

From Forms to APEX

Summit Case Study

Using PITSS.CON APEX Assistant
to re-engineer an Oracle Forms application
to Oracle Application Express

PITSS.CON 12.3.1

Case Study, May 2014



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Introduction

PITSS.CON Forms2APEX Assistant

This assistant helps to convert your Oracle Forms application to Oracle Application Express. This How-To will go through the conversion process for the Oracle Forms demo application, Summit, which can be downloaded from OTN.

1. Audience

This guide is for Oracle Forms developers with basic knowledge of APEX programming.

2. Prerequisites

2.1 Demo schema installation

For this guide it is not necessary to run the Summit Demo Application. It is sufficient to create the database user and import the database dump. Download the Forms Summit Application from OTN and follow the enclosed installation instructions.

To use the TIF images included in the Summit Demo Application they have to be converted to GIFs, then these images have to be copied to the image folder of the web server. But not everyone has access to a web server, so this document shows how to do it another way, which everyone can use (Application Builder -> Shared Components -> Files -> Images -> Upload as Application Image or as Workspace Image).

2.2 APEX installation

As described in the Oracle Application Express Installation Guide—How to install Oracle Application Express. To access Oracle APEX there are 4 ways to configure APEX on your database:

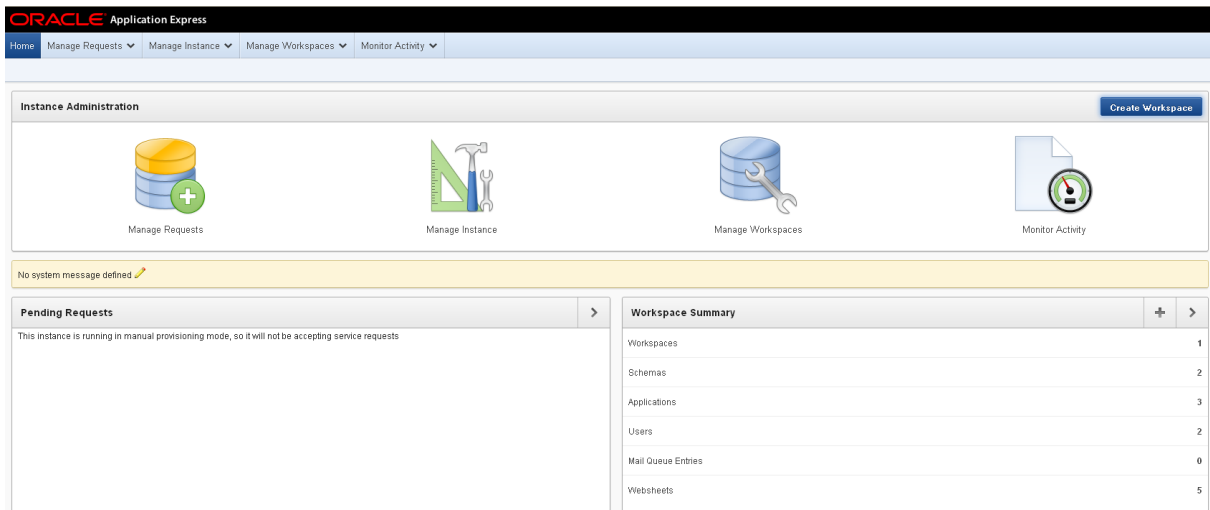
- Oracle Rest Data Services (formerly known as Oracle APEX Listener) in standalone mode
- Oracle Rest Data Services deployed on Application servers (Weblogic, Glassfish, Tomcat)
- Oracle HTTP Server
- Embedded PL/SQL Gateway

Please choose the appropriate approach for your environment.

2.3 APEX environment preparation

After the installation please set up a workspace for the demo schema and create a developer user so that the generated APEX application can be imported and edited.

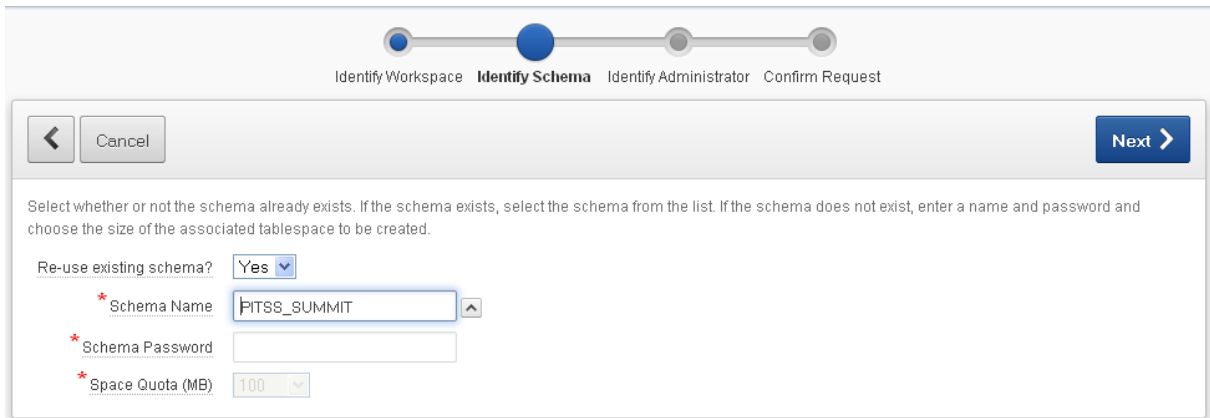
To create a new workspace, login as Administrator and click on the button "Create Workspace".



The screenshot shows the Oracle Application Express Instance Administration interface. At the top, there are navigation tabs: Home, Manage Requests, Manage Instance, Manage Workspaces, and Monitor Activity. Below this is the 'Instance Administration' section with a 'Create Workspace' button. It contains four main icons: Manage Requests, Manage Instance, Manage Workspaces, and Monitor Activity. A yellow message bar indicates 'No system message defined'. Below the message bar, there are two panels: 'Pending Requests' (showing a message about manual provisioning mode) and 'Workspace Summary' (a table with the following data):

Workspace Summary	Count
Workspaces	1
Schemas	2
Applications	3
Users	2
Mail Queue Entries	0
Web sheets	5

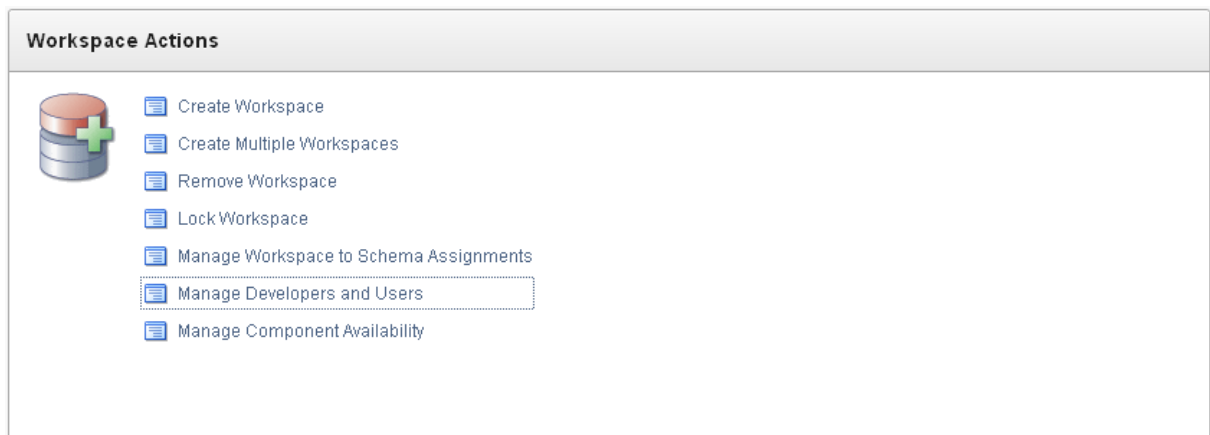
Set a name for the workspace in this dialog and select to reuse an existing schema—choose SUMMIT as the schema.



The screenshot shows the 'Identify Schema' dialog box in the Oracle Application Express workspace creation process. The progress bar at the top shows four steps: Identify Workspace, Identify Schema (current), Identify Administrator, and Confirm Request. The dialog has 'Cancel' and 'Next' buttons. The instructions state: 'Select whether or not the schema already exists. If the schema exists, select the schema from the list. If the schema does not exist, enter a name and password and choose the size of the associated tablespace to be created.' The form fields are: 'Re-use existing schema?' (Yes), '* Schema Name' (PITSS_SUMMIT), '* Schema Password' (empty), and '* Space Quota (MB)' (100).

Choose an administrator name and a password to finish creating the new workspace.

To use the workspace please create users. To do so click the link “Manage Developers and Users” in the Workspace Actions module.



The screenshot shows the 'Workspace Actions' module. It features a database icon with a plus sign and a list of actions: Create Workspace, Create Multiple Workspaces, Remove Workspace, Lock Workspace, Manage Workspace to Schema Assignments, Manage Developers and Users (highlighted with a dashed border), and Manage Component Availability.

Fill in the requested information and set SUMMIT as the default schema.

User:
Cancel **Create User** Create and Create Another

Show All User Attributes Account Privileges Password

User Attributes

* Username:

* Email Address:

First Name:

Last Name:

Description:

Default Date Format:

Account Privileges

* Workspace:

* Default Schema:

Accessible Schemas (null for all):

User is an administrator: Yes No

User is a developer: Yes No

Application Builder Access:

SQL Workshop Access:

Team Development Access:

Account Availability:

Password

Password: Passwords are case sensitive

Confirm Password:

Require Change of Password on First Use:

Further information can be found in the [Oracle Application Express Administration Guide](#).

3. Conversion

3.1 Import application to the PITSS.CON repository

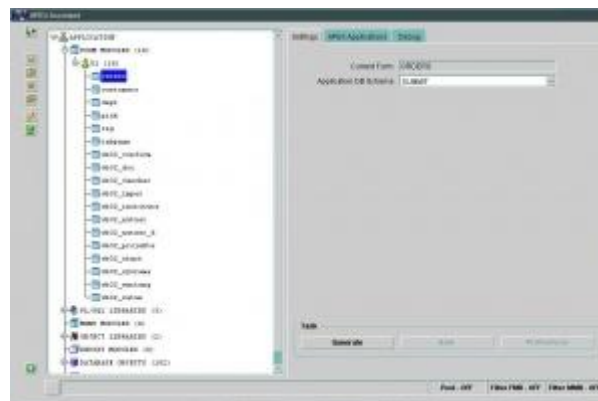
- Copy all FMBs files to the fmb folder of the PITSS.CON user.
- Copy all libraries (OLB, PLL) to the olb folder of the PITSS.CON user.
- Load all following objects of the Summit Demo application with the PITSS.CON Maintenance Module in the repository:
 - a. database schema
 - b. Forms libraries
 - c. Forms

3.2 Forms2APEX Assistant

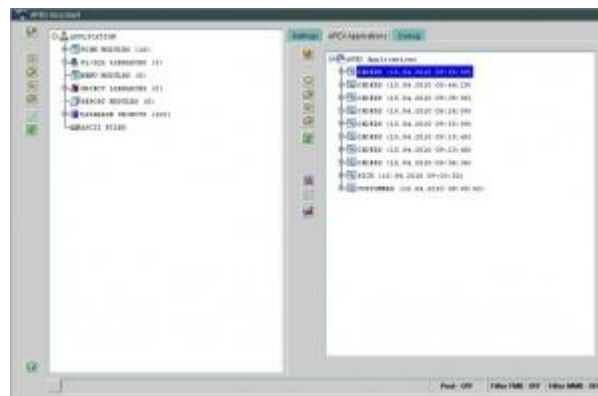
1. Open the Forms2APEX Assistant.



2. Choose the ORDERS Form from the Form Modules branch.



3. Choose the SUMMIT schema on the **Settings** tab page.
4. Press the **Generate** button.
5. Change to the **APEX Applications** tab page.



6. Click on the converted ORDERS Form in the tree.
7. Press the **Save** button to write the APEX PL/SQL script to the file system.
8. Right-click the on root of the converted ORDERS Form application and choose **View Log**.
9. The PITSS.CON Editor opens and the log file can be saved or printed.

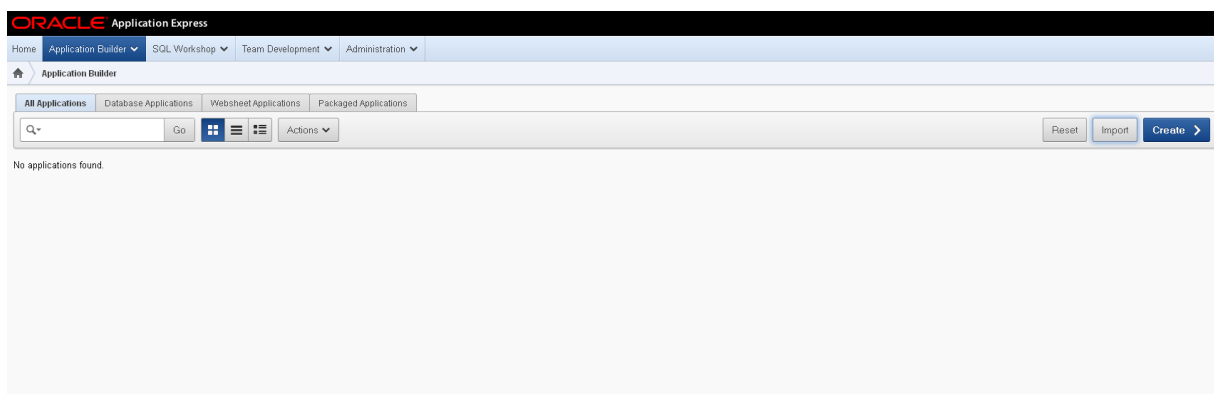
```

1
2 PITSS.CON APEX Generation Log
3
4
5 Application Name      : ORDERS
6 Forms Module Name    : ORDERS
7 Created at           : 05/05/2014 15:10
8
9
10 Summary of Forms Objects:
11
12 Object Type          Total      Transformed
13
14 Alert                2          0
15 Attached Library    1          0
16 Block                5          5
17 Canvas              5          5
18 Form Module         1          1
19 Graphics            12         0
20 Item                42        39
21 List of Values      1          0
22 Program Unit        6          0
23 Radio Button        2          0
24 Record Group        1          1
25 Relation            2          2
26 Trigger             47        11
27 Window              3          0
28
29
30 Generated APEX Objects :
31
32 Forms Object         APEX Object
33
34 Form Module         ORDERS
35 Application          ORDERS (Application)
36
37
38
39

```

3.3 Import the conversion output

1. Log into Apex as developer or administrator.
2. Open the Application Builder.



3. Click the **Import** button.
4. For the Import file select the APEX PL/SQL script which has been saved before.
 - **File Type:** Application, Page or Component Export
 - **File Character Set:** Unicode UTF-8

Specify File File Import Confirmation Install

Cancel Next >

Select the file you wish to import to the export repository. Once imported, you can install your file.
If the imported file is a packaged application export, the installation wizard will allow you to run the packaged installation scripts after installing the application definition.

* Import file: C:\Dokumente und Einstellungen\Administra\... Durchsuchen...

* File Type:

- Database Application, Page or Component Export
- Websheet Application Export
- Plug-in
- CSS Export
- Image Export
- File Export
- Theme Export
- User Interface Defaults
- Team Development Feedback

File Character Set: Unicode UTF-8

Tasks

- [Manage Export Repository](#)
- [Export](#)
- [Component Export](#)

5. After uploading the file choose SUMMIT as parsing schema.

- **Build Status:** Run and Build Application
- **Install As Application:** Auto Assign New Application ID

Specify File File Import Confirmation Install

< Cancel Install Application

When you install an application having the same ID as an existing application in the current workspace, the existing application is deleted and then replaced by the new application. If you attempt to install an application having the same ID as an existing application in a different workspace, a benign error message displays. If you are importing a packaged Application Express application, the installation wizard will allow you to install supporting objects.

Current Workspace: **PITSS_SUMMIT**

Export File Workspace ID: **122**

Export File Application ID: **122**

Export File Version: **2009.01.12**

Export File Parsing Schema: **PITSS_SUMMIT**

Application Origin: **This application was exported from another workspace.**

* Parsing Schema: PITSS_SUMMIT

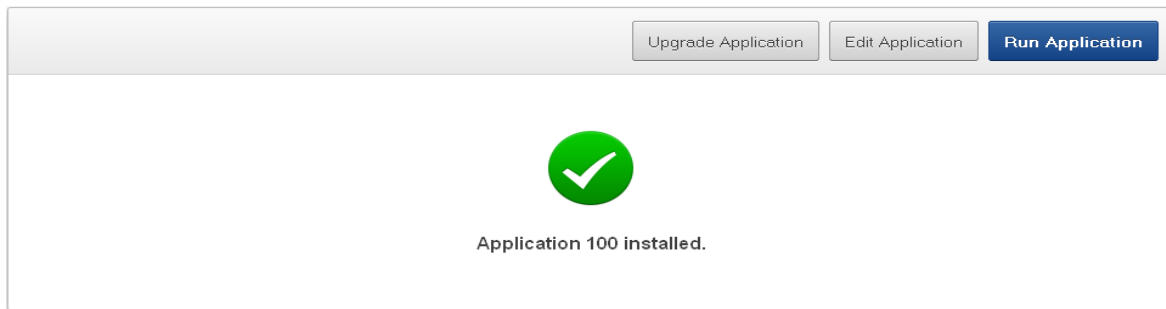
* Build Status: Run and Build Application

* Install As Application:

- Auto Assign New Application ID
- Reuse Application ID 122 From Export File
- Change Application ID

> **Tasks**

6. Install and edit the application.



4. Manual adjustments

4.1 Edit the order page

Go to Shared Components -> Navigation -> Tabs -> Manage tabs (Tab Set: T_TS_ORDERS) and click on "Cv_Order". Change the label to "Orders".

At "Manage Tabs" click on the parent tab called "Orders" and change the attributes as seen here:

Parent Tab Set:	ORDERS
* Sequence	10
* Name	T_TS_ORDERS
Current on Standard TabSet	T_TS_ORDERS (Home, Cv_Order, Cv_Inventory...)
* Label	ORDERS

Tab Target	
Target type	Page in this Application
Page	1 <input type="checkbox"/> reset pagination for this page

Go to the edit page and change the title to "Orders".

Editing the region S_ORD

- Go to Page 2.
- Change the title to "Order Information" and change User Interface -> Template -> to "Reports Region".
- Apply the changes.
- Go to the "Delete" button in "Order Information", set the condition to "Not Exists" and enter the following code:

```
SELECT 1
FROM S_ITEM
WHERE ORD_ID = :P2_S_ORD_ID
```

➔ This is needed so that only the order data that has no more references can be deleted.

Set the customer name to be displayed-> Go to P2_S_ORD_CUSTOMER_NAME -> Source:

Source

Source Used:

Source Type:

[static text] [DB Column] [SQL Query] [PL/SQL expression] [PL/SQL function body]

Maintain session state:

Source value or expression

SELECT NAME FROM S_CUSTOMER WHERE ID = v('P2_S_ORD_CUSTOMER_ID');

Post Calculation Computation

Format Mask:

Editing the region S_ITEM

Some columns have to be added to this report region. Columns are missing for the name of the image of an item as well as one column for displaying the image itself. Before the function called "get_product_image" can be used it has to be compiled in the SUMMIT schema using SQL Developer (or SQL PLUS, TOAD etc.):

```

create or replace FUNCTION "GET_PRODUCT_IMAGE" (product_number IN
NUMBER) RETURN VARCHAR2 IS
v_filename VARCHAR2(20);--
BEGIN
    SELECT s_image.filename INTO v_filename
    FROM   s_image, s_product
    WHERE  s_image.id = s_product.image_id
    AND
           s_product.id = product_number;
    if v_filename is null then
        v_filename := 'No file';
    end if;
    RETURN v_filename;
EXCEPTION
    WHEN no_data_found THEN return('No file');
END;
```

- Change the region title to "Items" and change User Interface -> Template -> to "Reports Region"
- Adapt the region source SQL query :
 - Add a column for the Item Picture
 - ,replace(get_product_image(PRODUCT_ID), '.tif','.gif') image_name

The new SQL Query should like this:

```
SELECT
  "ROWID"
, "ITEM_ID"
, "ORD_ID"
, "PRICE"
, "PRODUCT_ID"
, "QUANTITY"
, "QUANTITY_SHIPPED"
, (QUANTITY_SHIPPED*PRICE) Item Total
, "PRODUCT_ID" PRODUCT_ID_DISPLAY1
, replace(get_product_image(PRODUCT_ID), '.tif','.gif') image_name
from S_ITEM
where ORD_ID=:ORDERS_ID
```

➔ Apply your changes

- Change to the "Report Attributes" tab.

- Rearrange the columns (see screen shot).
- Edit the headings (see screen shot).
- In Column Image (Derived Column) set the display as Standard report column.
- Enter the following text in Column Image "Column Formatting" -> HTML Expression:

```

```

- Upload the images into APEX Application Builder -> Application 100 -> Shared Components -> Images (for being displayed in the report).
- ➔ If the images are not located in the environment of the server, or if a server (e.g. standalone) is not used this way, the best option is to upload the images in the so-called Shared Components section of your APEX Application. Then there is the choice of how to reference them, between Application Images and Workspace Images. If Workspace Images is chosen they are not related only to one specific application, so the images can be used (by referencing them) in every application of your workspace. In this Conversion of SUMMIT the Reference of Workspace Images is used.

- Go to Product_ID -> Set Display as "Select List (named LOV)" and click Apply Changes.

Region Name: Items

Show All Column Attributes Layout and Pagination Sorting Messages Report Export Break Formatting External Processing

Column Attributes

Headings Type: Column Names Column Names (InitCap) Custom PL/SQL None

Alias	Link	Edit	Heading	Column Width	Column Alignment	Heading Alignment	Show	Sum	Sort	Sort Sequence
[row selector]		✓	Select Row		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
ROWID			Rowid		left	center	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
ITEM_ID		✓	Item Id		left	center	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
ORD_ID		✓	Ord Id		left	center	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
PRODUCT_ID		✓	Product		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
PRICE		✓	Price		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
QUANTITY		✓	Quantity		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
QUANTITY_SHIPPED		✓	Shipped		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
IMAGE_NAME			Image Name		left	center	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
ITEM_TOTAL			Item Total		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-
[derived column]			Image		left	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
PRODUCT_ID_DISPLAY1	✓		Stock		right	center	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	-

When moving the last column further down, it will show up as the first column of your report.
When moving the first column up, it will be moved to the end of your report.

Adding the insert functionality for "Items" Region

First compile the following Sequence in SQL Developer (or SQL Plus, TOAD etc.):

```
CREATE SEQUENCE „SUMMIT"."S_ITEM_ID" MINVALUE 1 MAXVALUE 9999999
INCREMENT BY 1 START WITH 1 NOCACHE NOORDER NOCYCLE;
```

The next Step is to create this Trigger:

```
create or replace TRIGGER BI_S_ITEM
before insert on S_ITEM
for each row
begin
if :NEW.ITEM_ID is null then
select S_ITEM_ID.nextval into :NEW.ITEM_ID from dual;
end if;
end;
```

Add order sum

In the "Orders" region, add an item to this region to display the value of the order:

- Item: Display only
- Item Type: Display as Text (does not save state)
- Item Name: P2_ORDER_TOTAL
- Sequence: 115

- Region: Items
- Label: Order Total
- Label alignment: Left
- Label Template: No Template
- Item Source: SQL Query:

```
Select
to_char(sum(price*quantity_shipped), '999G999G999G999G990D00')
from s_item where ord_id=:P2_S_ORD_ID
```

Edit Control region

- Set the condition of the “Control” region to “Never”.

4.2 Edit Page Zero

- Go to Page 0 (Page Zero/Global Page)
- Set the title to “Toolbar” and column: 1, sequence: 1, and change User Interface -> Template -> to “Reports Region”.
- Delete items PO_CONTROL_IMMEDIATE, PO_CONTROL_AUTO_QUERY.
- Set the conditions of IMAGE_BUTTON and STOCK_BUTTON to “Never”.
- Edit the EXIT button:
 - a. Redirect to URL:


```
f?p=&APP_ID.:101
```
 - b. Apply Changes.

The screenshot displays the top navigation bar of an Oracle APEX application. The main header is blue and contains the text "ORDERS" on the left, a user profile icon labeled "u1" and a "Logout" button on the right. Below the main header is a secondary navigation bar with tabs for "Home", "Orders", "Inventory", and "Customers". To the right of these tabs is a button labeled "ORDERS". Below the navigation bar is a "Menu" section with a grey header. The menu contains two items: "S_CUSTOMER" and "S_ORD", each with a horizontal line underneath it.



ORDERS

u1 Logout

Home Orders Inventory Customers

ORDERS

Q

Go

Actions

Create

ID	CUSTOMER_ID	DATE_ORDERED	DATE_SHIPPED	SALES_REP_ID	TOTAL	PAYMENT_TYPE	ORDER_FILLED
	201	07.08.1992	10.09.1992	11	601100	CREDIT	N
	202	17.08.1992	01.09.1999	14	8056,6	CASH	Y
	202	01.09.1992	08.09.1992	15	8335	CASH	Y
	202	02.09.1992	22.09.1992	15	377	CREDIT	Y
	201	03.09.1992	23.09.1992	15	32430	CASH	Y
	202	04.09.1992	18.09.1992	11	2722,24	CREDIT	Y
	202	07.09.1992	29.09.1992	12	15634	CREDIT	Y
	201	07.09.1992	21.09.1992	15	142171	CREDIT	Y
	212	07.09.1992	10.09.1993	13	149570	CREDIT	Y
	213	08.09.1992	28.09.1992	11	1020935	CREDIT	Y
	214	30.09.1992	21.09.1992	11	1539,13	CASH	Y
	204	09.09.1992	21.09.1992	11	2770	CASH	Y
	201	28.08.1992	17.09.1992	12	84000	CREDIT	Y
	202	31.08.1992	10.09.1992	14	595	CASH	Y
	203	31.08.1992	18.09.1992	14	7707	CREDIT	Y

1 - 15

[Set Screen Reader Mode On](#)

release1.0



ORDERS

u1 Logout

Home Orders Inventory Customers **ORDERS**

Toolbar

Help Exit

Order Information

Cancel Apply Changes < >

Customer Name

Order Id

Customer Id

Date Ordered

Date Shipped

Sales Rep Id

Sales Rep Name

Payment Type Cash Credit

Order Filled

Order Total 11.763,00
15 of 3730

Items

Delete Checked Add Row

<input type="checkbox"/>	Product	Price	Quantity	Shipped	Item Total	Image	Stock
<input type="checkbox"/>	<input type="text" value="Chapman Helmet"/>	<input type="text" value="22.89"/>	<input type="text" value="75"/>	<input type="text" value="75"/>	1716,75		
<input type="checkbox"/>	<input type="text" value="Alomar Glove"/>	<input type="text" value="75"/>	<input type="text" value="98"/>	<input type="text" value="98"/>	7350		

4.3 Edit the stock page

Go to the parent tabs and open the tab "Cv_Inventory". Change the label to "Inventory".

Go to the edit page and change the title to "Inventory".

Change the title of region C_INVENTORY to "Stock Information" and change User Interface -> Template -> to "Reports Region".

Editing the report region S_INVENTORY

Set the Add_Row button to "Never" (-> Conditions) because it won't be used. The report region is displayed for updating and deleting but not for creating a new entry.

ORDERS u1 Logout

Home Orders **Inventory** Customers ORDERS

Stock Information Cancel Delete Submit

<input type="checkbox"/>	In Stock	Max In Stock	Reorder Point	Restock Date	Warehouse Id
<input type="checkbox"/>	<input type="text" value="233"/>	<input type="text" value="350"/>	<input type="text" value="200"/>	<input type="text" value=""/>	<input type="text" value="101"/>
<input type="checkbox"/>	<input type="text" value="75"/>	<input type="text" value="100"/>	<input type="text" value="60"/>	<input type="text" value=""/>	<input type="text" value="201"/>
<input type="checkbox"/>	<input type="text" value="224"/>	<input type="text" value="280"/>	<input type="text" value="150"/>	<input type="text" value=""/>	<input type="text" value="401"/>

1 - 3

4.4 Edit the customers page

Go to the parent tabs and open the tab "Cv_customer". Change the label to "Customers".

Go to the edit page and change the title to "Customers".

Change the title of region S_CUSTOMER to "Customer Information" and change User Interface -> Template -> to "Reports Region".

Add a process to the page:

- Type: PL/SQL
- Name: set customer totals
- Point: On Load-After Header
- PL/SQL Process:

```

DECLARE
v_sum number;
BEGIN
select nvl(sum(total),0)
INTO :P6_S_CUSTOMER_TOTAL_CASH
from s_ord
where customer_id = :P6_S_CUSTOMER_ID
and payment_type = 'CASH';
select nvl(sum(total),0)
INTO :P6_S_CUSTOMER_TOTAL_CREDIT
from s_ord
where customer_id = :P6_S_CUSTOMER_ID
and payment_type = 'CREDIT';
:P6_S_CUSTOMER_TOTAL:= round(:P6_S_CUSTOMER_TOTAL_CREDIT +
:P6_S_CUSTOMER_TOTAL_CASH,2);
select sum(total)
INTO v_sum
from s_ord;
:P6_S_CUSTOMER_OF_TOTAL :=
round((:P6_S_CUSTOMER_TOTAL/v_sum)*100,2);

```




END;

Condition EXISTS: select distinct 1 from s_ord where customer_id = :P6_S_CUSTOMER_ID

ID	NAME	PHONE	ADDRESS	CITY	STATE	COUNTRY	ZIP_CODE	CREDIT_RATING	SALES_REP_ID	REGION_ID	COMMENTS
	Unisports	55-2066101	72 Via Bahia	Rio de Janeiro	-	Brazil	-	EXCELLENT	23	2	Customer usually orders large amounts and has a high order total. This is okay as long as the credit rating remains excellent.
	Simms Athletics	81-20101	6741 Takashi Blvd.	Osaka	-	Japan	-	GOOD	14	4	Customer should always pay by cash until his credit rating improves.
	Delhi Sports	91-10351	11368 Chanakya	New Delhi	-	India	-	GOOD	14	4	Customer specializes in baseball equipment and is the largest retailer in India.
	Womansport	1-206-104-0103	281 King Street	Seattle	Washington	USA	98101	EXCELLENT	11	1	-
	Kam's Sporting Goods	852-3692888	15 Henessey Road	Hong Kong	-	-	-	EXCELLENT	15	4	-
	Sportique	33-2257201	172 Rue de Rivoli	Cannes	-	France	-	EXCELLENT	15	5	Customer specializes in Soccer. Likes to order accessories in bright colors.
	Sweet Rock Sports	234-6036201	6 Saint Antoine	Lagos	-	Nigeria	-	GOOD	-	3	-
	Muench	49-527454	435	Stuttgart	-	Germany	-	GOOD	15	5	Customer

ORDERS		u1	Logout
Home	Orders	Inventory	Customers
ORDERS			
Customer Information Cancel Delete Apply Changes			
Id	<input type="text" value="202"/>		
Name	<input type="text" value="Simms Athletics"/>		
Credit Rating	<input type="text" value="GOOD"/>		
Comments	<input type="text" value="Customer should always pay by"/>		
Total Cash	<input type="text" value="1713725.55"/>		
Total Credit	<input type="text" value="18733.24"/>		
Total Customer	<input type="text" value="1732458.79"/>		
%Total Sales	<input type="text" value="4,97"/>		

5. Summary

This case study initially defines the audience for which this document was made for and which prerequisites have to be fulfilled to create a successful conversion of the "Summit" application from Oracle Forms to Oracle Apex. The installations of the Demo Schema and of Apex have been described as well as the necessary prerequisites for the Apex environment. After that the approach for the conversion is shown: Starting with the import of the FMBs-files, to the right handling of the PITSS.CON Apex Assistant through to the final export of the SQL-File, which then can be imported in Apex without problems. In a last step the case study shows how the few manual adjustments for converting the "Summit" Application completely and successfully are covered. Looking to the future it can be said that the PITSS.CON Apex Assistant becomes more efficient, the degree of automation for migrations further increases and one is well prepared for the release of Apex 5.0.

About PITSS

PITSS is the leading supplier of fully integrated solutions for effective management of Oracle Forms applications. The PITSS Group was established in 1999 and has gained international recognition with over 1,000 customers and a multitude of successful Oracle projects. PITSS is an Oracle Gold partner and, as a member of the Oracle Modernization Alliance (OMA), is the only Oracle Forms Migration partner for automated migrations. With sites in Stuttgart (HQ), Wolfratshausen near Munich, Bielefeld (Germany), Milton Keynes (UK) and Troy (USA) as well as certified international partners, the company successfully provides support for IT projects of medium sized companies, large enterprises and public contractors across the globe.

PITSS.CON

The high performance software solution PITSS.CON has been convincing for years in all areas and phases of Oracle Forms projects through a high level of automation, speed, efficiency and reliability. The repository-based PITSS.CON tool provides support from analysis with exact project estimation, code revision and processing of business logic, right up to documentation and quality assurance. The savings are 30 % on average and often reach 90 %. With the upgrade of older Forms versions on Web-Logic Server 11g as well as technologically driven migrations, PITSS.CON meets the requirements for Oracle Forms & Reports, SOA, ADF, APEX to any GUI.



From Forms to APEX - Summit Case Study

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Authors: Markus Salm, Nihad Haskovic

Reviewer: Madi Serban

PITSS in Europe

Germany

+49-711-728.752.00

sales@pitss.com

www.pitss.com

PITSS in Americas

USA

+ 1 248.740.0935

pitssamerica@pitss.com

www.pitss.com

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