("initDetails", parameters);
}
}
```

AM code (\*Impl)

```
public void initDetails(String MoveId)
{
    Xxex008HeadersFullVOImpl vo = getXxex008HeadersFullVO1();
    if (vo == null)
    {
        MessageToken[] errTokens = { new MessageToken("OBJECT_NAME", "getXxex008HeadersFullVO1")};
        throw new OAException("AK", "FWK_TBX_OBJECT_NOT_FOUND", errTokens);
    }
    vo.initQuery( MoveId );
} // end initDetails()
```

VO Code (\*Impl)

```
public void initQuery(String MoveId)
{
    setWhereClause("MOVE_ID = :1");
    setWhereClauseParams(null); // Always reset
    setWhereClauseParam(0, MoveId);
    executeQuery();
}
```

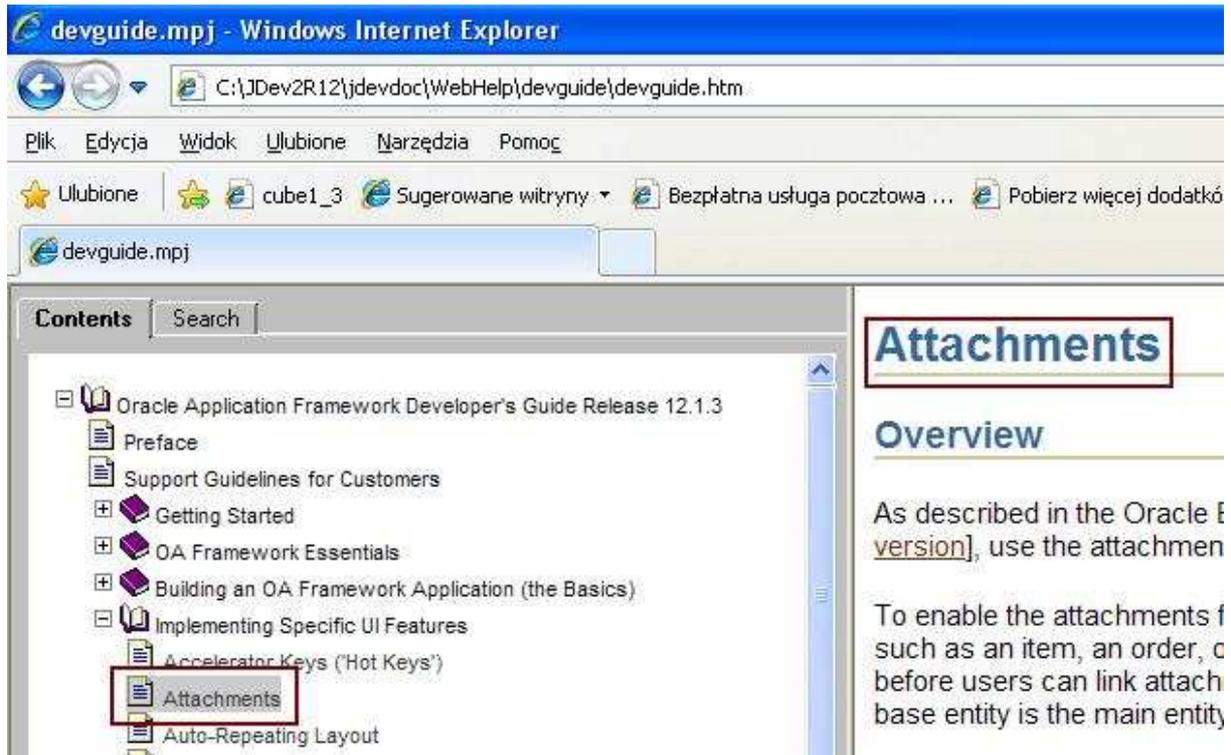
```
} // end initQuery()
```

More: See standard tutorial.

## Attachments

### Way 1:

It is strongly recommended to use standard attachments functionality. This is very easy to use – read standard documentation.

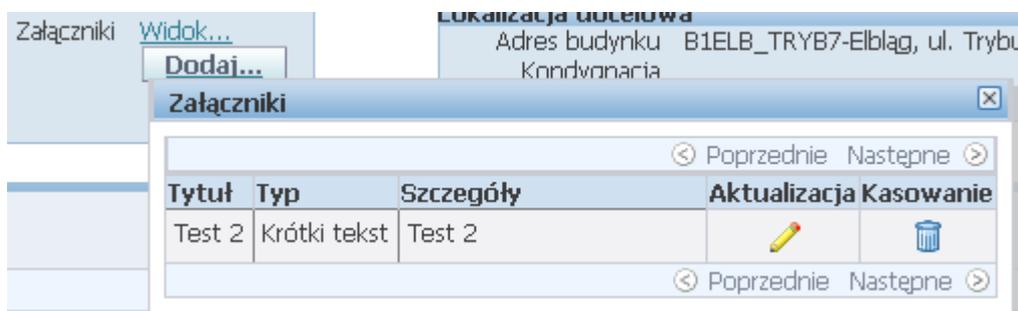


There are four types of attachments **attachmentTable**, **attachmentLink**, **messageInlineAttachment**, **AttachmentImage**, for example:

1/ Use item style **AttachmentImage** for grid:

Zgł. problemu	Opis	Status	Data wymagana	Utworzył	Załączniki
<a href="#">10166</a>	BZ	Odrzucone	21-02-2012	JJOBDA	 
<a href="#">20166</a>	Proszę o zakup nowego filtra.	Otwarte	30-03-2012	AKAPIELEWSKA	 

2/ Use item style **AttachmentLink** for single record view:



## Way 2:

Create EO, create VO on EO.

You can modify SQL of VO, creation will still work !

```

package pzu.oracle.apps.eam.zn_008_move.webui;

import java.io.Serializable;
import oracle.apps.fnd.common.VersionInfo;
import oracle.apps.fnd.framework.OAApplicationModule;
import oracle.apps.fnd.framework.OAException;
import oracle.apps.fnd.framework.OAViewObject;
import oracle.apps.fnd.framework.webui.OAControllerImpl;
import oracle.apps.fnd.framework.webui.OADataBoundValueViewObject;
import oracle.apps.fnd.framework.webui.OAPageContext;
import oracle.apps.fnd.framework.webui.OAWebBeanConstants;
import oracle.apps.fnd.framework.webui.beans.OAWebBean;
import oracle.apps.fnd.framework.webui.beans.message.OAMessageFileUploadBean;
import oracle.jbo.Row;
import java.sql.Connection;
import java.sql.PreparedStatement;
import oracle.apps.fnd.common.MessageToken;
import oracle.apps.fnd.framework.OAFwkConstants;

/**
 * Controller for ...
 */
public class MoveUploadRegionCO extends OAControllerImpl
{
    public static final String RCS_ID="$Header$";
    public static final boolean RCS_ID_RECORDERD =
        VersionInfo.recordClassVersion(RCS_ID, "%packagename%");

    private boolean isEmpty(String str) {
        return str == null || str.length()==0;
    }

    /**
     * Layout and page setup logic for a region.
     * @param pageContext the current OA page context

```

```

    * @param webBean the web bean corresponding to the region
    */
    public void processRequest(OAPageContext pageContext, OAWebBean webBean)
    {
        super.processRequest(pageContext, webBean);

        String MoveId;
        MoveId = pageContext.getParameter("MoveId");
        if ( !isEmpty(MoveId) )
        {
            //Update
            OAApplicationModule am = pageContext.getApplicationModule(webBean);
            OAViewObject vo = (OAViewObject)am.findViewObject("FndLobsVO");
            vo.setWhereClause("FILE_FORMAT = :1");
            vo.setWhereClauseParams(null); // Always reset
            vo.setWhereClauseParam(0, "X:" + MoveId);
            vo.executeQuery();
        }
        else
        {
            //Insert
            OAApplicationModule am = pageContext.getApplicationModule(webBean);
            OAViewObject vo = (OAViewObject)am.findViewObject("FndLobsVO");
            // Per the coding standards, this is the proper way to initialize a
            // VO that is used for both inserts and queries. See View Objects
            // in Detail in the Developer's Guide for additional information.
            if (!vo.isPreparedForExecution()) {
                vo.executeQuery();
            }
            Row row = vo.createRow();
            vo.insertRow(row);
            // Required per OA Framework Model Coding Standard M69
            row.setNewRowState(Row.STATUS_INITIALIZED);

            // Initialize columns
            row.setAttribute("FileFormat", "IGNORE");
            row.setAttribute("UploadDate", am.getOADBTransaction().getCurrentDBDate());
            row.setAttribute("FileContentType", "application/vnd.ms-excel");
            row.setAttribute("FileName", "dummy.csv");
            row.setAttribute("Language", "PL");
            row.setAttribute("OracleCharset", "UTF8");
            row.setAttribute("FileData", null);
            // set program name to the name of this module, i.e xxUpload
            // This way it is easy to identify that the record was inserted by this customization
            row.setAttribute("ProgramName", "xxUpload");
            // get a handle to the upload bean
            OAMessageFileUploadBean uploadBean = (OAMessageFileUploadBean)webBean.findChildRecursive("fileName");
            // set file name display
            OADataboundValueViewObject displayNameBoundValue = new OADataboundValueViewObject(uploadBean, "FileName");
            uploadBean.setAttributeValue(DOWNLOAD_FILE_NAME,displayNameBoundValue);
            // set content type (MIME)

            OADataboundValueViewObject contentBoundValue = new OADataboundValueViewObject(uploadBean, "FileContentType");
            uploadBean.setAttributeValue(FILE_CONTENT_TYPE, contentBoundValue);
        }
    }

    /**
     * Procedure to handle form submissions for form elements in
     * a region.
     * @param pageContext the current OA page context
     * @param webBean the web bean corresponding to the region
     */
    public void processFormRequest(OAPageContext pageContext, OAWebBean webBean)
    {
        super.processFormRequest(pageContext, webBean);
        if (pageContext.getParameter("Cancel") != null) {
            // Perform a rollback on the database
            OAApplicationModule am = pageContext.getApplicationModule(webBean);
            am.getTransaction().rollback();
        }
        else if (pageContext.getParameter("Apply") != null) {
            // Set column FILE_FORMAT to IGNORE, this column is used for the online help index
            String MoveId = pageContext.getParameter("MoveId");
            OAApplicationModule am = pageContext.getApplicationModule(webBean);
            OAViewObject vo = (OAViewObject)am.findViewObject("FndLobsVO");
            Row row = vo.getCurrentRow();
            row.setAttribute("FileFormat", "X:" + MoveId );

            //if ( isEmpty( (String)row.getAttribute("FileContentType") ) ) {
            // row.setAttribute("FileContentType", "application/vnd.ms-excel");
            //}

            am.getTransaction().commit();
            // Display upload confirmation message
            oracle.jbo.domain.Number fileId = (oracle.jbo.domain.Number)vo.getCurrentRow().getAttribute("FileId");
            //String fileName = (String)vo.getCurrentRow().getAttribute("FileName");
            //OAException confirmMessage = new OAException( MoveId + "File "+fileName+ "uploaded succesfully with ID
            "+fileId+".",OAException.CONFIRMATION);
            //pageContext.putDialogMessage(confirmMessage);

            try {
                Connection conn =
                    pageContext.getApplicationModule(webBean).getOADBTransaction().getJdbcConnection();

                String sql =
                    "UPDATE XXEX_008_HEADERS SET fnd_lobs_file_id = " + fileId.toString() +
                    " WHERE MOVE_ID = " + MoveId;

                //(webBean.findChildRecursive("FndLobsFileId")).setValue(pageContext, fileId);
            }
        }
    }

```

```

PreparedStatement updateFndLobs = conn.prepareStatement(sql);
int rs = updateFndLobs.executeUpdate();
} catch (java.sql.SQLException e) {
    OAException sqlErrorMessage =
        new OAException("SQL Error: " + e.getMessage(),
            OAException.ERROR);
    pageContext.putDialogMessage(sqlErrorMessage);
}
am.getTransaction().commit();

/** MoveId = MoveNumber, MoveNumber is not accessible since it is static text
String MoveNumber = pageContext.getParameter("MoveId");
MessageToken[] tokens = { new MessageToken("NUMBER", MoveNumber) };
OAException confirmMessage =
new OAException("XEXX", "XEXX_008_NEW_MOVE_CREATED", tokens,
    OAException.CONFIRMATION, null);
pageContext.putDialogMessage(confirmMessage);
pageContext.forwardImmediately("OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/webui/MoveSearchPG",
    null,
    OAWebBeanConstants.KEEP_MENU_CONTEXT,
    null, null, true,
    OAWebBeanConstants.ADD_BREAD_CRUMB_NO);
}
else if (pageContext.getParameter("TEST") != null)
{
    String MoveNumber = pageContext.getParameter("MoveNumber");
    String MoveId = pageContext.getParameter("MoveId");
    OAException sqlErrorMessage = new OAException("MoveNumber=" + MoveNumber + " MoveId=" + MoveId ,
OAException.ERROR);
    pageContext.putDialogMessage(sqlErrorMessage);
}
}
}

```

Source: <http://robertjungerius.wordpress.com/2011/04/08/building-a-generic-upload-page-in-oa-framework/>

## Standard tutorial shortcut

Goal: column delete + confirmation message

Number	Name	Position	Manager	Delete
1	Barnes, Penelope	President		
2	Brown, James	Vice President	Barnes, Penelope	
136	Broadbent, Chris	President		
137	Broadbent, Liza	Group Manager	Broadbent, Chris	

### EmployeeEOImpl, add:

```

public void remove()
{ super.remove(); }

```

### Implement deleteColumn

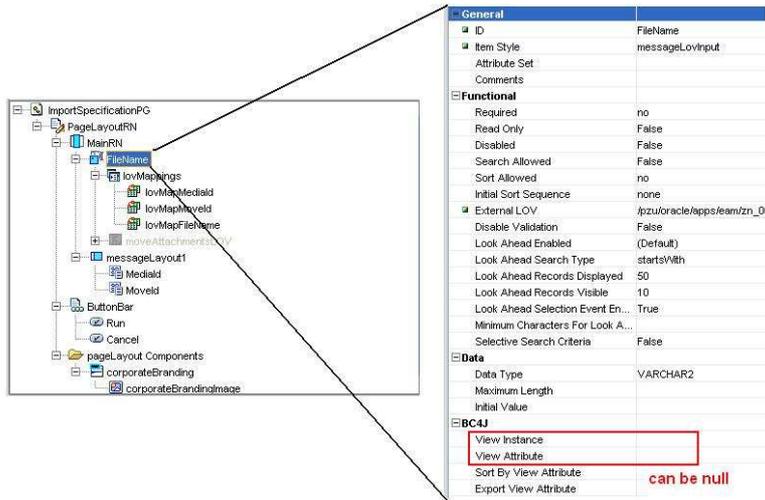
- 1/ Add to VO column DELETE\_SWITCHER
- 2/ Add to region Switch with fireAction delete
- 3/ format deleteColumn in controller (center allign)

### Implement deleteAction:

- On AM (procedure delete)
- On CO (show confirmation and onOK pressed)

## Non database form

Each page has to have reference to application module.  
 Just create page with items, items do not need references to VO:

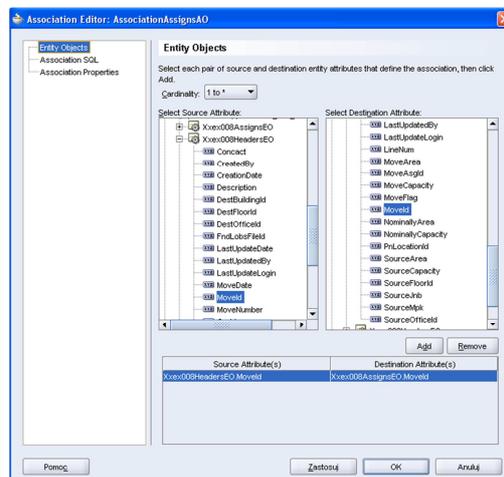


You can also create non-database VO. How to create non-database VO ? Create VO without SQL statement and without EO reference. Add attributes manually.

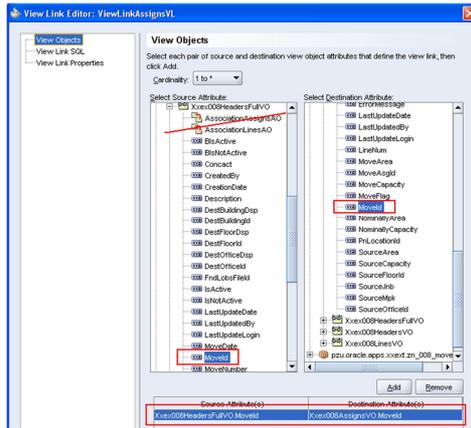
## Master-detail

Simplest demo

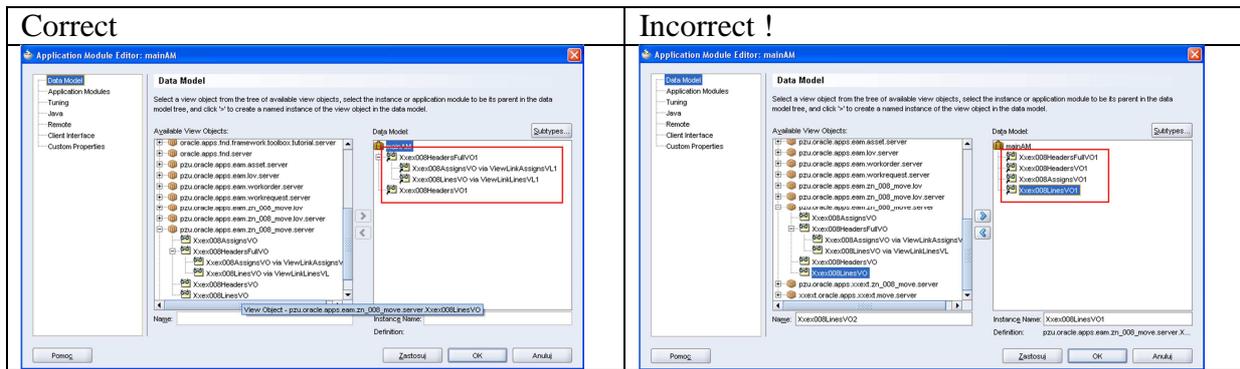
- 1/ Create MasterEO and DetailEO.
- 2/ Create MasterVO and DetailVO
- 3/ Create association MasterEO – DetailEO. Indicate master and data columns. Select cardinality. Accept all default settings.



- 4/ Create view link MasterVO – DetailVO. Select master and data columns too.

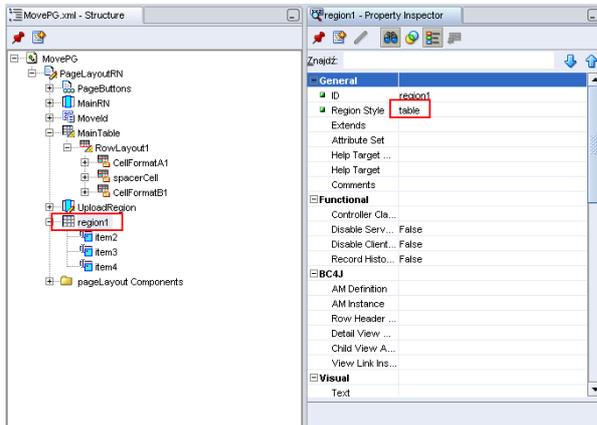


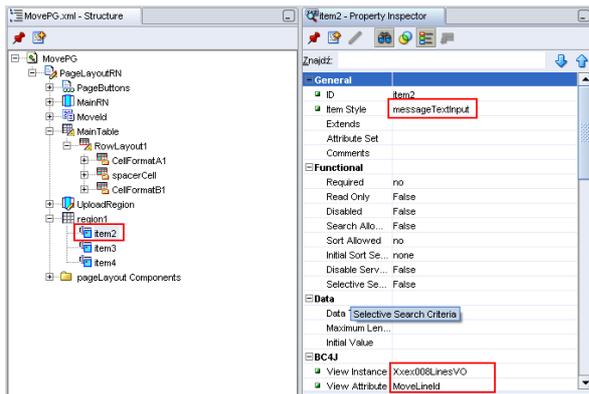
5/ Add objects do AM.



6/ Add master block as described before.

5/ Add a region of type „table” and its items. (region „table” is deprecated, „advanced table” is recommended, but for our simplest example we prefer „table”)





That is all, no code to refresh details is required. You will see the result.

**Dane podstawowe**

Numer przeprowadzki 529

Opis

\* Data przeprowadzki 30-03-2012

Osoba kontaktowa

Spółka

Status Wczytana specyfikacja

Jednostka organizacyjna

\* Projekt Sprzątanie

\* Zadanie 1

\* Numer zgłoszenia problemu  5167

<span>⏪</span> Poprzednie 1-10 <span>⏩</span> Następne 10 <span>⏪</span>		
725	gaśnica GP-4x/GP-4z009	GAS010
726	gaśnica GP-6x/GP-6z017	GAS018
727	hydrant fi52_001	HYDR001
728	hydrant fi25_003	HYDR003

## How to refer to row

processFormRequest:

```
String rowRef = pageContext.getParameter( EVENT_SOURCE_ROW_REFERENCE );
```

AM:

```
NoteLinesVORowImpl row = (NoteLinesVORowImpl)findRowByRef( rowRef );
row.setQuantityDependentValues();
```

how to refer to item ( set\_item\_instance\_value ) ?

# Preparing layout

## Fundamentals

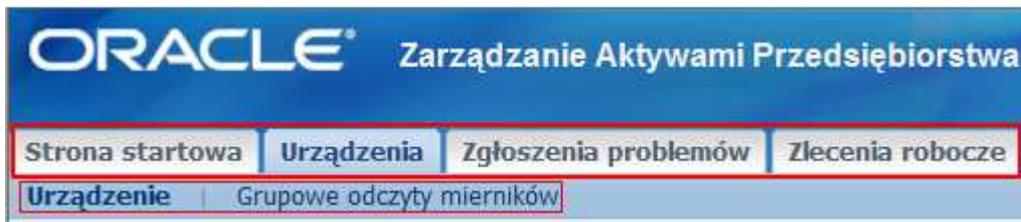
Most used form items:

messageStyledText	Field text
formValue	Hidden field
messageLOVText	Field text + LOV

.rendered = .visible

## Single record layout

## Menu



Each page is a SEPARATED page. In order to organize pages into tabs you have to build a menu in appropriate way. It is not difficult to do, glance on existing menu to find out more.

Tabs are not active ? Read this:

Po zdefiniowaniu autoryzacji należy dodać jej dostęp do organizacji magazynowych (?!?) (Tabela: org\_access - (inaczej nie będą wyświetlały się opcje - ze stronami OAF i być może Forms)

Należy to zrobić z aplikacji:

- (A) Autoryzacja: Magazyn
- (N) Opcja: Konfiguracja -> Organizacje -> Dostęp do organizacji

Wyciąg dla przykładowej autoryzacji:

```
select o.name
       , a.organization_code
       , a.application_name
       , a.responsibility_name
       --, a.*
from org_access_v a
```

```

, hr_all_organization_Units o
where responsibility_id IN (51222) --, 51059)
and a.organization_id = o.organization_id

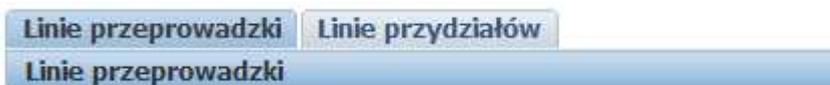
```

## Grid layout

							Skład	
Do przeniesienia	Nr linii	Piętro	Pokój	Urządzenie	Numer ewidencyjny	MPK JNB Proj	Imię i nazwisko osoby przeprowadzanej	
<input checked="" type="checkbox"/>	3			hydrant fi52_001	HYDR001			
<input type="checkbox"/>	6			gaśnica GP-4x/GP-4z007	GAS008			

Region style: advanced Table (obsolete: Table)

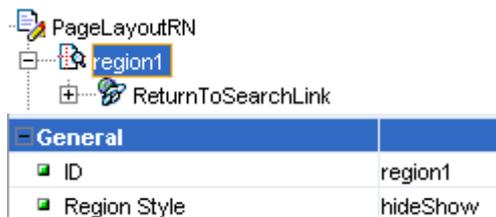
## Tab layout



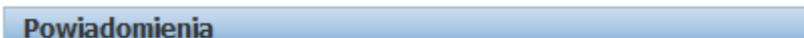
Region style: subTabLayout

Subregions: header

## Hide/show region



## Header



Region style: header

## Global variables ( session variables)

```

str7 = paramOAPageContext.getSessionValue("OrgId").toString();
paramOAPageContext.putSessionValue("OrgId", "12")

```

```

str = (String)paramOAPageContext.getTransactionValue("eamReturnToPageTitle");
paramOAPageContext.putTransactionValue("eamReturnToPageTitle", "Wyszukiwanie");

```

## Dialogbox

### MessageBox (message box)

With fnd\_new\_messages

```

import oracle.apps.fnd.framework.OAException;
import oracle.apps.fnd.common.MessageToken;

String MoveNumber = (String)vo.getCurrentRow().getAttribute("MoveNumber");

```

```

MessageToken[] tokens = { new MessageToken("NUMBER", MoveNumber) };
OAException confirmMessage = new OAException("XXEX", "XXEX_008_NEW_MOVE_CREATED", tokens,
OAException.CONFIRMATION, null);
pageContext.putDialogMessage(confirmMessage);

//optionally
pageContext.forwardImmediatelyToCurrentPage(null, true, "N");
pageContext.setForwardURLToCurrentPage(null, true, OAWebBeanConstants.ADD_BREAD_CRUMB_YES, OAWebB
eanConstants.IGNORE_MESSAGES); ← will not show the message

shortcut:

throw new OAException("XXEX", "XXX_READ_CUSTOM_MSG", null, OAException.ERROR, null);

```

### Without fwd\_new\_messages (polish chars problem !)

```

public void processFormRequest(OAPageContext pageContext, OAWebBean webBean)
{
    super.processFormRequest(pageContext, webBean);
    if (pageContext.getParameter("Go") != null)
    {
        String userContent = pageContext.getParameter("HelloName");
        String message = "Hello, " + userContent + "!";
        throw new OAException(message, OAException.INFORMATION);
    }
}

```

### QuestionBox

```

public void processFormRequest(OAPageContext pageContext, OAWebBean webBean)
{
    super.processFormRequest(pageContext, webBean);

    if (pageContext.getParameter("Create") != null)
    {
        pageContext.setForwardURL("OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/webui/MovePG",
            null,
            OAWebBeanConstants.KEEP_MENU_CONTEXT,
            null,
            null,
            true, // Retain AM
            OAWebBeanConstants.ADD_BREAD_CRUMB_YES,
            OAWebBeanConstants.IGNORE_MESSAGES);
    }
    else if ("delete".equals(pageContext.getParameter(EVENT_PARAM)))
    {
        String MoveNumber = pageContext.getParameter("MoveNumber");
        String MoveId = pageContext.getParameter("MoveId");
        // String MoveNumber = (String)vo.getCurrentRow().getAttribute("MoveNumber");
        MessageToken[] tokens = { new MessageToken("NUMBER", MoveNumber) };

        OAException mainMessage = new OAException("XXEX", "XXEX_008_MOVE_DEL_CONFIRM", tokens);

        OADialogPage dialogPage = new OADialogPage(OAException.WARNING,
            mainMessage, null, "", "");

        String yes = pageContext.getMessage("AK", "FWK_TBX_T_YES", null);
        String no = pageContext.getMessage("AK", "FWK_TBX_T_NO", null);

        dialogPage.setOkButtonItemName("DeleteYesButton");

        dialogPage.setOkButtonToPost(true);
        dialogPage.setNoButtonToPost(true);
        dialogPage.setPostToCallingPage(true);

        dialogPage.setOkButtonLabel(yes);
        dialogPage.setNoButtonLabel(no);

        java.util.Hashtable formParams = new java.util.Hashtable(1);
        formParams.put("MoveNumber", MoveNumber);
        formParams.put("MoveId", MoveId);
    }
}

```

```
dialogPage.setFormParameters(formParams);

pageContext.redirectToDialogPage(dialogPage);
}
else if (pageContext.getParameter("DeleteYesButton") != null)
{
String MoveNumber = pageContext.getParameter("MoveNumber");
String MoveId = pageContext.getParameter("MoveId");
Serializable[] parameters = { MoveId };
OAApplicationModule am = pageContext.getApplicationModule(webBean);
am.invokeMethod("deleteMove", parameters);

MessageToken[] tokens = { new MessageToken("NUMBER", MoveNumber) };
OAException message = new OAException("XXEX",
"XXEX_008_MOVE_DELETED", tokens, OAException.CONFIRMATION, null);
pageContext.putDialogMessage(message);
}
}
```

### Approach 2 – javascript:

```
javascript:if (confirm('Are you sure you want to?')) {
this.disabled=true; this.value='Submitted...';
doSubmit('OA.jsp?page=/XXX/oracle/apps/xxx/.....&retainAM=Y');
}
```

## Actions

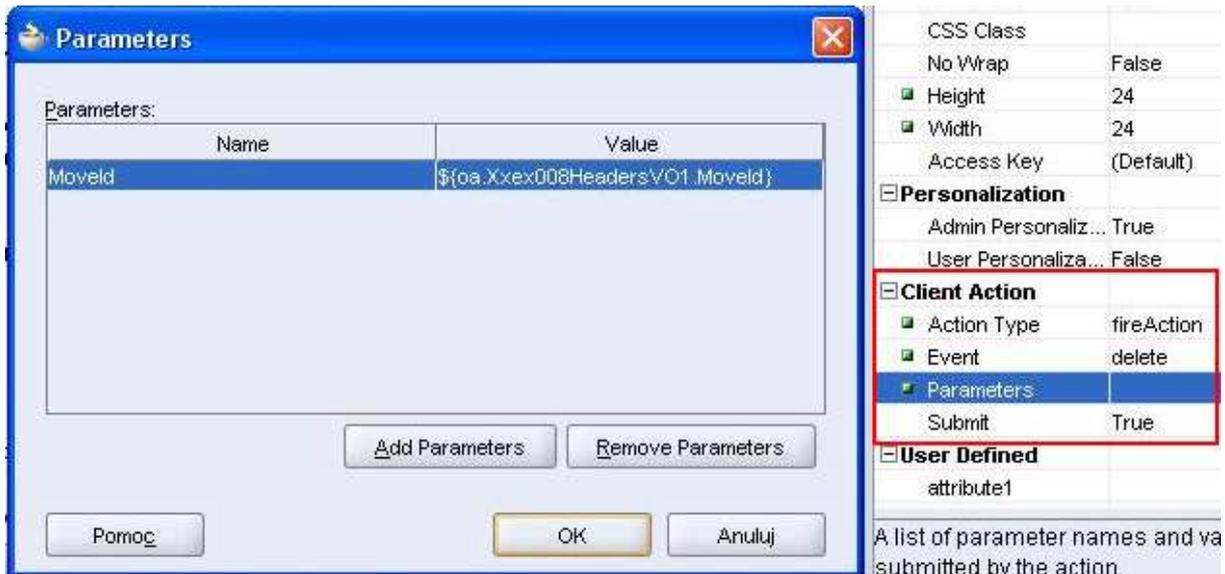
### When-button-pressed

Code on controller.

```
public void processFormRequest(OAPageContext pageContext, OAWebBean webBean)
{
super.processFormRequest(pageContext, webBean);
if (pageContext.getParameter("Go") != null)
{
String userContent = pageContext.getParameter("HelloName");
String message = "Hello, " + userContent + "!";
throw new OAException(message, OAException.INFORMATION);
}
}
```

## Links

### Way 1 – image & action type



onFormRequest :

```
if ("delete".equals(pageContext.getParameter(EVENT_PARAM)))
...

```

See more: Delete tutorial

**Way 2 – see drill down demo in this document**

- General	
<input checked="" type="checkbox"/> ID	MoveNumber
<input checked="" type="checkbox"/> Item Style	messageStyledText
Extends	
Attribute Set	
Comments	
[-] Functional	
Popup ID	
Required	no
Popup Render Event	onClick
Popup Enabled	False
<input checked="" type="checkbox"/> Search Allowed	True
<input checked="" type="checkbox"/> Sort Allowed	yes
Initial Sort Sequence	none
Disable Server Side Validation	False
<input checked="" type="checkbox"/> Selective Search Criteria	True
[-] Data	
<input checked="" type="checkbox"/> Data Type	VARCHAR2
[-] BC4J	
<input checked="" type="checkbox"/> View Instance	Xxex008HeadersFullVO1
<input checked="" type="checkbox"/> View Attribute	MoveNumber
Sort By View Attribute	
Export View Attribute	
[-] Navigation	
<input checked="" type="checkbox"/> Destination URI	OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/webui/MovePG&MoveId={@MoveId}

[OA.jsp?page=/pzu/oracle/apps/eam/zn\\_008\\_move/webui/MovePG&MoveId={@MoveId}&retainAM=Y&addBreadcrumb=Y](OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/webui/MovePG&MoveId={@MoveId}&retainAM=Y&addBreadcrumb=Y)

Alternate syntax ( obsolete) :

```
OA.jsp?akRegionCode=EAM_WR_WORK_REQUEST_DETAIL_PL&akRegionApplicationId=426
&viewMode=V&retainAM=Y&addBreadCrumb=Y
```

```
select * from AK_REGIONS where region_code =
'EAM_WR_WORK_REQUEST_DETAIL_PL'
```

=

```
OA.jsp?_rc=EAM_WR_WORK_REQUEST_DETAIL_PL&_ri=426&retainAM=Y&addBreadCrumb=Y
&viewMode=V&eamWrRequestId={@WorkRequestId}&createdBy={@UserId}&profileId=3
&OrgId={@OrganizationId}
```

=

recommended syntax is:

```
OA.jsp?page=/oracle/apps/eam/workrequest/webui/EAM_WR_WORK_REQUEST_DETAIL_P
L&retainAM=Y&addBreadCrumb=Y&viewMode=V&eamWrRequestId={@WorkRequestId}&cre
atedBy={@UserId}&profileId=3&OrgId={@OrganizationId}
```

### Way 3- code in Controller - processFormRequest

```
if (pageContext.getParameter("ButtonIdHere") != null)
{
pageContext.forwardImmediately("OA.jsp?page=/pzu/oracle/apps/eam/zn_008_mov
e/webui/MoveSearchPG",
    null,
    OAWebBeanConstants.KEEP_MENU_CONTEXT,
    null, null, true,
    OAWebBeanConstants.ADD_BREAD_CRUMB_NO);
}
```

Home page ( strona startowa ):

```
"OA.jsp?OAFunc=OAHOMEPAGE"
```

It is Possible to pass parameters, examples:

```
"OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/webui/MoveSearchPG&MoveId=162"
```

Or

```
pageContext.putParameter("MoveId", (String)moveId);
```

```
mainAMImpl am = (mainAMImpl)pageContext.getApplicationModule(webBean);
OAViewObject vo = (OAViewObject)am.findViewObject("Xxex008HeadersFullV01");
String MoveId = vo.getCurrentRow().getAttribute("MoveId")+"";
"OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/webui/MoveSearchPG&MoveId="+MoveId
```

You can read parameter in called form like this:

```
public void processRequest(OAPageContext pageContext, OAWebBean webBean) {
    super.processRequest(pageContext, webBean);
    String MoveId;
    MoveId = pageContext.getParameter("MoveId");
    ...
}
```

Or

```
pageContext.setForwardURL("OA.jsp?page=/pzu/oracle/apps/eam/zn_008_move/web
ui/MovePG",
    null,
    OAWebBeanConstants.KEEP_MENU_CONTEXT,
    null,
    null,
    true, // Retain AM
    OAWebBeanConstants.ADD_BREAD_CRUMB_YES,
```

```
OWebBeanConstants.IGNORE_MESSAGES);
```

setForwardURL does not break controller code immediately.

## Code snippets

### FND\_NEW\_MESSAGES

```
String sReturnMsg = oapagecontext.getMessage("XXSCM",  
"XXSCM_MANDATORY_FIELD ", new MessageToken[] {new MessageToken("FIELD_NAME  
", "PO Number") });
```

More:

[http://imdjkoch.wordpress.com/tag/fnd\\_new\\_messages/](http://imdjkoch.wordpress.com/tag/fnd_new_messages/)

### Controller-application module-View object

See below

### Serializable

See below

### Set\_where\_clause

```
public void processRequest(OAPageContext pageContext, OWebBean webBean)  
{  
    super.processRequest(pageContext, webBean);  
  
    OAApplicationModule am = pageContext.getApplicationModule(webBean);  
    OAViewObject vo = (OAViewObject)am.findViewObject("assetsVO");  
  
    String lineSourceFloorId = "dummy1";  
    String lineSourceOfficeId = "dummy2";  
  
    Serializable params[] = { lineSourceFloorId, lineSourceOfficeId };  
    Class paramTypes[] = { String.class, String.class };  
    vo.invokeMethod("modifyWhereClause", params, paramTypes);  
}  
  
public class assetsVOImpl extends OAViewObjectImpl {  
    /**This is the default constructor (do not remove)  
    */  
    public assetsVOImpl() {  
    }  
  
    public void modifyWhereClause( String lineSourceFloorId, String lineSourceOfficeId )  
    {  
        setWhereClauseParams(null); // Always reset  
        setWhereClause(  
            "instance_id in\n"+  
            "\n"+  
            "select child_instance_id\n"+  
            "  from xxex_008_hierarchy_v\n"+  
            " connect by prior child_instance_id = parent_instance_id\n"+  
            " start with parent_instance_id = nvl(:1, :2)\n"+  
            " )"  
        );  
        setWhereClauseParam( 0, lineSourceFloorId );  
        setWhereClauseParam( 1, lineSourceOfficeId );  
    }  
}
```

Important: Review also “debugging am.invokeMethod” in this file

### Dynamic create VO, read query result

```
localObject1 = (OAViewObject)localOAApplicationModuleImpl.findViewObject("PjiConfigCostCurrencyVO");  
if (localObject1 == null)  
{  
    localObject1 = (OAViewObjectImpl)localOAApplicationModuleImpl.createViewObject("PjiCostCurrencyVO",  
"oracle.apps.pa.project.server.PjiConfigCostCurrencyVO");  
}  
Object[] arrayOfObject = null;  
arrayOfObject = ((OAViewObject)localObject1).getWhereClauseParams();  
  
if (((!(OAViewObject)localObject1).isPreparedForExecution()) || (((OAViewObject)localObject1).isPreparedForExecution()) &&  
(!str1.equals((String)arrayOfObject[0])))  
{  
    localObject2 = new Serializable[] { str1 };  
}
```

```

((OAViewObject)localObject1).setWhereClauseParams(localObject2);
((OAViewObject)localObject1).executeQuery();
((OAViewObject)localObject1).first();

if (((OAViewObject)localObject1).getCurrentRow().getAttribute("CurrencyCode") != null)
{
    str5 = ((OAViewObject)localObject1).getCurrentRow().getAttribute("CurrencyCode").toString();
}
}

```

## Set\_item\_value, get\_item\_value

### page context:

```
String s12 = pageContext.getParameter("MoveNumber");
```

You can referer to form parameters only. **You cannot referer to page elements this way !**

### Page elements:

```
((OAMessageDateFieldBean)paramOAWebBean.findChildRecursive("DateFromSS")).setValue(paramOAPageContext, (String)null);
```

```
moveNumber = ((OAMessageTextInputBean)webBean.findChildRecursive("MoveNumber")).getValue(pageContext);
fileNumber = (String)((OAFormValueBean)webBean.findChildRecursive("FndLobsFileId")).getValue(pageContext);
```

### in general:

```
(OAMessageDateFieldBean):
    OA<item style here>Bean, for example
    OAMessageTextInputBean
    OAFormValueBean
    OAMessageDateFieldBean
```

### From VO:

```
import oracle.apps.fnd.framework.OAApplicationModule;
import oracle.apps.fnd.framework.OAViewObject;

OAApplicationModule am = pageContext.getApplicationModule(webBean);
OAViewObject vo = (OAViewObject)am.findViewObject("DebugLabEmpFullVO1");
String MoveNumber = (String)vo.getCurrentRow().getAttribute("MoveNumber");
java.sql.Date MoveDate = (oracle.jbo.domain.Date)vo.getCurrentRow().getAttribute("MoveDate")
.dateValue();
```

## Get the value of a check box field in a page

```
OAMessageCheckBoxBean InventoryCheckBoxBean =
(OAMessageCheckBoxBean)webBean.findChildRecursive("InventoryCheckBox");
```

```
Object InventoryCheckBoxObj = InventoryCheckBoxBean.getValue(pageContext);
String InventoryCheckBoxValue = InventoryCheckBoxObj.toString();
```

## Set\_item\_property, get\_item\_property

### Way 1 – CO code

#### Read-only field:

```
webBean.findIndexedChildRecursive("MoveNumber").setAttributeValue(READ_ONLY_ATTR, new
Boolean(true));
```

#### disabled button:

```
webBean.findChildRecursive("Create").setAttributeValue(DISABLED_ATTR, new Boolean(true));
```

#### NullPointerException ?

```
findIndexedChildRecursive returns NULL => use
findChildRecursive instead of findIndexedChildRecursive
```

Example:

```

CO.java | mainAMImpl.java | MoveCO.java | Xxex008HeadersFullVORowImpl.java | Xxex008HeadersFullVO.xml
*/
public void processRequest(OAPageContext pageContext, OAWebBean webBean) {
    super.processRequest(pageContext, webBean);

    mainAMImpl tmp = (mainAMImpl)pageContext.getApplicationModule(webBean);

    String rof;
    rof = tmp.getReadOnlyFormFlag();

    if (rof.equals("Y")) {
        webBean.findIndexedChildRecursive("Description").setAttributeValue(READ_ONLY_ATTR,
                                                                              new Boolean(true));
    }
}

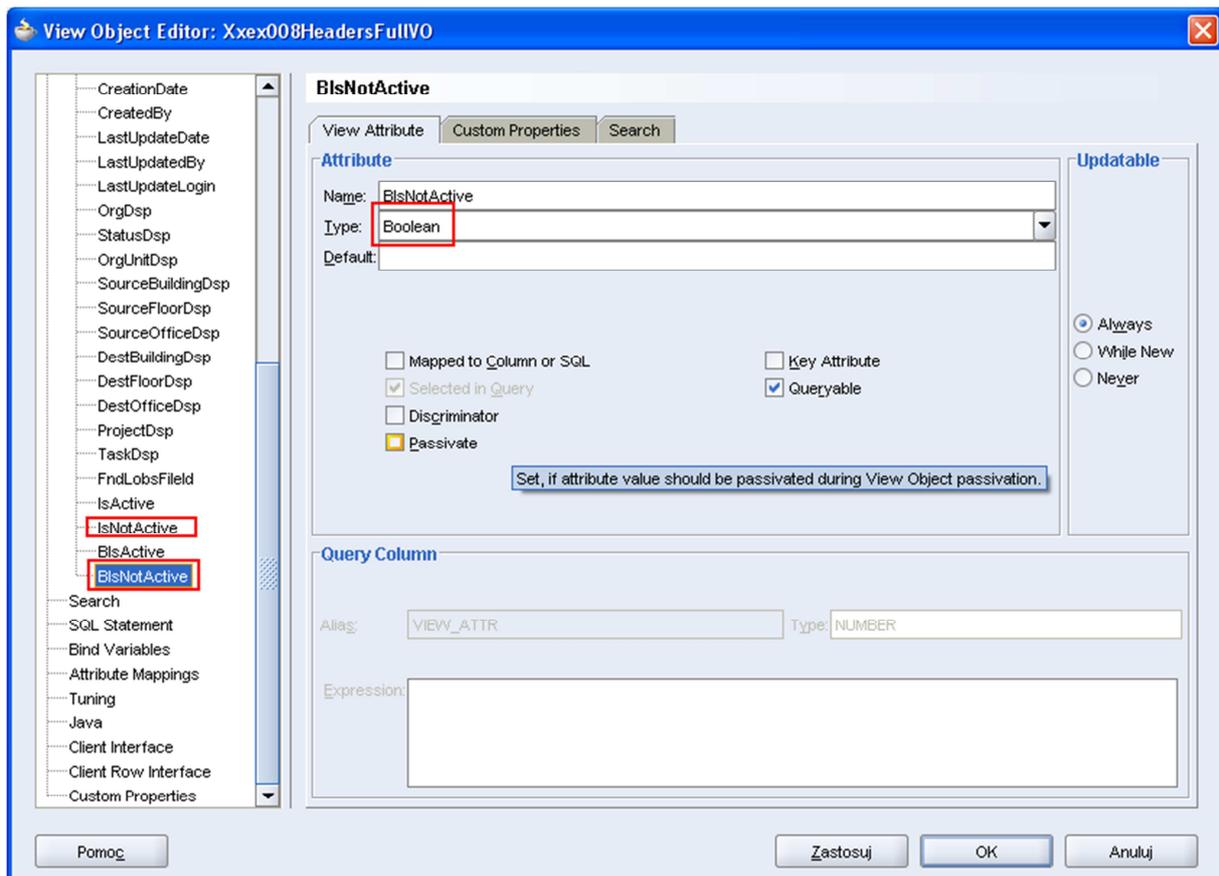
```

## Way 2 – SPEL ( \${oa. } )

Properties that can be modified at run time this way are :

- Rendered - To conditionally make a field in OA Framework hidden/displayed
- Read Only - To conditionally make a enterable or non-enterable
- Required - To make a field mandatory or non-mandatory
- Enabled - To conditionally enable or disable that field

General	
■ ID	GenerateSpecification
■ Item Style	submitButton
Extends	
Attribute Set	
Comments	
Functional	
■ Disabled	<span style="border: 1px solid red; padding: 2px;">\${oa.Xxex008HeadersFullVO1.BisNotActive}</span>

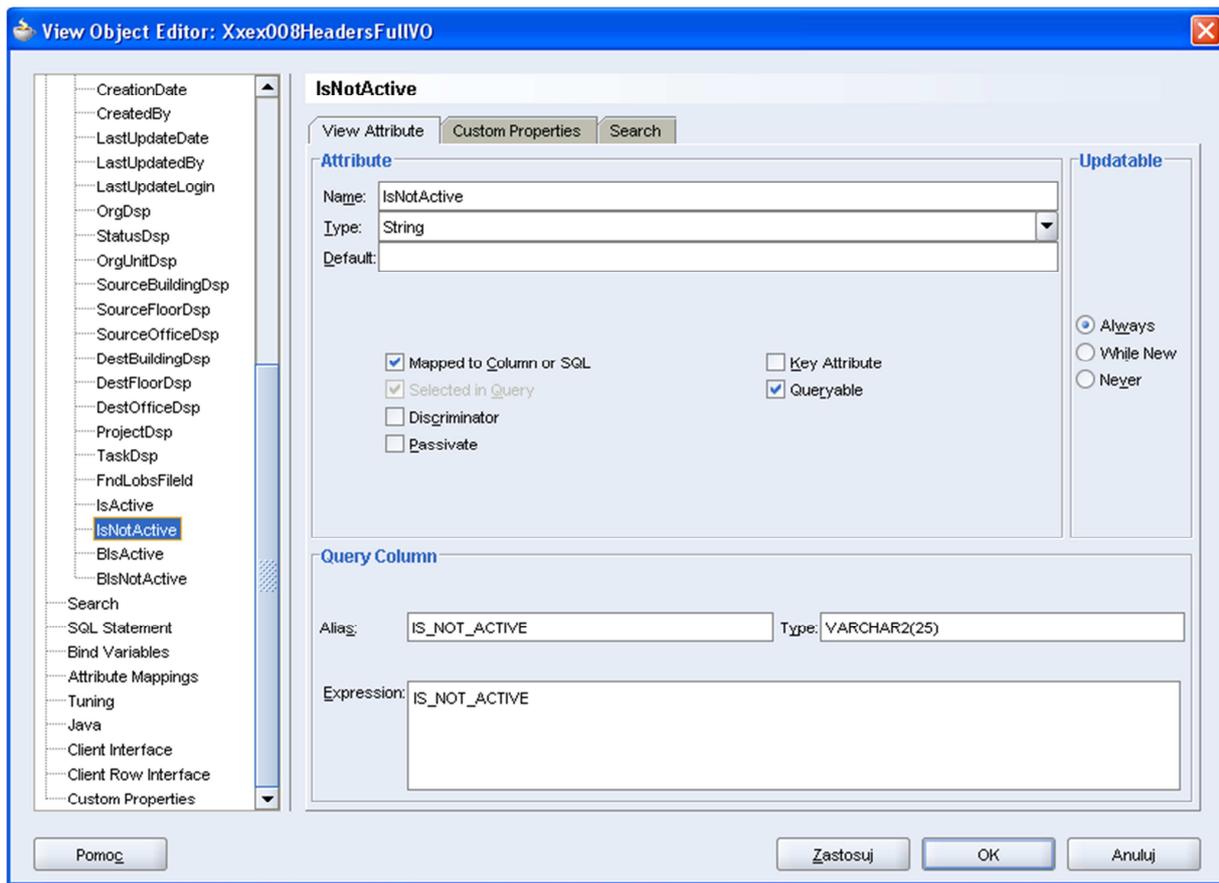


```

dRegionCO.java  22  mainAMImpl.java  22  MoveCO.java  22  Xxex008HeadersFullVORowImpl.java
-  /**Gets the attribute value for the calculated attribute BIsNotActiv
  */
-  public Boolean getBIsNotActive() {
    System.out.println("XX getIsNotActive() is " + getIsNotActive());
    return getIsNotActive().equals("1");
  }

```

IsNotActive is database column. We cannot use it directly since SPEL requires Boolean string, bo String value. So we created Boolean attribute called BIsNotActive.



```

create or replace view xxex_008_headers_v as
select h.*
  (select organization_name from xxex_008_l1_orgs_v where organization_id = h.org_id) org_dsp
  (select meaning from fnd_lookup_values where lookup_type = 'XXEX_008_MOVE_STATUS' and language = userenv('LANG') and lookup_code = h.status) status_dsp
  (select name from xxex_008_org_units_v where organization_id = h.org_unit_id) org_unit_dsp
  (select instance_number||'-'||address_dsp from xxex_008_l2_building_v where instance_id = h.source_building_id ) source_building_dsp
  (select instance_number from xxex_008_l3_floor_v where instance_id = h.source_floor_id ) source_floor_dsp
  (select instance_number from xxex_008_l4_office_v where instance_id = h.source_office_id ) source_office_dsp
  (select instance_number||'-'||address_dsp from xxex_008_l2_building_v where instance_id = h.dest_building_id ) dest_building_dsp
  (select instance_number from xxex_008_l3_floor_v where instance_id = h.dest_floor_id ) dest_floor_dsp
  (select instance_number from xxex_008_l4_office_v where instance_id = h.dest_office_id ) dest_office_dsp
  (select name from xxex_008_work_projs_v where project_id = h.project_id ) project_dsp
  (select task number from xxex_008_work_tasks_v where task_id =h.task_id ) task_dsp
  (case when status in ('CANCELLED','CLOSED') or fnd profile.value('XXEX_008_MOVE_READ_ONLY')='Y' then 0 else 1 end ) is active
  (case when status in ('CANCELLED','CLOSED') or fnd profile.value('XXEX_008_MOVE_READ_ONLY')='Y' then 1 else 0 end ) is not active
from xxex_008_headers h;

```

More:

<http://oracle.anilpassi.com/spel-in-oa-framework-with-audio-visual-demo.html>

### Way3- bound values

```

taskDsp.setAttributeValue( RENDERED_ATTR,
new ComparisonBoundValue( ComparisonBoundValue.COMPARISON_EQUALS,
new StringExistsBoundValue( new OADDataBoundValueViewObject( taskDsp, "ProjectId" ) ),
" " )); //StringExistsBoundValue //NonEmptyTextBoundValue

```

```

OAMessageLovInputBean taskDsp =
(OAMessageLovInputBean)webBean.findChildRecursive("TaskDsp");
taskDsp.setAttributeValue( READ_ONLY_ATTR,
new NotBoundValue( new StringExistsBoundValue( new OADDataBoundValueViewObject(
taskDsp, "ProjectDsp" ) ) ));

```

see also “Show/ Hide link depending on there is value in a field”

## Set focus

<http://robertjungerius.blogspot.com>

In OAF it is easy to set the focus to the first input field so the user can start typing and does not need the mouse.

Add the following to processRequest:

```
import oracle.apps.fnd.framework.webui.beans.OABodyBean;  
  
public void processRequest(OAPageContext pageContext, OAWebBean webBean)  
{  
    super.processRequest(pageContext, webBean);  
    // Set focus on the first search item segment1  
    OABodyBean oabean = (OABodyBean)pageContext.getRootWebBean();  
    oabean.setInitialFocusId("Segment1");  
}
```

## Open in new form

```
javascript:var a = window.open('OA.jsp?page=/XXX/oracle/apps/xxx/.....&retainAM=Y',  
'a',height=500,width=900,status=yes,toolbar=no,menubar=no,location=no'); a.focus();
```

## Timely refresh of a OA Page

```
OABodyBean bodyBean = (OABodyBean) oapagecontext.getRootWebBean();
```

```
String javaS = "javascript:setTimeout('window.location.reload()',10000)";  
bodyBean.setOnLoad(javaS);
```

from:

<http://mukx.blogspot.com/2007/07/javascript-in-oa-framework.html>

## code to attach js url programatically to a button/image bean

```
OAlmageBean img = (OAlmageBean) webBean.findChildRecursive("");  
//url of the page  
String url = "/XXX/oracle/apps/xxx/....."  
//retain am parameter  
string amMode = "true";  
//additional parameters i want to pass to to pop up page  
String params = "order_id={@workorder_id}";  
  
//Computing page_url  
String page =  
url + "&retainAM=" + amMode + "&fndOAJSPIEmbeddedMode=y" + "&" +  
params;  
//Computing final url  
String destURL =  
OAWebBeanConstants.APPS_HTML_DIRECTORY + OAWebBeanConstants.APPLICATION_JSP +  
"? " + OAWebBeanConstants.JRAD_PAGE_URL_CONSTANT + "=" + page;
```

```
//Securing js function from MAC key validation
OABoundValueEmbedURL jsBound =
new OABoundValueEmbedURL(img, "openWindow(self, "", destURL,
" , 'longTipWin', {width:" + width +
" , height:" + height +
"}, true); return false;");
```

```
//Attaching bound value embed url to on click of image.
img.setAttributeValue(OAWebBeanConstants.ON_CLICK_ATTR, jsBound);
```

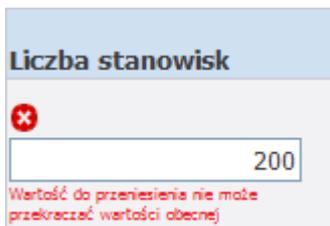
from:

<http://mukx.blogspot.com/2007/07/javascript-in-oa-framework.html>

## Validations

### Simple example – dependences inside record

Desired effect:



Code:

```

/**Gets the attribute value for MoveCapacity, using the alias name MoveC
*/
public Number getMoveCapacity() {
    return (Number)getAttributeInternal(MOVECAPACITY);
}

/**Sets <code>value</code> as the attribute value for MoveCapacity
*/
public void setMoveCapacity(Number value) {
    if (!(value==null)) {
        // MoveCapacity > SourceCapacity
        String a = value.toString();
        String b = getSourceCapacity().toString();
        System.out.println("a="+ a + " b=" + b );

        if (value.getValue() > getSourceCapacity().getValue() ) {
            throw new OAAttrValException(OAException.TYP_ENTITY_OBJECT,
            getEntityDef().getFullName(), // EO name
            getPrimaryKey(), // EO PK
            "MoveCapacity", // Attribute Name
            value, // Attribute value
            "XXEX", // Message product short name
            "XXEX_008_VALUE_TOO_BIG"); // Message name
        }
    }
    setAttributeInternal(MOVECAPACITY, value);
}

/**Gets the attribute value for MoveArea, using the alias name MoveArea

```

```

public void setMoveCapacity(Number value) {
    if (!(value==null)) {
        // MoveCapacity > SourceCapacity
        String a = value.toString();
        String b = getSourceCapacity().toString();
        System.out.println("a="+ a + " b=" + b );

```

```

        if (value.getValue() > getSourceCapacity().getValue() ) {
            throw new OAttrValException(OAException.TYP_ENTITY_OBJECT,
                getEntityDef().getFullName(), // EO name
                getPrimaryKey(), // EO PK
                "MoveCapacity", // Attribute Name
                value, // Attribute value
                "XXEX", // Message product short name
                "XXEX_008_VALUE_TOO_BIG"); // Message name
        }
    }
    setAttributeInternal(MOVECAPACITY, value);
}

```

## Advanced example – dependencies with database

Desired effect:

**Błąd**  
Numer przeprowadzki - Numer przeprowadzki musi być unikatowy

Przeprowadzka

\* Wskazuje wymagane pole

Generowanie linii    Specyfikacja    Wczytanie

**Dane podstawowe**

Spółka	OMM	Status	Wygenerowana specyfikacja
Numer przeprowadzki	1800A	Jednostka organizacyjna	
	Numer przeprowadzki musi być unikatowy	* Projekt	55
Opis		* Zadanie	1
* Data przeprowadzki	27-03-2012	Załączniki	Brak
* Numer zgłoszenia problemu	35169		<b>Dodaj...</b>
Osoba kontaktowa			

Code:

Solution:

```

public void setMoveNumber(String value) {

    String moveNumberUnique;
    String sqlStmt =
        "begin\n" +
        " :1 := XXEX_008_PKG.check_move_number_unique (:2, :3);\n" +
        "end;";

    OADBTransaction txn = getOADBTransaction();
    CallableStatement cs = txn.createCallableStatement( sqlStmt, 1 );
    try
    {
        cs.setString( 2, value );
        cs.setLong( 3, getMoveId().longValue() );
        ((OracleCallableStatement)cs).registerOutParameter(1, Types.VARCHAR, 0);
        cs.execute();
        OAExceptionUtils.checkErrors( txn );
        moveNumberUnique = cs.getString(1);
        cs.close();
    }
    catch (Exception e) {
        throw OAException.wrapperException(e);
    }

    if ( moveNumberUnique.equals("N") )
    {
        throw new OAttrValException(OAException.TYP_ENTITY_OBJECT,
            getEntityDef().getFullName(), // EO name
            getPrimaryKey(), // EO PK
            "MoveNumber", // Attribute Name
            value, // Attribute value
            "XXEX", // Message product short name
            "XXEX_MOVENUMBER_UK"); // Message name
    }
    setAttributeInternal(MOVENUMBER, value);
}

```

```

public void setMoveNumber(String value) {

    String moveNumberUnique;
    String sqlStmt =
        "begin\n" +
        " :1 := XXEX_008_PKG.check_move_number_unique (:2, :3);\n" +
        "end;";

    OADBTransaction txn = getOADBTransaction();
    CallableStatement cs = txn.createCallableStatement( sqlStmt, 1 );
    try
    {
        cs.setString( 2, value );
        cs.setLong( 3, getMoveId().longValue() );
    }
}

```

```

        ((OracleCallableStatement)cs).registerOutParameter(1, Types.VARCHAR, 0);
        cs.execute();
        OAExceptionUtils.checkErrors (txn);
        moveNumberUnique = cs.getString(1);
        cs.close();
    }
    catch (Exception e) {
        throw OAException.wrapperException(e);
    }

    if ( moveNumberUnique.equals("N") )
    {
        throw new OAAAttrValException(OAException.TYP_ENTITY_OBJECT,
            getEntityDef().getFullName(), // EO name
            getPrimaryKey(), // EO PK
            "MoveNumber", // Attribute Name
            value, // Attribute value
            "XXEX", // Message product short name
            "XXEX_MOVENUMBER_UK"); // Message name
    }
    setAttributeInternal(MOVENUMBER, value);
}

```

```

function check_move_number_unique (pmove_number varchar2, pignore_move_id number) return varchar2 is
l_cnt number;
begin
select count(*)
into l_cnt
from xxex_008_headers
where move_number = pmove_number and move_id <> pignore_move_id;
if l_cnt = 0 then return 'Y';
else return 'N'; end if;
end check_move_number_unique;

```

## Use a sequence value when saving a record in OA Framework

<http://robertjungerius.blogspot.com>

Most tables in EBS have a unique identifier which can be generated using a database sequence. For custom tables i also use the same approach.

In Oracle Forms this is relatively easy to achieve, how about OA Framework ?

If you use an EO (Entity Object) then it is also very easy to achieve, just put the code in the setter method of the required column:

```

public void setFileId(Number value) {
    if (value == null) {
        OADBTransaction t = getOADBTransaction();
        value = t.getSequenceValue("<sequence_name>");
    }

    setAttributeInternal(FILEID, value);
}

```

If you need to do it in the PR of PFR then use:

```

OAApplicationModule ap = pageContext.getApplicationModule(webBean);
// Assign a new sequence value to a row attribute for example
row.setAttribute("FileId",ap.getSequenceValue("<sequence_name>"));

```

## CO - Read only page

```

public void setPageReadOnly(OAPageContext pageContext, OAWebBean webBean)
{
    OAWebBean rgnBean =
webBean.findIndexedChildRecursive("ResidenceLayout");
    if (rgnBean != null)
        setRegionKidsReadOnly(rgnBean);

    rgnBean = webBean.findIndexedChildRecursive("ServiceLayout");
}

```

```

    if (rgnBean != null)
        setRegionKidsReadOnly(rgnBean);

    rgnBean = webBean.findIndexedChildRecursive("WntLayout");
    if (rgnBean != null)
        setRegionKidsReadOnly(rgnBean);
}

protected void setRegionKidsReadOnly(OAWebBean rgnBean)
{
    int i = rgnBean.getIndexedChildCount();
    for(int j = 0; j <= i - 1; j++)
    {
        OAWebBean itemBean = (OAWebBean)rgnBean.getIndexedChild(j);
        itemBean.setAttributeValue(READ_ONLY_ATTR, new Boolean(true));
        setRegionKidsReadOnly( itemBean );
    }
}

```

### ***Hide a Button***

```

OASubmitButtonBean saveT = (OASubmitButtonBean)webBean.findChildRecursive("Save1");
saveT.setRendered(true);

```

### ***Disable a Button***

```

OASubmitButtonBean saveT = (OASubmitButtonBean)webBean.findChildRecursive("Save1");
saveT.setDisabled(true);

```

### ***Loop Through Fetched Records in VO***

This particular example was written for Oracle Sourcing.

It is very useful because you are able to get all records fetched from OAF, identify the ones you want and do some work on them, by writing e.g. a pl/sql block.

```

OAApplicationModule rootAM = pageContext.getRootApplicationModule();
OAViewObject ReqVO = (OAViewObject)rootAM.findViewObject("BidHeaderSectionsVO");

if (null!=ReqVO) {
    Row ReqRow = ReqVO.first();
    if (null != ReqRow) {

        int idx = ReqVO.getRowCount();

        for (int xx = 0; xx < idx; xx++) {
            if (null != ReqRow) {
                // Do some work....
                ReqRow = ReqVO.next();
            }
            else {}
        }
    }
}

```

## PL/SQL from OAF

In AM:

```
String sqlStmt =
    "BEGIN\n"+
    "  :1 = XXAP_NOTE_PKG.CREATE_EMPTY_NOTE( :2, :3, :4 );\n"+
    "END;";

OADBTransaction txn = getOADBTransaction();

CallableStatement cs = txn.createCallableStatement( sqlStmt, 1 );

Number noteId = null;

try {
    Number invId = new Number(strInvoiceId);

    //set 1st parameter - null support
    if (invId == null) { cs.setNull( 2, java.sql.Types.INTEGER ); }
    else { cs.setLong( 2, invId.longValue() ); }

    // set 2nd, 3rd parameter as out parametr
    ((OracleCallableStatement)cs).registerOutParameter(1, Types.VARCHAR);
    ((OracleCallableStatement)cs).registerOutParameter(3, Types.INTEGER, 0);
    ((OracleCallableStatement)cs).registerOutParameter(4, Types.INTEGER, 0);

    cs.execute();

    OAExceptionUtils.checkErrors (txn);
    String s = cs.getString(3);
    noteId = new Number(cs.getString(4));
    cs.close();
}
catch (Exception e) {
    throw OAException.wrapperException(e);
}
```

In controller: see next example

## Fnd\_value.profile from OAF

In AM:

```
public String getReadOnlyFormFlag() {
    String readOnlyFormFlag;
    OADBTransaction transaction = getOADBTransaction();
    readOnlyFormFlag = transaction.getProfile("XXEX_008_MOVE_READ_ONLY");
    //transaction.writeDiagnostics(this, "XX readOnlyFormFlag="+readOnlyFormFlag, OAFwkConstants.PROCEDURE);
    readOnlyFormFlag = (readOnlyFormFlag == null)?"Y":readOnlyFormFlag;
    return readOnlyFormFlag;
}
```

In controller:

```
public void processRequest(OAPageContext pageContext, OAWebBean webBean)
{
    super.processRequest(pageContext, webBean);

    // mainAMImpl - your AM class name here
    mainAMImpl tmp = (mainAMImpl)pageContext.getApplicationModule(webBean);

    if ( tmp.getReadOnlyFormFlag().equals("Y") ) {
        webBean.findChildRecursive("Create").setAttributeValue(DISABLED_ATTR, new Boolean(true));
    };
}
```

## Breadcrumbs

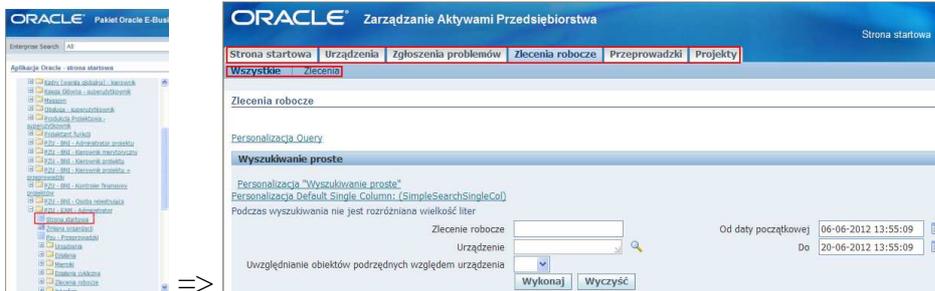
```
OABreadCrumbsBean oabreadcrumbsbean =
(OABreadCrumbsBean)oapagecontext.getPageLayoutBean().getBreadCrumbsLocator(
);
if(oabreadcrumbsbean != null)
{
    oabreadcrumbsbean.removeAllLinks(oapagecontext);
    int j = oabreadcrumbsbean.getLinkCount();
}
```

```

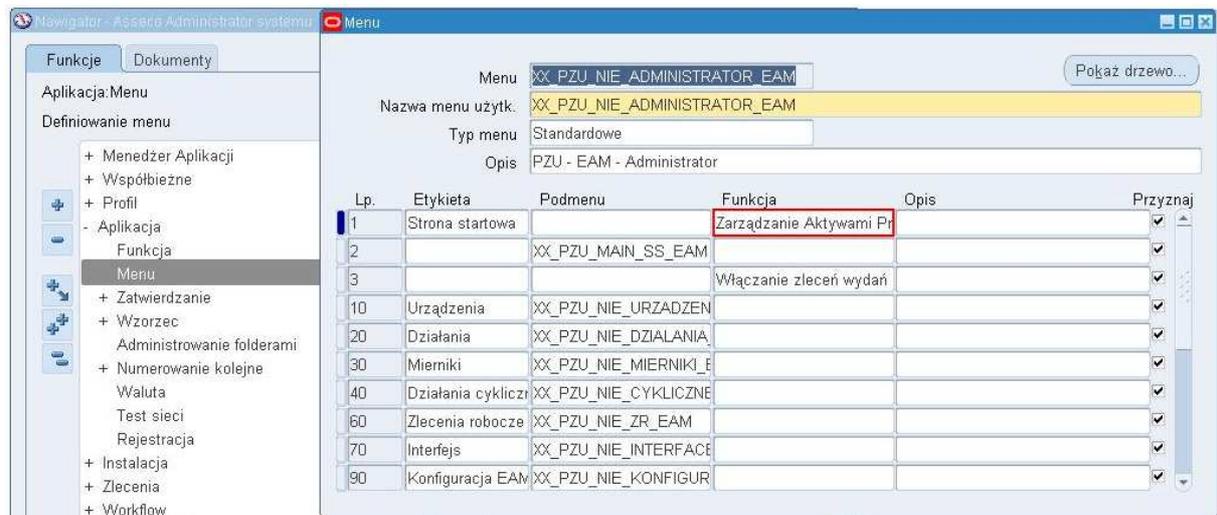
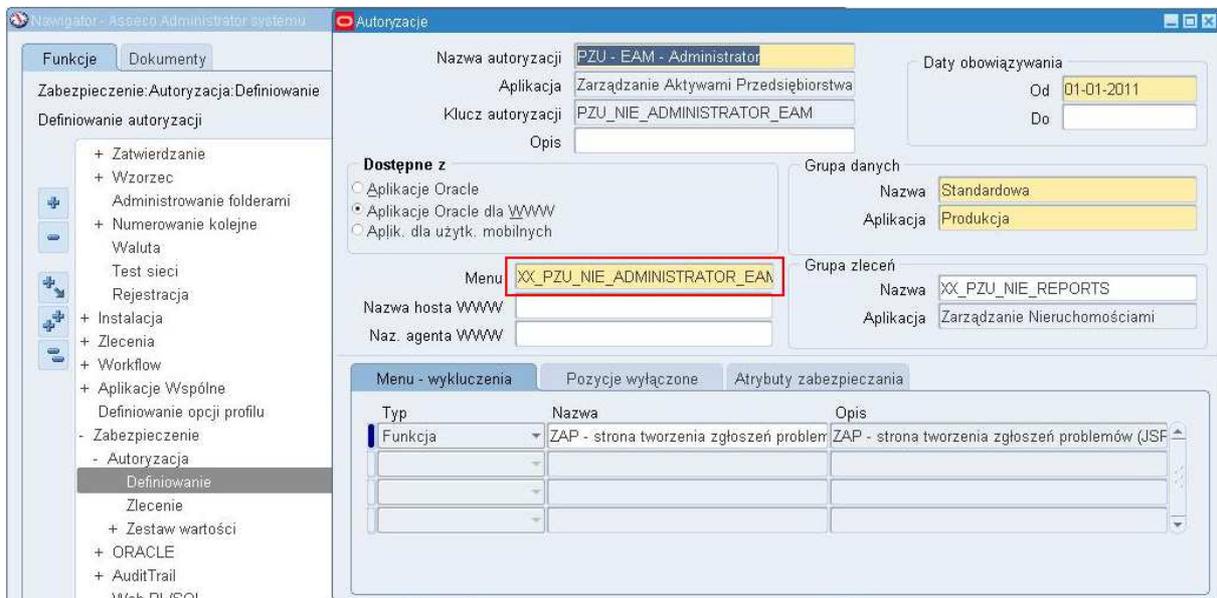
if(j > 1)
    oabreadcrumbsbean.removeLink(oapagecontext, 1);
}

```

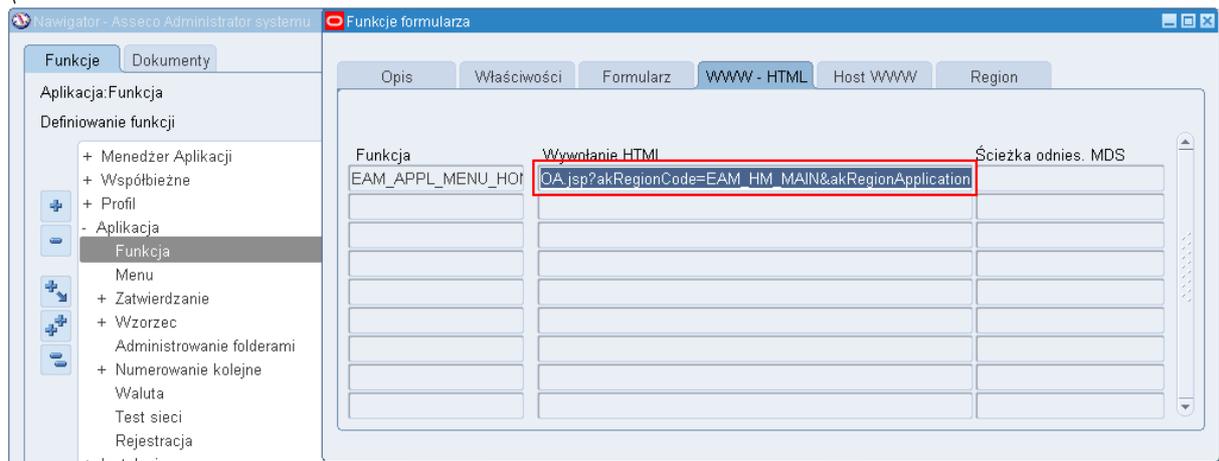
## Menu in OAF



It is achieved by menu i special “spell” in function definition:



Special “spell”

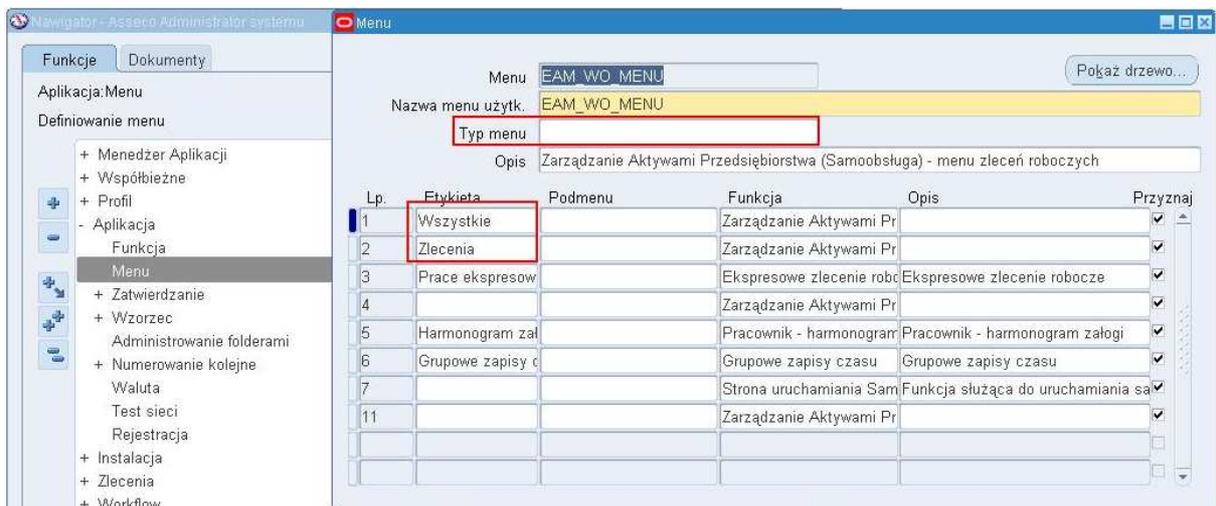
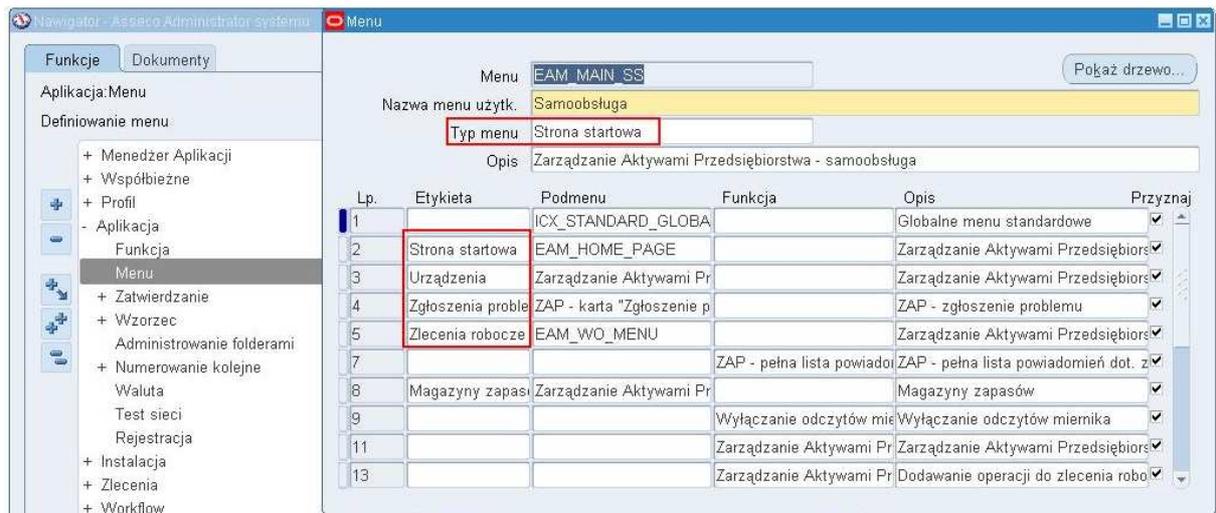


Type = SSWA - funkcja jsp

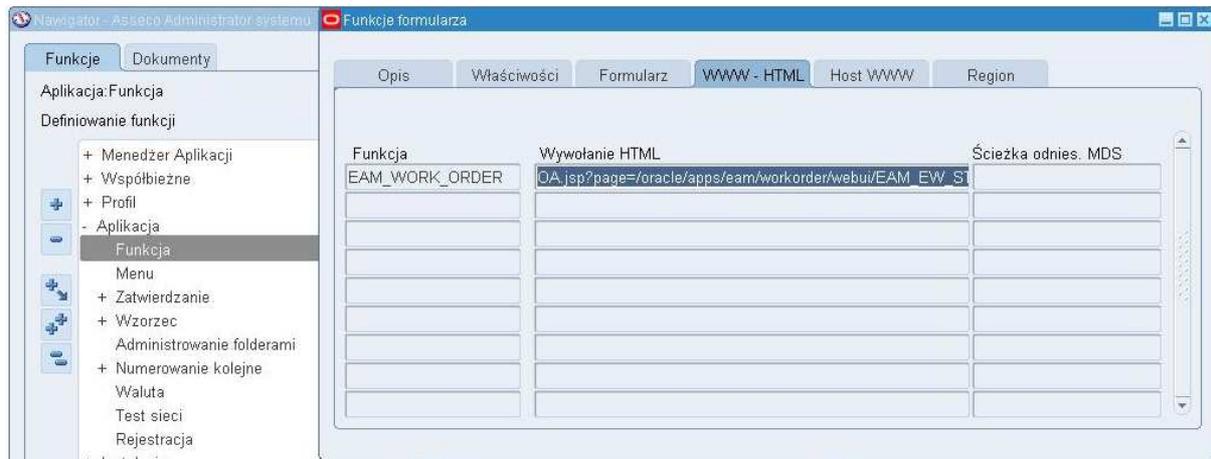
HTML =

OA.jsp?akRegionCode=EAM\_HM\_MAIN&akRegionApplicationId=426&WFWorklistPortlet=Y&OAPB=EAM\_BRAND\_NAME&OAHP=EAM\_MAIN\_SS&eAMReleaseSearch=Y

OAHP means Oracle Applications Home Page



## Open issue: Why “Harmonogram Zał” does not appear ?



OA.jsp?page=/oracle/apps/eam/workorder/webui/EAM\_EW\_START\_PAGE&akRegionApplicationId=426&OAPB=EAM\_BRAND\_NAME&OAHP=EAM\_MAIN\_SS&eAMReleaseSearch=Y&eAMRequestsSearch=Y

## SQL from CO – shortcut

```
import java.sql.Connection;
import java.sql.PreparedStatement;

try {
    Connection conn =
        pageContext.getApplicationModule(webBean).getOADBTransaction().getJdbcConnection();

    // Update FND_LOBS ProgramName column
    String sql =
        "UPDATE fnd_lobs SET Program_Name = 'XXXXXX_' + appListSelectedValue +
        "' WHERE FILE_ID = " + fileId.toString();

    PreparedStatement updateFndLobs = conn.prepareStatement(sql);
    int rs = updateFndLobs.executeUpdate();
} catch (java.sql.SQLException e) {
    OAException sqlErrorMessage =
        new OAException("SQL Error: " + e.getMessage(),
            OAException.ERROR);
    pageContext.putDialogMessage(sqlErrorMessage);
}
```

## Create new button programatically

Source:

<http://oafdevelopment.blogspot.com/2011/06/create-new-button-programatically.html>

The following code requires you to setup a new custom message in Applications (Application Developer Responsibility) with name XXX\_CUSTOM\_MSG\_BUTTON.

```
OASubmitButtonBean oasb =
    (OASubmitButtonBean)pageContext.getWebBeanFactory().createWebBean(pageContext,
        "BUTTON_SUBMIT");

oasb.setID("xxCustomButton");
oasb.setUINodeName("xxCustomButton");
oasb.setEvent("xxCustomButton");
```

```
String printTextMsg = pageContext.getMessage("XXX","XXX_CUSTOM_MSG_BUTTON",null);
oasb.setText(printTextMsg);
oawebbean.addIndexedChild(oasb);
```

## Sysdate

```
row.setAttribute("UploadDate", am.getOADBTransaction().getCurrentDBDate());
```

## Integration

### Run Oracle Forms from OAF

General	
ID	RecurJournalBtn
Item Style	button
Extends	
Attribute Set	
Comments	
<b>Functional</b>	
Popup ID	
Popup Render Event	onClick
Disabled	
Popup Enabled	False
Disable Server Side Validation	False
<b>Data</b>	
Data Type	VARCHAR2
<b>BC4J</b>	
View Instance	
View Attribute	
Export View Attribute	
<b>Navigation</b>	
Warn About Changes	True
Destination URI	form:SQLGL:RBPL KG PODSTAWOWY:STANDARD:GLXRJDEF_A
Target Form	

### Launch a Workflow from OAF

```
public void launchWorkFlowFromOAF(OAPageContext pageContext)
```

```
{
String wfItemType = "XXSR";
String wfProcess = "SR_MAIN_PROCESS";
OADBTransaction transaction = getOADBTransaction();
String Sr_No ;
String wfItemKey = " ";
Sr_No = pageContext.getParameter("sr_no");
wfItemKey = Sr_No+ transaction.getSequenceValue("xxsr_key_s.NEXTVAL").toString();
OANavigation wfClass = new OANavigation();
```

```

// Create Workflow Process

wfClass.createProcess(pageContext, wfItemType, wfProcess, wfItemKey);

// Set Number Attribute: SR_NO

wfClass.setItemAttrNumber(pageContext,
    wfItemType,
    wfItemKey,
    "SR_NO",
    Sr_No);

// Start Workflow Process

wfClass.startProcess(pageContext, wfItemType, wfProcess, wfItemKey);

}

```

## Call Concurrent Program from OA Framework

<http://prasanna-adf.blogspot.com/2008/11/call-concurrent-program-from-oa.html>

Recommended method is just call PL/SQL procedure.

Alternatyvely you can use this code snipped:

OA Framework provides the ConcurrentRequest class to call the concurrent program from the page. The submitRequest() method in the ConcurrentRequest class takes 6 parameters and returns request id of the submitted concurrent request:

```

public int submitRequest(
String ProgramApplication ,
String ProgramName ,
String ProgramDescription ,
String StartTime,
boolean SubRequest,
Vector Parameters ) throws RequestSubmissionException

```

**ProgramApplication** -Application Short name of application under which the program is registered.

**ProgramName** - Concurrent Program Name for which the request has to be submitted

**ProgramDescription** - Concurrent Program Description

**StartTime** - Time at which the request has to start running.

**SubRequest** - Set to TRUE if the request is submitted from another running request and has to be treated as a sub request.

**Parameters** - Parameters of the concurrent Request

Here is the example for calling a concurrent program from a OA framework page.

```

import oracle.apps.fnd.cp.request.ConcurrentRequest;
import oracle.apps.fnd.framework.server.OADBTransaction;

public int submitCPRequest(Number headerId) {

try {

OADBTransaction tx = (OADBTransaction)getDBTransaction();
java.sql.Connection pConnction = tx.getJdbcConnection();
ConcurrentRequest cr = new ConcurrentRequest(pConnction);

String applnName = "PO"; //Application that contains the concurrent program
String cpName = "POXXXX"; //Concurrent program name
String cpDesc = "Concurrent Program Description"; // concurrent Program description

// Pass the Arguments using vector
// Here i have added my parameter headerId to the vector and passed the vector to the concurrent program

Vector cpArgs = new Vector();
cpArgs.addElement(headerId.stringValue());

// Calling the Concurrent Program

int requestId = cr.submitRequest(applnName, cpName, cpDesc, null, false, cpArgs);

```

```
tx.commit();  
  
return requestId;  
  
} catch (RequestSubmissionException e) {  
    OAException oe = new OAException(e.getMessage());  
    oe.setApplicationModule(this);  
    throw oe;  
}  
}
```

### **How to monitor the submitted concurrent request OA Framework**

The Request Monitoring user interface provides the ability to search for a current user's requests. It allows the user to specify criteria to search for a request based on a specific request ID, requests for a specific program or a range of scheduled requests. Using the search results list, a user can select a request to see the details of that request or view its output file. From the Details page for a request, a user can place a hold on a pending request, cancel a pending request or view the request's log file.

You can call the Request Monitoring page by calling following URL  
[OA.jsp?akRegionCode=FNDCPREQUESTVIEWREGION&akRegionApplicationId=0](#)

## **Personalizations**

Są dwa tryby wprowadzania personalizacji:

Administratora

Użytkownika

### **Poziom administratora**

Link „Informacje na temat strony” – na dole strony: tutaj można odczytać z drzewa nazwę widoku VO

Link „Strona personalizacji” – tutaj można dodawać własne elementy, personalizować istniejące.

Żeby ww linki były dostępne trzeba ustawić profil (patrz prezentacja)

Personalizacje są trzymane w bazie danych.

Własne kryteria wyszukiwania to właściwości elementu:

Initial value

Rendered = visible

Promet

Można np. zmieniać kryteria filtrowania dla lov, dodawać pola.

Tworzenie pozycji –(Np. Dodawanie nowego przycisku do eksportu)

styl pozycji „export button” => wypełnij również View instancje

message test input – pole do wpisania => wypełnij view attribute i view instancje

tip – balloon hint

## Poziom użytkownika

Może mniej niż admin.

Może utworzyć perspektywę z określeniem kolumn, order.

Może zmieniać tylko atrybuty oznaczone jako „user personalization”

## Wybór kontekstu personalizacji

Personalizacje są zhierarchizowane na podobnej zasadzie jak profile.

Profile:

FND\_CUSTOM\_OA\_DEFINITION – dostępne personalizacje

FND\_PERSONALIZATION\_REGION\_LINK\_ENABLED – od razu do danego regionu możemy iść

FND\_DISABLE\_OA\_CUSTOMIZATIONS – wyłączamy wszystkie personalizacje, również STANDARDOWE personalizacje. Nie używaj.

FND\_DIAGNOSTICS –

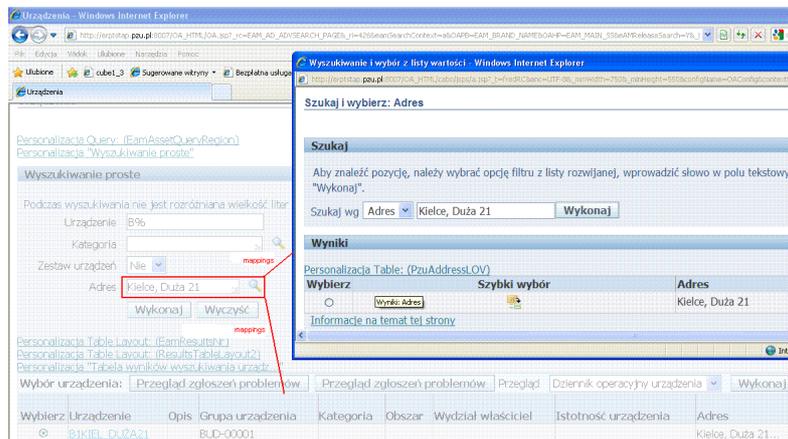
Inne informacje:

Wzorce opisowe nie pokażą się jeżeli zostaną zdefiniowane w ebs. Trzeba je dodatkowo włączyć personalizacją.

---

## LOV

Challenge:



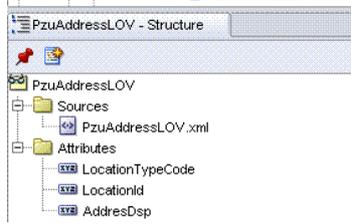
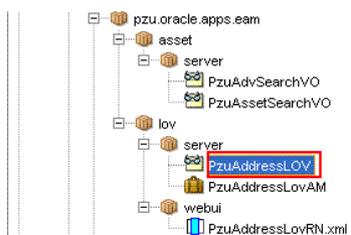
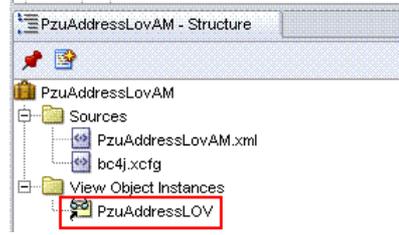
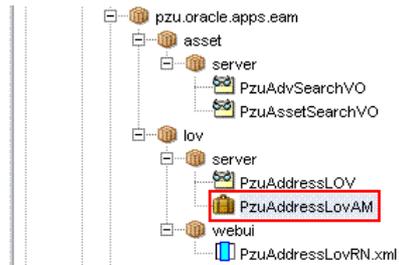
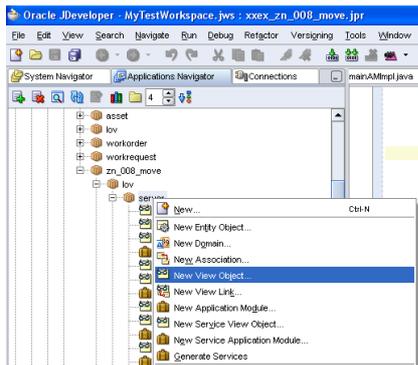
## Create LOV

Create VO

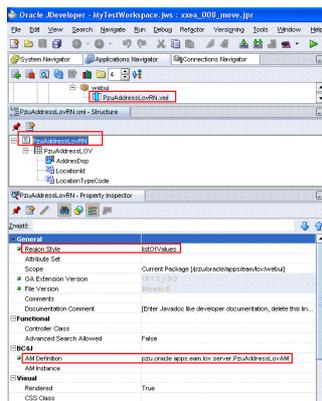
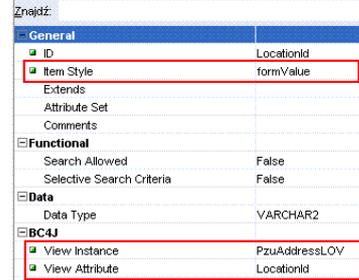
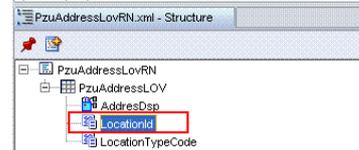
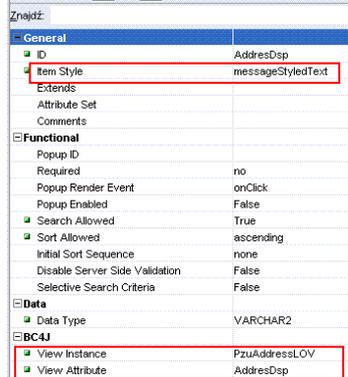
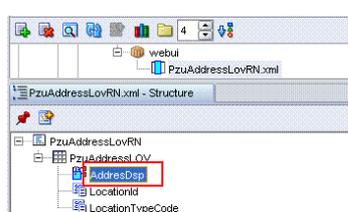
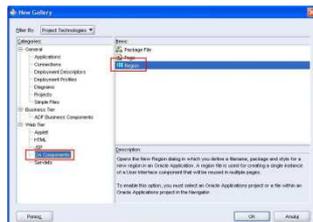
Select no java files  
Postfix name by VO  
Set VO in folder lov/server

Create dummy AM, add VO to AM

Select no java files  
In case you have several LOVs, you might have one AM for all LOVs.



## Create Region



Scope=public  
Advanced Search Allowed=true

+searchAllowed = true

## Advanced: LOV with a custom query

Source: <https://forums.oracle.com/forums/thread.jspa?threadID=840715>

1. create a new Lov Map for the new criteria.
2. set the "programmatic query" property in Lov Map to "True"
3. create a controller of LOV region
4. You can get the passive criteria in the LOV region as follows.

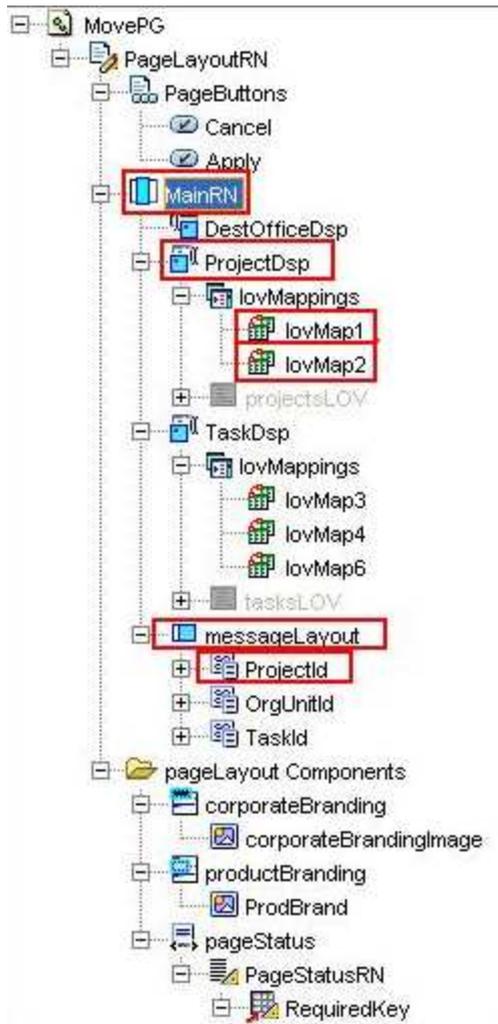
```
Dictionary passiveCriteriaItems = pageContext.getLovCriteriaItems();  
String empId = (String) passiveCriteriaItems.get("EmpId");
```

5. Use the above value to set the where clause using `viewobject.setWhereClause("queryString")` method

### Example

```
public void processRequest(OAPageContext pageContext, OAWebBean webBean)  
{  
    super.processRequest(pageContext, webBean);  
  
    OAApplicationModule am = pageContext.getApplicationModule(webBean);  
    OAViewObject vo = (OAViewObject)am.findViewObject( "BoardMembersVO" );  
  
    Dictionary passiveCriteriaItems = pageContext.getLovCriteriaItems();  
    String strInvoiceAmt = (String)passiveCriteriaItems.get( "SigningLimit" );  
  
    OADBTransactionImpl trx = (OADBTransactionImpl)am.getOADBTransaction();  
    String currCode = (String)trx.getValue( "invoiceCurrency" );  
  
    Number invoiceAmt = (new XXUtil()).getCurrencyNumericValue( trx, strInvoiceAmt, currCode );  
  
    Serializable params[] = { invoiceAmt };  
    Class paramTypes[] = { Number.class };  
    vo.invokeMethod( "modifyWhereClause", params, paramTypes );  
}  
  
public void modifyWhereClause( Number limitAmt )  
{  
    setWhereClauseParams(null); // Always reset  
  
    if (limitAmt != null)  
    {  
        setWhereClause( " SIGNING_LIMIT > :1" );  
        setWhereClauseParam( 0, limitAmt );  
    }  
}
```

## ***Assign LOV to field***



Standard region to show form ( do not use defaultSingleColumn - obsolete )

General	
ID	MainRN
Region Style	messageComponentLayout

Visible LOV-item (displayed value)

- General	
■ ID	ProjectDsp
■ Item Style	messageLovInput
Attribute Set	
Comments	
[-] Functional	
■ Required	yes
Read Only	False
Disabled	False
Search Allowed	False
Sort Allowed	no
Initial Sort Sequence	none
■ External LOV	/pzu/oracle/apps/eam/zn_008_move/lov/webui/projectsLOV
Disable Validation	False
Look Ahead Enabled	(Default)
Look Ahead Search Type	startsWith
Look Ahead Records Displayed	50
Look Ahead Records Visible	10
Look Ahead Selection Event Enabled	True
Minimum Characters For Look Ahead	
Selective Search Criteria	False
[-] Data	
■ Data Type	VARCHAR2
■ Maximum Length	255
Initial Value	
[-] BC4J	
■ View Instance	Xxex008HeadersFullVO1
■ View Attribute	ProjectDsp

Mappings between LOV and LOV-item: displayed

- General	
■ ID	lovMap1
Attribute Set	
Comments	
[-] Functional	
■ LOV Region Item	Nazwa
■ Return Item	ProjectDsp
■ Criteria Item	ProjectDsp
Required	False
Programmatic Query	False
[-] Advanced	
Use for Validation	default

Mappings between LOV and LOV-item: id

- General	
☑ ID	lovMap2
Attribute Set	
Comments	
[-] <b>Functional</b>	
☑ LOV Region Item	ProjectId
☑ Return Item	ProjectId
Criteria Item	
Required	False
Programmatic Query	False
[-] <b>Advanced</b>	
Use for Validation	default

We need to add form value to store id.

We cannot add formValue into MessageComponentLayout (MessageComponentLayout allows only add Message\* components )

So we need add dummy messageLayout

- General	
☑ ID	messageLayout
Attribute Set	
Comments	
[-] <b>Visual</b>	
Prompt	
Rendered	True
[-] <b>Personalization</b>	
Admin Personalization	True

And now we can add formValue.

Do not use instead of formValue TextItem with rendered=false, because it not works with lovs.

- General	
☑ ID	ProjectId
☑ Item Style	formValue
Extends	
Attribute Set	
☑ Comments	
[-] <b>Functional</b>	
Search Allowed	False
Selective Search Criteria	False
[-] <b>Data</b>	
Data Type	VARCHAR2
[-] <b>BC4J</b>	
☑ View Instance	Xxex008HeadersFullVO1
☑ View Attribute	ProjectId
[-] <b>Visual</b>	
Prompt	
☑ Rendered	True

## Assign LOV to field - personalization

It is possible to do by personalization as well:

Add displayed item and mappings to “Search region”

```
<insert after="EamAssetCategoryId">
  <oa:messageLovInput
    id="AddresDsp"
    adminCustomizable="true"
    cellNoWrapFormat="false"
    comment="."
    dataType="VARCHAR2"
    disabled="false"
    externalListOfValues="/pzu/oracle/apps/eam/lov/webui/PzuAddressLovRN"
    initSortSeq="none"
    lookAheadRecordsDisplayed="50"
    lookAheadRecordsVisible="10"
    lookAheadSearchType="startsWith"
    lookAheadSelectionEventEnabled="true"
    prompt="Adres"
    queryable="false"
    readOnly="false"
    rendered="true"
    required="no"
    rows="1"
    scope="."
    selectiveSearchCriteria="true"
    showRequired="false"
    sortState="no"
    tipType="none"
    unvalidated="false"
    userCustomizable="false"
    vAlign="middle"
    warnAboutChanges="true"
    xmlns:oa="http://xmlns.oracle.com/oa">
    <lovMappings>
      <lovMap
        id="PzuMap1"
        criteriaFrom="AddresDsp"
        lovItem="AddresDsp"
        programmaticQuery="false"
        requiredForLOV="false"
        resultTo="AddresDsp"
        scope="."
        useForValidation="default"/>
      <lovMap
        id="PzuMap2"
        lovItem="LocationId"
        programmaticQuery="false"
        requiredForLOV="false"
        resultTo="PzuLocationId"
        scope="."
        useForValidation="default"/>
    </lovMappings>
  </oa:messageLovInput>
</insert>
```

Add id item to „search region“- not visible

```
<insert after="EamAssetCategoryId">
  <oa:formValue
    id="PzuLocationId"
    adminCustomizable="true"
    dataType="NUMBER"
    encrypted="false"
    queryable="false"
    rendered="true"
    scope="."
    securityMode="standard"
    selectiveSearchCriteria="false"
    userCustomizable="false"
    xmlns:oa="http://xmlns.oracle.com/oa"/>
</insert>
```

## Assign search region do result table

Personalization

Add mapping from “search region” to “result table”

```
<insert after="FullDescription1">
  <oa:messageStyledText
    id="LocationId1"
    adminCustomizable="true"
    cellNoWrapFormat="false"
    dataType="NUMBER"
    initSortSeq="none"
    popupEnabled="false"
    popupRenderEvent="onClick"
    queryable="false"
    rendered="true"
    required="no"
    scope="."
    selectiveSearchCriteria="false"
    serverUnvalidated="false"
    sortState="no"
    tipType="none"
    totalValue="false"
    userCustomizable="false"
    vAlign="middle"
    viewAttr="LocationId"
    viewName="AdvSearchVO"
    warnAboutChanges="true"
    xmlns:oa="http://xmlns.oracle.com/oa"/>
</insert>

<insert after="AssetCategoryIdMapSS">
  <oa:queryCriteriaMap
    id="PzulSS"
    criteriaItem="PzuLocationId"
    resultsItem="LocationId1"
    scope="."
    xmlns:oa="http://xmlns.oracle.com/oa"/>
</insert>
```

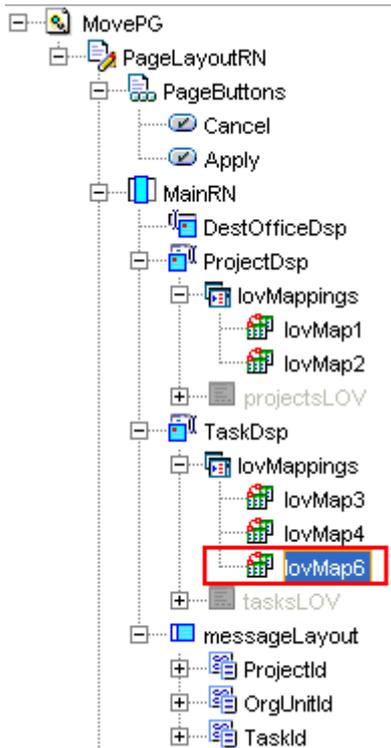
## LOV – hierarchical (dependent LOVs)

\* Projekt  🔍

\* Zadanie  🔍

We need just create appropriate mappings.

Since we need only task to given projectId we need create 3<sup>rd</sup> mappings:



General	
ID	lovMap6
Attribute Set	
Comments	
Functional	
LOV Region Item	ProjectId
Return Item	ProjectId
Criteria Item	ProjectId

+required=true

Tip: you can customize this error message here:

**✖ Błąd**

Należy wprowadzić wartość pozycji ProjectId jako kryterium listy wartości.

<oa:formValue id="ProjectId" dataType="NUMBER" prompt=" **ProjectId** " viewAttr="DestFloorId"/>

## **LOV – hierarchical – hide dependent LOV**

Idea: use event `pageContext.isLovEvent()`

See `\pzu\oracle\apps\eam\zn_008_move\webui\SpecificationPG.xml`

## **LOV –clear dependent fields**

Dependent LOV are cleared automatically, but others field of course are not cleared.

This code will do that:

Controller:

```
else if (pageContext.isLovEvent())
{
    String lovInputSourceId = pageContext.getLovInputSourceId();
    Number resetLineLevel = null;

    if ("PoDocumentNum".equals(lovInputSourceId))
        resetLineLevel = new Number(1);

    ...
    if (resetLineLevel != null)
    {
        Serializable params[] = { rowRef, resetLineLevel };
        Class paramTypes[] = { rowRef.getClass(), resetLineLevel.getClass() };
        am.invokeMethod( "resetLinePOAttributes", params, paramTypes );
    }
}
```

AM:

```
public void resetLinePOAttributes( String rowRef, Number level )
{
    int lvl = 999;
    NoteLinesVORowImpl row = (NoteLinesVORowImpl)findRowByRef( rowRef );

    if (row != null)
    {
        if (level != null)
            lvl = level.intValue();

        if (lvl <= 1)
            row.setPoLineId( null );
        if (lvl <= 2)
            row.setLineLocationId( null );
        if (lvl <= 3)
            row.setPoDistributionId( null );
    }
}
```

## **Picklist (LOV)**

- 1/ Prepare VO, per OAF standards put this VO in location `*.poplist.server`
- 2/ insert an item with properties

- General	
■ ID	RoUpdateFlagDsp
■ Item Style	messageChoice
Extends	
Attribute Set	
Comments	
[-] Functional	
■ Required	yes
Read Only	False
Disabled	False
Search Allowed	False
Disable Server Side Validation	False
Selective Search Criteria	False
Add Blank Value	True
[-] Data	
■ Data Type	VARCHAR2
■ Initial Value	Y
■ Picklist View Definition	pzu.oracle.apps.eam.zn_008_move.polist.server.YesNoVO
■ Picklist View Instance	
■ Picklist Display Attribute	Meaning
■ Picklist Value Attribute	LookupCode
[-] BC4J	
■ View Attribute	RoUpdateFlag
Export View Attribute	
[-] Navigation	
Destination Function	
Warn About Changes	True
[-] Visual	
■ Prompt	Aktualizacja atrybutów Podział terytorialny

**Note that picklist view definition is separated by “.”(DOT), not by “/”(slash).**

## Typical Personalizations/Customizations

What	
VO	xml - \$JAVA_TOP  Substytucją podmieniamy VO (business components > substitutions, zapisywane są w pliku .jpx, ważnego dla całego projektu)
RN	Xml – database  W jdev widzimy stronę tylko w formacie drzewa xml, nie można zobaczyć layoutu.
CO	.class in \$JAVA_TOP  Jak robimy kustomizację CO to musimy podmienić kontroler za pomocą personalizacji
AM, AS, EO	xml - \$JAVA_TOP

Substytucją podmieniamy AM

UWAGA: po zmianach klas java trzeba zrestartować serwer http i serwer aplikacyjny

## Customization - How to add own column

Challenge:

**Wyszukiwanie proste**

Podczas wyszukiwania nie jest rozróżniana wielkość liter

Urządzenie: B%

Kategoria:

Zestaw urządzeń: Nie

Adres: Kielce, Duża 21

[Personalizacja Table Layout: \(FamResultsNr\)](#)  
[Personalizacja Table Layout: \(ResultsTableLayout2\)](#)  
[Personalizacja "Tabela wyników wyszukiwania urzadz..."](#)

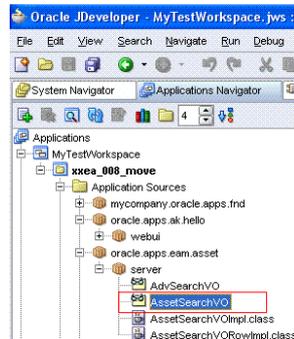
Wybór urządzenia:

Wybierz	Urządzenie	Opis	Grupa urządzenia	Kategoria	Obszar	Wydział właściciel	Istotność urządzenia	Adres
<input checked="" type="radio"/>	B1KIEL_DUŻA21		BUD-00001					Kielce, Duża 21...

### 1/ Modify View Object

Ignore this step if there is the column in existing VO.

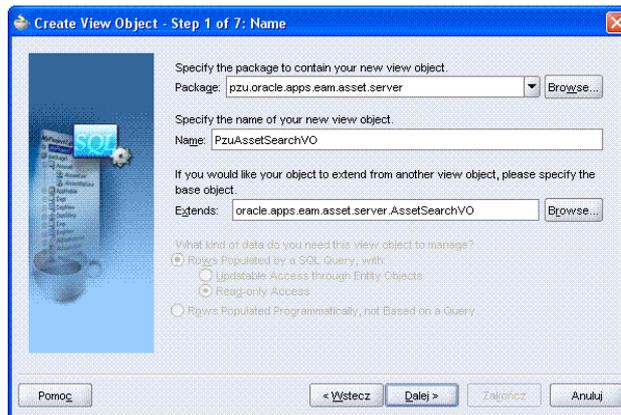
#### 1. copy VO from the server



#### 2. make a descendant. Name: <CustomerName><oldName>

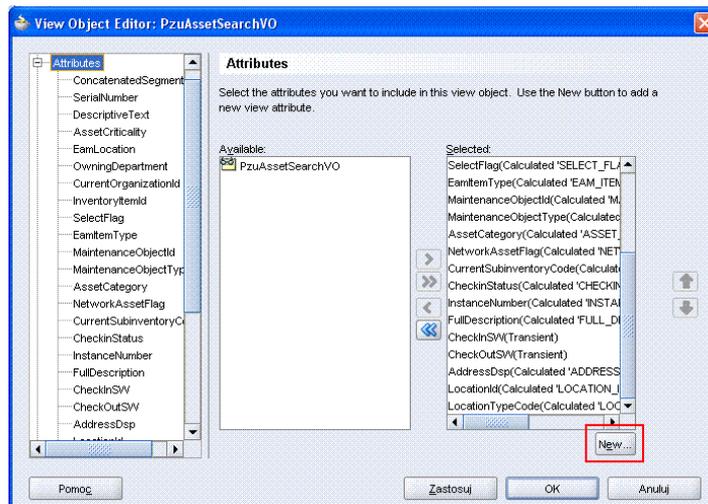
make sure, that you wrote value in field extents



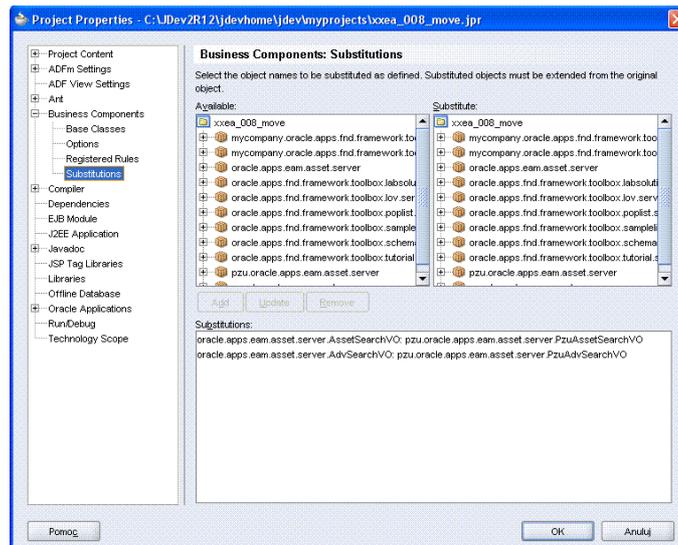


### 3. modify SQL, add attributes (sometimes attributes are added automatically sometimes not)

Compare whether attributes are identical and correct in XML file.  
 Creator has an error, and sometimes confuses it.  
 In case of error fix XML file manually.



### 4. make substitution (= information that system should use our VO instead of standard VO)



## 5. Deploy changes on server

- a) export substitution
- b) copy VO changes
- c) bounce server

ad a) export substitution

Copy on server file .jspx and compile it.

Example:

Copy C:\JDev2R12\jdevhome\jdev\myprojects\xxea\_008\_movejspx to any location on server.

```
Exporting substitutions
-----

java oracle.jrad.tools.xml.importer.JPXImporter xxea_008_movejspx \
-username apps \
-password n8thobn1 \
-dbconnection
"(description=(address_list=(address=(community=tcp.world)(protocol=tcp)(host=ERPTSTAP.PZU.PL)(port=1528))(connect_data=(sid=OSEAD2)))"
```

Extra info:

```
Reviewing and deleting substitutions
-----

exec jdr_utils.listDocuments('/oracle/apps/eam/asset/server', true)
/oracle/apps/eam/asset/server/customizations/site/0/AssetSearchVO

exec jdr_utils.DeleteDocument('/oracle/apps/eam/asset/server/customizations/site/0/AssetSearchVO')
commit
```

```
xxea_008_movejspx is an ordinary xml file so you can check whether substitution is added:

<?xml version='1.0' encoding='UTF-8' ?>
<!DOCTYPE JboProject SYSTEM "jbo_03_01.dtd">
<JboProject
  Name="xxea_008_move"
  SeparateXMLFiles="true"
  ...
  <Substitutes>
    <Substitute OldName ="oracle.apps.eam.asset.server.AdvSearchVO" NewName ="pzu.oracle.apps.eam.asset.server.PzuAdvSearchVO" />
    <Substitute OldName ="oracle.apps.eam.asset.server.AssetSearchVO" NewName ="pzu.oracle.apps.eam.asset.server.PzuAssetSearchVO" />
  </Substitutes>
</JboProject>
```

- b) copy VO changes

1/ Compile java classes ( if any )

- 2/ Copy entire catalog structure from **myprojects** to server to \$JAVA\_TOP
- 3/ Copy entire catalog structure from **myclasses** to server to \$JAVA\_TOP
- 4/ run XMLImport for regions ( if any )

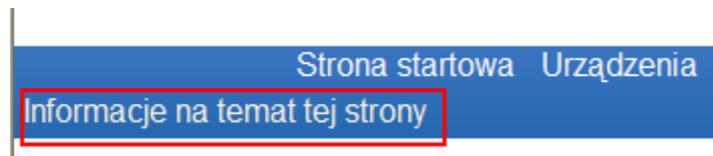
c) bounce server

```
#adapctl.sh          - apache
#adoacorectl.sh      - OC4J

$ADMIN_SCRIPTS_HOME/adapctl.sh stop
$ADMIN_SCRIPTS_HOME/adoacorectl.sh stop
$ADMIN_SCRIPTS_HOME/adoacorectl.sh start
$ADMIN_SCRIPTS_HOME/adapctl.sh start
```

## 6. Review changes

Note that VO name will not be changed, but SQL statement will be changed.



Old name:

table: Tabela wyników wyszukiwania urządzeń	ResultsTableCO	AssetSearchVO	
column: (column1)			
messageStyledText: Urządzenie		AssetSearchVO	InstanceNumber
sortableHeader: Urządzenie			
column: (column2)			

But changed sql here:

Informacje o obiektach widoku

Select a view object: pzu.oracle.apps.eam.asset.server.PzuAssetSearchVO

**Szczegóły obiektu widoku**

Zastępowanie: AssetSearchVORowImpl.java 120.4

Wersja: AssetSearchVORowImpl.java 120.4

Zapytanie: **SELECT \* FROM (SELECT concatenated\_segments, v.serial\_number, CASE WHEN (fnd\_p NULL) AND (length(descriptive\_text) > 30) THEN concat(substr(descriptive\_text, 1, 3 ('EAM\_HIERARCHY\_DESCRIPTION\_LENGTH') is NULL) AND (length(descriptive\_text) < ('EAM\_HIERARCHY\_DESCRIPTION\_LENGTH') is NOT NULL) AND (length(descriptive\_text) < ('EAM\_HIERARCHY\_DESCRIPTION\_LENGTH')) THEN Concat(substr(descriptive\_text, 1 ('EAM\_HIERARCHY\_DESCRIPTION\_LENGTH')), '...') WHEN (fnd\_profile.Value('EAM\_HIERARCHY\_DESCRIPTION\_LENGTH') < To\_Number(fnd\_profile.Value('EAM\_HIERARCHY\_DESCRIPTION\_LENGTH'))) THEN descriptive\_text END AS descriptive\_text, asset\_criticality, area\_eam\_location, owning\_organization\_id, select\_flag, eam\_item\_type, maintenance\_object\_id, maintenance\_object\_type, cat**

## 2/ Add column – personalization

Advanced Search Panel						
Header: Wyszukiwanie zaawansowane	Tak					
Table: Tabela zgłoszeń p...	Tak	Tak				
Message Styled Text: Numer	Tak					
Message Styled Text: Opis	Tak					
Message Styled Text: Adres	Tak					

Zimbra: Skrzynka odbiorcza (5) Update Item

X Znajdź: pro Poprzednie Następne Opcje

**Update Item**

\* Pole wymagane

Poziom Site  
Styl pozycji Message Styled Text

Właściwość	Wartość
* ID	XXAddressDsp
Prompt	Adres
View Attribute	AddressDsp
View Instance	PzuWorkRequestResultsVO

Other attributes are not required

You can help yourself by reviewing page content:

`exec`

```

jdr_utils.printDocument('/oracle/apps/eam/asset/webui/EAM_AD_ADVSEARCH_PAGE
');

```

```

154 </ui:columnHeader>
155 <ui:contents>
156 <oa:messageStyledText
157   id="AssetCriticality"
158   columns="80"
159   sortState="ascending"
160   prompt="Criticality"
161   viewAttr="AssetCriticality"
162   viewAttr="AssetCriticality"
163   maximumLength="80"
164   promptTranslationExpansion="100%"
165   user="skAttributeCode=EAM_ASSET_CRITICALITY"
166   user="skAttributeApplicationId=426"
167   shortDesc="Criticality"/>
168 </ui:contents>

```

<oa:advancedTable id="EamResultsTable" viewName="AssetSearchVO"

You can also review/modify personalization code

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <customization xmlns="http://xmlns.oracle.com/jrad" version="9.0.6.0.0_45" xml:lang="pl-PL" >
3   <modifications>
4     <move element="column2" after="column1"/>
5     <move element="column10" after="column2"/>
6     <move element="column3" after="column10"/>
7     <move element="column4" after="column3"/>
8     <move element="column5" after="column4"/>
9     <move element="column6" after="column5"/>
10    <move element="column7" after="column6"/>
11    <move element="columnGroup1" after="column7"/>
12    <insert before="columnGroup1">
13      <oa:column id="XxColumnAddressDsp" adminCustomizable="true" bandingShade="none" cell
14        <ui:columnHeader xmlns:ui="http://xmlns.oracle.com/uix/ui">
15          <oa:sortableHeader id="XxSortableHeaderAddressDsp" abbreviation="Adres" adminC
16        </ui:columnHeader>
17        <ui:contents xmlns:ui="http://xmlns.oracle.com/uix/ui">
18          <oa:messageStyledText id="XXAddressDsp" columns="80" maximumLength="80" prompt
19        </ui:contents>
20      </oa:column>
21    </insert>
22  </modifications>
23 </customization>

```

How to export/import personalization:

```

begin
  dbms_output.put_line(' *START' );

Jdr_utils.listcustomizations('/oracle/apps/eam/asset/webui/EAM_AD_ADVSEARCH
_PAGE');
  dbms_output.put_line(' *STOP' );
end;

*START
/oracle/apps/eam/asset/webui/customizations/site/0/EAM_AD_ADVSEARCH_PAGE
*STOP

java oracle.jrad.tools.xml.exporter.XMLExporter
/oracle/apps/eam/asset/webui/customizations/site/0/EAM_AD_ADVSEARCH_PAGE \
  -rootdir $XXEX_TOP/xxeraseme \
  -username apps \
  -password n8thobn1 \
  -dbconnection
"(description=(address_list=(address=(community=tcp.world)(protocol=tcp)(ho
st=ERPTSTAP.PZU.PL)(port=1528)))(connect_data=(sid=OSEAD2)))"

-----

cd $XXEX_TOP/xxeraseme/oracle/apps/eam/asset/webui/customizations/site/0

java oracle.jrad.tools.xml.importer.XMLImporter
$XXEX_TOP/xxeraseme/oracle/apps/eam/asset/webui/customizations/site/0/EAM_A
D_ADVSEARCH_PAGE.xml \
  -username apps \
  -password n8thobn1 \
  -rootdir $XXEX_TOP/xxeraseme/ \
  -rootPackage / \
  -dbconnection
"(description=(address_list=(address=(community=tcp.world)(protocol=tcp)(ho
st=ERPTSTAP.PZU.PL)(port=1528)))(connect_data=(sid=OSEAD2)))"

```

## CO replacement

Challenge: we need to replace CO. How to do this:

1/ Extend CO in JDeveloper

- a) Copy file JAVA\_TOP\$/oracle/apps/eam/workorder/webui/WOQuerySimpleSearchCO.class
- b) Decompile it using jad.exe or other decompiler.
- c) Copy decompiled file into your jdeveloper:  
\$JDEV\_HOME/oracle/apps/eam/workorder/webui/WOQuerySimpleSearchCO.java
- d) Make a copy of file (using windows explorer) and make a new one  
\$JDEV\_HOME/pzu/oracle/apps/eam/workorder/webui/PzuWOQuerySimpleSearchCO.java
- e) Modify file header and make changes:

Replace from	Replace to
package oracle.apps.eam.workorder.webui;	package pzu.oracle.apps.eam.workorder.webui;
public class WOQuerySimpleSearchCO	public class PzuWOQuerySimpleSearchCO extends WOQuerySimpleSearchCO

Use *super. syntax* to prevent prior functionality, for example:

```
public class PzuTaskDetailsLayoutCO extends TaskDetailsLayoutCO
{
    public PzuTaskDetailsLayoutCO ()
    {
    }
    public void processRequest(OAPageContext oapagecontext, OAWebBean oawebbean)
    {
        super.processRequest(oapagecontext, oawebbean);
        <your code here>
        if (oapagecontext.isLoggingEnabled(OAFwkConstants.STATEMENT))
            oapagecontext.writeDiagnostics(this, "XXXX Inside
PzuTaskDetailsLayoutCO.processRequest", OAFwkConstants.STATEMENT);
    }
}
```

- f) Deploy your java file as described before. Bounce server ( for the first time you do not need this. You can replace your class file name each time to prevent from bouncing )

2/ Tell application to use your new CO. Do it by personalization (poprzez menu: Strona personalizacji, jeśli klikamy na personalizacje na linkach regionów możemy nie znaleźć wszystkiego i nie widać nazw kontrolerów, które chcemy podmienić)

Zakres: Page: Zlecenia robocze Nazwa dokumentu: /oracle/apps/eam/workorder/webui/EAM_EW_START_PAGE Siedziba: Uwzględnianie Organizacja: PZU SA (JO) Autoryzacja: PZU - EAM - Administrator						
Właściwości personalizacji						
Czyszczenie personalizacji		Wybór wyświetlanych poziomów				
	Pierwotna definicja	Site	Organization: PZU SA (JO)	Responsibility: PZU - EAM - Administrator		Wynik / źródło
Admin Personalization	true	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		true / Pierwotna definicja
CSS Class	Domyślny	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		Domyślny / Pierwotna definicja
Controller Class	oracle.apps.eam.workorder.webui.WOQuerySimpleSearchCO	pzu.oracle.apps.eam.wo	Dziedziczenie 5	Dziedziczenie 5		pzu.oracle.apps.eam.workorder.webui.PzuWOQueSite
Help Target Appl Short Name	Domyślny	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		Domyślny / Pierwotna definicja
Icon URI	Domyślny	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		Domyślny / Pierwotna definicja
Post Initial Values	false	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		false / Pierwotna definicja
Record History Enabled	false	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		false / Pierwotna definicja
Rendered	true	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		true / Pierwotna definicja
Text	Domyślny	Dziedziczenie 5	Dziedziczenie 5	Dziedziczenie 5		Domyślny / Pierwotna definicja

WSKAZÓWKA Wiersze tabeli zawierają personalizowane właściwości obiektu, a jej kolumny - poziomy personalizacji każdej właściwości. Każda właściwość dziedzicząca przyjmuje wartość z bezpośredniego wyższego poziomu.

pzu.oracle.apps.eam.workorder.webui.PzuWOQuerySimpleSearchCO

We can see now, that CO is changed

Strona	Personalizacja	Kontekst strony	Składniki technologiczne	Właściwości systemowe Java	Profile	Prog. korekcyjne																																																								
/oracle/apps/eam/workorder/webui/EAM_EW_START_PAGE																																																														
120.3.12010000.2																																																														
Definicja strony																																																														
Rozwiń wszystkie   Zwiń wszystkie																																																														
<table border="1"> <thead> <tr> <th>Fokus</th> <th>Nazwa</th> <th>Kontroler</th> <th>Moduł</th> </tr> </thead> <tbody> <tr> <td></td> <td>pageLayout: Zlecenia robocze</td> <td>EasyWorkOrderSearchPageCO</td> <td>EasyWorkOrderSe</td> </tr> <tr> <td></td> <td>rawText: &lt;noscript&gt;Włączono JavaScript - wymagan...</td> <td></td> <td></td> </tr> <tr> <td></td> <td>stackLayout</td> <td></td> <td></td> </tr> <tr> <td></td> <td>header: Wyszukiwanie zaawansowane</td> <td></td> <td></td> </tr> <tr> <td></td> <td>stackLayout: (WOSearchResultsRG)</td> <td>WOQueryRGCO</td> <td></td> </tr> <tr> <td></td> <td>div</td> <td></td> <td></td> </tr> <tr> <td></td> <td>styledText: Personalizacja Query: (WOSearchResultsR...</td> <td></td> <td></td> </tr> <tr> <td></td> <td>stackLayout</td> <td></td> <td></td> </tr> <tr> <td></td> <td>header: Wyszukiwanie proste</td> <td></td> <td></td> </tr> <tr> <td></td> <td>div</td> <td></td> <td></td> </tr> <tr> <td></td> <td>styledText: Personalizacja "Wyszukiwanie proste"</td> <td></td> <td></td> </tr> <tr> <td></td> <td>borderLayout: (SimpleSearchSingleCol_p13n)</td> <td></td> <td></td> </tr> <tr> <td></td> <td>header: (SimpleSearchSingleCol)</td> <td>PzuWOQuerySimpleSearchCO</td> <td></td> </tr> </tbody> </table>							Fokus	Nazwa	Kontroler	Moduł		pageLayout: Zlecenia robocze	EasyWorkOrderSearchPageCO	EasyWorkOrderSe		rawText: <noscript>Włączono JavaScript - wymagan...				stackLayout				header: Wyszukiwanie zaawansowane				stackLayout: (WOSearchResultsRG)	WOQueryRGCO			div				styledText: Personalizacja Query: (WOSearchResultsR...				stackLayout				header: Wyszukiwanie proste				div				styledText: Personalizacja "Wyszukiwanie proste"				borderLayout: (SimpleSearchSingleCol_p13n)				header: (SimpleSearchSingleCol)	PzuWOQuerySimpleSearchCO	
Fokus	Nazwa	Kontroler	Moduł																																																											
	pageLayout: Zlecenia robocze	EasyWorkOrderSearchPageCO	EasyWorkOrderSe																																																											
	rawText: <noscript>Włączono JavaScript - wymagan...																																																													
	stackLayout																																																													
	header: Wyszukiwanie zaawansowane																																																													
	stackLayout: (WOSearchResultsRG)	WOQueryRGCO																																																												
	div																																																													
	styledText: Personalizacja Query: (WOSearchResultsR...																																																													
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	header: Wyszukiwanie proste																																																													
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	styledText: Personalizacja "Wyszukiwanie proste"																																																													
	borderLayout: (SimpleSearchSingleCol_p13n)																																																													
	header: (SimpleSearchSingleCol)	PzuWOQuerySimpleSearchCO																																																												

## Line in xml personalization file

```
<modifications>
  <modify
    element="WOSearchResultsRG.SimpleSearchSingleCol"
    controllerClass="pzu.oracle.apps.eam.workorder.webui.PzuWOQuerySimpleSearchCO"
  />
</modifications>
```

## CO – how to add link dynamically

### Challenge

Personalizacja "W tej tabeli wyświetlana jest list..."

#### Temat

Nie znaleziono wyników.

[Powrót na stronę Zgłoszenia problemów](#)

[Powrót na stronę Zlecenia robocze](#)

[Powrót na stronę szczegółów Zgłoszenia problemów](#)

[Go to APEX](#)

### Code:

```
package pzu.oracle.apps.pa.project.webui;

import oracle.apps.fnd.common.VersionInfo;
import oracle.apps.fnd.framework.webui.OAPageContext;
import oracle.apps.fnd.framework.webui.OAWebBeanConstants;
import oracle.apps.fnd.framework.webui.beans.OAWebBean;
import oracle.apps.fnd.framework.webui.beans.layout.OAPageLayoutBean;
import oracle.apps.fnd.framework.webui.beans.nav.OALinkBean;
import oracle.apps.pa.project.webui.ProjectHomePageLayoutCO;

public class PzuProjectHomePageLayoutCO extends ProjectHomePageLayoutCO
{
    public void processRequest(OAPageContext oapagecontext, OAWebBean oawebbean)
    {
        super.processRequest(oapagecontext, oawebbean);

        OALinkBean returnLink = (OALinkBean)createWebBean(oapagecontext, OAWebBeanConstants.LINK_BEAN, null, "returnLink");
        returnLink.setDestination("http://apex.oracle.com/i/index.html");
        String linkText = "Go to APEX";
        returnLink.setText(linkText);
        ((OAPageLayoutBean)oawebbean).setReturnNavigation(returnLink);
    }
}
```

```

public static final String RCS_ID = "$Header: ProjectHomePageLayoutCO.java 120.1 2005/07/12 11:29:26 appldev ship $";
public static final boolean RCS_IDRECORDED = VersionInfo.recordClassVersion("$Header: ProjectHomePageLayoutCO.java 120.1
2005/07/12 11:29:26 appldev ship $", "oracle.apps.pa.project.webui");
}

```

Note: You can also add link manually, by personalization page. Use described here method only for creating links with dynamic content.

## How to add your own region to the form

Challenge: your own region on the standard form:

 **WSKAZÓWKA** Należy przejść na stronę Szczegóły struktury finansowej, aby przesłać wszystkie nowe zadania do zatwierdzenia lub skasować niezatwierdzone zadania.  
 **WSKAZÓWKA** Jeśli do zatwierdzenia zostało przesłane zadanie z niezatwierdzonym zadaniem nadrzędnym, będzie ono miało status "Oczekujące".  
[Personalizacja "Zgłoszenia problemów"](#)

Personalizacja Table: (WorkRequestsVO)

Zgłoszenie problemu	Opis	Status	Data wymagana	Utworzył	Załączniki
10166	BZ	Odrzucone	21-02-2012	JJOBDA	
20166	Proszę o zakup nowego filtra.	Otwarte	30-03-2012	AKAPIELEWSKA	

Personalizacja "Zlecenia robocze"

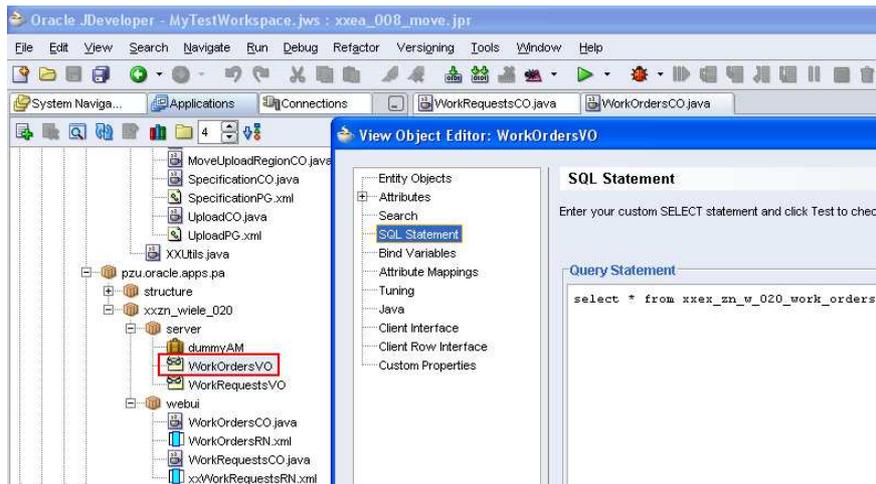
Personalizacja Table: (WorkOrdersVO)

Zlecenie robocze	Urządzenie	Grupa urzędzeń	Opis	Działanie	Data rozp. wg harm.	Status
28003	Klimatyzator General 2	KLII-KLI			27-02-2012	Zamknięte
44008	B1SZC_MATE34_K2_100P	POM-POM			30-04-2012	Wydane
47006	B1SZC_MATE34_K2_100P	POM-POM			10-05-2012	Wydane
44010	B1SZC_MATE34_K2_100P	POM-POM			30-04-2012	Wydane
20001	B1WAWA_POST18_K2	KON-KON			24-02-2012	Zamknięte
10005	Split Fujitsu 5	KLII-KLI	sprzedaż klimatyzacji	konserwacja miesięczna płatna	28-02-2012	Wydane
6002	Klimatyzator Fujitsu 5	KLII-KLI	montaż klimy w pomieszczeniu biurowym		26-02-2012	Wydane
26004	Klimatyzator General 1	KLII-KLI			27-02-2012	Wydane
26008	Klimatyzator Fujitsu 1	KLII-KLI			27-02-2012	Wykonane - bez obciążenia
12001	Klimatyzator General 3	KLII-KLI	montaż klimatyzacji na SOK	konserwacja kwartalna niepłatna	21-04-2012	Zakończone

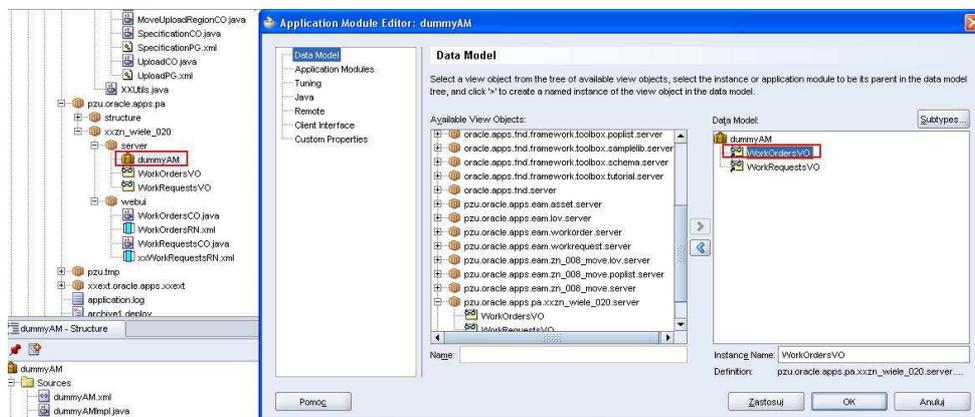
## 1/ Prepare the region in JDeveloper

Prepare VO

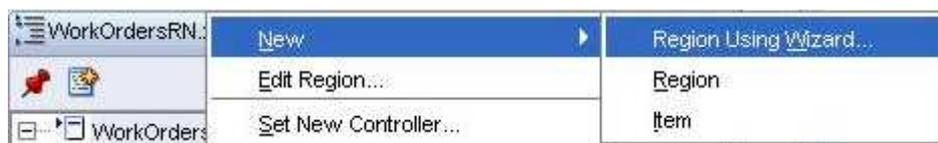


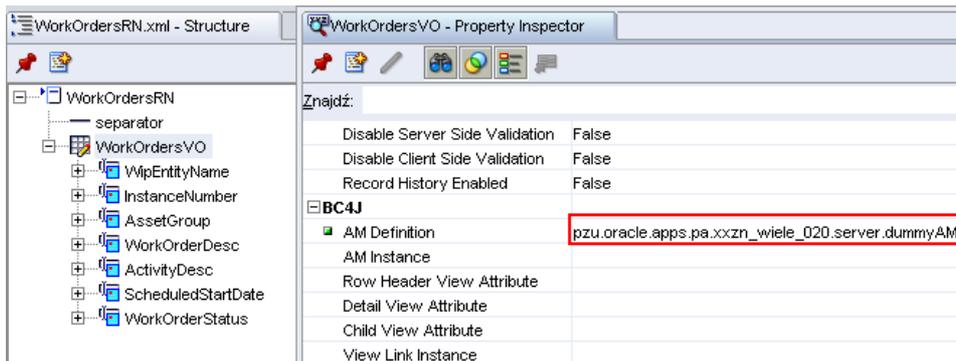


Prepare AM. Pin VO to this AM.



Prepare region with table region inside. Pin AM to this region





Prepare Controller which queries your VO properly



```

WorkRequestsCO.java  WorkOrdersCO.java

public class WorkOrdersCO extends OAControllerImpl
{
    public static final String RCS_ID="$Header$";
    public static final boolean RCS_ID_RECORDED =
        VersionInfo.recordClassVersion(RCS_ID, "%packagename%");

    /**
     * Layout and page setup logic for a region.
     * @param pageContext the current OA page context
     * @param webBean the web bean corresponding to the region
     */
    public void processRequest(OAPageContext pageContext, OAWebBean webBean)
    {
        super.processRequest(pageContext, webBean);
        OAApplicationModule amroot = pageContext.getRootApplicationModule();
        OAViewObjectImpl TaskDetailsVO = (OAViewObjectImpl)amroot.findViewObject("TaskDetailsVO");
        Row r = TaskDetailsVO.getCurrentRow();
        oracle.jbo.domain.Number peId = (oracle.jbo.domain.Number )r.getAttribute("ProjElementId");
        if (pageContext.isLoggingEnabled(OAFwkConstants.STATEMENT)) pageContext.writeDiagnostics(this

        OAApplicationModule am = pageContext.getApplicationModule(webBean);
        OAViewObjectImpl v = (OAViewObjectImpl)am.findViewObject("WorkOrdersVO");
        v.setWhereClause("task_id <> :1");
        v.setWhereClauseParams(null);
        v.setWhereClauseParam(0, peId );
        v.executeQuery();
        v.first();
    }
}

```

```

super.processRequest(pageContext, webBean);
OAApplicationModule amroot = pageContext.getRootApplicationModule();
OAViewObjectImpl TaskDetailsVO = (OAViewObjectImpl)amroot.findViewObject("TaskDetailsVO");
Row r = TaskDetailsVO.getCurrentRow();
oracle.jbo.domain.Number peId = (oracle.jbo.domain.Number )r.getAttribute("ProjElementId");
if (pageContext.isLoggingEnabled(OAFwkConstants.STATEMENT)) pageContext.writeDiagnostics(this, "XXXX Inside
WorkRequestsCO.processRequest peId=" + peId,OAFwkConstants.STATEMENT);

OAApplicationModule am = pageContext.getApplicationModule(webBean);

```

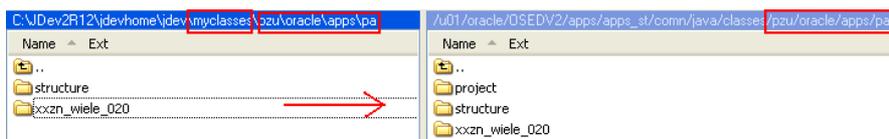
```
OAViewObjectImpl v = (OAViewObjectImpl)am.findViewObject("WorkOrdersVO");
v.setWhereClause("task_id <> :1");
v.setWhereClauseParams(null);
v.setWhereClauseParam(0, peId);
v.executeQuery();
v.first();
```

Keep all created element in one package for your convenience



Deploy region on the server

Copy whole content of your package to \$JAVA\_TOP



Upload region, restart env

```
password=$1
host=$2
port=$3
sid=$4

java oracle.jrad.tools.xml.importer.XMLImporter
$JAVA_TOP/pzu/oracle/apps/pa/xxzn_wiele_020/webui/WorkOrdersRN.xml \
-username apps \
-password $password \
-rootdir $JAVA_TOP/ \
-rootPackage / \
-dbconnection
"(description=(address_list=(address=(community=top.world)(protocol=tcp)(host=$host)(port=$port)))(connect_data=(sid=$sid)))"

$ADMIN_SCRIPTS_HOME/adapctl.sh stop
$ADMIN_SCRIPTS_HOME/adoacorectl.sh stop
$ADMIN_SCRIPTS_HOME/adoacorectl.sh start
$ADMIN_SCRIPTS_HOME/adapctl.sh start
```

## 2/ Pin the region to form using personalization

Tworzenie pozycji

\* Pole wymagane

Poziom Site

Styl pozycji Stack Layout

Właściwość	Wartość
* ID	WorkOrdersRN
AM Definition	
AM Instance	
Add Indexed Children	prawda
Admin Personalization	prawda
Attribute Set	
CSS Class	
Child View Attribute	
Child View Instance	
Comments	
Controller Class	
Extends	/pzu/oracle/apps/pa/xxzn_wiele_020/webui/WorkOrdersRN
Help Target	
Help Target Appl Short Name	
Initial Sort Sequence	none
No Wrap	fałsz

## Region with combobox filter

Desired effect:

\* Filtr Tylko otwarte

Person OrdersVO

Zlecenie	Grupa urządzeń	Grupa urządzeń	Opis	Działanie	Data rozp. wg harm.	Status
10005	Split Fujitsu 5	KLI-KLI	sprzedaż klimatyzacji	konserwacja miesięczna płatna	28-02-2012	Wydane
24001	B1SZC_MATE34	BUD-BUD	przeгляд kominów roczny	przeгляд kominów roczny	24-02-2012	Wydane
26004	Klimatyzator General 1	KLI-KLI			27-02-2012	Wydane
26008	Klimatyzator Fujitsu 1	KLI-KLI			27-02-2012	Wykonane - bez obciążania
44008	B1SZC_MATE34_K2_100P	POM-POM			30-04-2012	Wydane
44010	B1SZC_MATE34_K2_100P	POM-POM			30-04-2012	Wydane
46009	E1	LIC-LIC			09-05-2012	Wydane
47006	B1SZC_MATE34_K2_100P	POM-POM			10-05-2012	Wydane
49007	B1WAWA_POST18M	BUD-BUD			14-05-2012	Kopia robocza
6002	Klimatyzator Fujitsu 5	KLI-KLI	montaż klimy w pomieszczeniu biurowym		26-02-2012	Wydane

Receipt:

1/ Add table or advanced table as usual

2/ Add combobox (=messagechoice) with the following properties:

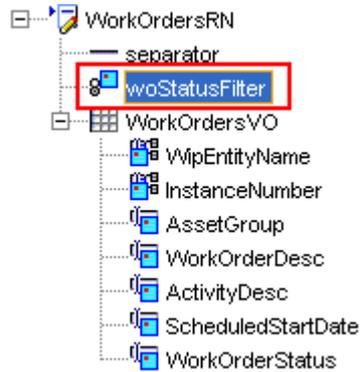
```
<oa:messageChoice
  id="woStatusFilter"
  defaultValue="OPENED"
  pickListDispAttr="Meaning"
  pickListValAttr="LookupCode"
  pickListViewDef="pzu.oracle.apps.pa.xxzn_wiele_020.poplist.server.WrStatusesVO"
  prompt="Filtr"
  required="yes">
  <ui:primaryClientAction>
    <ui:firePartialAction event="StatusFilterChange"/>
  </ui:primaryClientAction>
</oa:messageChoice>
```

```

</ui:primaryClientAction>
</oa:messageChoice>

```

To find out more about creating messagechoice go to section “Picklist (LOV)”



3/ Add controller and catch events: onCreate and on comboBoxChange.

Note that controller must be associated with WorkOrderRN but not with WorkOrdersVO in order to “see” woStatusFilter.

<pre> package pzu.oracle.apps.pa.xzn_wiele_020.webui;  import oracle.apps.fnd.common.VersionInfo; import oracle.apps.fnd.framework.OAApplicationModule; import oracle.apps.fnd.framework.OAFwkConstants; import oracle.apps.fnd.framework.server.OAViewObjectImpl; import oracle.apps.fnd.framework.webui.OAControllerImpl; import oracle.apps.fnd.framework.webui.OAPageContext; import oracle.apps.fnd.framework.webui.OAWebBeanConstants; import oracle.apps.fnd.framework.webui.beans.OAWebBean;  import oracle.apps.fnd.framework.webui.beans.message.OAMessageChoiceBean;  import oracle.jbo.Row;  /**  * Controller for ...  */ public class WorkOrdersCO extends OAControllerImpl {     public static final String RCS_ID="\$Header\$";     public static final boolean RCS_ID_RECORDED =         VersionInfo.recordClassVersion(RCS_ID, "%packageName%");      public void setFilter (OAPageContext pageContext, OAWebBean webBean) {          OAApplicationModule amroot = pageContext.getRootApplicationModule();         OAViewObjectImpl TaskDetailsVO = (OAViewObjectImpl)amroot.findViewObject("TaskDetailsVO");         Row r = TaskDetailsVO.getCurrentRow();         oracle.jbo.domain.Number peId = (oracle.jbo.domain.Number )r.getAttribute("ProjElementId");         if (pageContext.isLoggingEnabled(OAFwkConstants.STATEMENT)) pageContext.writeDiagnostics(this,"XXXX Inside WorkRequestsCO.processRequest peId=" + peId,OAFwkConstants.STATEMENT);          OAMessageChoiceBean StatusFilter = (OAMessageChoiceBean)webBean.findChildRecursive("woStatusFilter");         Object StatusFilterObj = StatusFilter.getValue(pageContext);         String StatusFilterValue = StatusFilterObj.toString();         if (pageContext.isLoggingEnabled(OAFwkConstants.STATEMENT)) pageContext.writeDiagnostics(this,"XXXX Inside WorkRequestsCO.processRequest StatusFilterValue=" + StatusFilterValue,OAFwkConstants.STATEMENT);          /* select status_id, work_order_status --, system_status, system_status_desc from eam_wo_statuses_v order by 1 1      Niewydane 3      Wydane 4      Zakończzone 5      Wykonane - bez obciżania 6      Wstrzymane 7      Anulowane 12     Zamknięte 14     Oczekujące na zamknięcie 15     Zamykanie nie powiodło się 17     Kopia robocza 98     Anulowane przez obsługę zapobiegawczą 99     Anulowane przez osobę zatwierdzającą 1000  Cykliczny - z harmonogramu */ String filterClause = "0=0"; if ( StatusFilterValue.equalsIgnoreCase("OPENED") ) { </pre>	<pre> Function SetFilter keeps entire logic.  Get master VO primary key  Read current value of combobox  Build where clause </pre>
---	--

<pre>         filterClause = "user_defined_status_id not in (98, 99, 12, 4)";     }     if ( StatusFilterValue.equalsIgnoreCase("ALL") ) {         filterClause = "0=0";     }     if ( StatusFilterValue.equalsIgnoreCase("CLOSED") ) {         filterClause = " user_defined_status_id in (98, 99, 12, 4)";     }     if (pageContext.isLoggingEnabled(OAFwkConstants.STATEMENT)) pageContext.writeDiagnostics(this,"XXXX filterClause=" + filterClause,OAFwkConstants.STATEMENT);      OAApplcationModule am = pageContext.getApplicationModule(webBean);     OAViewObjectImpl v = (OAViewObjectImpl)am.findViewObject("WorkOrdersVO");     v.setWhereClause("task_id &lt;&gt; :1 and "+ filterClause);     v.setWhereClauseParams(null);     v.setWhereClauseParam(0, peId );     v.executeQuery();     v.first(); }  /**  * Layout and page setup logic for a region.  * @param pageContext the current OA page context  * @param webBean the web bean corresponding to the region  */ public void processRequest(OAPageContext pageContext, OAWebBean webBean) {     super.processRequest(pageContext, webBean);     setFilter(pageContext, webBean); }  /**  * Procedure to handle form submissions for form elements in  * a region.  * @param pageContext the current OA page context  * @param webBean the web bean corresponding to the region  */ public void processFormRequest(OAPageContext pageContext, OAWebBean webBean) {     super.processFormRequest(pageContext, webBean);     if ("StatusFilterChange".equals(pageContext.getParameter(OAWebBeanConstants.EVENT_PARAM))) {         setFilter(pageContext, webBean);     } } } </pre>	<p>Set where clause and query detail VO.</p> <p>Launch SetFilter on "onCreate" event</p> <p>Launch SetFilter on "onComboboxChange" event</p>
---	--

## Show/ Hide link depending on there is value in a field

Use SPEL ( recommended ) or boundvalues:

```

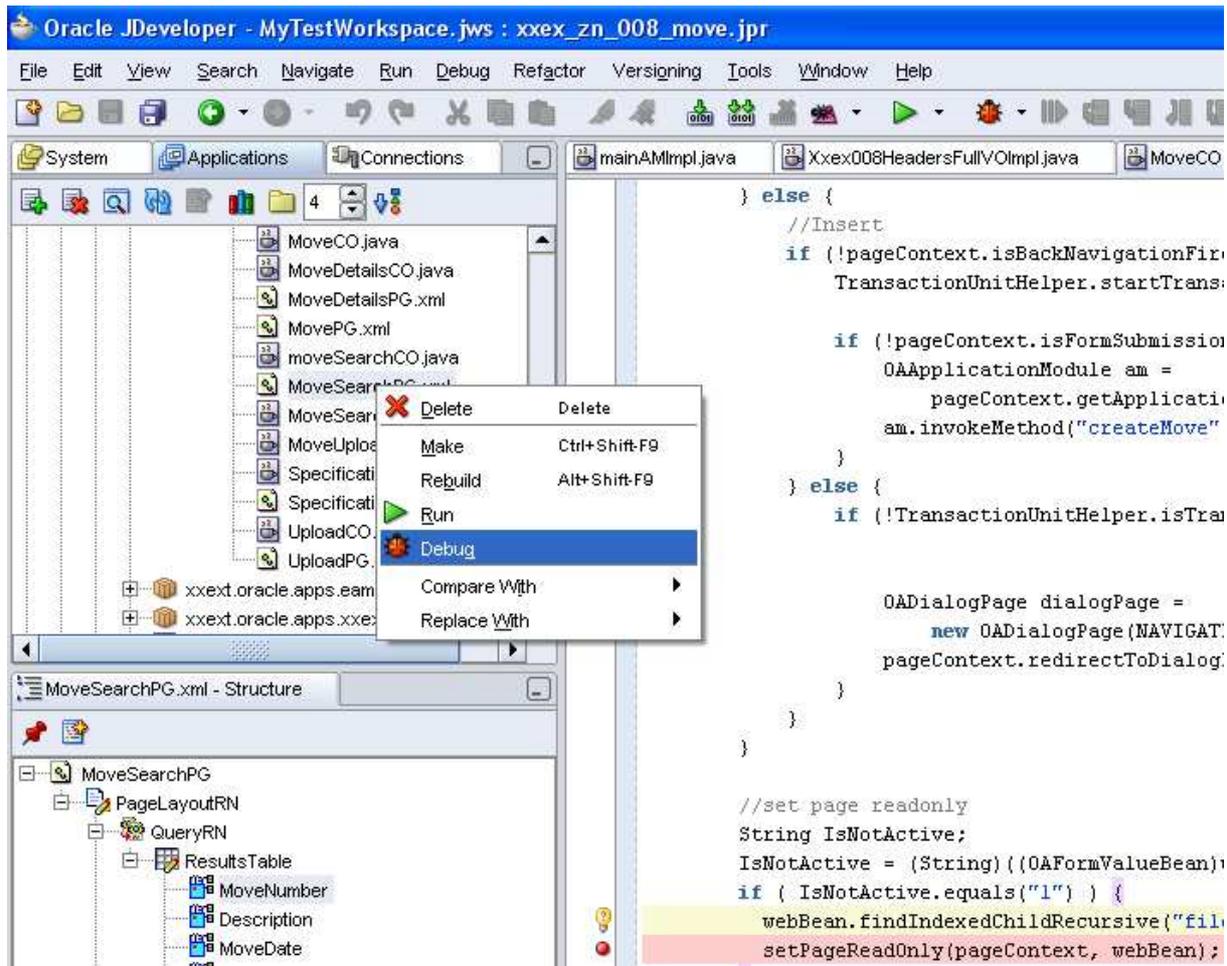
public void processRequest(OAPageContext paramOAPageContext, OAWebBean paramOAWebBean) {
    OAWebBean localObject10;
    localObject10 = paramOAWebBean.findIndexedChildRecursive("ProjDetailsLnkId");
    if (localObject10 != null) {
        localObject10.setAttributeValue( RENDERED_ATTR,
            new ComparisonBoundValue( ComparisonBoundValue.COMPARISON_NOT_EQUALS,
                new OADataBoundValueViewObject( localObject10, "Attribute5", "RequestDetailsVO" ),
                FixedBoundValue.NULL_VALUE ));
    }
}

```

= do not render when RequestDetailsVO.Attribute5 is NULL

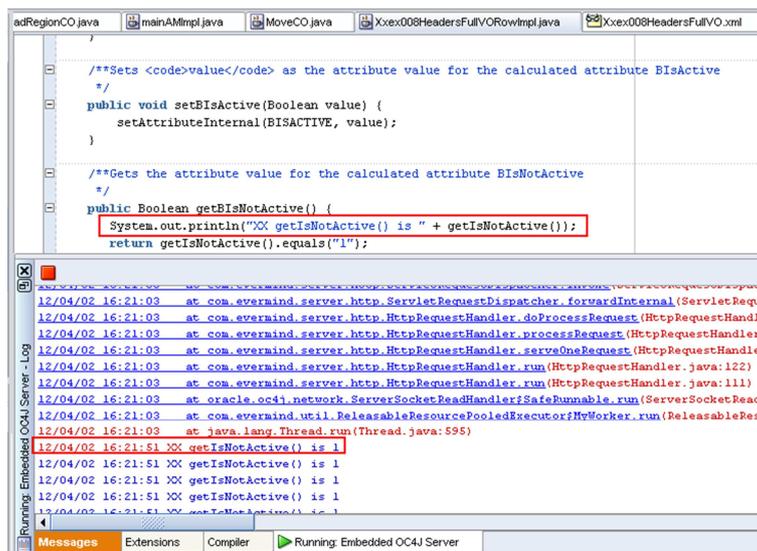
## Logging in the OAF (debug, diagnostics)

### Integrated debug



## Local java debug

System.out.println("")



## Using a button – code for a controller

```
if (pageContext.getParameter("TEST") != null)
{
```

```
String MoveNumber = pageContext.getParameter("MoveNumber");
String MoveId = pageContext.getParameter("MoveId");
OAException sqlErrorMessage = new OAException("MoveNumber=" + MoveNumber
+ " MoveId=" + MoveId , OAException.ERROR);
pageContext.putDialogMessage(sqlErrorMessage); }
```

## In a Controller

### Step 1

```
import oracle.apps.fnd.framework.OAFwkConstants;

if (pageContext.isLoggingEnabled(OAFwkConstants.STATEMENT))
    pageContext.writeDiagnostics(this, "building :"+s_building,OAFwkConstants.STATEMENT);
```

Writes an entry to the diagnostics log according to a specific log level.

#### Parameters:

- module - current module, usually the "this"
- pointermessageText - message to be included in the log. Limit 4000 characters.
- logLevel - category or type of log message. Valid values are from OAFwkConstants. (UNEXPECTED, ERROR, EXCEPTION, EVENT, PROCEDURE, STATEMENT, PERFORMANCE)

### Step 2- show log

Tip: you can use web browser **back** button to go to your page back.

### Set 3- see result:

ORACLE Administrator systemu Diagnostyka Strona startowa Wylogowanie

**Ostrzeżenie**  
Logowanie diagnostyki niskiego poziomu jest włączone. Może to spowodować czasowe zmniejszenie wydajności.

Przeprowadzki - wyszukiwanie

**Wyszukiwanie proste**  
Podczas wyszukiwania nie jest rozróżniana wielkość liter  
Nr zlecenia roboczego

Nr przeprowadzki	Opis	Data przeprowadzki
Nie przeprowadzono wyszukiwania.		

Diagnostyka Strona startowa Wylogowanie Preferencje Strona personalizacji

Informacje na temat tej strony Polityka prywatności

```
Request Parameters
security_group_id=0
esp_id=20420
wkJBSearchTypeSource=/pzu/oracle/apps/eam/zn_008_move/webui/MoveSearchFG_QueryRN_426
```

## To log bc4j objects in OAF

Pagecontext will not be available for AM, View Object Impl and Entity object Impl. So in this case, you can use OADBTransactionImpl.writeDiagnostics to log your messages.

```
oracle.apps.fnd.framework.server.OADBTransactionImpl
```

```
OADBTransaction transaction = getOADBTransaction();
if (transaction.isLoggingEnabled(OAFwkConstants.PROCEDURE)) {
    transaction.writeDiagnostics(this, "your message",
OAFwkConstants.PROCEDURE);
}
```

Now you will be able to see the application log appened to the bottom of the page.

Then set profile option AFLOG\_LEVEL  
"FND: Debug Log Level"/"BOA: Poziom dziennika usuwania błędów" (at user-level).

Finally query FND\_LOG\_MESSAGES in the database for all the debugging messages:

```
SELECT module, message_text
FROM fnd_log_messages
WHERE user_id = AND timestamp > SYSDATE - (1/24/60) -- in the past minute;
this cuts down the number of records
ORDER BY timestamp;
```

You will see this on OAF Debug Screen too.

## How To Generate A SQL Trace In OAF

You can refer to Metalink note **ID 357597.1**

1. Set profile 'FND: Diagnostics' to Yes at user level.
2. Login to Personal Home Page as that user and select the 'Diagnostics' icon at the top of the

page.

3. Select 'Set Trace Level?' and click Go
4. Select the desired trace level and click Save
5. Write down the trace id number(s).
6. Perform the activity that you want to trace
7. Return to the 'Diagnostics' page.
8. Select 'Set Trace Level' and click Go
9. Select 'Disable Trace' and click Go.
10. Write down the trace id number(s) if different.
11. Go to user\_dump\_dest for your database and collect the raw trace file(s) suffixes by the trace id number(s) you have recorded.
12. Exit Applications.

Note: you can identify the user\_dump\_dest directory in your environment by running the following SQL:

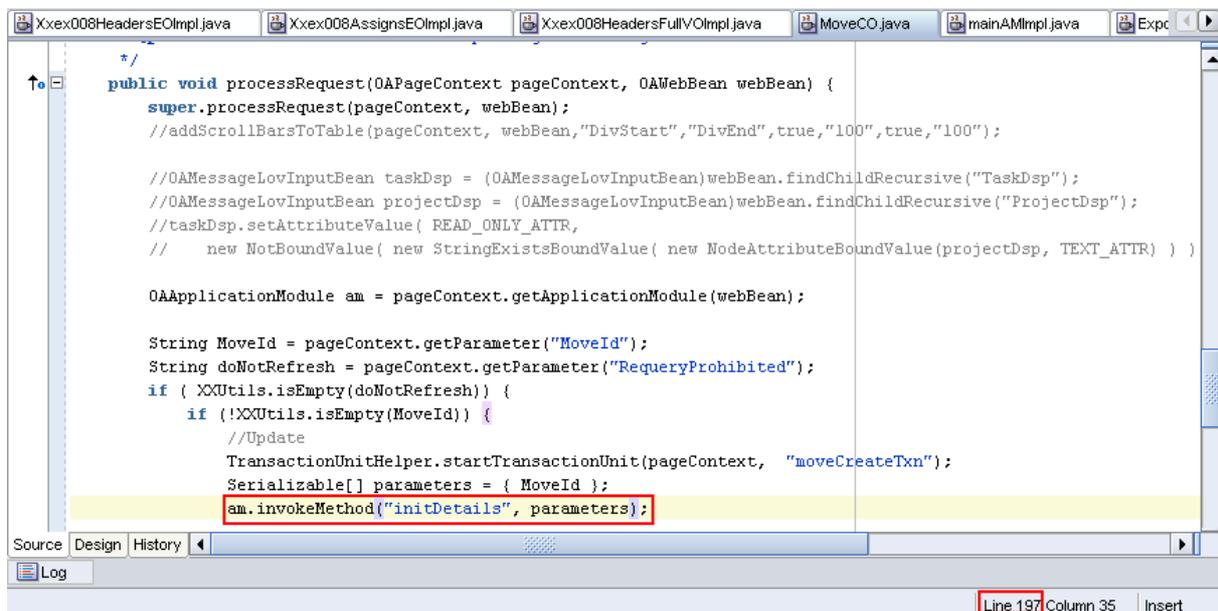
```
SQL> select name, value from v$parameter where name like 'user%';
```

More:

<http://apps2fusion.com/apps/oa-framework/187-debugging-oa-framework-7-different-techniques>

## ***debugging am.invokeMethod***

Be aware of that issue:



```
public void processRequest(OAPageContext pageContext, OAWebBean webBean) {
    super.processRequest(pageContext, webBean);
    //addScrollBarsToTable(pageContext, webBean,"DivStart","DivEnd",true,"100",true,"100");

    //OAMessageLovInputBean taskDsp = (OAMessageLovInputBean)webBean.findChildRecursive("TaskDsp");
    //OAMessageLovInputBean projectDsp = (OAMessageLovInputBean)webBean.findChildRecursive("ProjectDsp");
    //taskDsp.setAttributeValue( READ_ONLY_ATTR,
    //    new NotBoundValue( new StringExistsBoundValue( new NodeAttributeBoundValue(projectDsp, TEXT_ATTR) ) )

    OAApplicationModule am = pageContext.getApplicationModule(webBean);

    String MoveId = pageContext.getParameter("MoveId");
    String doNotRefresh = pageContext.getParameter("RequeryProhibited");
    if ( XXUtils.isEmpty(doNotRefresh) ) {
        if (!XXUtils.isEmpty(MoveId) ) {
            //Update
            TransactionUnitHelper.startTransactionUnit(pageContext, "moveCreateTxn");
            Serializable[] parameters = { MoveId };
            am.invokeMethod("initDetails", parameters);
        }
    }
}
```

Line 197 Column 35 Insert

```
public void initDetails(String MoveId)
{
    int a1d = 1/0;
    Xxex008HeadersFullVOImpl vo = getXxex008HeadersFullV01();
    if (vo == null)
    {
        MessageToken[] errTokens = { new MessageToken("OBJECT_NAME", "getXxex008HeadersFullV01")};
        throw new OAException("AK", "FWK_TBX_OBJECT_NOT_FOUMD", errTokens);
    }
    vo.initQuery( MoveId );
}
```

Line 272 Column 14

In this case you will obtain such stack:

#### Error Page

##### Exception Details.

```
oracle.apps.fnd.framework.OAException: java.lang.ArithmeticException: / by zero
    at oracle.apps.fnd.framework.OAException.wrapperException(Unknown Source)
    at oracle.apps.fnd.framework.OAException.wrapperException(Unknown Source)
    at oracle.apps.fnd.framework.OAException.wrapperInvocationTargetException(Unknown Source)
    at oracle.apps.fnd.framework.server.OAUtility.invokeMethod(Unknown Source)
    at oracle.apps.fnd.framework.server.OAUtility.invokeMethod(Unknown Source)
    at oracle.apps.fnd.framework.server.OAApplicationModuleImpl.invokeMethod(Unknown Source)
    at pzu.oracle.apps.eam.zn_008_move.webui.MoveCO.processRequest(MoveCO.java:197)
    at oracle.apps.fnd.framework.webui.OAWebBeanHelper.processRequest(Unknown Source)
    at oracle.apps.fnd.framework.webui.OAWebBeanContainerHelper.processRequest(Unknown Source)
```

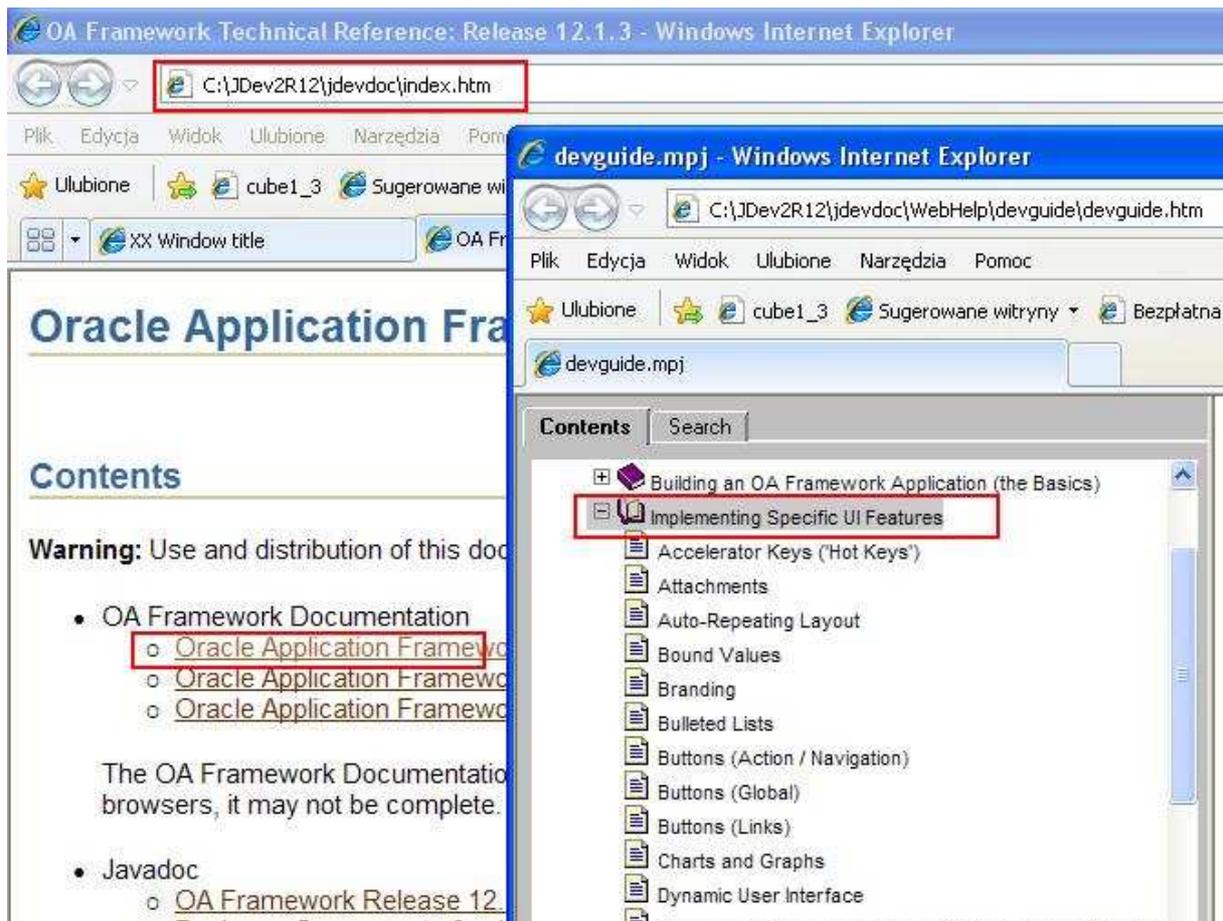
**There is NO INFO about line 272 in file mainAMImpl.java**

## inne informacje

***Apps2fusion.com - great video presentations by anil passi***

<http://imdjkoch.wordpress.com/category/oracle/oracle-technologies/oa-framework/> - brilliant articles R12compatible

## ***Fine help***



OAF form/region status ? ?dirty

OAF użytkownik będzie mógł 'przesuwać' zakres wyświetlanych linii przy użyciu pionowego suwaka w tabeli

OAF region na bazie bazy danych

Debugger

Personalizacja - dodanie pola