Oracle Application Express - Application Migration Workshop

Microsoft Access “Northwind Traders” Migration to Oracle Application Express

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1.0 Introduction

This document contains a guide to migrate the commonly used Microsoft Access sample application, Northwind Traders, to Oracle Application Express. This is a multi-step process that utilizes several products to migrate first the database to Oracle and then the application. It is important that these steps are carried out in the order in which they appear. This exercise is useful for any user that wishes to undertake migrating their applications from MS Access to Oracle Application Express.

The migration process begins with the use of the Exporter tool together with Oracle SQL Developer Migration Workbench, to export the Northwind Traders database and application metadata, and migrate the database objects to Oracle. After that initial step, you then use Application Migrations to generate a Migration Project based upon the application metadata retrieved by the Exporter tool from Northwind Traders, and the migrated Oracle database. Within the Migration Project, the retrieved objects can be reviewed and modified, where necessary, to make them valid for Oracle. As the final step, you have the option of generating either an application based on valid forms and reports or a maintenance application based on valid tables and views within the Migration Project.

2.0 Export Northwind Traders Metadata

The Exporter for Microsoft Access tool enables you to extract database and application schema information from a Microsoft Access database for migration to Oracle. It is shipped as part of both the Oracle SQL Developer Migration Workbench and Oracle Application Express 3.0.

The database migration should be carried out before the migration of your forms & reports. With this in mind, you should firstly use Oracle SQL Developer Migration Workbench, from which the Exporter tool can be launched. Review Export via Oracle SQL Developer Migration Workbench for further information.

Alternatively, for the convenience of users who may not have carried out the database migration themselves, but wish to migrate their MS Access Forms & Reports to Oracle Application Express, the Exporter is available for download via Oracle Application Express 3.0. Review Export via Oracle Application Express for further information.

Export via Oracle SQL Developer Migration Workbench

1. Download and install the latest version of Oracle SQL Developer Migration Workbench from OTN.

2. Navigate to your Oracle SQL Developer install, and run \sqldeveloper\sqldeveloper.exe to launch Oracle SQL Developer.

3. Form the menu bar, select **Help** > **About** and review the list of installed extensions, to ensure that Oracle Migration Workbench is installed.

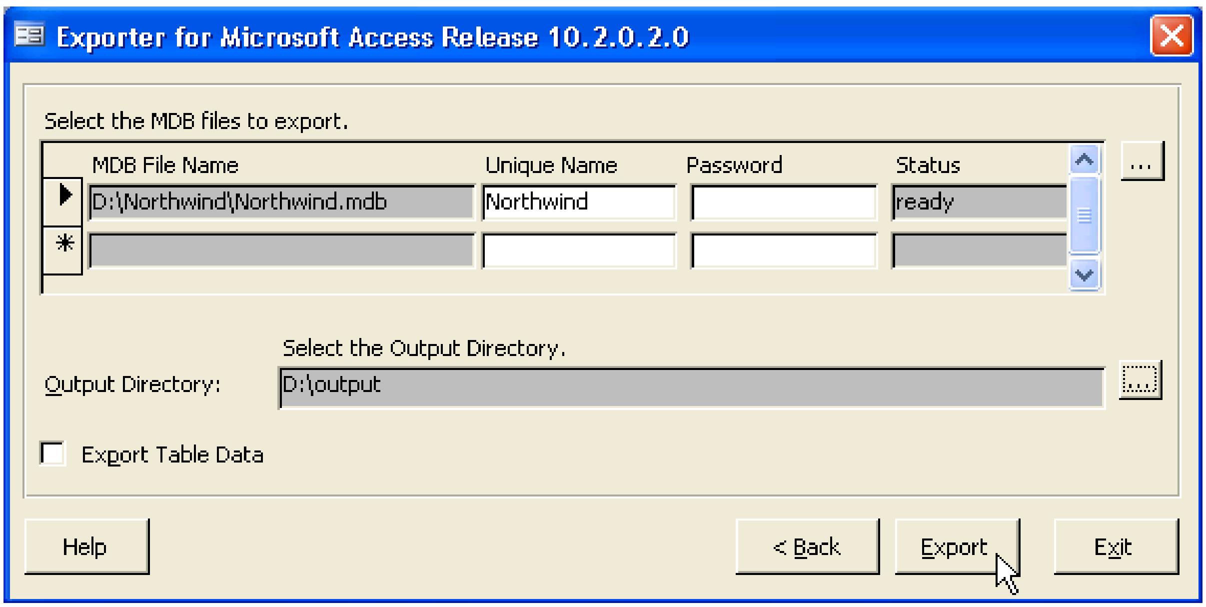
4. From the menu bar, select **Migration** > **Microsoft Access Exporter** > **Run MS Access Exporter** to launch the Exporter tool.

   Note: Four versions of Microsoft Access are supported by the Exporter tool: 97, 2000, 2002/XP, 2003. Ensure that you use the version of the tool that matches the Microsoft Access version that created the .mdb file and that is installed on your PC (for example, select **Run MS Access 2003 Exporter** for Access 2003).

5. On the first dialog of the Tool, select the **Export for Both** option. This option will generate an XML file containing the database schema information, and a SQL script containing the application information for a selected MS Access MDB file. Click Next to proceed.

6. Browse to select the Northwind.mdb file for exporting.

7. Browse to select an Output directory. This is the location where the generated file(s) will be saved.



   Note: You can also select the option to **Export Table Data**. If your Microsoft Access database does not reside on the machine where Oracle SQL Developer Migration Workbench is installed, then you may wish to load the table data into the migrated Oracle database via SQL*Loader. SQL*Loader will use the DAT files generated by the Exporter Tool to load the data into the migrated database.

8. Click **Export** to begin the export process.

9. On completion, navigate to the location you selected in the Output directory field. Two files should have been saved to this location, an XML file called Northwind.xml containing the database schema information, and a SQL script called Northwind.sql containing the application information.

Oracle SQL Developer Migration Workbench will use the Northwind.xml file in the migration of the database schema to Oracle. Oracle Application Express Application Migration Workshop will use the Northwind.sql script to generate a migration project based upon the migrated Oracle schema.

Export via Oracle Application Express

Note: You do not need to carry out the steps in this section if you have already exported the Microsoft Access database using the Exporter tool in Oracle SQL Developer Migration Workbench with the **Export for Both** option.

1. Download and install the latest version of Oracle Application Express 3.0 from OTN.

2. Log on to Oracle Application Express Administration Services of Oracle Application Express. For more information, refer to Logging in to Oracle Application Express Administration Services in the Oracle Application Express User's Guide.

3. Create a new Workspace by running the Create Workspace Wizard. For more information on creating a workspace, refer to the Oracle Application Express User's Guide. Set the following information:

    - Workspace name: **NORTHWIND**
    - Re-use existing schema: **Yes**
    - Schema: **NORTHWIND** i.e. the name of the migrated schema generated by Oracle SQL Developer Migration Workbench.

4. Create a new Developer user account for the workspace. For more information on creating a user, refer to Creating New User Accounts in Oracle Application Express User's Guide. Set the following information:

    - User Name: **NORTHWIND**
    - Password: **northwind**
    - Default schema: **NORTHWIND**
    - User is a developer: **Yes**
    - User is a workspace administrator: **No**

    Once you have created the Developer user, log out of Oracle Application Express Administration Services.

5. Log in to the NORTHWIND workspace as user NORTHWIND. The workspace home page will appear.

6. On the workspace home page, select the **Application Migrations** link in the Migrations task region on the right of the page. The Application Migrations home page appears.

7. Select the **Download Exporter tool for Microsoft Access** link in the Tasks region to the right of the page. The Exporter for Microsoft Access download page appears.

8. Under the Download column, select the Export tool zip file for download.

   Note: Four versions of Microsoft Access are supported by the Exporter tool: 97, 2000, 2002/XP, 2003. Ensure that you use the version of the tool that matches the Microsoft Access version that created the .mdb file and that is installed on your PC (for example, select **omwb2003.zip** for Microsoft Access 2003).

9. On your local machine unzip the Exporter tool zip file that you downloaded.

10. Launch the Exporter for Microsoft Access by double-clicking on the MDE file (for example, omwb2003.mde).

11. On the first dialog of the Tool, select the **Export for Oracle Application Express** option. This option will generate a SQL script containing the application information for a selected Microsoft Access MDB file. Click Next to proceed.

12. Browse to select the Northwind.mdb file for exporting.

13. Browse to select an Output directory. This is the location where the generated file(s) will be saved.

14. Click Export to begin the export process.

3.0 Migrate the Microsoft Access Database to Oracle

Using Oracle SQL Developer Migration Workbench, you can quickly and easily migrate your Microsoft Access database to Oracle. There are three main steps in the database migration process:

1. Capture the Source Database
   The Northwind.xml file generated by the Exporter tool contains the database schema information for the Microsoft Access Northwind Traders database. Oracle SQL Developer Migration Workbench uses this file as the basis for building a representation of the structure of the source Microsoft Access database. This structure is called the Captured Model.

2. Convert the Captured Database
   Oracle SQL Developer Migration Workbench uses the Captured Model to convert the captured objects to Oracle-format objects, building up a representation of the structure of the destination database. This structure is called the Converted Model.

3. Generate the new Oracle database
   Oracle SQL Developer Migration Workbench generates DDL statements to create the new Oracle database, based upon the Converted Model objects. Running the DDL statements will

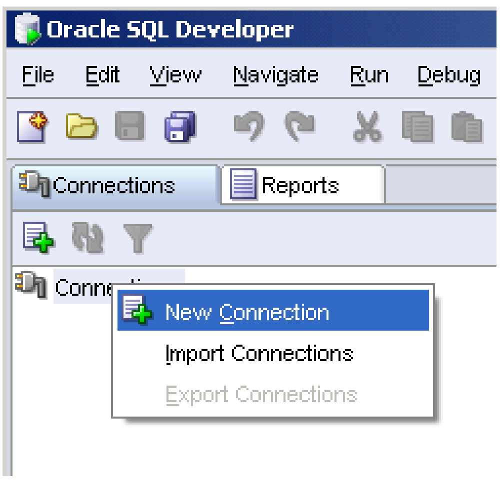
result in the creation of the objects in the Oracle database. At this point, the Northwind Traders database has been migrated to Oracle.

For further information on the steps outlined above, refer to the **Migrating Third-Party Databases** section in the Oracle SQL Developer online help.

To migrate Microsoft Access Northwind Traders database:

1. Launch the Oracle SQL Developer Migration Workbench, by running the sqldeveloper.exe file from your installation folder.

2. Create a connection to your Oracle Database by right clicking on **Connections**, and selecting the **New Connection** menu item, to launch the New / Select Database Connection screen.



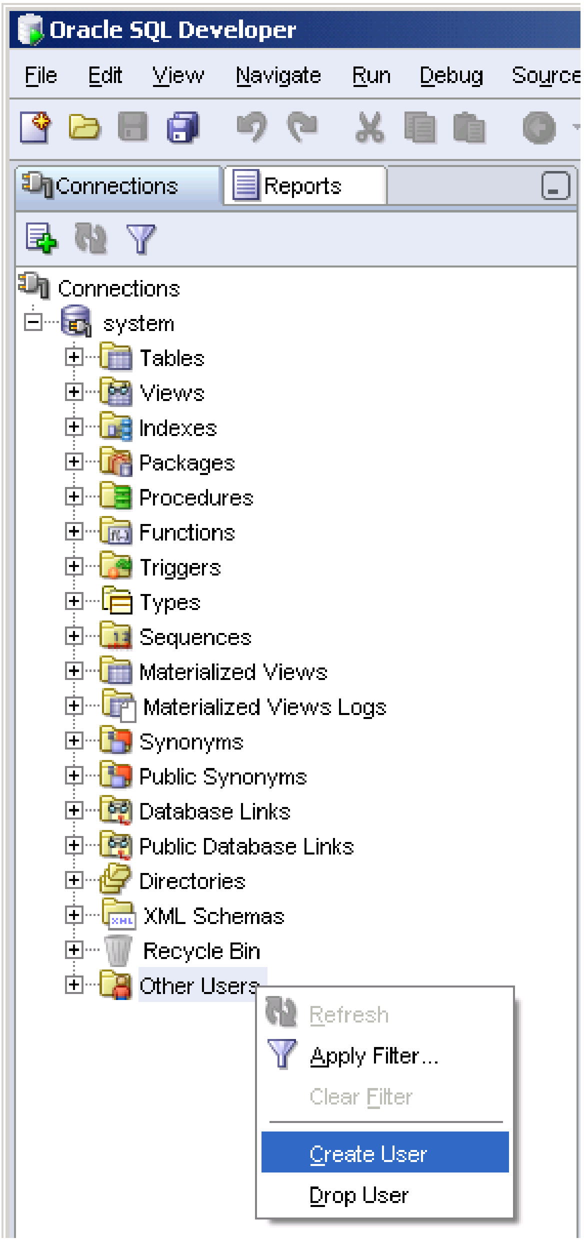
Note: This user should have the CREATE USER privilege, as this connection will be used to create a new schema for the Migration Repository.

3. Enter the connection details for a user with the CREATE USER privilege on the Oracle database (for example, SYSTEM), as follows:

   - Connection Name: **SYSTEM**
   - Username: **SYSTEM**
   - Password: **<password>**
   - Hostname: **localhost**
   - Port: **1521**
   - SID: **10GR2**

4. Click **Test** to verify that the details supplied are correct. The Status at the bottom left of the screen should display a **Success** message in order to successfully connect. Click **Connect** to create the connection. The new connection SYSTEM will now be listed under the Connections.

5. Expand the SYSTEM connection node, right-click on the **Other Users** node and select the **Create User** menu item, to launch the User Dialog.



6. In the User tab of the User Dialog, enter the following information:

- User Name: **OMWBREP**
- New Password: **omwbrep**
- Confirm Password: **omwbrep**
- Default Tablespace: **USERS**
- Temporary Tablespace: **TEMP**

7. In the Roles tab of the User Dialog, checkmark the Granted column for the RESOURCE role.

8. In the System Privileges tab of the User Dialog, checkmark the Granted column for CREATE SESSION and CREATE VIEW privileges. Click Apply, to create the new user.
Note: The repository contains a set of tables that holds the Captured and Converted Models, along with PL/SQL functions that perform migration tasks.

9. Create a new connection for the OMWBREP user.

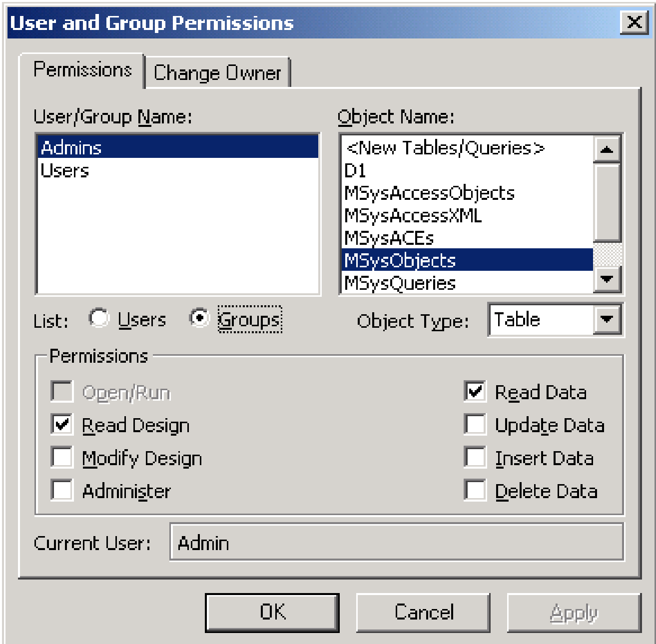
10. Right-click on the new connection, **OMWBREP**, and select **Create Repository**. The Oracle SQL Developer Migration Workbench will then create the required repository tables and PL/SQL packages.

11. Using Microsoft Access, open Northwind.mdb in database view and make the system objects visible in the database. From the menu bar select **Tools** > **Options**. On the View tab checkmark System objects, and click **Apply** to save the update. Click **Ok** to close the Options.

12. The MSysObjects system table in Northwind.mdb should be updated to have read permissions. From the Microsoft Access menu bar, select **Tools** > **Security** > **User and Group Permissions** for the Northwind.mdb file. On the Permissions tab, make the following settings:

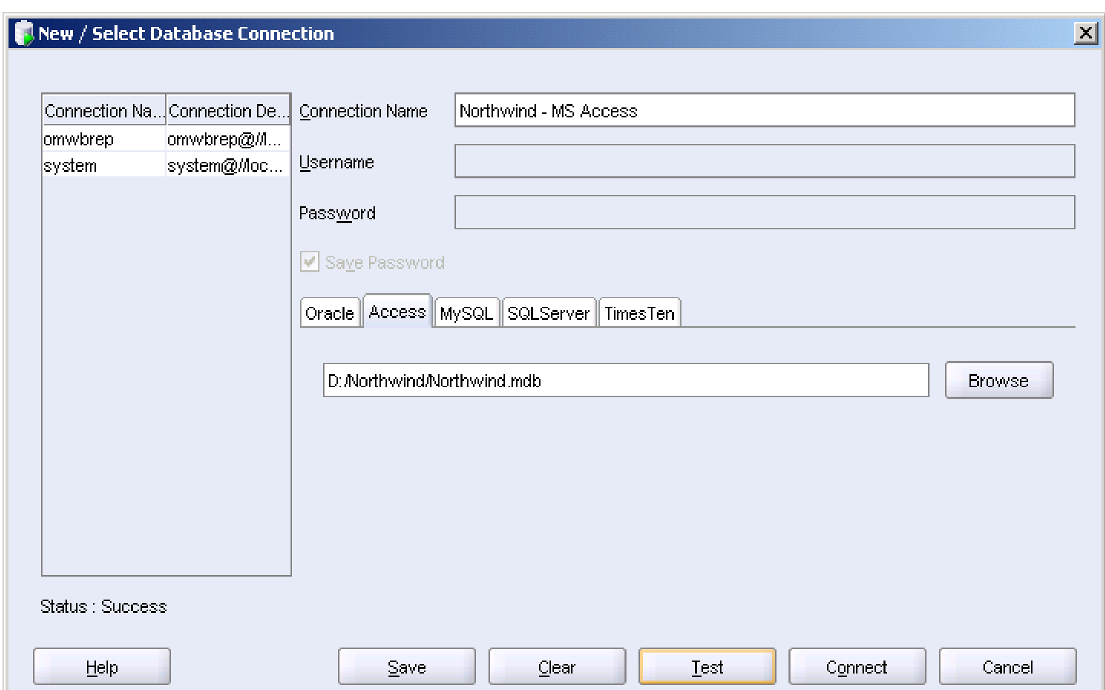
    - List: **Users**
    - User/Group Name: **Admin**
    - Object Type: **Table**
    - Object Name: **MSysObjects**
    - In the Permissions section checkmark **Read Design** and **Read Data**
    - Click Apply

    - List: **Groups**
    - User/Group Name: **Admins**
    - Object Type: **Table**
    - Object Name: **MSysObjects**
    - In the Permissions section checkmark **Read Design** and **Read Data**
    - Click Apply, then click OK and close Microsoft Access.



Note: You must have **Read Design** and **Read Data** permissions on the MSysObjects system table, in order to create a connection to the Northwind.mdb file.

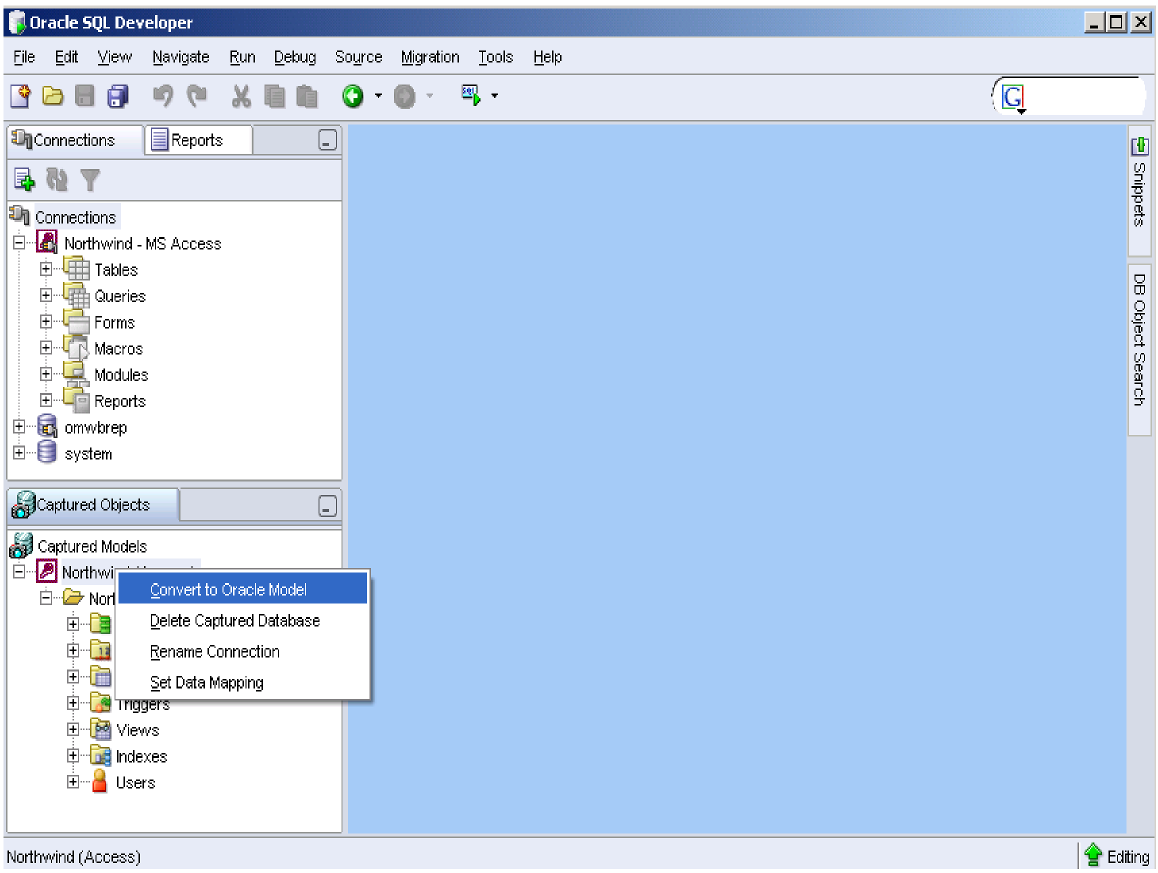
13. In Oracle SQL Developer Migration Workbench, create a connection to the Northwind Microsoft Access database. Right click on **Connections**, and selecting the **New Connection** menu item, to launch the **New / Select Database Connection** screen. Set the connection name to **Northwind – MS Access**. Select the Access tab, and browse to the Northwind.mdb file. Click Connect to create a new connection.



14. From the menu bar, select **Migration** > **Capture Exporter XML**, to capture the Northwind.xml file generated by the Exporter tool. Browse to the location of the Northwind.xml file. This process captures the database definition (tables, queries, indexes, etc.), but not the data contained within the tables. The captured information will appear as a new entry in the Captured Models view. Expand the new entry, **Northwind (Access)**, to view the database objects captured for the Northwind Traders database.

    Note: The Capture Exporter XML menu item will only be enabled when the OMWBREP user is connected and contains the migration repository tables, as generated by the Create Repository option.

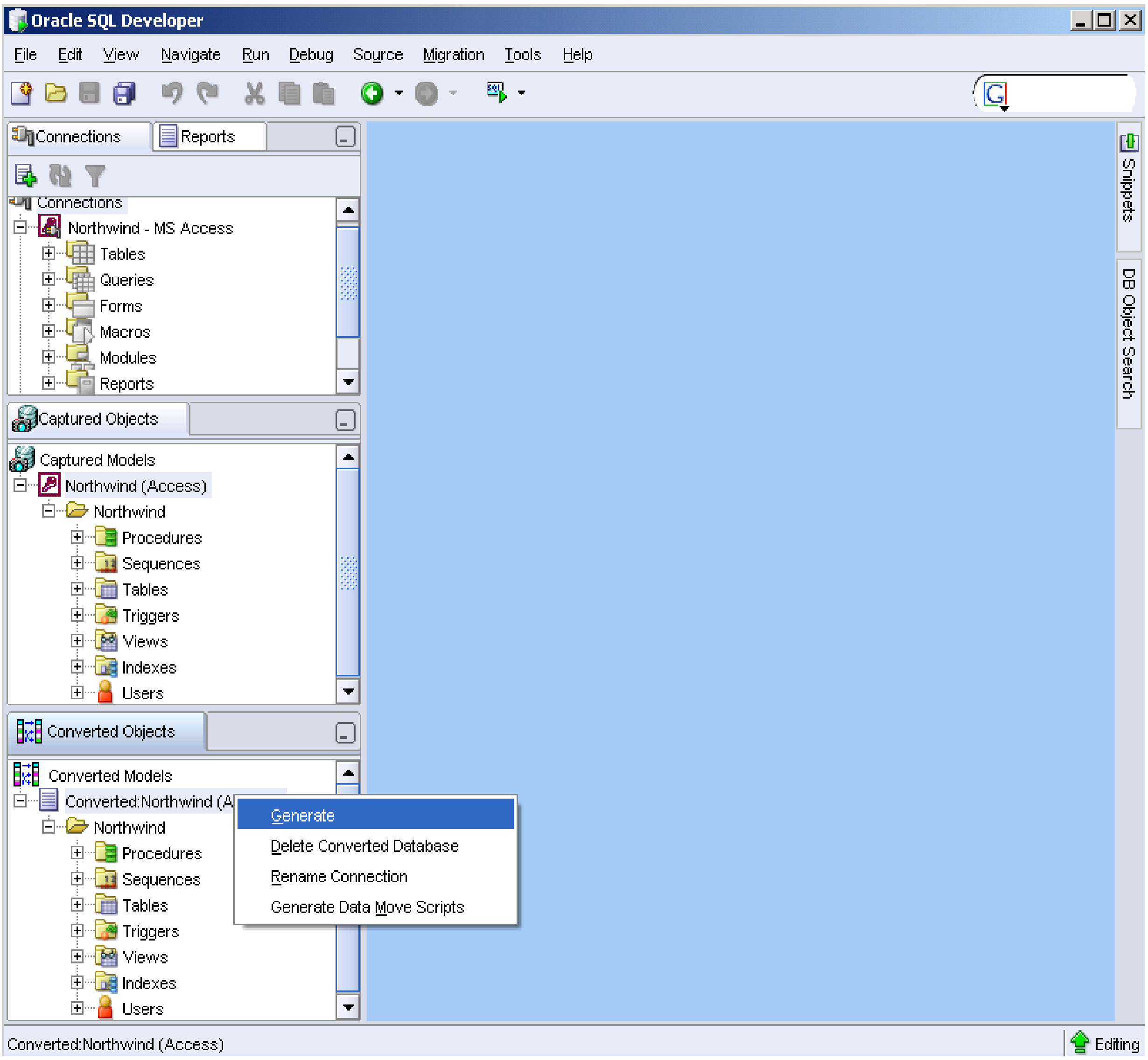
15. In the Captured Models view, right-click on the **Northwind (Access)** connection select **Convert to Oracle Model**.



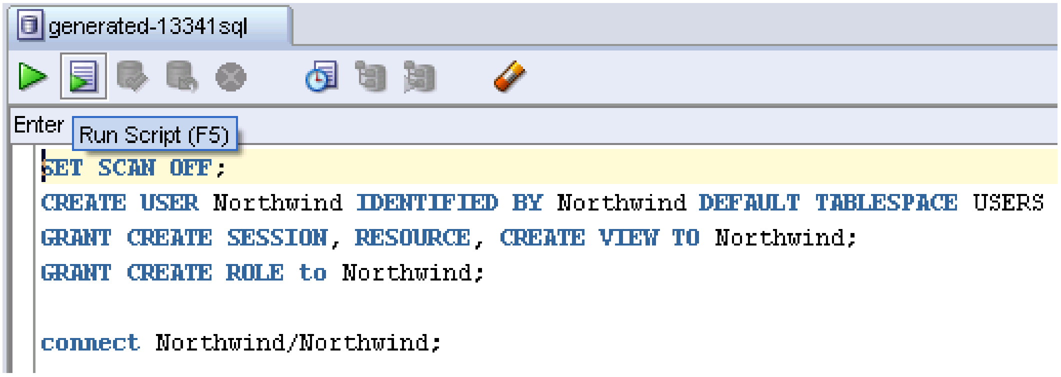
16. Review the data type mappings in the Set Data Map dialog. Click **Apply** to begin the conversion process.

    Note: Oracle SQL Developer Migration Workbench will convert each captured object in Northwind (Access) to its Oracle equivalent. When the conversion process is complete, the Converted Objects view is launched. This view contains a new Converted Model entry for the Northwind database Converted: Northwind (Access), where you can browse the converted objects. The converted objects are held within a model, and have not been generated as real objects in an Oracle database yet.

17. Right-click on the Converted Model entry **Converted: Northwind (Access)** and select **Generate**. This generates a SQL script with DDL statements that can be run to create the objects in an Oracle database.



18. Select the **Run Script** icon at the top of the SQL worksheet to execute the script and generate the object to Oracle.



Note: When prompted to select a connection to run this script, the user associated with the Oracle database connection that you select must have the following roles and privileges:

Roles
CONNECT WITH ADMIN OPTION
RESOURCE WITH ADMIN OPTION

Privileges
ALTER ANY ROLE
ALTER ANY SEQUENCE
ALTER ANY TABLE
ALTER TABLESPACE
ALTER ANY TRIGGER
COMMENT ANY TABLE
CREATE ANY SEQUENCE
CREATE ANY TABLE
CREATE ANY TRIGGER
CREATE VIEW WITH ADMIN OPTION
CREATE PUBLIC SYNONYM WITH ADMIN OPTION
CREATE ROLE
CREATE TABLESPACE
CREATE USER
DROP ANY SEQUENCE
DROP ANY TABLE
DROP ANY TRIGGER
DROP TABLESPACE
DROP USER
DROP ANY ROLE
GRANT ANY ROLE
INSERT ANY TABLE
SELECT ANY TABLE
UPDATE ANY TABLE

The Oracle database instance you select to run the SQL script against must be the same Oracle database instance where Oracle Application Express 3.0 is installed. The migrated Northwind schema will be used for your Oracle Application Express application development.

19. Review errors reported during the migration process. Review the Script Output log window containing the output from running the SQL script in the previous step. There are two known issues during the migration of the Northwind database, and these relate to the migration of the following Microsoft Access queries to Oracle views:

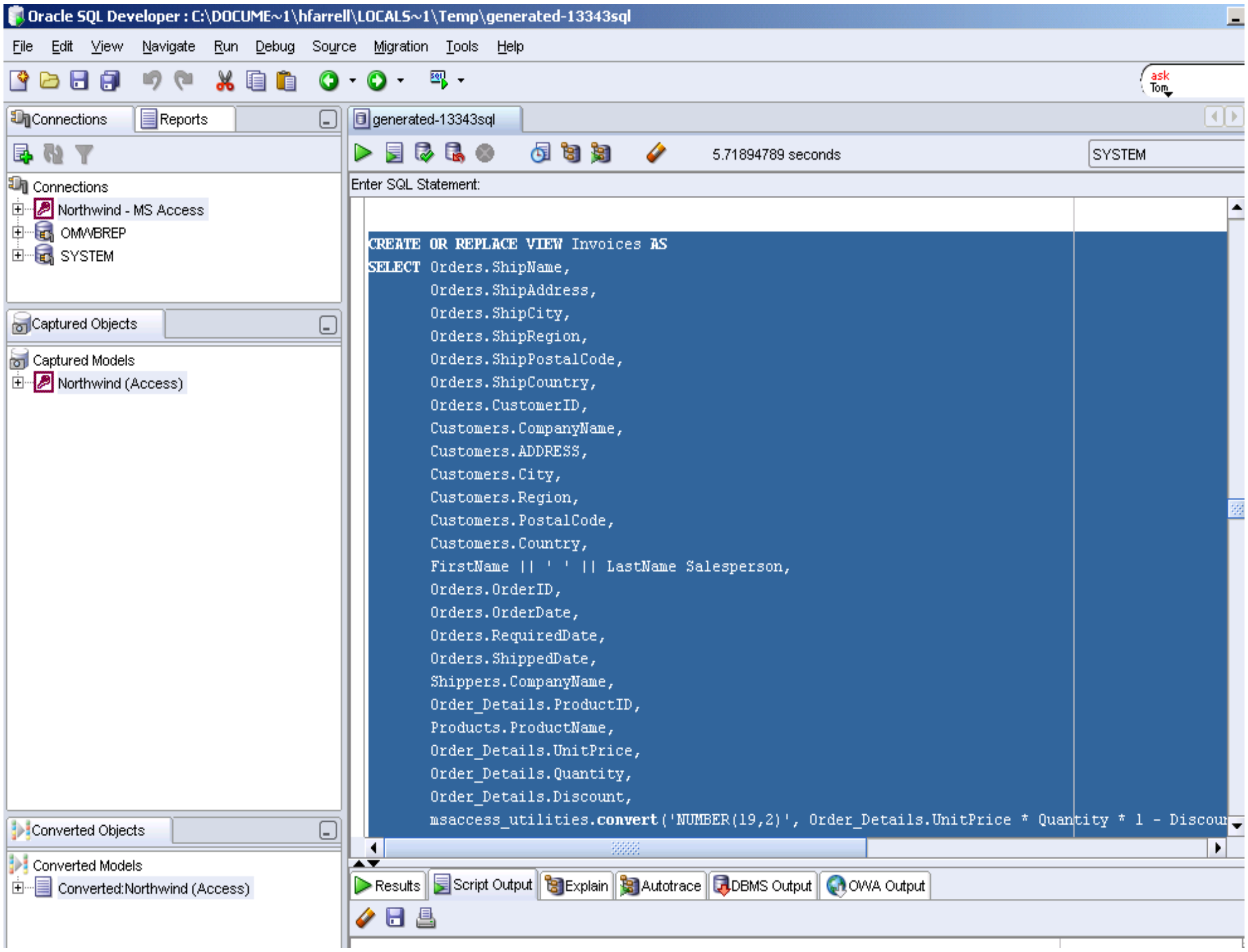
    - **Invoices**
      This query reported the error "SQL Error: ORA-00957: duplicate column name". The current version of Oracle SQL Developer Migration Workbench does not support the migration of queries with duplicate column names used in the syntax.

    - **Invoices_Filter**
      This query reported the error "SQL Error: ORA-00942: table or view does not exist.". This query has a dependency on the Invoices query. Once the Invoices error is resolved and migrated, this query will successfully migrate.

    Note: The Category_Sales_for_1997 and Employee_Sales_by_Country queries failed to migrate to Oracle, reporting the error "SQL Error: ORA-00942: table or view does not exist". This error was due to a dependency creation parser bug, which will be resolved in the upcoming Oracle SQL Developer Migration Workbench production release. To resolve queries that did not successfully migrate to Oracle, using Oracle Application Express Application Migration Workshop, review the Resolve Invalid Queries section in the Appendix.

20. Create a new connection for the NORTHWIND user, **Northwind - Migrated**. This user was created during the SQL script execution in the previous step. By default, the password for user Northwind is "northwind".

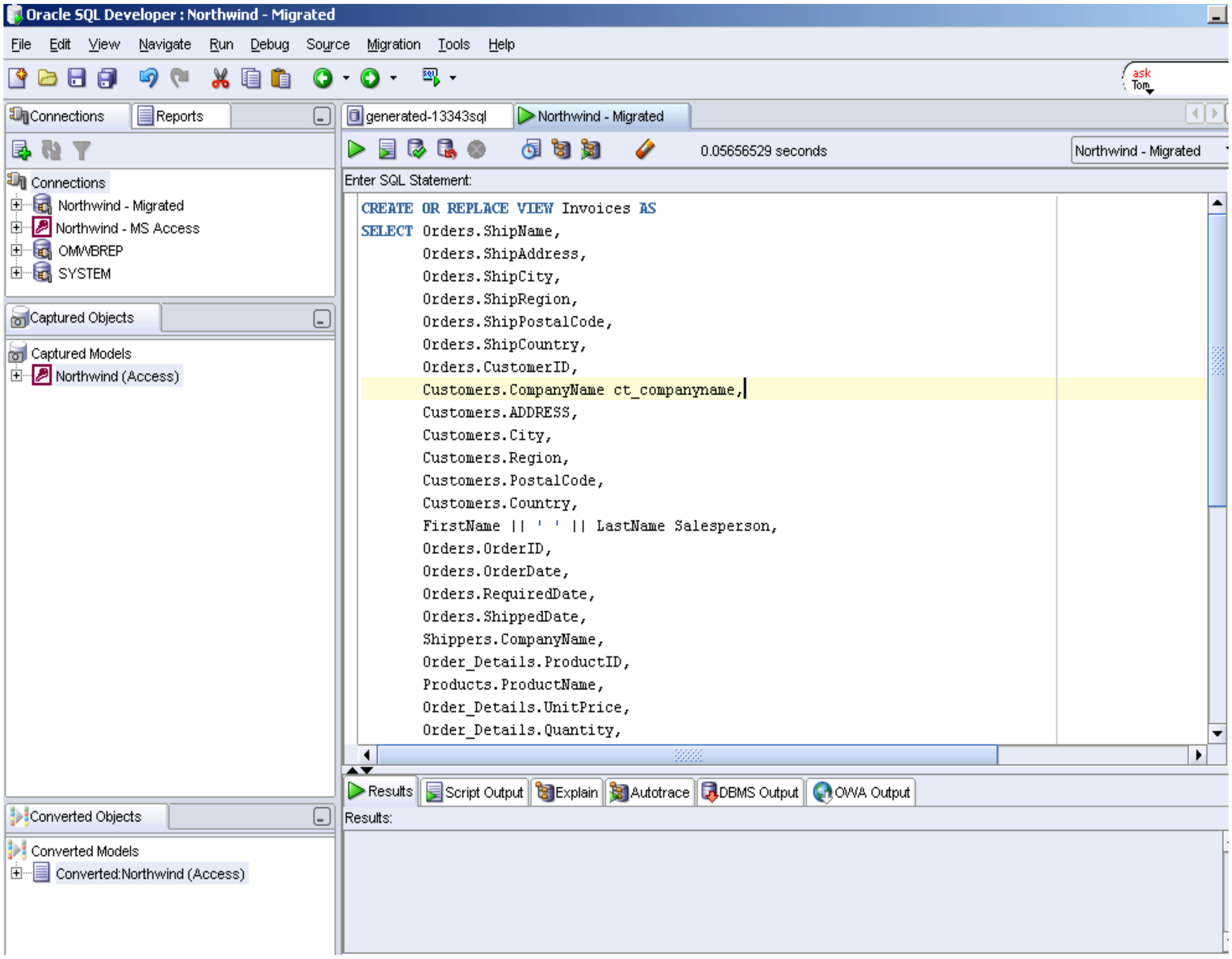
21. In the SQL Worksheet, locate the DDL statement to create the Invoices view. This statement will have to be modified to make the statement valid.



Note: the syntax contains the duplicate column names Customers.**CompanyName** and Shippers.**CompanyName**. Applying a column alias to one of these entries will resolve the error.

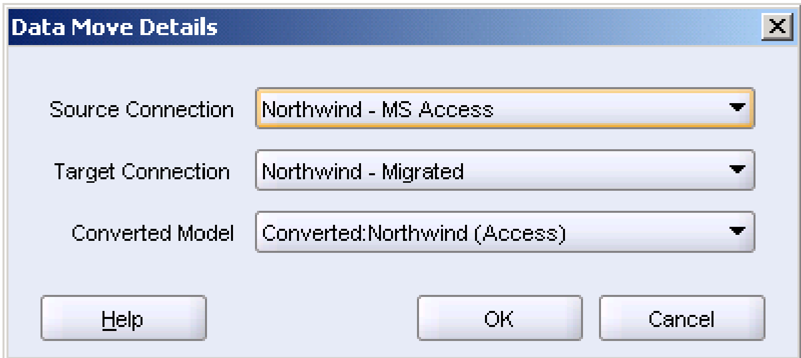
22. Copy the Invoices CREATE statement from the generated SQL script to a **Northwind – Migrated** SQL worksheet.

23. In the SQL worksheet, modify the Invoices syntax line “Customers.CompanyName,” to “Customers.CompanyName ct_companyname,” to include an alias “ct_companyname”. Then execute the statement. This will generate a new Oracle view, INVOICES.



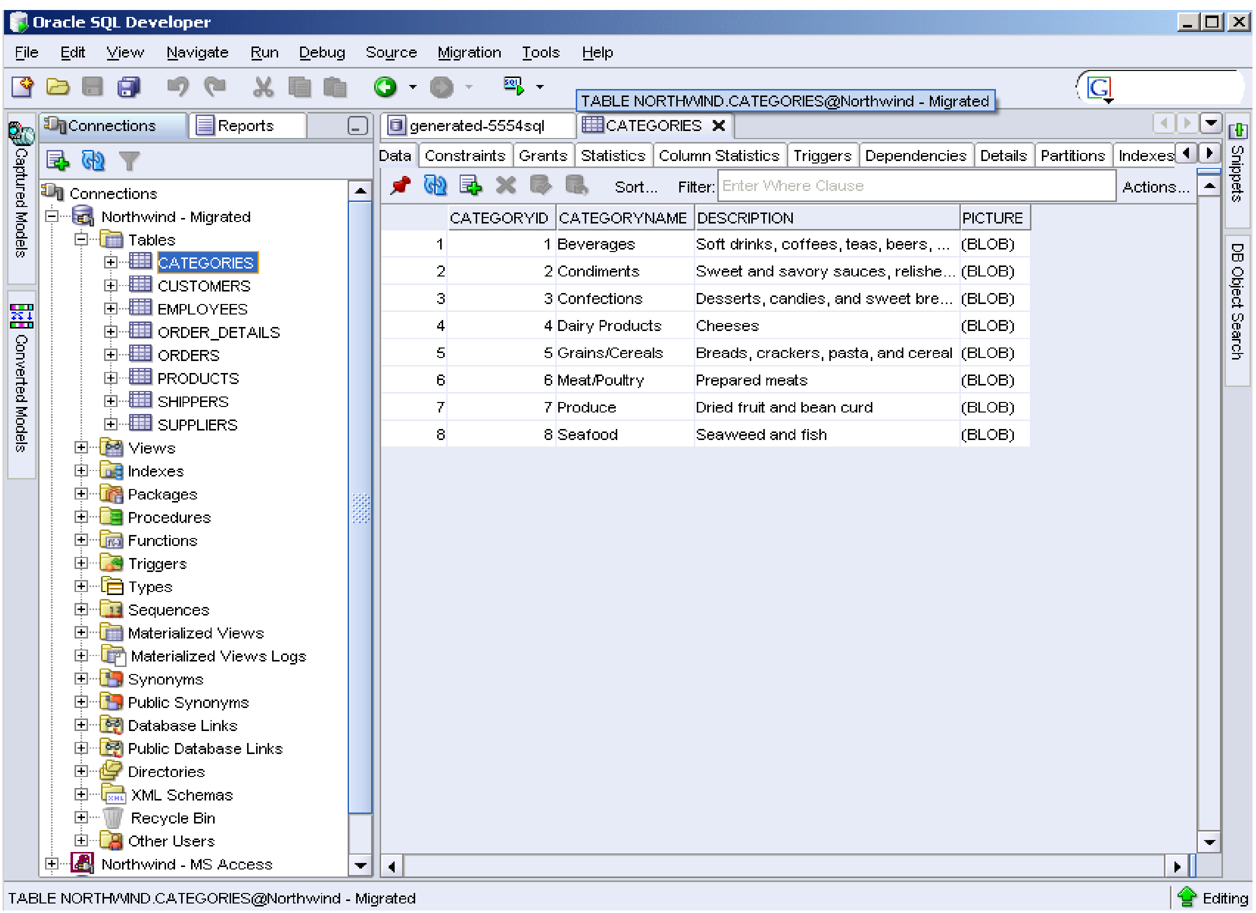
24. Copy the Invoices_Filter CREATE statement from the generated SQL script to the **Northwind – Migrated** SQL worksheet, and execute the statement. This will generate a new Oracle view, INVOICES_FILTER. This view was not originally migrated because it has a dependency on the Invoice query, which hadn’t been originally migrated either.

25. The Northwind Traders table data can now be migrated from Microsoft Access to Oracle. From the menu bar, select **Migration** > **Migrate Data**. Set the Data Move Details as follows:



Click OK to begin the process of moving the data.

26. Expand the **Northwind – Migrated** node in the Connections tab, and view the data content in the **Tables** node.



4.0 Create an Oracle Application Express Workspace

Note: Ensure that you have carried out the steps outlined in Export Northwind Traders Metadata and Migrate the Microsoft Access Database to Oracle **before** you proceed to use Oracle Application Express 3.0.

Oracle Application Express Application Migration Workshop is a new feature of Oracle Application Express 3.0. In order to use the Application Migrations facility, you must be logged in to a workspace within an Oracle Application Express 3.0 install.

1. Download and install Oracle Application Express 3.0 from OTN, ensuring you install it into the same Oracle database instance where your migrated Oracle database schema Northwind resides.

2. Log in to your Oracle Application Express 3.0 instance, and provision a new workspace, e.g., NORTHWIND. The workspace **must** be associated with the migrated Northwind database schema, created by the Oracle SQL Developer Migration Workbench. See Migrate the Microsoft Access Database to Oracle.

   Note: The method for creating workspaces depends on your Application Express configuration. For more information, see Quick Start in the Oracle Application Express User's Guide Release 3.0.

3. Create a new Developer user, **Northwind**, with no administrative permissions. Set the password to **northwind**.

5.0 Create a Migration Project

Oracle Application Express Application Migration Workshop assists users in the migration of their Microsoft Access Forms & Reports to Oracle Application Express. The Application Migration Workshop can be accessed via the Oracle Application Express 3.0 Home Page.

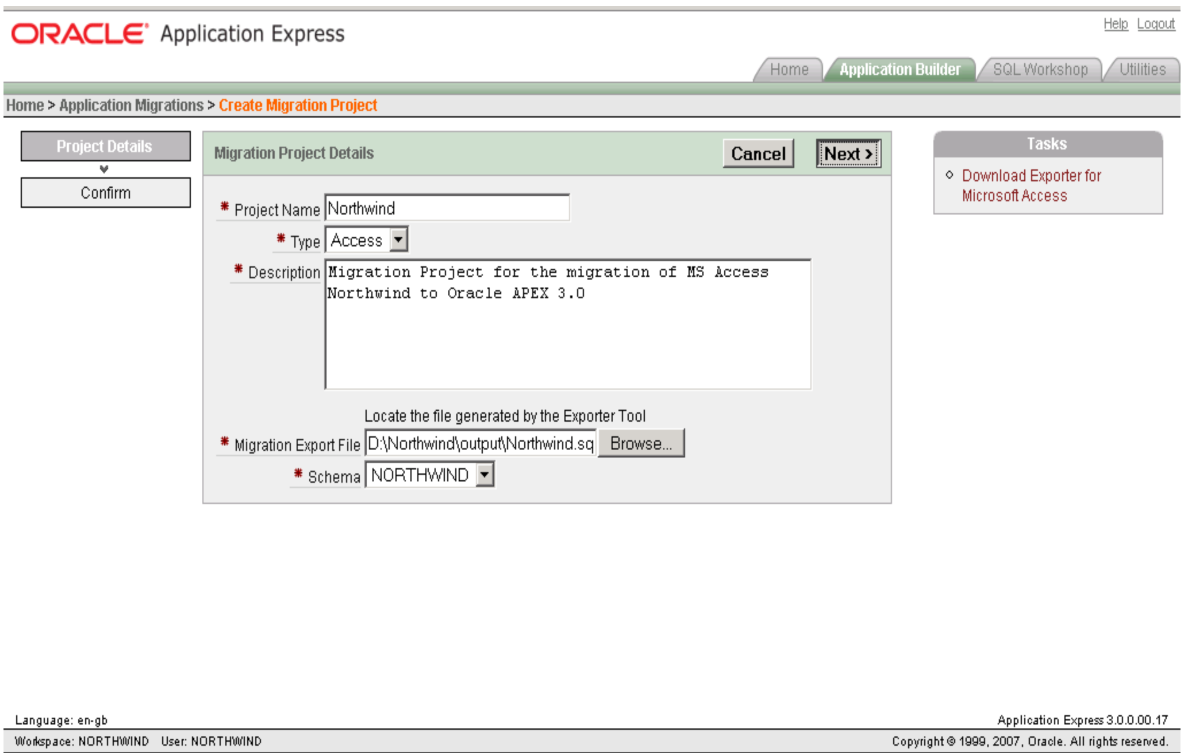
1. Connect to the NORTHWIND workspace, using the Northwind/northwind combination that you created by following the steps outlined in Create an Oracle Application Express Workspace.

2. From the Workspace Home Page, under the Migrations task region, click the **Application Migrations** link on the right side of the page. This leads to the Application Migrations Home Page.

3. On the Application Migrations Home page select the **Create Project** > button.

4. Enter the following Migration Project Details:

   - Project Name: **Northwind**
   - Type: **Access**
   - Description: **Migration Project for the migration of MS Access Northwind to Oracle Application Express 3.0**
   - Migration Export File: Browse to location of Northwind.sql generated by the Exporter for Microsoft Access.
   - Schema: **NORTHWIND**, i.e., the default workspace schema should be the migrated Oracle database schema.



5. Click Next to proceed to the summary page of the Create Project wizard. Review the project details, and click Finish to create the project. On successful creation, the Northwind project page appears.

6.0 Review Your Retrieved Objects

On the successful creation of your Northwind Migration Project, a high-level overview of the retrieved objects is displayed in the Objects table on the main Project Page. The overview shows the status of the Tables, Queries, Forms and Reports objects in your database.

Migration Project: **Northwind** Database: - All -

Objects	Count	Valid	Invalid	Included
Databases	1			
Tables	8	8	0	8
Queries	21	21	0	21
Forms	23	14	9	14
Reports	14	14	0	14
Modules	2			
Pages	5			

For each of the above listed objects, you can view the following information:

- **Count –** the number of objects retrieved, e.g., 21 Queries
- **Valid –** the number of valid objects retrieved, e.g., 21 of the 21 queries retrieved are valid
- **Invalid –** the number of invalid objects retrieved, e.g., 9 of the 23 forms retrieved are invalid
- **Included –** the number of objects included for migration to Oracle Application Express, e.g., 17 Queries

Note: An object must have a status of Valid in order to be included. Only objects selected for inclusion will be used in the process of generating your Oracle Application Express application. By default, on project creation, all objects with a status of Valid are included. If you did not associate the Northwind workspace with the migrated Northwind schema, then the count of valid column would be zero (0) for all of the retrieved tables and queries.

Additionally, for reference purposes only, the project page also includes Database, Modules, and Pages information.

Tables

Review the Retrieved Tables by clicking the Tables link on the project page.

The information displayed on this page is based upon the migrated tables in your migrated Northwind database schema. All of the tables are valid and are automatically included in the Migration Project. If you wish to exclude an object from the migration project, de-select the item using the checkbox to the left of the item name, and then click Apply Changes to save the update.

☐	Access Table ▲	Oracle Table	Primary Key	Foreign Key	UI Defaults	Status
☑	Categories	CATEGORIES	✓	-	-	Valid
☑	Customers	CUSTOMERS	✓	-	-	Valid
☑	Employees	EMPLOYEES	✓	-	-	Valid
☑	Order Details	ORDER_DETAILS	✓	✓	-	Valid
☑	Orders	ORDERS	✓	✓	-	Valid
☑	Products	PRODUCTS	✓	✓	-	Valid
☑	Shippers	SHIPPERS	✓	-	-	Valid
☑	Suppliers	SUPPLIERS	✓	-	-	Valid
					1 - 8	

Note: For details on the information displayed on this Tables page, refer to the Review Retrieved Tables section in Chapter 21 – Migrating Applications of the Oracle Application Express User's Guide Release 3.0.

Apply User Interface Defaults

Oracle Application Express uses User Interface Defaults during the generation of an application. They are used to populate initial values for region and item properties, providing consistency across multiple pages in an application or multiple applications. The following section outlines the suggested User Interface Default settings for each of the tables in the Northwind schema.

Categories table

1. From the main Forms page, select the **CATEGORIES** link in the Oracle Table column. This opens the Oracle Table page, displaying detailed information on the selected Oracle Table.

2. Select the **UI Defaults** link in the Tasks region to the right of the page.

3. On the UI Defaults page select **Create Defaults**. User Interface Defaults will be generated for the table.

4. Select the **CATEGORYID** link in the Column Name column. This will open the Column Defaults page for this column. Select the **List of Values** tab.

5. Set the **List of Value Types** to **Dynamic**, and copy the following syntax in to the **List of Values Query** text area:

   ```
   SELECT distinct categoryname d, categoryid r
   FROM   categories
   ORDER BY 1
   ```

   If you create a form, report, or tabular form that includes this column **CATEGORYID** and if the appropriate Display As Type is set to use a list of values (Radio Group or Select List) then a Named List of Values will be created within the application and will be referenced by the resulting item or report column.

   Click **Apply Changes**, to save the update.

6. Select the **CATEGORYNAME** link in Column Name column. This will open the Column Defaults page for this column.

7. In the Label Default section of the Column Definition, set the Label to **Category**.

8. In the Report Defaults section of the Column Definition, set Display to **Yes**.

9. In the Form Defaults section of the Column Definition, set the following:

   - Display: **Yes**
   - Width: **40**
   - MaxWidth: **40**
   - Height: **1**
   - Required: **Yes**
   - Help Text: **Enter a name for the category.**

   Click **Apply Changes**, to save the updates.

10. Select the **DESCRIPTION** link in the Column Name column, to open the Column Defaults page.

11. In the Report Defaults section, set Display to **Yes**.

12. In the Form Defaults section, set the following:

    - Width: **37**
    - Required: **Yes**
    - Help Text: **Enter a description for the category.**

    Click **Apply Changes**, to save the updates.

13. Select the **PICTURE** link in the Column Name column, to open the Column Defaults page.

14. In the Reports Defaults section, set Display As to **Hidden**.

15. In the Tabular Form Default section, set Display As to **Hidden**.

16. In the Form Defaults section, set Display As to **Hidden**.

    Click **Apply Changes**, to save the updates. The updated User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
CATEGORYID	Category ID	-	1	-	-	-	✓	1	✓
CATEGORYNAME	Category	✓	2	✓	-	-	✓	2	✓
DESCRIPTION	Description	✓	3	-	-	-	✓	3	✓
PICTURE	Picture	-	4	-	-	-	-	4	-
								row(s) 1 - 4 of 4	

17. To return to the Tables report in Migration project, use the breadcrumb to navigate to the **Home** page. Then select the **Application Migrations** link to the right of the page, opening the Application Migrations home page. Select the **Northwind** migration project, and then select the **Tables** link to review the Tables page. The Categories table now has User Interface Defaults associated with it.

☐	Access Table	Oracle Table	Primary Key	Foreign Key	UI Defaults	Status
☑	Categories	CATEGORIES	✓	-	✓	Valid
☑	Customers	CUSTOMERS	✓	-	-	Valid
☑	Employees	EMPLOYEES	✓	-	-	Valid
☑	Order Details	ORDER_DETAILS	✓	✓	-	Valid
☑	Orders	ORDERS	✓	✓	-	Valid
☑	Products	PRODUCTS	✓	✓	-	Valid
☑	Shippers	SHIPPERS	✓	-	-	Valid
☑	Suppliers	SUPPLIERS	✓	-	-	Valid
					1 - 8	

Note: It is recommended that you apply User Interface Defaults to each of the tables you want to include in the migration.

Customers table

1. Follow steps 1 – 3 from the section above applying User Interface Defaults to the Categories table, replacing the Categories table with **Customers**.

2. Select the **CUSTOMERID** link in the Column Name column, to open the Column Defaults page.

3. In the Report Defaults, set Display to **Yes**, and Display As to **Hidden**.

4. In the Form Defaults section, set the following:

   - Display: **Yes**
   - Display As: **Hidden**
   - Help Text: **Unique five-character code based on customer name.**

5. Select the List of Values tab, and set the List of Values Type to **Dynamic**. In the List of Values Query region enter the following syntax:

   ```
   SELECT distinct companyname d, customerid r
   FROM   customers
   ORDER BY 1
   ```

   Click **Apply Changes**, to save the updates.

6. Select the **COMPANYNAME** link in the Column Name column.

7. In the Label Default section, set Label to **Company**.

8. In the Report Defaults section, set Display to **Yes**.

9. In the Form Defaults section, set Display to **Yes**, and the Width to **40**. Click **Apply Changes**, to save the updates.

10. Select the **CONTACTNAME** link in the Column Name column.

11. In the Label Default section, set Label to **Contact Name**.

12. In the Report Defaults section, set Display to **Yes**.

13. In the Form Defaults section, set the following:

    - Display: **Yes**
    - Width: **40**
    - MaxWidth: **40**

    Click **Apply Changes**, to save the updates.

14. Select the **CONTACTTITLE** link in the Column Name column.

15. In the Label Default section, set Label to **Title**.

16. In the Report Defaults section, set Display to **No**, and Display As to **Hidden**.

17. In the Form Defaults section, set the following:

    - Display: **Yes**
    - Width: **30**

    Click **Apply Changes**, to save updates.

18. Select the **ADDRESS** link in the Column Name column.

19. In the Form Defaults section, set the following:

    - Display As: **Textarea**
    - Width: **37**
    - MaxWidth: **2000**
    - Height: **4**
    - Required: **Yes**

    Click **Apply Changes**, to save the updates.

20. Select the **CITY** link in the Column Name column.

21. In the Form Defaults section, set the following:

    - Width: **25**
    - MaxWidth: **25**
    - Required: **Yes**

    Click **Apply Changes**, to save the update.

22. Select the **REGION** link in the Column Name column.

23. In the Form Defaults section, set the following:

    - Width: **30**
    - MaxWidth: **30**

    Click **Apply Changes**, to save the updates.

24. Select the **POSTALCODE** link in the Column Name column.

25. In the Label Default section, set the Label to **Postal Code**.

26. In the Form Defaults, set the width to **25**, and Required to **Yes**. Click **Apply Changes** to save the updates.

27. Select the **COUNTRY** link in the Column Name column.

28. In the Form Defaults section, set the Width to **30**, maxWidth to **30**, and Required to **Yes**. Click **Apply Changes**, to save the updates.

29. Select the **PHONE** link in the Column Name column.

30. In the Form Defaults section, set the width to **25**, maxwidth to **25**, and Required to **Yes**. Click **Apply Changes**, to save the updates.

31. Select the **FAX** link in the Column Name column.

32. In the Form Defaults section, set the width to **30**, maxwidth to **30** and Required to **Yes**. Click **Apply Changes**, to save the updates. The resulting User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
CUSTOMERID	Customer ID	✓	1	✓	-	-	✓	1	✓
COMPANYNAME	Company	✓	2	✓	-	-	✓	2	✓
CONTACTNAME	Contact Name	✓	3	✓	-	-	✓	3	-
CONTACTTITLE	Title	-	4	✓	-	-	✓	4	-
ADDRESS	Address	✓	5	✓	-	-	✓	5	✓
CITY	City	✓	6	✓	-	-	✓	6	✓
REGION	Region	✓	7	✓	-	-	✓	7	-
POSTALCODE	Postal Code	✓	8	✓	-	-	✓	8	-
COUNTRY	Country	✓	9	✓	-	-	✓	9	✓
PHONE	Phone	✓	10	✓	-	-	✓	10	✓
FAX	Fax	✓	11	✓	-	-	✓	11	✓

row(s) 1 - 11 of 11

Employees Table

1. Follow steps 1 – 3 from the section above applying User Interface Defaults to the Categories table, replacing the Categories table with **Employees**.

2. Select the **EMPLOYEEID** link in the Column Name column.

3. In the Report Defaults section, set Display to **No**.

4. In the Form Defaults section, set Display to **No**. Click **Apply Changes**, to save the updates.

5. Select the **LASTNAME** link in the Column Name column.

6. In the Label Default section, set Label to **Last Name**.

7. In the Form Defaults section, set the following:

    - Width: **35**
    - Maxwidth: **35**

    Click **Apply Changes**, to save the updates.

8. Select the **FIRSTNAME** link in the Column Name column.

9. In the Label Default section, set Label to **First Name**.

10. In the Form Defaults section, set the following:

    - Width: **35**
    - Maxwidth: **35**

    Click **Apply Changes**, to save the updates.

11. Select the **TITLE** link in the Column Name column.

12. In the Form Defaults section, set the width to **35**, and the maxwidth to **35**. Click **Apply Changes**, to save the updates.

13. Select the **TITLEOFCOURTESY** link in the Column Name column.

14. In the Label Default section, set the Label to **Title of Courtesy.**

15. In the Report Defaults section, set Display As to **Display as Text (based on LOV, does not save state)**.

16. In the Form Defaults section, set the following:

    - Display As: **Select List**
    - Width: **35**
    - Maxwidth: **35**
    - Required to **Yes**. Click **Apply Changes**, to save the updates.

17. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

18. In the List of Values Query region, enter the following syntax:

```
SELECT distinct titleofcourtesy d, titleofcourtesy r
FROM   employees
ORDER BY 1
```

    Click **Apply Changes**, to save the updates.

19. Select the **BIRTHDATE** link in the Column Name column.

20. In the Label Defaults section, set the Label to **Birth Date**.

21. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

22. Select the **HIREDATE** link in the Column Name column.

23. In the Label Defaults section, set the Label to **Hire Date**.

24. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

25. Select the **ADDRESS** link in the Column Name column.

26. In the Form Defaults section, set the following:

    - Display As: **Textarea**
    - Width: **35**
    - Maxwidth: 2000
    - Height: **3**
    - Required: **Yes**

Click **Apply Changes**, to save the updates.

27. Select the **CITY** link in the Column Name column.

28. In the Form Defaults section, set the width and maxwidth to **35**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

29. Select the **REGION** link in the Column Name column.

30. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

31. Select the **POSTALCODE** link in the Column Name column.

32. In the Label Default section, set the Label to **Postal Code**.

33. In the Form Defaults section, set the width and maxwidth to **35**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

34. Select the **COUNTRY** link in the Column Name column.

35. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

36. Select the **HOMEPHONE** link in the Column Name column.

37. In the Label Default section, set the Label to **Home Phone**.

38. In the Form Defaults section, set the width and maxwidth to **35**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

39. Select the **EXTENSION** link in the Column Name column.

40. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

41. Select the **PHOTO** link in the Column Name column.

42. In the Report Defaults section, set the Display to **No**, and Display As to **Hidden**.

43. In the Form Defaults section, set Display to **No**, and Display As to **Hidden**. Click **Apply Changes**, to save the updates.

44. Select the **NOTES** link in the Column Name column.

45. In the Form Defaults section, set the width to **35**, the maxwidth to **32000**, and the Height to **8**. Set Required to **Yes** and click **Apply Changes**.

46. Select the **REPORTSTO** link in the Column Name column.

47. In the Label Default section, set the Label to **Reports To**.

48. In the Form Defaults section, set the following:

    - Display As: **Select List**
    - Width: **35**
    - Maxwidth: **200**
    - Required: **Yes**

49. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

50. In the List of Values Query region, enter the following syntax:

```
SELECT LastName ||', '||FirstName d, EmployeeID r
FROM   Employees
ORDER BY EmployeeID
```

Click **Apply Changes**, to save the updates.

The resulting User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
EMPLOYEEID	Employeeid	-	1	-	-	-	-	1	✓
LASTNAME	Last Name	✓	2	✓	-	-	✓	2	✓
FIRSTNAME	First Name	✓	3	✓	-	-	✓	3	✓
TITLE	Title	✓	4	✓	-	-	✓	4	-
TITLEOFCOURTESY	Title Of Courtesy	✓	5	✓	-	-	✓	5	✓
BIRTHDATE	Birth Date	✓	6	-	-	-	✓	6	✓
HIREDATE	Hire Date	✓	7	-	-	-	✓	7	✓
ADDRESS	Address	✓	8	✓	-	-	✓	8	✓
CITY	City	✓	9	✓	-	-	✓	9	✓
REGION	Region	✓	10	✓	-	-	✓	10	✓
POSTALCODE	Postal Code	✓	11	✓	-	-	✓	11	✓
COUNTRY	Country	✓	12	✓	-	-	✓	12	✓
HOMEPHONE	Home Phone	✓	13	✓	-	-	✓	13	✓
EXTENSION	Extension	✓	14	✓	-	-	✓	14	✓
PHOTO	Photo	-	15	-	-	-	-	15	-
NOTES	Notes	✓	16	-	-	-	✓	16	✓
REPORTSTO	Reports To	✓	17	-	-	-	✓	17	✓

row(s) 1 - 17 of 17

Order Details Table

1. Follow steps 1 – 3 from the section above applying User Interface Defaults to the Categories table, replacing the Categories table with **Order Details**.

2. Select the **ORDERID** link in the Column Name column.

3. In the Label Default section, set the Label to **Order ID**. Click **Apply Changes**, to save the updates.

4. Select the **PRODUCTID** link in the Column Name column.

5. In the Label Default section, set the Label to **Product ID**. Click **Apply Changes**, to save the updates.

6. Select the **UNITPRICE** link in the Column Name column.

7. In the Label Default section, set the Label to **Unit Price.**

8. In the Report Defaults section using the object finder, set the Mask to **£5,234.10** i.e. to apply a currency masking to the field. Click **Apply Changes**, to save the updates.

9. Select the **QUANTITY** link in the Column Name column.

10. In the Report Defaults section, using the object finder, set the Mask to **5,234**. Click **Apply Changes**, to save the updates. The resulting User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence ▲	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
ORDERID	Order ID	✓	1	-	-	-	✓	1	-
PRODUCTID	Product ID	✓	2	-	-	-	✓	2	-
UNITPRICE	Unit Price	✓	3	-	-	-	✓	3	-
QUANTITY	Quantity	✓	4	-	-	-	✓	4	-
DISCOUNT	Discount	✓	5	-	-	-	✓	5	-

row(s) 1 - 5 of 5

Orders Table

1. Follow steps 1 – 3 from the section above applying User Interface Defaults to the Categories table, replacing the Categories table with **Orders**.

2. Select the **ORDERID** link in the Column Name column.

3. In the Label Default section, set the Label to **Order ID**.

4. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

5. Select the **CUSTOMERID** link in the Column Name column.

6. In the Report Defaults section, set Display to **No**, and Display As to **Hidden**.

7. In the Form Defaults section, set Display to **No**, and Display As to **Hidden**. Click **Apply Changes**, to save the updates.

8. Select the **EMPLOYEEID** link in the Column Name column.

9. In the Label Default section, set the Label to **Sales Person**.

10. In the Form Default section, set the Display As to **Select List**, width and maxwidth to **32**. Set Required to **Yes**.

11. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

12. In the List of Values Query region, enter the following syntax:

```
SELECT FirstName ||', '||LastName d, EmployeeID r
FROM   Employees
ORDER BY EmployeeID
```

    Click **Apply Changes**, to save the updates.

13. Select the **ORDERDATE** link in the Column Name column.
14. In the Label Default section, set the Label to **Order Date**. Click **Apply Changes**, to save the updates.

15. Select the **REQUIREDDATE** link in the Column Name column.

16. In the Label Defaults section, set the Label to **Required Date**. Click **Apply Changes**, to save the updates.

17. Select the **SHIPPEDDATE** link in the Column Name column.

18. In the Label Defaults section, set the Label to **Shipped Date**. Click **Apply Changes**, to save the updates.

19. Select the **SHIPVIA** link in the Column Name column.

20. In the Label Default section, set the Label to **Ship Via:**.

21. In the Form Default section, set the Display As to **Select List**.

22. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

23. In the List of Values Query, enter the following syntax:

```
SELECT distinct companyname d, shipperid r
FROM   shippers
ORDER BY 1
```

    Click **Apply Changes**, to save the updates.

24. Select the **FREIGHT** link in the Column Name column.

25. In the Report Defaults section, set the Mask to **£5,234.10**, to display the value as currency. Click **Apply Changes**, to save the updates.

26. Select the **SHIPTO** link in the Column Name column.

27. In the Label Defaults section, set the Label to **Ship To:**. Click **Apply Changes**, to save the updates.

28. Select the **SHIPADDRESS** link in the Column name column.

29. In the Label Default section, set the Label to **Address:**.

30. In the Form Defaults section, set the Display As to **Textarea**, set the width to **32**, maxwidth to **2000**, and height to **4**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

31. Select the **SHIPCITY** link in the Column Name column.

32. In the Label Default section, set the Label to **City**:.

33. In the Form Defaults section, set the width and maxwidth to **15**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

34. Select the **SHIPREGION** link in the Column Name column.

35. In the Label Default section, set the Label to **Region:**.

36. In the Form Defaults section, set the width and maxwidth to **15**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

37. Select the **SHIPPOSTALCODE** link in the Column Name column.

38. In the Label Default section, set the Label to **Postal Code**.

39. In the Form Defaults section, set the width and maxwidth to **10**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

40. Select the **SHIPCOUNTRY** link in the Column Name column.

41. In the Label Default section, set the Label to **Country:**.

42. In the Form Defaults section, set the width and maxwidth to **15**. Set Required to **Yes**. Click **Apply Changes**, to save the updates. The resulting User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
ORDERID	Order ID	✓	1	-	-	-	✓	1	✓
CUSTOMERID	Customer ID	-	2	✓	-	-	-	2	-
EMPLOYEEID	Sales Person	✓	3	-	-	-	✓	3	✓
ORDERDATE	Order Date	✓	4	-	-	-	✓	4	-
REQUIREDDATE	Required Date	✓	5	-	-	-	✓	5	-
SHIPPEDDATE	Shipped Date	✓	6	-	-	-	✓	6	-
SHIPVIA	Ship Via:	✓	7	-	-	-	✓	7	-
FREIGHT	Freight	✓	8	-	-	-	✓	8	-
SHIPNAME	Ship To:	✓	9	✓	-	-	✓	9	-
SHIPADDRESS	Address	✓	10	✓	-	-	✓	10	-
SHIPCITY	City	✓	11	✓	-	-	✓	11	✓
SHIPREGION	Region	✓	12	✓	-	-	✓	12	-
SHIPPOSTALCODE	Postal Code	✓	13	✓	-	-	✓	13	-
SHIPCOUNTRY	Country	✓	14	✓	-	-	✓	14	-

row(s) 1 - 14 of 14

Products Table

1. Follow steps 1 – 3 from the section above applying User Interface Defaults to the Categories table, replacing the Categories table with **Products**.

2. Select the **PRODUCTNAME** link in the Column Name column.

3. In the Label Default section, set the Label to **Product**.

4. In the Form Defaults section, set the width and maxwidth to **45**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

5. Select the **SUPPLIERID** link in the Column Name column.

6. In the Label Default section, set the Label to **Supplier**.

7. In the Form Defaults section, set the Display As to **Select List**, width and maxwidth to **40**. Set Required to **Yes**.

8. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

9. In the List of Values Query region, enter the following syntax:

```
SELECT distinct companyname d, supplierid r
FROM   suppliers
ORDER BY 1
```

   Click **Apply Changes**, to save the updates.

10. Select the **CATEGORYID** link in the Column Name column.

11. In the Label Default section, set the Label to **Category**.

12. In the Form Defaults section, set the Display As to **Select List**, width and maxwidth to **40**. Set Required to **Yes**.

13. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

14. In the List of Values Query region, enter the following syntax:

```
SELECT distinct categoryname d, categoryid r
FROM   categories
ORDER BY 1
```

   Click **Apply Changes**, to save the updates.

15. Select the **QUANTITYPERUNIT** link in the Column Name column.

16. In the Label Default section, set the Label to **Quantity Per Unit**.

17. In the Form Defaults section, set the width and maxwidth to **20**. Set Required to **No**. Click **Apply Changes**, to save the updates.

18. Select the **UNITPRICE** link in the Column Name column.

19. In the Label Default section, set the Label to **Unit Price**.

20. In the Report Defaults section, use the object finder icon to set the Mask to **£5,234.10**, to display the value as currency.

21. In the Form Defaults section, set the width and maxwidth to **5**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

22. Select the **UNITSINSTOCK** link in the Column Name column.

23. In the Label Default section, set the Label to **Units In Stock**.

24. In the Report Defaults section, use the object finder icon to set the Mask to **5,234**.

25. In the Form Defaults section, set the width and maxwidth to **20**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

26. Select the **UNITSONORDER** link in the Column Name column.

27. In the Label Default section, set the Label to **Units On Order**.

28. In the Report Defaults section, use the object finder icon to set the Mask to **5,234**.

29. In the Form Defaults section, set the width and maxwidth to **5**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

30. Select the **REORDERLEVEL** link in the Column Name column.

31. In the Label Default section, set the Label to **Reorder Level**.

32. In the Form Defaults section, set the width and maxwidth to **20**. Set Required to **No**. Click **Apply Changes**, to save the updates.

33. Select the **DISCONTINUED** link in the Column Name column.

34. In the Form Defaults section, set the Display As to **Checkbox**, set the width and maxwidth to **5**. Set Required to **Yes**.

35. Select the List of Values tab, set the List of Values Type to **Static**.

36. In the List of Values Query region, enter the following:

    Display Value: ** **
    Return Value: **1**

    Click **Create**. The resulting User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
PRODUCTID	Productid	✓	1	-	-	-	✓	1	✓
PRODUCTNAME	Product Name	✓	2	✓	-	-	✓	2	✓
SUPPLIERID	Supplier	✓	3	-	-	-	✓	3	✓
CATEGORYID	Category	✓	4	-	-	-	✓	4	✓
QUANTITYPERUNIT	Quantity Per Unit	✓	5	✓	-	-	✓	5	-
UNITPRICE	Unit Price	✓	6	-	-	-	✓	6	-
UNITSINSTOCK	Units In Stock	✓	7	-	-	-	✓	7	✓
UNITSONORDER	Units On Order	✓	8	-	-	-	✓	8	✓
REORDERLEVEL	Reorder Level	✓	9	-	-	-	✓	9	-
DISCONTINUED	Discontinued	✓	10	-	-	-	✓	10	✓

row(s) 1 - 10 of 10

Shippers Table

1. Follow steps 1 – 3 from the section above applying User Interface Defaults to the Categories table, replacing the Categories table with **Shippers**.

2. Select the **SHIPPERID** link in the Column Name column.

3. In the Form Defaults section, set the Display As to **Select List**.

4. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

5. In the List of Values Query, enter the following syntax:

   ```
   SELECT distinct companyname d, shipperid r
   FROM   shippers
   ORDER BY 1
   ```

   Click **Apply Changes**, to save the updates.

6. Select the **COMPANYNAME** link in the Column Name column.

7. In the Label Default section, set the Label to **Company**. Click **Apply Changes**, to save the update.

   The resulting User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
SHIPPERID	Shipperid	✓	1	-	-	-	✓	1	✓
COMPANYNAME	Company	✓	2	✓	-	-	✓	2	✓
PHONE	Phone	✓	3	✓	-	-	✓	3	-

row(s) 1 - 3 of 3

Suppliers Table

1. Follow steps 1 – 3 from the section above applying User Interface Defaults to the Categories table, replacing the Categories table with **Products**.

2. Select the **SUPPLIERID** link in the Column Name column.

3. In the Form Defaults section, set the Display As to **Select List**.

4. Select the List of Values tab, and set the List of Values Type to **Dynamic**.

5. In the List of Values Query region, enter the following syntax:

   ```
   SELECT distinct companyname d, supplierid r
   FROM   suppliers
   ORDER BY 1
   ```

   Click **Apply Changes**, to save the updates.

6. Select the **COMPANYNAME** link in the Column Name column.

7. In the Label Default section, set the Label to **Company**.

8. In the Form Defaults section, set the following:

   - Width: **40**
   - Maxwidth: **40**
   - Required: **Yes**

   Click **Apply Changes**, to save the updates.

9. Select the **CONTACTNAME** link in the Column Name column.

10. In the Label Default section, set the Label to **Contact Name**.

11. In the Form Defaults section, set the Width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

12. Select the **CONTACTTITLE** link in the Column Name column.

13. In the Label Default section, set the Label to **Title**.

14. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

15. Select the **ADDRESS** link in the Column Name column.

16. In the Form Default section, set the following:

    - Display As: **Textarea**
    - Width: **37**
    - Maxwidth: **2000**
    - Height: **4**
    - Required: **Yes**

    Click **Apply Changes**, to save the updates.

17. Select the **CITY** link in the Column Name column.

18. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

19. Select the **REGION** link in the Column Name column.

20. In the Form Defaults section, set the width and maxwidth to **30**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

21. Select the **POSTALCODE** link in the Column Name column.

22. In the Label Default section, set the Label to **Postal Code**.

23. In the Form Defaults section, set the width and maxwidth to **30**, and set Required to **Yes**. Click **Apply Changes**, to save the updates.

24. Select the **COUNTRY** link in the Column Name column.

25. In the Form Defaults section, set the width and maxwidth to **30**, and set Required to **Yes**. Click **Apply Changes**, to save the updates.

26. Select the **PHONE** link in the Column Name column.

27. In the Form Defaults section, set the width and maxwidth to **30**, and set Required to **Yes**. Click **Apply Changes**, to save the updates.

28. Select the **FAX** link in the Column Name column.

29. In the Form Defaults section, set the width and maxwidth to **30**, and set Required to **Yes**. Click **Apply Changes**, to save the updates.

30. Select the **HOMEPAGE** link in the Column Name column.

31. In the Label Default section, set the Label to **Home Page**.

32. In the Form Defaults section, set Display As to **Text Field**, the width and maxwidth to **40,** and the height to **1**. Set Required to **Yes**. Click **Apply Changes**, to save the updates.

The resulting User Interface Defaults grid should look similar to the following:

Column Name	Label	Include in Reports	Report Sequence	Searchable	Group By	Aggregate By	Include in Forms	Form Sequence	Required
SUPPLIERID	Supplierid	✓	1	-	-	-	✓	1	✓
COMPANYNAME	Company	✓	2	✓	-	-	✓	2	✓
CONTACTNAME	Contact Name	✓	3	✓	-	-	✓	3	✓
CONTACTTITLE	Title	✓	4	✓	-	-	✓	4	✓
ADDRESS	Address	✓	5	✓	-	-	✓	5	✓
CITY	City	✓	6	✓	-	-	✓	6	✓
REGION	Region	✓	7	✓	-	-	✓	7	✓
POSTALCODE	Postal Code	✓	8	✓	-	-	✓	8	✓
COUNTRY	Country	✓	9	✓	-	-	✓	9	✓
PHONE	Phone	✓	10	✓	-	-	✓	10	✓
FAX	Fax	✓	11	✓	-	-	✓	11	✓
HOMEPAGE	Home Page	✓	12	-	-	-	✓	12	✓

row(s) 1 - 12 of 12

Queries

Review the Retrieved Queries by clicking on the Queries link on the project page.

The information displayed on this page is based upon the migrated views in your Northwind database schema. Microsoft Access queries are migrated to Oracle views. An object must have a status of valid in order to include it in the migration. All the objects have a status of valid.

Note: For details on the information displayed on this Queries page, refer to the Review Retrieved Queries section in Chapter 21 – Migrating Applications of the Oracle Application Express User's Guide Release 3.0.

Apply User Interface Defaults

As discussed in the Tables section, Oracle Application Express uses User Interface Defaults during the generation of an application. They are used to populate initial values for region and item properties, providing consistency across multiple pages in an application or multiple applications. It is recommended that you apply User Interface Defaults to the Oracle views that you want to include in your migration.

Alphabetical List of Products

1. From the main Queries page, select the **ALPHABETICAL LIST OF PRODUCTS** link in the Oracle View column. This opens the Oracle View page, displaying the syntax of the selected Oracle View.

2. Select the **UI Defaults** link in the Tasks region to the right of the page.

3. On the UI Defaults page select **Create Defaults**. User Interface Defaults will be generated for the view.

4. To edit the information, select **Grid Edit** to allow for editing of the default information.

5. Update the values in the Label, Include in Reports, and Report Sequence columns of the grid as follows:

Column Name	Label	Include in Reports	Report Sequence
PRODUCTID	Productid	No	
PRODUCTNAME	Product Name:	Yes	1
SUPPLIERID	Supplierid	No	
CATEGORYID	Categoryid	No	
QUANTITYPERUNIT	Quantity Per Unit:	Yes	3
UNITPRICE	Unitprice	No	
UNITSINSTOCK	Units In Stock:	Yes	4
UNITSONORDER	Unitsonorder	No	
REORDERLEVEL	Reorderlevel	No	
DISCONTINUED	Discontinued	No	
CATEGORYNAME	Category Name:	Yes	2

These settings will generate a report with the same information as that displayed on the original MS Access report to display the list of products, alphabetically. Click **Apply Changes**, to save the updates.

Employee Sales By Country

1. From the main Queries page, select the **EMPLOYEE_SALES_BY_COUNTRY** link in the Oracle View column. This opens the Oracle View page, displaying the syntax of the selected Oracle View.

2. Select the **UI Defaults** link in the Tasks region to the right of the page.

3. On the UI Defaults page select **Create Defaults**. User Interface Defaults will be generated for the view.

4. To edit the information, select **Grid Edit** to allow for editing of the default information.

5. Update the values in the Label, Include in Reports, and Report Sequence columns of the grid as follows:

Column Name	Label	Include in Reports	Report Sequence
COUNTRY	Country	Yes	1
LASTNAME	Last Name	Yes	2
FIRSTNAME	First Name	Yes	3
SHIPPEDDATE	Shipped Date	Yes	4

ORDERID	Order ID	Yes	5
SALESAMOUNT	Sales Amount	Yes	6

Click **Apply Changes**, to save the updates.

The main Queries report should look similar to the following, identifying that all queries are valid, and UI Defaults have been applied to two of them:

☐	Access Query ▲	Oracle View	Status	UI Defaults
☑	Alphabetical List of Products	ALPHABETICAL_LIST_OF_PRODUCTS	Valid	✓
☑	Category Sales for 1997	CATEGORY_SALES_FOR_1997	Valid	-
☑	Current Product List	CURRENT_PRODUCT_LIST	Valid	-
☑	Customers and Suppliers by City	CUSTOMERS_AND_SUPPLIERS_BY_CIT	Valid	-
☑	Employee Sales by Country	EMPLOYEE_SALES_BY_COUNTRY	Valid	✓
☑	Invoices	INVOICES	Valid	-
☑	Invoices Filter	INVOICES_FILTER	Valid	-
☑	Order Details Extended	ORDER_DETAILS_EXTENDED	Valid	-
☑	Order Subtotals	ORDER_SUBTOTALS	Valid	-
☑	Orders Qry	ORDERS_QRY	Valid	-
☑	Product Sales for 1997	PRODUCT_SALES_FOR_1997	Valid	-
☑	Products Above Average Price	PRODUCTS_ABOVE_AVERAGE_PRICE	Valid	-
☑	Products by Category	PRODUCTS_BY_CATEGORY	Valid	-
☑	Quarterly Orders	QUARTERLY_ORDERS	Valid	-
☑	Quarterly Orders by Product	QUARTERLY_ORDERS_BY_PRODUCT	Valid	-
☑	Sales Totals by Amount	SALES_TOTALS_BY_AMOUNT	Valid	-
☑	Sales by Category	SALES_BY_CATEGORY	Valid	-
☑	Sales by Year	SALES_BY_YEAR	Valid	-
☑	Summary of Sales by Quarter	SUMMARY_OF_SALES_BY_QUARTER	Valid	-
☑	Summary of Sales by Year	SUMMARY_OF_SALES_BY_YEAR	Valid	-
☑	Ten Most Expensive Products	TEN_MOST_EXPENSIVE_PRODUCTS	Valid	-

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Forms

Review the Retrieved Forms by clicking on the Forms link on the project page.

The information displayed on this page is based upon the Microsoft Access Forms information extracted from your Northwind application. Eight of the forms have a status of invalid. A form object with no source object will always have a status of invalid. A form based on a SQL Query will automatically have a status of invalid until the SQL Query has been successfully compiled.

The Migration Workbench does not parse SQL Query syntax for Microsoft Access Forms/Reports during the database migration process, as the syntax is a property of the form/report object. In order to include a form object in the migration, its source object must have a status of valid <u>and</u> must also be included. For example, the "Suppliers" form has a status of valid because its underlying source object, the table "Suppliers" has a status of valid <u>and</u> has been included in the migration.

☐	Access Form	Source Type	Source Name	Status	Startup Form	Parent Form	Migrate To
☑	Categories	Table	CATEGORIES	Valid			Form
☑	Customer Orders	Table	CUSTOMERS	Valid			Form
☑	Customer Phone List	Table	CUSTOMERS	Valid			Form
☑	Customers	Table	CUSTOMERS	Valid			Form
☑	Employees	Table	EMPLOYEES	Valid			Form
☑	Customer Orders Subform1	Table	ORDERS	Valid		Customer Orders	Form
☑	Product List	Table	PRODUCTS	Valid		Categories	Form
☑	Products	Table	PRODUCTS	Valid			Form
☑	Suppliers	Table	SUPPLIERS	Valid			Form
☑	Orders Subform	Query	ORDER_DETAILS_EXTENDED	Valid		Orders	Form
☑	Customer Orders Subform2	Query	ORDER_DETAILS_EXTENDED	Valid		Customer Orders	Form
☑	Orders	Query	ORDERS_QRY	Valid			Form
☑	Quarterly Orders Subform	Query	QUARTERLY_ORDERS_BY_PRODUCT	Valid		Quarterly Orders	Form
☑	Quarterly Orders	Query	QUARTERLY_ORDERS	Valid			Form
☐	Sales Analysis Subform1	SQL Query		Invalid		Sales Analysis	
☐	Sales Analysis Subform2	SQL Query		Invalid			
☐	Customer Labels Dialog			Invalid			
☐	Main Switchboard			Invalid			
☐	Sales Analysis			Invalid			
☐	Sales Reports Dialog			Invalid			
☐	Sales by Year Dialog			Invalid			
☐	Startup			Invalid	✓		

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- Attempt to compile invalid SQL queries

Note: For details on the information displayed on this Forms page, refer to the Review Retrieved Forms section in Chapter 21 – Migrating Applications of the Oracle Application Express User's Guide Release 3.0.

The Forms with no source type associated with them have a status of invalid, as they will not be included in the migration. However, during the customization of your Oracle Application Express application, you may wish to refer to the retrieved forms controls information. To access the Forms controls information, select the form name link from the Access Form column, e.g., Startup. This opens the Form Control Details page, which lists details about the original Microsoft Access form controls.

For example, you may wish to reuse the label text displayed on the Northwind startup form for the generated Oracle Application Express home page. The text from the "Caption" column for the "Paragraph1" and "Paragraph2" controls can easily be copied and pasted to a new HTML region on the home page of the generated Oracle Application Express application. This will be covered in more detail in Customize your Oracle Application Express Application.

Control Name	Type	Visible	Control Source	Default Value	Rowsource	Rowsourcetype	Caption
GrayBox	Rectangle	Yes					
HideStartupForm	Checkbox	Yes		0			
HideStartupFormLabel	Label	Yes					Don't show this screen again.
Label4	Label	Yes					The names of companies, products, people, characters, and/or data mentioned herein are fictitious and are in no way intended to represent any real individual, company, product, or event, unless otherwise noted.
Line5	Line separator	Yes					
Logo	Image	Yes					
OK	Button	Yes					OK
Paragraph1	Label	Yes					Welcome to Northwind Traders, a sample database you can use to learn about Microsoft Access. You can experiment with the data stored in Northwind, and use the forms, reports, and other database objects as models for your own database.
Paragraph2	Label	Yes					All the objects in Northwind are available from the Database window, which will be displayed when you click OK. In the Database window, you can display descriptions of the objects by clicking Details on the View menu.

Resolve Invalid SQL Queries

The SQL Queries associated with Microsoft Access Forms objects are properties of the Forms. These SQL queries use Access syntax, and may require modification to make them valid Oracle syntax. Oracle SQL Developer Migration Workbench can be used to assist in the modification / validation of these SQL Queries. Out of the 22 retrieved forms, 2 forms have a source type of SQL Query:

- Sales Analysis Subform1
- Sales Analysis Subform2

Note: these forms are based on the same SQL query, therefore to avoid the creation of duplicate pages in the generated Application Express application only Sales Analysis Subform1 needs to be validated.

Use the following steps to validate the SQL Query for the Sales Analysis Subform1 Microsoft Access form.

1. Select the **Attempt to compile invalid SQL queries** link under the main Forms region. As the link suggests, the operation attempts to compile the SQL query syntax. In some cases, where no modification is required to make the syntax valid Oracle syntax, the SQL Query will compile, and the overlying form object status will be updated to Valid. In this case, this operation is not successful. You are required to modify the syntax.

2. Click on the **SQL Query** link in the Source Type column associated with the **Sales Analysis Subform1** form. This opens the SQL Query Editing page.

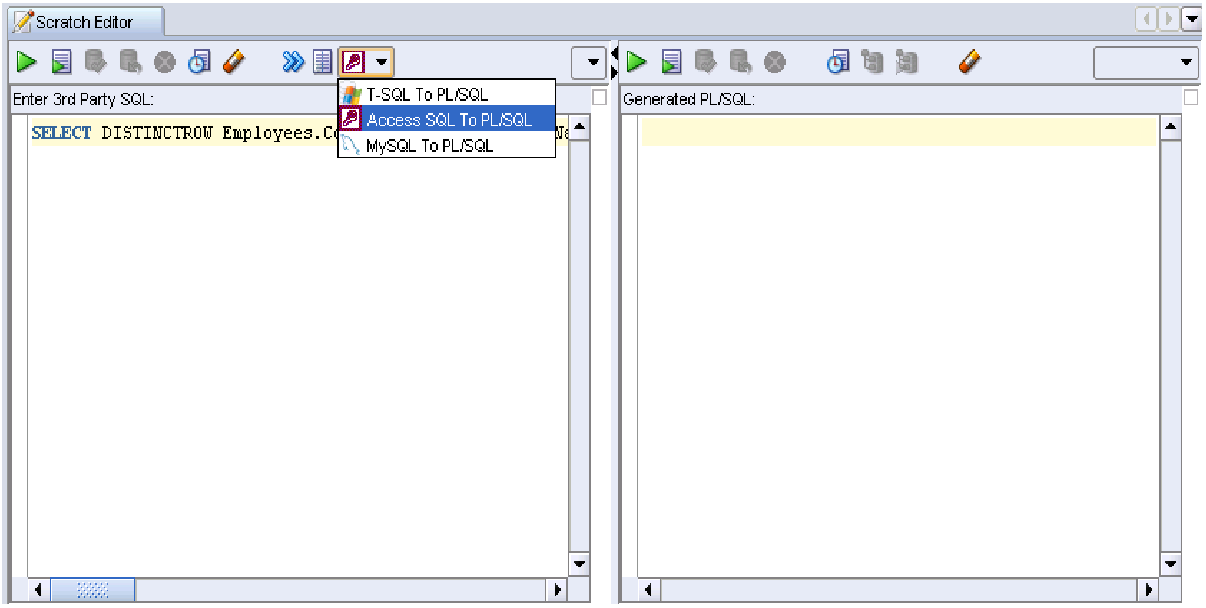
3. Copy the syntax from the edit window to a buffer.

```
SELECT DISTINCTROW Employees.Country, Employees.LastName,
       Employees.FirstName,
       Orders.ShippedDate,
       Orders.OrderID,
       [Order Subtotals].Subtotal AS SaleAmount
FROM   Employees
INNER JOIN (Orders INNER JOIN [Order Subtotals] ON
Orders.OrderID=[Order Subtotals].OrderID) ON
Employees.EmployeeID=Orders.EmployeeID;
```

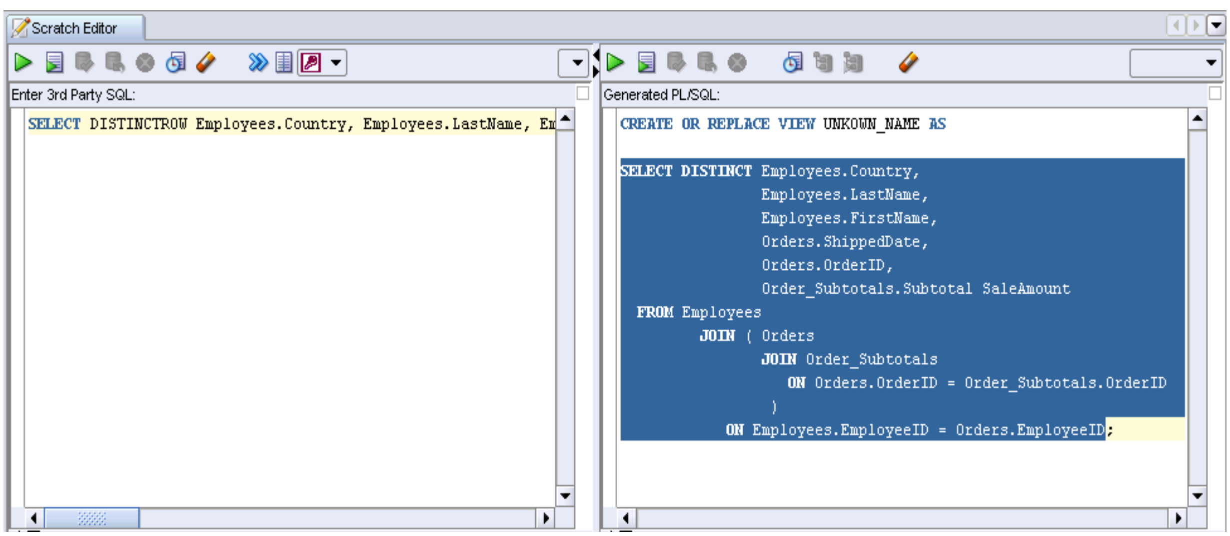
4. From the Migration Workbench, go to the **Migration** > **Translation Scratch Editor** menu item.

5. Paste the content of the buffer into the SQL Worksheet **Enter 3rd Party SQL** in the Migration Workbench.

6. Using the select list on this worksheet, select **Access SQL to PL/SQL**. Click the **Translate** icon to begin the translation.



7. Copy the translated syntax from the **Generated PL/SQL** tab.



```
SELECT DISTINCT Employees.Country,
Employees.LastName,
Employees.FirstName,
Orders.ShippedDate,
Orders.OrderID,
Order_Subtotals.Subtotal SaleAmount
FROM Employees
JOIN (Orders
JOIN Order_Subtotals
ON Orders.OrderID = Order_Subtotals.OrderID
)
ON Employees.EmployeeID = Orders.EmployeeID
```

Note: Do not include the first line of the syntax, i.e. exclude the **CREATE OR REPLACE VIEW UNKNOWN_NAME AS** line of the syntax.

8. Paste the syntax into the edit region of the SQL Query Editing page in Application Migration Workshop. Click **Compile**.

9. Using the breadcrumb, navigate back to the main Forms page, checkmark the updated form **Sales Analysis Subform1**, and click **Apply Changes** to save the update. This form will now be included in the migration project.

Migrate To Option

For Microsoft Access Forms based on a source type of **Table** or **Query**, there is an option to select the type of Oracle Application Express item you wish to migrate your form to:

- Form – default
- Tabular Form
- Report and Form

The Report and Form option allows for easy navigation and editing of the information contained within the underlying source object. An image can be associated with a Report. The image can be used as a navigation or menu item in your new Application Express application.

The Switchboard form in the original Microsoft Access Northwind application acts as the main navigation through the application. It has five main items:

- Categories
- Suppliers
- Products
- Orders
- Reports

Based upon the original Northwind application, I would recommend selecting the **Report and Form** option to migrate the forms. This option automatically generates a report and form on the source type object.

☐	Access Form	Source Type	Source Name	Status	Startup Form	Parent Form	Migrate To
☐	Startup			Invalid	✓		
☑	Suppliers	Table	SUPPLIERS	Valid			Report and Form
							21 - 22

For example, for the Suppliers form object the source type is the SUPPLIERS table, and setting Migrate To to **Report and Form** will generate a report and form based on the SUPPLIERS table. This option allows for easy navigation and editing of the information contained within the Suppliers table. The report allows you to view the contents of the Suppliers table, and the form allows you to create, update, or delete information in the table.

Set the Migrate To field option to **Report and Form** for each of the valid forms, where their source type is Table or Query.

Remove Duplicate Selections

On the main Forms page, sort the information based on the Source Name. Click on the Source Name heading to alphabetically sort the report by the name of the underlying source object:

☐	Access Form	Source Type	Source Name	Status	Startup Form	Parent Form	Migrate To
☑	Categories	Table	CATEGORIES	Valid			Report and Form
☑	Customer Orders	Table	CUSTOMERS	Valid			Report and Form
☑	Customer Phone List	Table	CUSTOMERS	Valid			Report and Form
☑	Customers	Table	CUSTOMERS	Valid			Report and Form
☑	Employees	Table	EMPLOYEES	Valid			Report and Form
☑	Customer Orders Subform1	Table	ORDERS	Valid		Customer Orders	Report and Form

Review the forms that reference the same source name. For example, **Customer Orders** and **Customer Phone List** are based on the same source object, the **CUSTOMERS** table. To avoid generating duplicate Report and Form pages on the same table or query, checkmark only one Access form on a table or query. Uncheck **Customers** and **Customer Phone List,** to generate only one Report and Form on the **CUSTOMERS** table.

☐	Access Form	Source Type	Source Name
☑	Categories	Table	CATEGORIES
☑	Customer Orders	Table	CUSTOMERS
☐	Customer Phone List	Table	CUSTOMERS
☐	Customers	Table	CUSTOMERS

Review the full list of Access forms on this report, and ensure that the following Access forms have been unchecked:

Customers
Customer Phone List
Products
Customer Orders Subform2
Sales Analysis Subform2

Click **Apply Changes**, to save the updates.

Reports

Review the Retrieved Reports by clicking on the Reports link on the project page.

All of the reports now have a status of valid due to the validation steps carried out on their underlying Oracle Views , i.e., EMPLOYEE_SALES_BY_COUNTRY and INVOICES. To include these reports in the migration, check the two unchecked boxes and Click Apply Changes to save the update.

☐	Access Report	Source Type ▲	Source Name	Status
☑	Catalog	Table	CATEGORIES	Valid
☑	Customer Labels	Table	CUSTOMERS	Valid
☑	Catalog Subreport	Table	PRODUCTS	Valid
☑	Alphabetical List of Products	Query	ALPHABETICAL_LIST_OF_PRODUCTS	Valid
☐	Employee Sales by Country	Query	EMPLOYEE_SALES_BY_COUNTRY	Valid
☐	Invoice	Query	INVOICES	Valid
☑	Products by Category	Query	PRODUCTS_BY_CATEGORY	Valid
☑	Sales Totals by Amount	Query	SALES_TOTALS_BY_AMOUNT	Valid
☑	Sales by Category	Query	SALES_BY_CATEGORY	Valid
☑	Sales by Category Subreport	Query	SALES_BY_CATEGORY	Valid
☑	Sales by Year	Query	SALES_BY_YEAR	Valid
☑	Sales by Year Subreport	Query	SALES_BY_YEAR	Valid
☑	Summary of Sales by Quarter	Query	SUMMARY_OF_SALES_BY_QUARTER	Valid
☑	Summary of Sales by Year	Query	SUMMARY_OF_SALES_BY_YEAR	Valid
			1 - 14	

Note: For details on the information displayed on this Reports page, refer to the Review Retrieved Reports section in Chapter 21 – Migrating Applications of the Oracle Application Express User's Guide Release 3.0.

Databases, Modules, and Pages Information

Review the Databases, Modules and Pages Information. Application Migration Workshop does not migrate Modules or Pages; they are listed on the summary page for reference purposes only.

Note: For details on the information displayed on the Databases, Modules, and Pages page, refer to the Review Database, Module, and Pages Information section in Chapter 21 – Migrating Applications of the Oracle Application Express User's Guide Release 3.0.

Updated Objects Table

Review the main Objects Table.

Following the compilation and validation of the previously invalid queries and SQL queries, the status of the migration project objects has been updated, and this is reflected in the Objects table on the main project page.

Migration Project: Northwind Database: - All -

Objects	Count	Valid	Invalid	Included
Databases	1			
Tables	8	8	0	8
Queries	21	21	0	21
Forms	22	16	6	16
Reports	14	14	0	14
Modules	2			
Pages	5			

7.0 Generate the Oracle Application Express Application

Once you have reviewed the Retrieved Objects, and included the objects you wish to migrate, use the Generate Application link in the Tasks region on the right of the main Migration Project page. This option generates an Oracle Application Express application based upon the Forms and Reports objects included in your Migration Project.

Note: The Generate Maintenance Application link, in the Tasks region, generates an Oracle Application Express application based upon the Tables and Queries objects included in your Migration Project.

Generate Application Defaults

The Application Builder uses Application Defaults during the generation of a new Oracle Application Express application. The defaults apply to any new application generated within the Northwind workspace.

Note: The Generate Application wizard does allow you to override the User Interface Theme selected in your Application Defaults.

1. Select the Generate Application Defaults link to the right of the main Migration Project Page. Set the values as follows:

    - Tabs: No Tabs
    - Authentication: Application Express
    - Theme: Theme 4
    - Globalization: Set according to your requirements

2. Click **Apply Changes**, to save the updates.

Generate Application

The Generate Application wizard builds an Oracle Application Express application based upon the included items in your Migration Project. For each Microsoft Access object being migrated, an associated Oracle Application Express page will be created. If you selected to migrate a Microsoft Access form to a Report and Form, two pages will be generated for that one original object. On the first page of the wizard, a summary of the selected application objects is displayed. Review this summary page to ensure that all of your required objects have been included.

Review Selected Application Objects

Review the list of pages under the Home page and the Reports page in the Selected Application Objects report. To reduce the size of the application being generated, and also to avoid generating duplicate forms and reports, remove duplicate pages. Duplicate pages occur when you have multiple pages based on the same page source and page type, e.g., Pages 4 & 5, both named Customers, are a Report and Form based on the CUSTOMERS table. Using the Delete Page icon, remove any other pages where the source is CUSTOMERS.

Selected Application Objects Cancel Next >

Page ID	Page Name	Page Type	Page Source	Source	Delete Page
1	Home Page	Blank			
2	Categories	Report	Table	CATEGORIES	
3	Categories	Form	Table	CATEGORIES	
4	Customers	Report	Table	CUSTOMERS	
5	Customers	Form	Table	CUSTOMERS	
6	Customer Orders Subform1	Report	Table	ORDERS	
7	Customer Orders Subform1	Form	Table	ORDERS	
8	Employees	Report	Table	EMPLOYEES	
9	Employees	Form	Table	EMPLOYEES	
10	Orders	Form	Table	ORDERS_QRY	
11	Customer Orders Subform2	Report	Table	ORDER_DETAILS_EXTENDED	
12	Customer Orders Subform2	Form	Table	ORDER_DETAILS_EXTENDED	

13	Product List	Report	Table	PRODUCTS
14	Product List	Form	Table	PRODUCTS
15	Sales Analysis Subform1	Report	SQL Query	SELECT DISTINCT Employee
16	Suppliers	Report	Table	SUPPLIERS
17	Suppliers	Form	Table	SUPPLIERS
18	Reports Home Page	Blank		
19	Alphabetical List of Pro	Report	Table	ALPHABETICAL_LIST_OF_PRO
20	Catalog	Report	Table	CATEGORIES
21	Catalog Subreport	Report	Table	PRODUCTS
22	Customer Labels	Report	Table	CUSTOMERS
23	Employee Sales by Countr	Report	Table	EMPLOYEE_SALES_BY_COUNTR
24	Products by Category	Report	Table	PRODUCTS_BY_CATEGORY
25	Sales by Category	Report	Table	SALES_BY_CATEGORY
26	Sales by Year	Report	Table	SALES_BY_YEAR
27	Sales Totals by Amount	Report	Table	SALES_TOTALS_BY_AMOUNT
28	Summary of Sales by Quar	Report	Table	SUMMARY_OF_SALES_BY_QUAR
29	Summary of Sales by Year	Report	Table	SUMMARY_OF_SALES_BY_YEAR

Update Page Definitions

To view/edit the Page Definition information of a selected application object, click the Page Name link, e.g., in the screenshot above, clicking the Home link would open the Page Definition for the Home page.

Home Page – Page 1

This page acts as the main navigation point for your Oracle Application Express application, similar to the Switchboard form in the original Microsoft Access Northwind application. By default, all Microsoft Access Form objects included in your migration project will be generated as child pages to the parent Home Page.

1. Click the **Home Page** link in the Page Name column, to view the Page Definition information for page 1.

2. Change the Page Name to **Home**.

3. In the Navigation section, select the **Horizontal Images List**.

4. Click **Apply Changes**, to save the updates. The Page Name for page 1 should now have been updated to **Home**.

Categories – Page 2

1. Click the **Categories** link in the Page Name column, to view the Page Definition information for page 2.

2. Select **Books** from the Page Icon select list. The icon displayed to the right of the Page Icon field will be updated to reflect this change.

3. Click **Apply Changes**, to save the update.

Categories – Page 3

1. Click the **Categories** link in the Page Name column, to view the Page Definition information for page 3.

2. Change the Page Name to **Category Details**.

3. Click **Apply Changes**, to save the update.

Customers – Page 4

1. Click the **Customers** link in the Page Name column, to view the Page Definition information for page 4.

2. Select **Business Users** from the Page Icon select list. The icon displayed to the right of the Page Icon field will be updated to reflect this change.

3. Click **Apply Changes**, to save the update.

Customers – Page 5

1. Click the **Customers** link in the Page Name column, to view the Page Definition information for page 5.

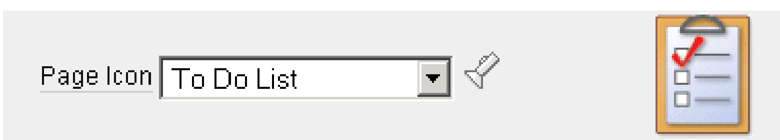
2. Change the Page Name to **Customer Details**.

4. Click **Apply Changes**, to save the update.

Customer Orders Subform1 – Page 6

1. Click the **Customer Orders Subform1** link in the Page Name column, to view the Page Definition information for page 6.

2. Select **To Do List** from the Page Icon select list. The icon displayed to the right of the Page Icon field will be updated to reflect this change.



3. Change the Page Name to **Orders**.

4. Click **Apply Changes**, to save the updates.

Customer Orders Subform1 – Page 7

1. Click the **Customer Orders Subform1** link in the Page Name column, to view the Page Definition information for page 7.

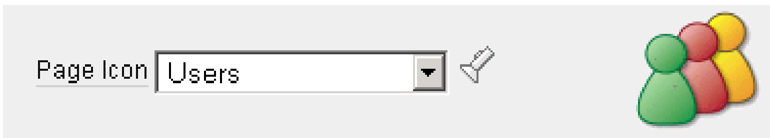
2. Change the Page Name to **Order Details**.

5. Click **Apply Changes**, to save the update.

Employees – Page 8

1. Click the **Employees** link in the Page Name column, to view the Page Definition information for page 8.

2. Select **Users** from the Page Icon select list. The icon displayed to the right of the Page Icon field will be updated to reflect this change.



3. Click **Apply Changes**, to save the update.

Employees – Page 9

1. Click the **Employees** link in the Page Name column, to view the Page Definition information for page 9.

2. Change the Page Name to **Employee Details**.

3. Click **Apply Changes**, to save the update.

Customer Orders Subform1 – Page 10

1. Click the **Customer Orders Subform1** link in the Page Name column, to view the Page Definition information for page 10.

2. Change the Page Name to **Orders**.

3. Click **Apply Changes**, to save the update.

Customer Orders Subform1 – Page 11

1. Click the **Customer Orders Subform1** link in the Page Name column, to view the Page Definition information for page 11.

2. Select **Clipboard** from the Page Icon select list. The icon displayed to the right of the Page Icon field will be updated to reflect this change.

3. Change the Page Name to **Orders**.

4. Click **Apply Changes**, to save the updates.

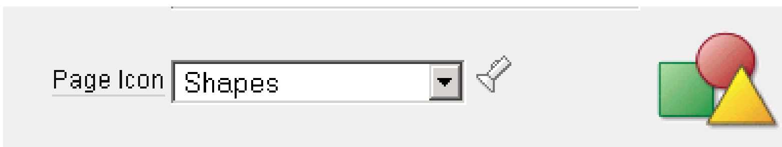
Customer Orders Subform1 – Page 12

1. Delete page 12 by clicking the  delete icon. The page entry will be removed from the Selected Application Objects list.

Products – Page 13

1. Click the **Products List** link in the Page Name column, to view the Page Definition information for page 13.

2. Select **Shapes** from the Page Icon select list. The icon displayed to the right of the Page Icon field will be updated to reflect this change.



3. Change the Page Name to **Products**.

4. Click **Apply Changes**, to save the update.

Products – Page 14

1. Click the **Products** link in the Page Name column, to view the Page Definition information for page 14.

2. Change the Page Name to **Product Details**.

3. Click **Apply Changes**, to save the update.

Sales Analysis Subform1 – Page 15

1. Click the **Sales Analysis Subform1** link in the Page Name column, to view the Page Definition information for page 15.

2. Set the Parent Page to **Reports (18)**.

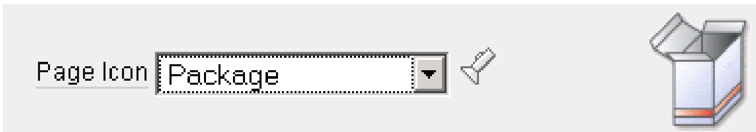
3. Change the Page Name to **Sales Analysis**.

4. Click **Apply Changes**, to save the update.

Suppliers – Page 16

1. Click the **Suppliers** link in the Page Name column, to view the Page Definition information for page 16.

2. Select **Package** from the Page Icon select list. The icon displayed to the right of the Page Icon field will be updated to reflect this change.



3. Click **Apply Changes**, to save the update.

Suppliers – Page 17

1. Click the **Suppliers** link in the Page Name column, to view the Page Definition information for page 17.

2. Change the Page Name to **Supplier Details**.

3. Click **Apply Changes**, to save the update.

Reports Home Page – Page 18

This page acts as the main navigation point for your migrated Microsoft Access Report objects. To be able to navigate to the Reports information via the Home page, update the Parent Page setting on the Page Definition page. By default, all Microsoft Access Reports objects included in your migration project will be generated as child pages to the parent Reports Home Page.

1. Click the **Reports Home Page** link in the Page Name column, to view the Page Definition information for page 18.

2. Set the Parent Page to **Home (1)**.

3. Change the Page Name to **Reports**.

   Note: an image can be associated with this page after the application has been generated.

4. Click **Apply Changes**, to save the update.

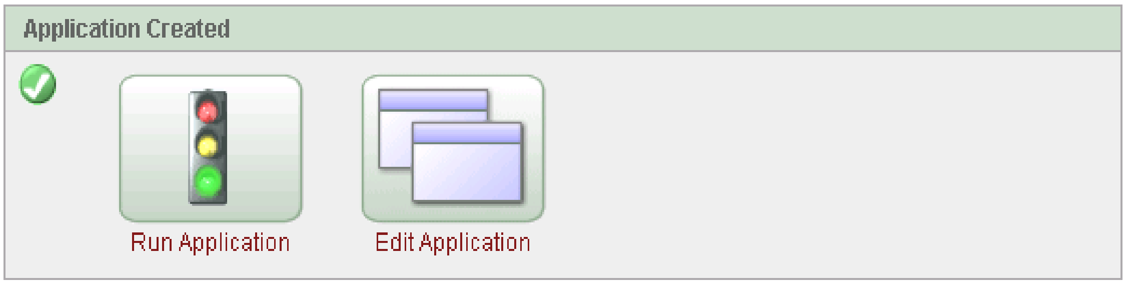
Create Application

1. Once you have updated the page definition information for the objects listed on the **Selected Application Objects** report proceed through the wizard, click **Next** to proceed to the theme selection step for the wizard.

2. By default, **Theme 4** is selected, based upon the [Application Defaults]() defined earlier. Click **Next** to view the summary information for the application being generated.

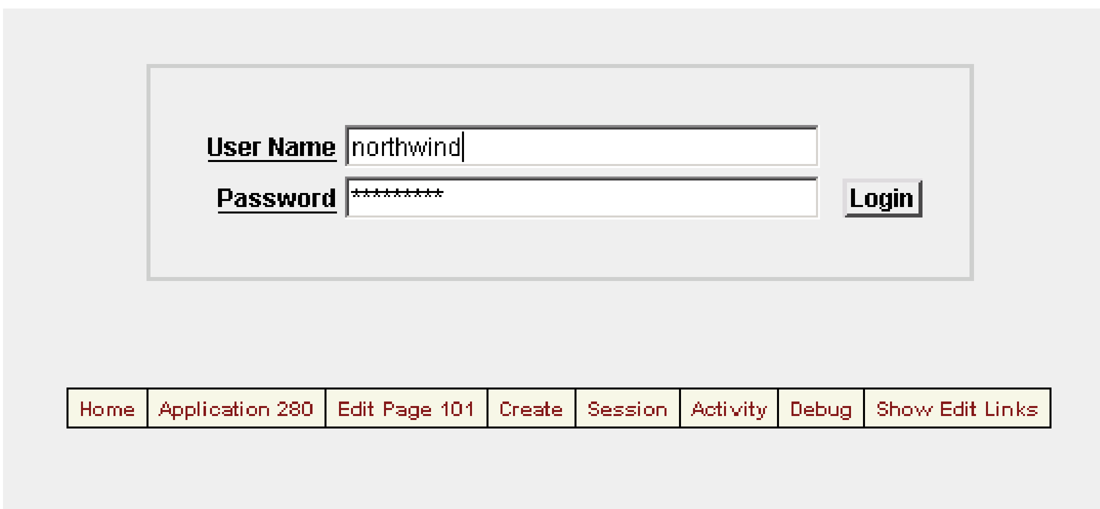
3. On the summary page, Click **Create** to create your new Application Express application.

4. On successful creation, you will receive the **Application Created** message, as follows:



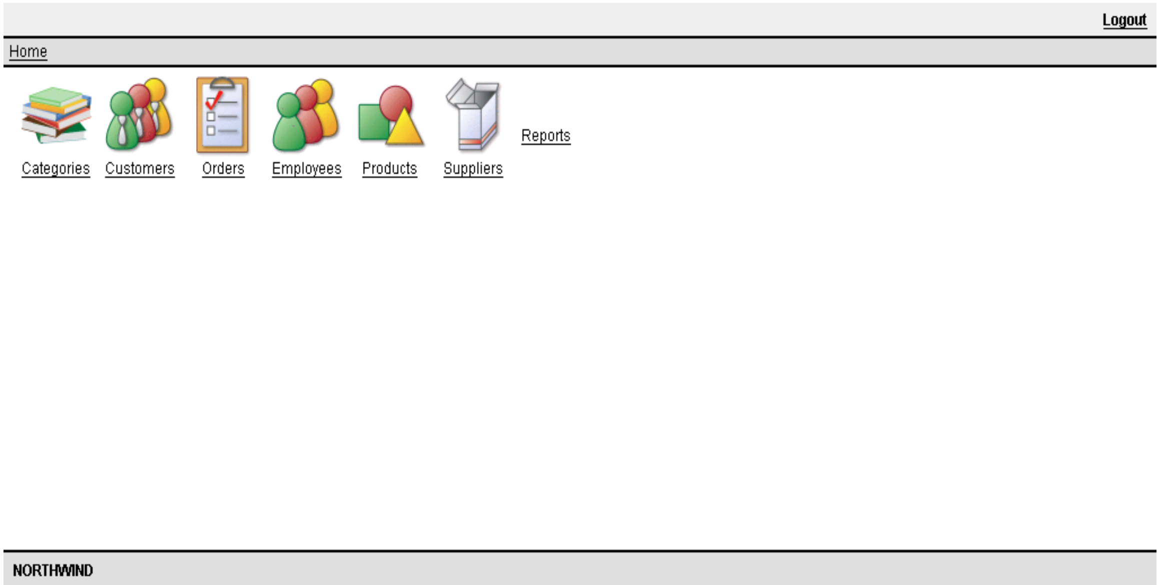
Click **Run Application**, to start the new application.

5. On the **Login** page, enter the connection details for your Workspace user, namely Northwind / northwind. Click **Login**.



Note: The new application has been created with Application Express authentication, based upon the Application Defaults you defined prior to its creation. This creates an application with a login page.

6. On successful login to your new Northwind Application Express application, the main page should look similar to the following:



The images act as the navigation or menu for the application.

8.0 *Customize your Oracle Application Express Application*

You may wish to update your generated Oracle Application Express Application, to modify the appearance to appear closer to your original Microsoft Access application. To edit your application, use the developer toolbar located at the bottom of the Oracle Application Express page.

Page 0

A Page 0 in your Oracle Application Express application acts as a master page, allowing you to add information or page items that will be displayed on all pages within the application. To add the main navigation region to all pages within the Southwind Wholesalers application, do the following to create a Page 0:

1. Edit the application, and select the **Create Page** > button.

2. Select a **Blank Page** type. Click **Next**.

3. Set Page Number to **0**. Click **Next**.

4. Set Name to **Zero**. Click **Next**.

5. Select the **No** tab option. Click **Next**.

6. On completion of the wizard, click **Finish**.
7. Edit the page, and in the Regions section, click the Create icon.

8. Select the **List** region type.

9. Set the Title to **Switchboard**, and Region Template to **No Template**. Click **Next**.

10. Set the Display Point to be **Page Template Body (1)**. Click **Next**.

11. Select the List that displays the navigation images, as displayed on the Home page, i.e. **Navigation_1**.

12. In the Condition Display section, set the Condition Type to **Current Page Is NOT in Expression**, and set Expression 1 to **101**. This ensures that the navigation list does not get displayed on the Login page. Click **Create Region**.

13. Navigate to Page 1 of the application using the page finder  and select the **Navigation** region link. Click **Delete**.

14. Click **Delete Region**, to remove the navigation region from the Home Page. The region is removed, as it will now be picked up from the new Page 0.

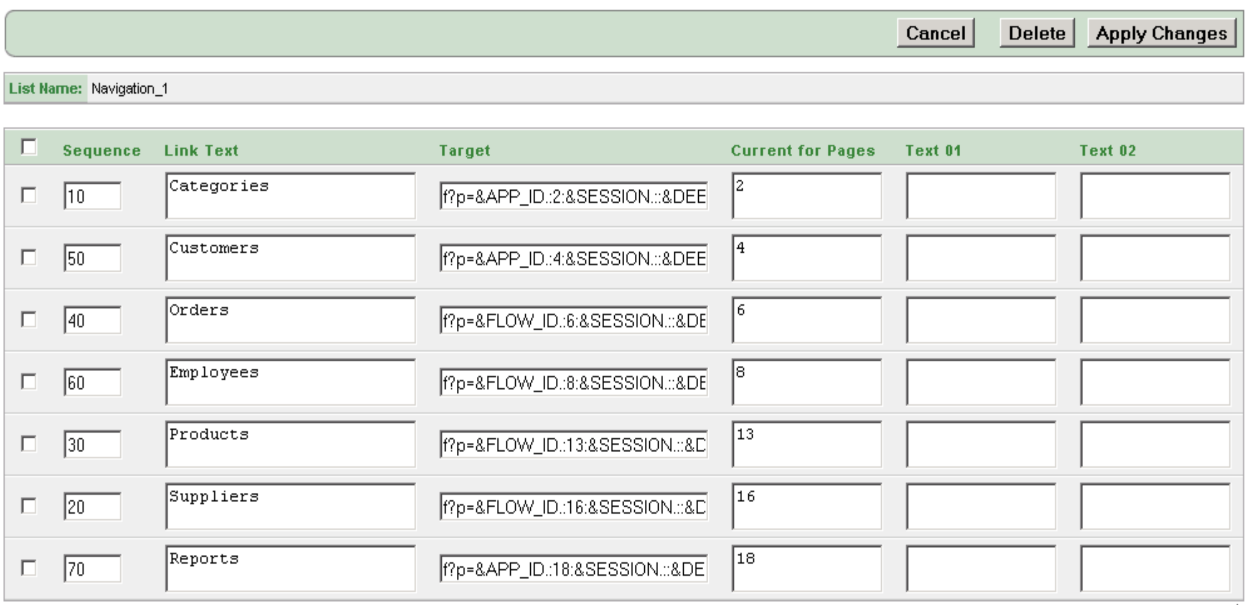
Navigation List

The navigation list generated by Oracle Application Express contains an image for each of the Microsoft Access reports included in the migration. This list will act as the main navigation through the new application, similar to the Switchboard form in the Microsoft Access application. By default, the images added are 64x64 in size.

To change the order of the entries in the navigation list:

1. Navigate to the Shared Components for the application, and in the Navigation section select the **Lists** link. Select the **Navigation_1** list. Select the **Grid Edit** button.

2. Update the numbers in the Sequence column for the list entries as follows:



Cancel | Delete | Apply Changes

List Name: Navigation_1

	Sequence	Link Text	Target	Current for Pages	Text 01	Text 02
	10	Categories	f?p=&APP_ID.:2:&SESSION.::&DEE	2		
	50	Customers	f?p=&APP_ID.:4:&SESSION.::&DEE	4		
	40	Orders	f?p=&FLOW_ID.:6:&SESSION.::&DE	6		
	60	Employees	f?p=&FLOW_ID.:8:&SESSION.::&DE	8		
	30	Products	f?p=&FLOW_ID.:13:&SESSION.::&D	13		
	20	Suppliers	f?p=&FLOW_ID.:16:&SESSION.::&D	16		
	70	Reports	f?p=&APP_ID.:18:&SESSION.::&DE	18		

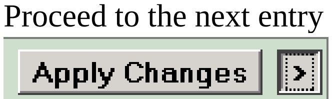
3. Click **Apply Changes,** to save the updates.

To select smaller (32x32) images for the navigation list entries:

1. On the **List Entries** page for the **Navigation_1** list, select the **Categories** link.

2. Set the Image to **/menu/books_32.gif**

3. Proceed to the next entry in the list by selecting the button to the right of Apply Changes



.

4. Set the Image to **menu/package_32.gif** for the **Suppliers** list entry. Proceed to the next list entry by pressing the > button.

5. Set the Image to **menu/shapes_32.gif** for the **Products** list entry. Proceed to the next list entry.

6. Set the Image to **menu/todo_32.gif** for the **Orders** list entry. Proceed to the next list entry.

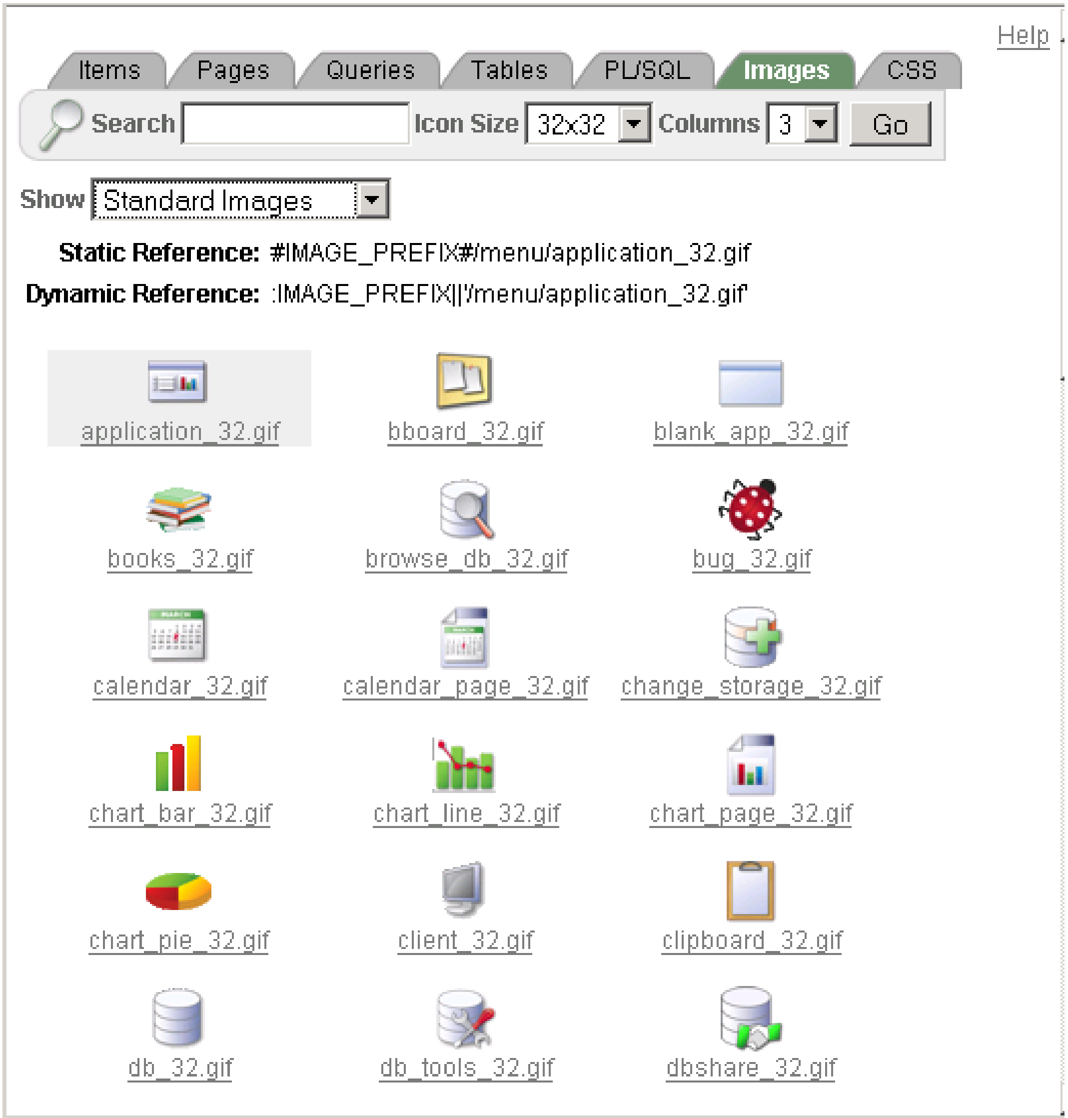
7. Set the Image to **menu/users_business_32.gif** for the **Customer** list entry. Proceed to the next list entry.

8. Set the Image to **menu/users_32.gif** for the **Employees** list entry. Proceed to the next list entry.

9. To add / change an image to the **Reports** list entry select the flashlight icon in the navigation region under the page tabs 

to launch the **Item Finder**.

10. On the **Images** tab set the Icon Size to **32x32** and click **Go** to view the available images of this size.



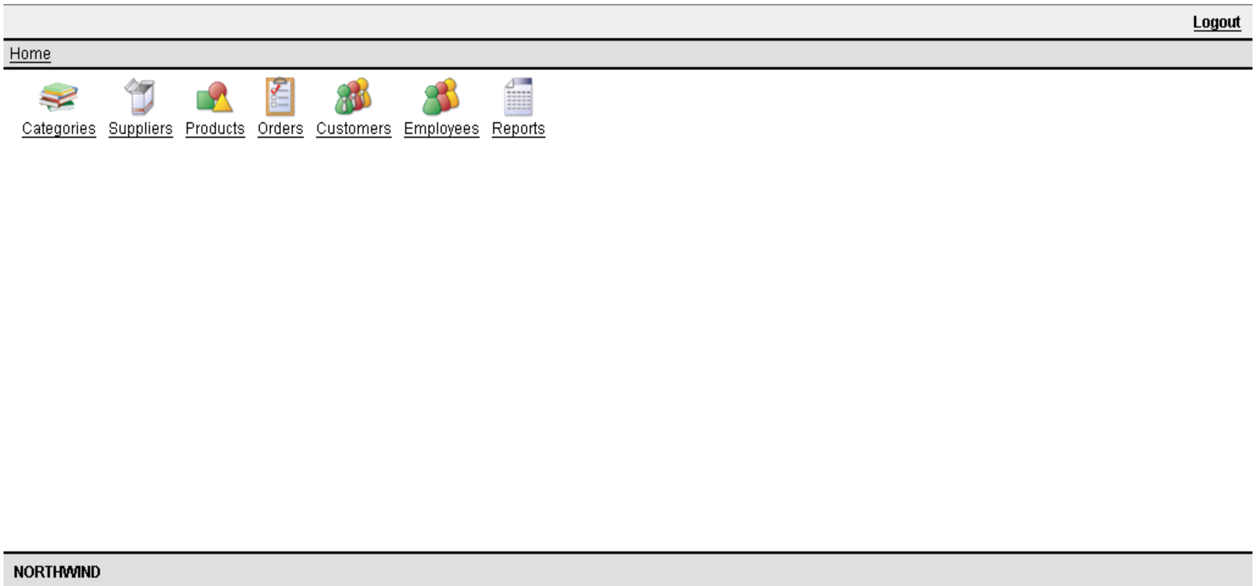
11. Enter **report_32.gif** in the Search field and click **Go** to begin the search process. The returned image 

is displayed, and the Static Reference has been updated with the full reference for the selected image i.e. **Static Reference:#IMAGE_PREFIX#menu/report_32.gif**. Copy the following section of the static reference: **menu/report_32.gif**. Then close the Item Finder.

12. Set the Image to **menu/report_32.gif** for the **Reports** list entry.

13. Click **Apply Changes**, to save the updates

14. Using the breadcrumb, navigate back to the application, and run the application to view the updated navigation list.



To highlight the link text when navigation icon selected:

15. Edit the application, and navigate to the Shared Components.

16. In the User Interface section, select the **Templates** link.

17. Set the Show select list to **List**. Click **Go**. This will display all the list templates associated with the application.

18. Select the **Horizontal Images with Label List** link in the Name column of the report.

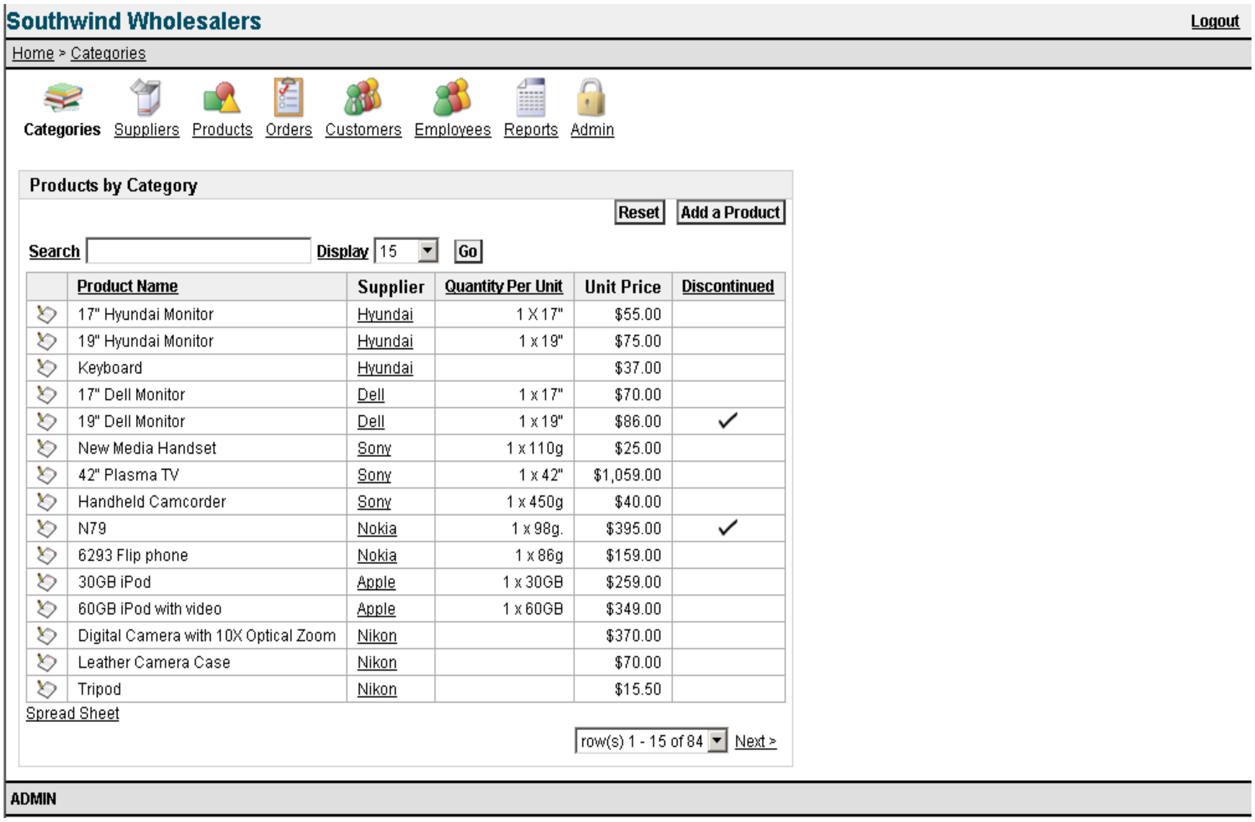
19. In the Template Definition section, update the syntax in the List Template Current field as follows:

    from:
    ```
    <td class="t4current"><img src="#IMAGE_PREFIX##IMAGE#" border="0" alt=""
    #IMAGE_ATTR#/><br />#TEXT#</td>
    ```

    to:
    ```
    <td class="t4current"><img src="#IMAGE_PREFIX##IMAGE#" border="0" alt=""
    #IMAGE_ATTR#/><br /><b>#TEXT#</b></td>
    ```

    Note: the inclusion of the <b/> tag tells the browser to render the contained text in bold. This will mean that when a navigation icon is selected, its associated text will be in bold.

20. Click **Apply Changes**, to save the update to the List template. Run the application to view the updated navigation list when the Categories icon is selected:



Application Name and Logo

Using the Shared Components page, the definition of the generated application can be modified. For the purposes of this document, and to accompany the Southwind Wholesalers sample application, the name of the application is to be Southwind.

To modify the new Application Express application name:

1. Edit the application.

2. Select the **Shared Components**, and in the Application section, select the **Definition** link.

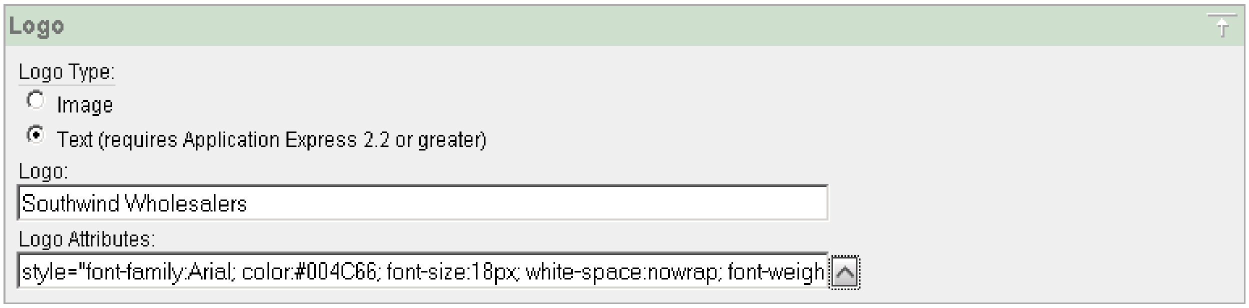
3. Set the name to **Southwind**. Click **Apply Changes** to save the update.

To add the company name to the top left corner of the application:

1. Edit the application.

2. Select the **Shared Components**, and in the Application section, select the **Definition** link.

3. In the Logo section, update as follows:



Note: Use the Logo Attributes finder icon, and select **Blue Text** from the popup page.

4. Click **Apply Changes**, to save the updates. Run the page, selecting the traffic light icon to view your updated page, where the company name should now be visible in the top left corner of the application.

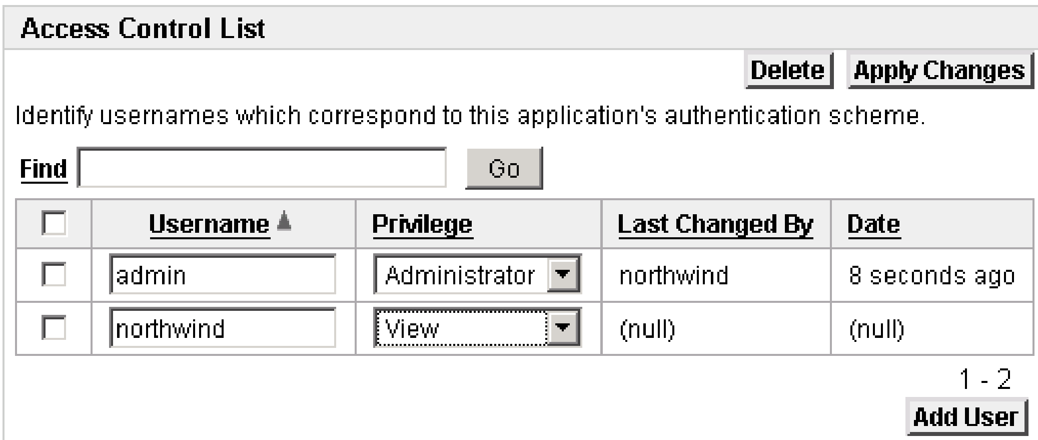
Application Access Control

To add access control to your new Oracle Application Express Southwind application and include it as a new navigation list entry, do the following:

1. Edit your application, and from the Application Builder page, select the **Create Page** button.
2. Select a page type of **Access Control.** Click **Next**.
3. For the Tab Options select **Do not use tabs**. Click **Next** and review the summary information for the new page. Click **Finish** to generate the new authentication page.
4. Run the page.
5. To set the application mode for your application, select the **Restricted access. Only users defined in the access control list are allowed** option.
6. Click **Set Application Mode**, to save the update.

7. To add users that correspond to your workspace's authentication scheme, select the **Add User** button twice. This will create two empty rows in the **Access Control List** table.

8. Update the **Username** and **Privilege** fields with the user information for existing users associated with the workspace. For example:



   Click **Apply Changes**, to save the update.

   Note: there are three privilege options, Administrator, Edit and View. The setting of this privilege allows you to control the access that different users have to the application.

9. Edit the application, and navigate to the Shared Components.

10. In the Navigation section select the **Lists** link select the **Navigation_**1 list. In the **Navigation_1** list, select the **Create List Entry** > button.

11. In the Entry section, set the Sequence to **80**, or the next number in the sequence, to ensure that the new entry occurs last in the list.

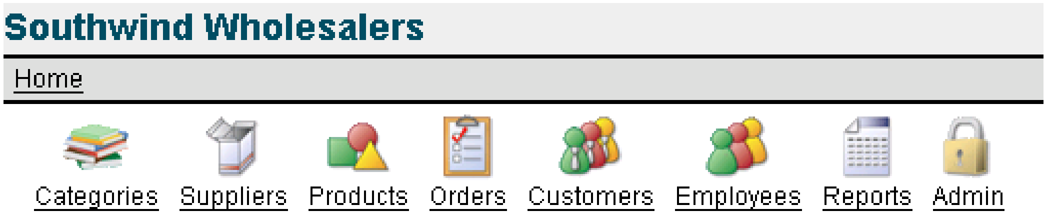
12. Set the Image to **menu/lock_32.gif**.

    Note: to select an alternative image, use the Images tab in the Item Finder, which can be launched by clicking the flashlight icon  in the developers navigation region.

13. Set the List Entry Label to **Admin**.

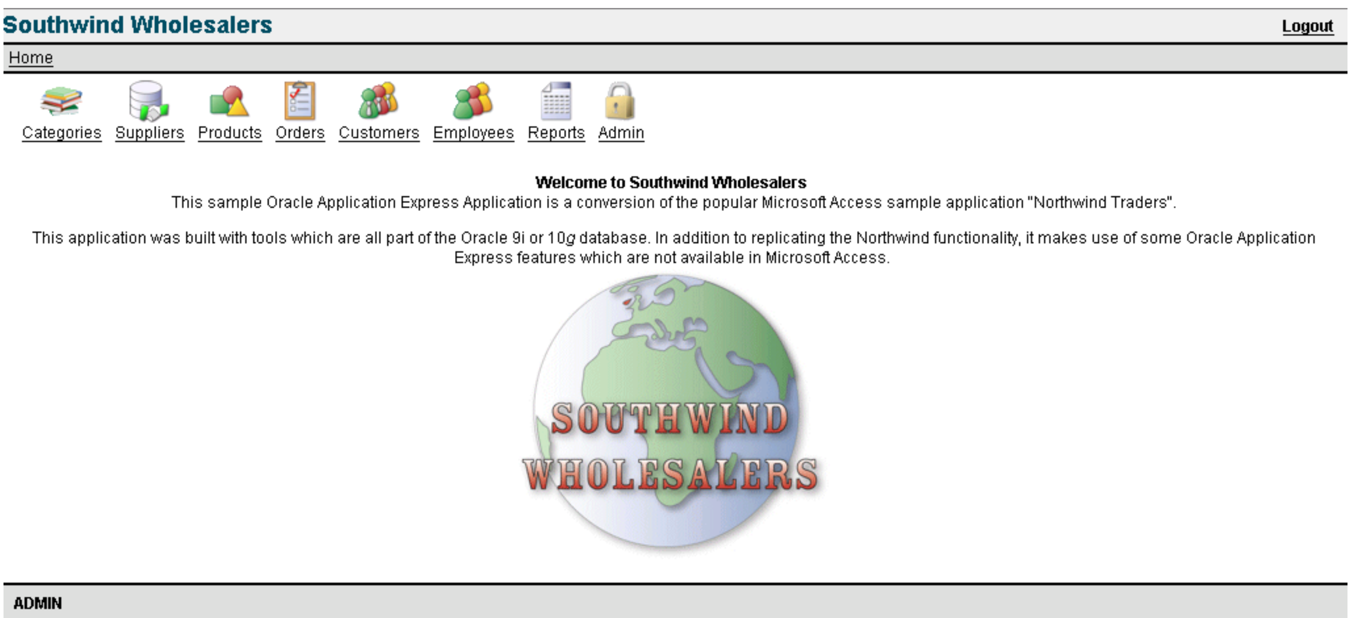
14. In the Target section, enter the page number for the newly created Access Control Administration Page.

15. Click **Create**, to add the item to the navigation list.   Using the breadcrumb, navigate to the main application page, and run the page to view the updated navigation list.



Home Page

The updated page can be modified to look similar to the following:



The text used on the Startup form of the Microsoft Access Northwind application can be applied to your new Oracle Application Express application Home page.

To apply introductory text to the Home page, do the following:

1. Navigate to your Workspace home page. Select the **Application Migrations** link in the Task region to the right of the page.

2. Select the **Northwind** Migration Project, and then select the **Forms** link.

3. Select the **Startup** link, to view the controls retrieved for the form object.

4. Copy the text in the **Caption** field for the Paragraph1 control. Paste the text to a text editor. Do the same for the Paragraph2 control.

5. Using the breadcrumb, navigate to the main Northwind project page.

6. Select the **Applications** show/hide link under the main Objects report. The **Southwind** application that was generated via the Generate Application wizard will be listed in this region. Select the **Southwind** application.

7. Select **Page 1** Home page, and in the Regions section, click the **Create** icon.

8. Create an **HTML** type region, and set the region title to **Welcome to Southwind Wholesalers**.

9. Set the Region Template to **No template**, to ensure that the region is displayed with no title information showing.

10. Set the Display Point to be **Page Template Region Position 2**, and set the column to **3**.

11. Enter the following text in the HTML Text Region Source:

```
<table width="100%" class="instructiontext">
<tr>
<td><center>
<b><a name="align"><font size="7">Welcome to Southwind
Wholesalers</font></a></b>
<br/>
This sample Oracle Application Express Application is a conversion of the
popular Microsoft Access sample application "Northwind Traders".
<p/>
This application was built with tools which are all part of the Oracle 9i or
10<i>g</i> database.  In addition to replicating the Northwind functionality,
it makes use of some Oracle Application Express features that are not
available in Microsoft Access.
<br/>
<img src="#WORKSPACE_IMAGES#southwind.gif" />
</center></td>
</tr>
</table>
```

    Note: the image **southwind.gif** is referenced in the above HTML syntax. This image will be added to the Shared Components for the application in the next section.

12. Click **Next** to proceed to the last step of the wizard. Click **Create Region**. The region is then added to the page.

13. In the Regions section, select the **Welcome to Southwind Wholesalers** link to edit the new region.

14. In the Header and Footer region, add **
** HTML tag to the **Region Header**.

15. Click **Apply Changes**, to save the updates.

16. Navigate to the **Shared Components** of your new Oracle Application Express application, by using the icon, displayed under the SQL Workshop tab in the top right corner of the page.

17. Under the Files section, select the **Images** link.

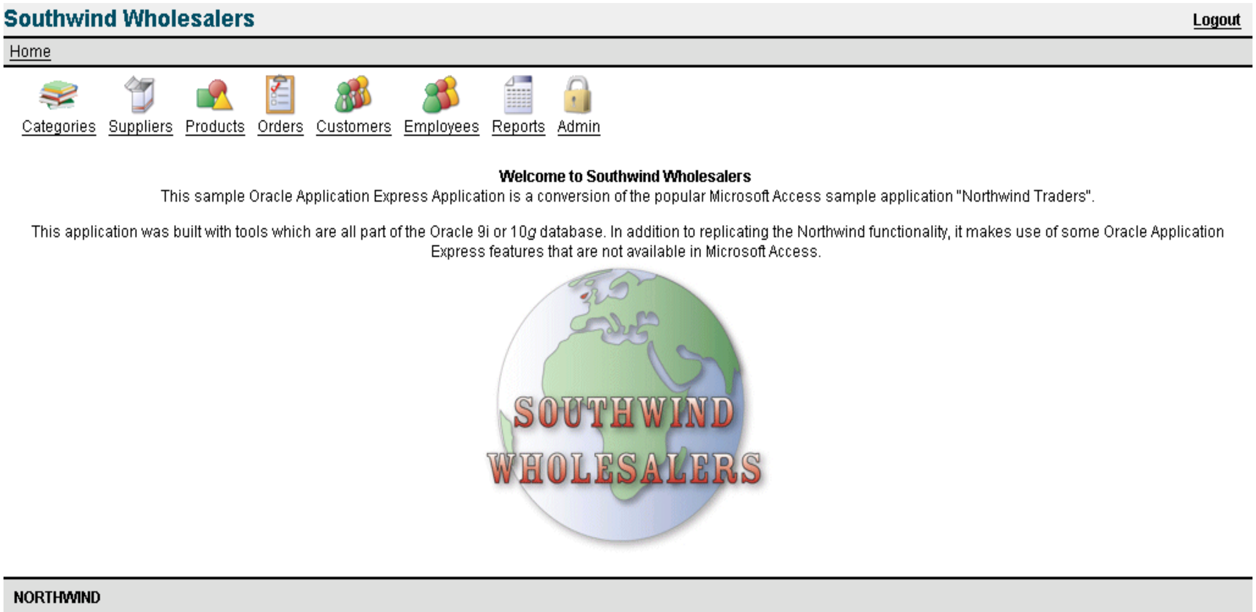
18. Click **Create** to load up the company logo from your local file system.

19. Set the following information:

    - Application: Select the **Southwind** application from the select list
    - Upload New Images: Browse to the **southwind.gif** file referenced in the HTML syntax of the **Welcome to Southwind Wholesalers** HTML region. Click **Upload**.

Note: the southwind.gif image is packaged as part of the Southwind packaged application, which is available for download from OTN.

20. Run the application to view the updated Home page.



Login / Logout

When a new Oracle Application Express application is generated with Application Express authentication, a Login page, page 101, is created by default. The username / password combination is the same as the current user’s login details, e.g., for the Northwind workspace, the login details would be northwind / northwind. A Logout navigation link is included on each page of the application, and is located in the top right corner of the page. Selecting this link logs the user out of the Southwind application, and redirects the user to the Login page.

To add introductory text to the Login page:

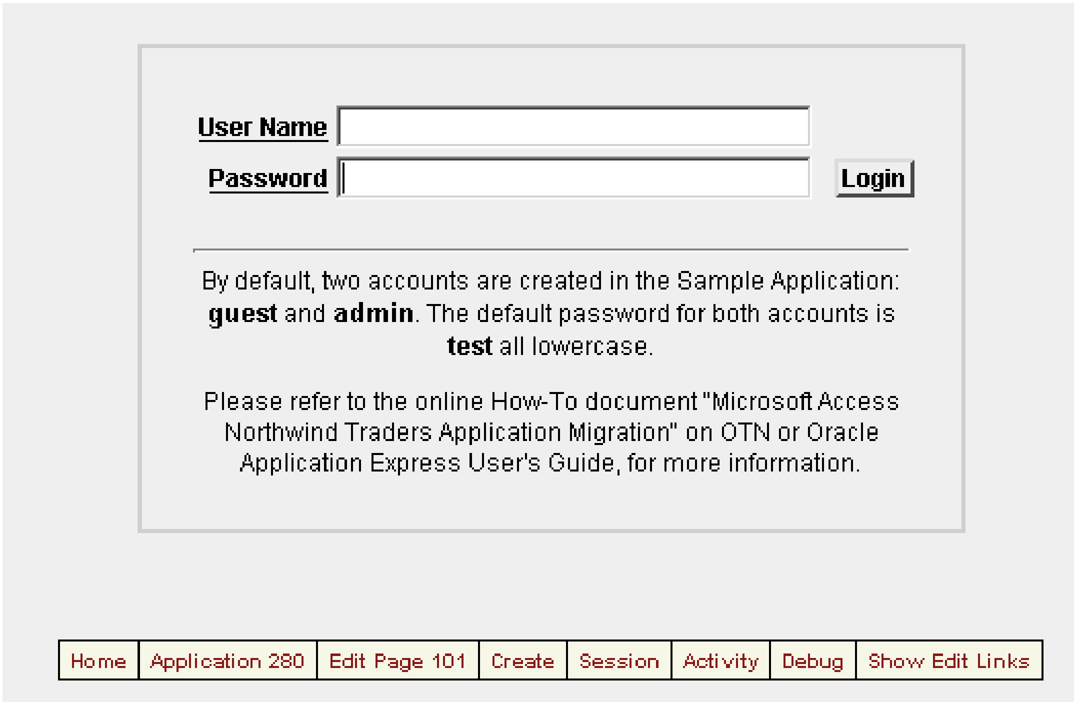
1. Edit Page 101 of the application.

2. Select the **Login** HTML region in the Regions section.

3. In the Region Source enter the following:

```
<br/>
<hr/>
By default, two accounts are created in the Sample Application: <span
class="fielddatabold">guest</span> and <span
class="fielddatabold">admin</span>. The default password for both accounts is
<span class="fielddatabold">test</span> all lowercase.
<p/>
Please refer to the online How-To document "Microsoft Access Northwind
Traders Application Migration" on OTN or Oracle Application Express User's
Guide, for more information.
```

4. Click **Apply Changes**, to save the update. Run the page to view the updated information.

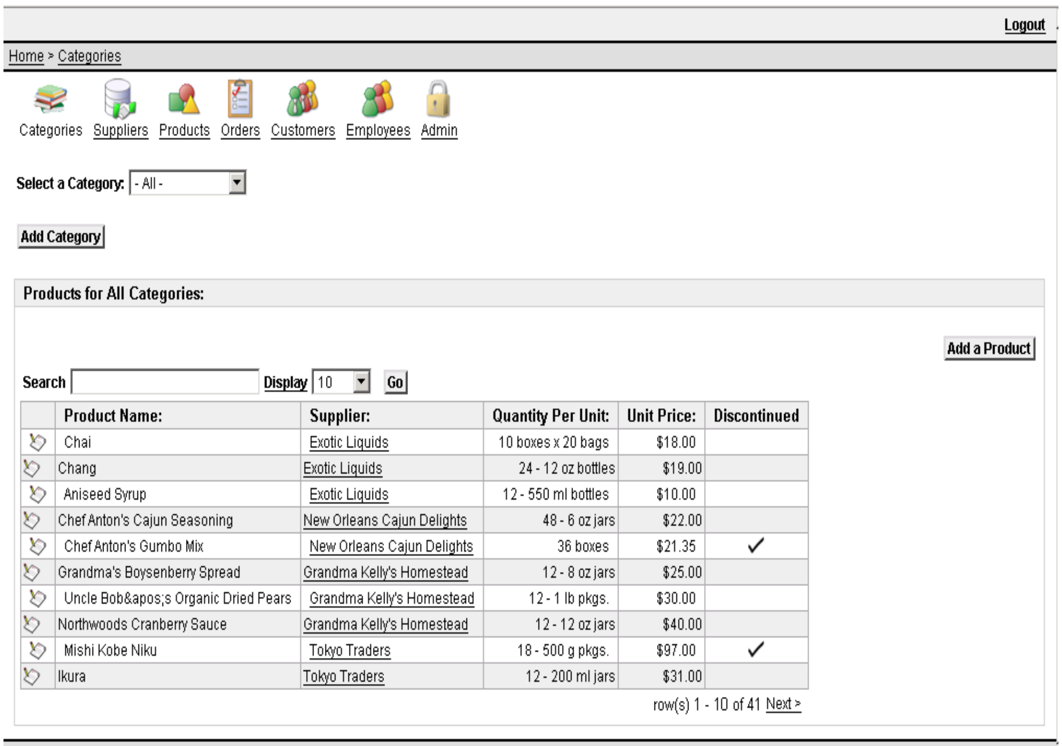


Reports

The following are examples of how you can update your Southwind reports, to make the report look more like your original Microsoft Access report, and also to add functionality to your new Oracle Application Express report.

Categories Report

The Categories report can be updated to use the Report **Products by Category**, to add more detail to this page. The report page can you updated to look similar to the following:



To apply the Products by Category report to the main Categories page:

1. Select the **Reports** navigation icon.

2. Select the **Products by Category** link, to open the Products by Category page. Note the page number. Edit the Products by Category page.

3. In the Regions section, select the Copy icon, and then select the Products by Category to copy from the list of regions for this page.

4. Identify the page for the new region, by using the filter button. This launches a pop-up window with a list of the pages in your application. Select the main Categories page, page **2**.

5. Set Copy Region Items to **No**, and set Copy Buttons to **No**. Click **Next**.

6. Set the Display Point to be **Page Template Body (3. items above region content)**. Click **Copy Region**.

7. Navigate to page 2 using the page finder 

.

8. Run the main **Categories** page, where you should now be able to view the new region below the original Categories report region.

To remove the original Categories report region that is not required:

1. Edit the main **Categories** page, and click **Delete**.

2. On the confirmation page click **Delete Region**.

To move the Create button from the original Categories region to the new region:

1. In the Buttons region, select the **Create** button item.

2. In the Name region, set the Text Label / Alt to **Add a Product**.

3. In the Displayed section, set the Display in Region to **Products by Category (1)**.

4. In the Authorization section, set the Authorization Scheme to **access control – administrator**. This setting will mean that this button will only be visible to users with the administrator privilege on the application.

5. In the Optional URL Redirect section, set the Target is a **Page in this Application**.

6. Using the pop-up finder, select the **Product Details** page from the list of pages within your application (for example, page 14).

7. Set **Clear Cache** to the page selected in the previous step (for example, page **14**).

8. Click **Apply Changes** to save the updates.

To display the Discontinued field as a checkmark icon:

1. Edit the **Categories** page.

2. In the Regions section, select the **Products by Category** region to edit.

3. In the **Region Source** section, update the syntax as follows:

   from:

```
select
"CATEGORYNAME",
"PRODUCTNAME",
"QUANTITYPERUNIT",
"UNITSINSTOCK",
"DISCONTINUED"
 from   "PRODUCTS_BY_CATEGORY"
```

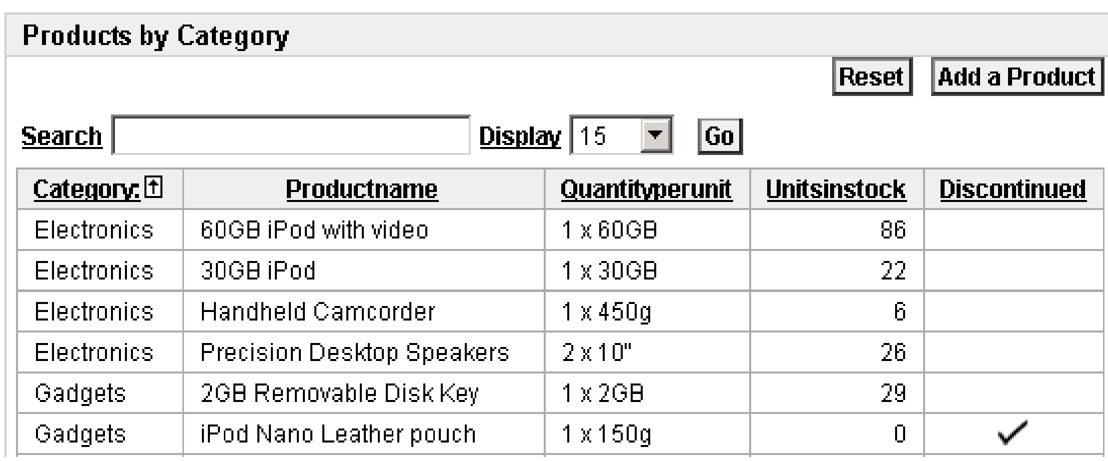
   to:

```
select
"CATEGORYNAME",
"PRODUCTNAME",
"QUANTITYPERUNIT",
"UNITSINSTOCK",
decode(discontinued,1,'<img
src="#IMAGE_PREFIX#check_small_black.gif"
              alt="Yes"/>',null) "DISCONTINUED"
from   "PRODUCTS_BY_CATEGORY"
```

4. Select the **Region Attributes** tab at the top of the page.

5. Set the Column Alignment to **Center** and Heading Alignment to **Left** for the DISCONTINUED alias.

6. Click **Apply Changes** to save the updates. Run the page to view the updated representation of values in the Discontinued column of the report.



To remove the Products by Category from the navigation list on Reports page:

1. Select the **Reports** icon to navigate to the Reports Page.

2. Edit the page (for example, page **18**).

3. In the Regions section, select the **Navigation** List to edit.

4. Select the **Products by Category** item in the list to edit.

5. Click **Delete**, and when prompted **Would you like to perform this delete action?** Click **OK**. The list entry is now removed.

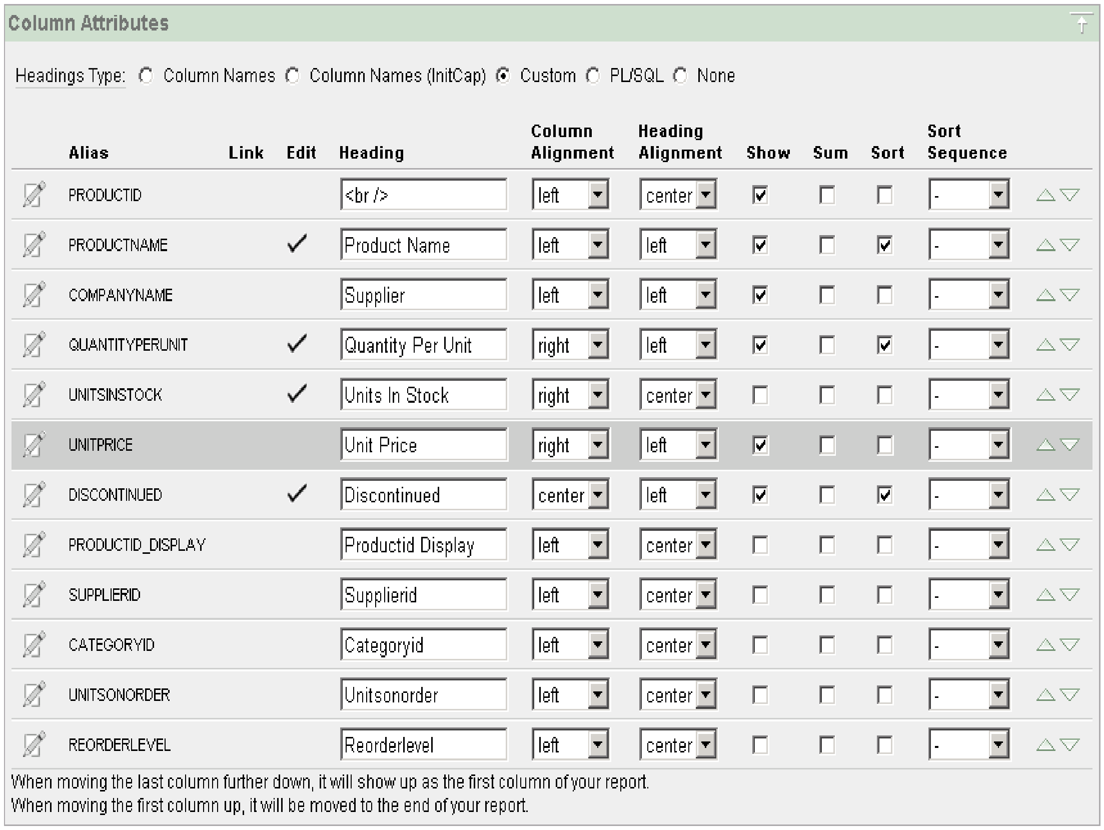
To join the Products by Category report with Suppliers table information:

1. In the Regions section, select the **Products by Category** link to edit. Modifying the source query to join the Products and Suppliers table, will allow for the display of additional information on each product.

2. In the Region Source update the syntax to the following:

```
select
a.PRODUCTID,
a.PRODUCTID PRODUCTID_DISPLAY,
a.PRODUCTNAME,
a.SUPPLIERID,
a.CATEGORYID,
a.QUANTITYPERUNIT,
a.UNITPRICE,
a.UNITSINSTOCK,
a.UNITSONORDER,
a.REORDERLEVEL,
b.COMPANYNAME,
decode(a.discontinued,1,'<img
src="#IMAGE_PREFIX#check_small_black.gif"
              alt="Yes"/>',null) "DISCONTINUED"
from PRODUCTS a, SUPPLIERS b
where a.supplierid = b.supplierid
and
(
instr(upper("PRODUCTNAME"),upper(nvl(:P2_REPORT_SEARCH,"PRODUCTNAME"
))) > 0
)
```

3. Select the **Report Attributes** tab, and update the Column Attributes table as follows:



Column Attributes

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

Alias	Link	Edit	Heading	Column Alignment	Heading Alignment	Show	Sum	Sort	Sort Sequence
PRODUCTID			 	left	center	✓			-
PRODUCTNAME		✓	Product Name	left	left	✓		✓	-
COMPANYNAME			Supplier	left	left	✓			-
QUANTITYPERUNIT		✓	Quantity Per Unit	right	left	✓		✓	-
UNITSINSTOCK		✓	Units In Stock	right	center				-
UNITPRICE			Unit Price	right	left	✓			-
DISCONTINUED		✓	Discontinued	center	left	✓		✓	-
PRODUCTID_DISPLAY			Productid Display	left	center				-
SUPPLIERID			Supplierid	left	center				-
CATEGORYID			Categoryid	left	center				-
UNITSONORDER			Unitsonorder	left	center				-
REORDERLEVEL			Reorderlevel	left	center				-

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.

4. Select the edit button to the left of the **UNITPRICE** alias.

5. In the Column Formatting section, use the popup finder icon to set the Number / Date Formatting value to **€5,234.10** i.e. currency. Click **Apply Changes**, to save the update.

6. Select the edit button to the left of the **PRODUCTID** alias.

7. In the Column Link section, set the following:

- Link Text: ****
- Target: **Page in this Application**
- Page: **14** i.e. the Product Details page
- Item 1: **P14_PRODUCTID**
- Value: **#PRODUCTID#**
- Item 2: **P14_CATEGORYID**
- Value: **#CATEGORYID#**

Adding this link, will allow the user to navigate from the **Products by Category** report region down to the Product Details page for the selected product. Click **Apply Changes**, to save the updates.

8. Select the edit button to the left of the **COMPANYNAME** alias.

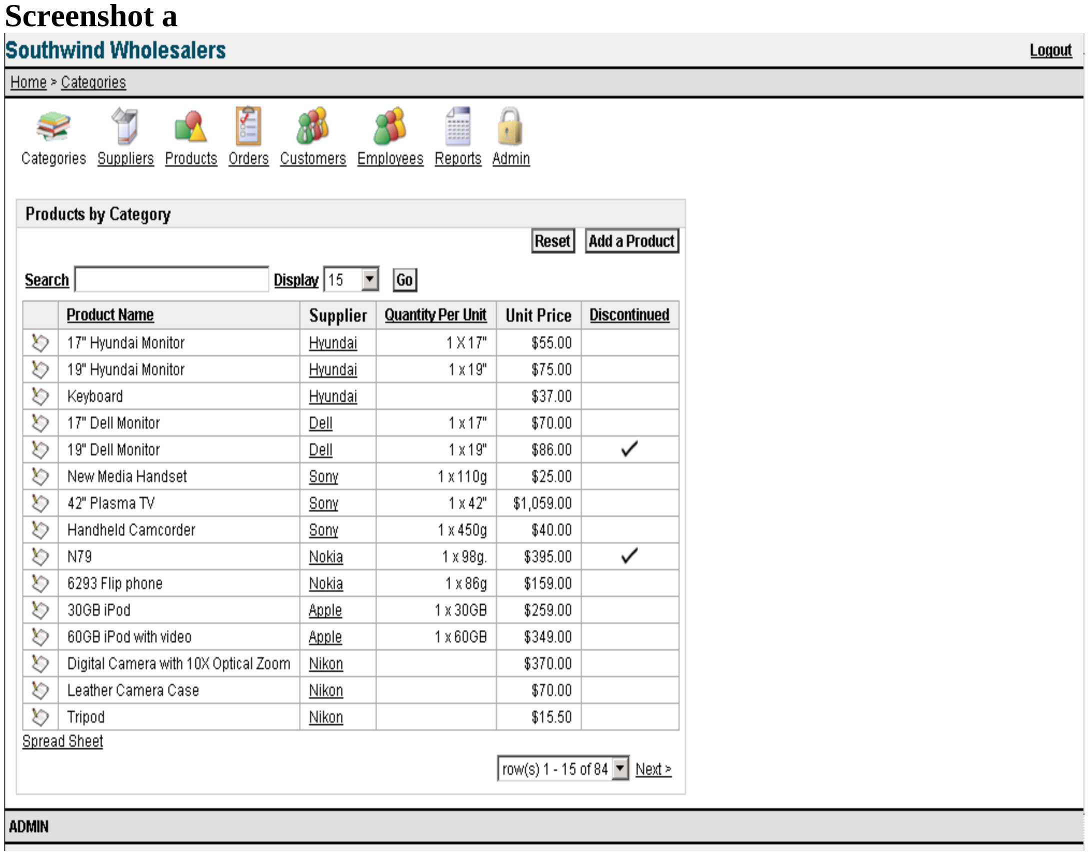
9. In the Column Link section, set the following:

   - Link Text: **#COMPANYNAME#**
   - Target: **Page in this Application**
   - Page: **17** i.e. the Supplier Details page
   - Item 1: **P17_COMPANYNAME**
   - Value: **#COMPANYNAME#**
   - Item 2: **P17_SUPPLIERID**
   - Value: **#SUPPLIERID#**

10. In the Authorization section, set the Authorization Scheme to **access control – edit**. This means the link will only be visible to users with **Edit** privileges on the application. Click **Apply Changes**, to save the updates.

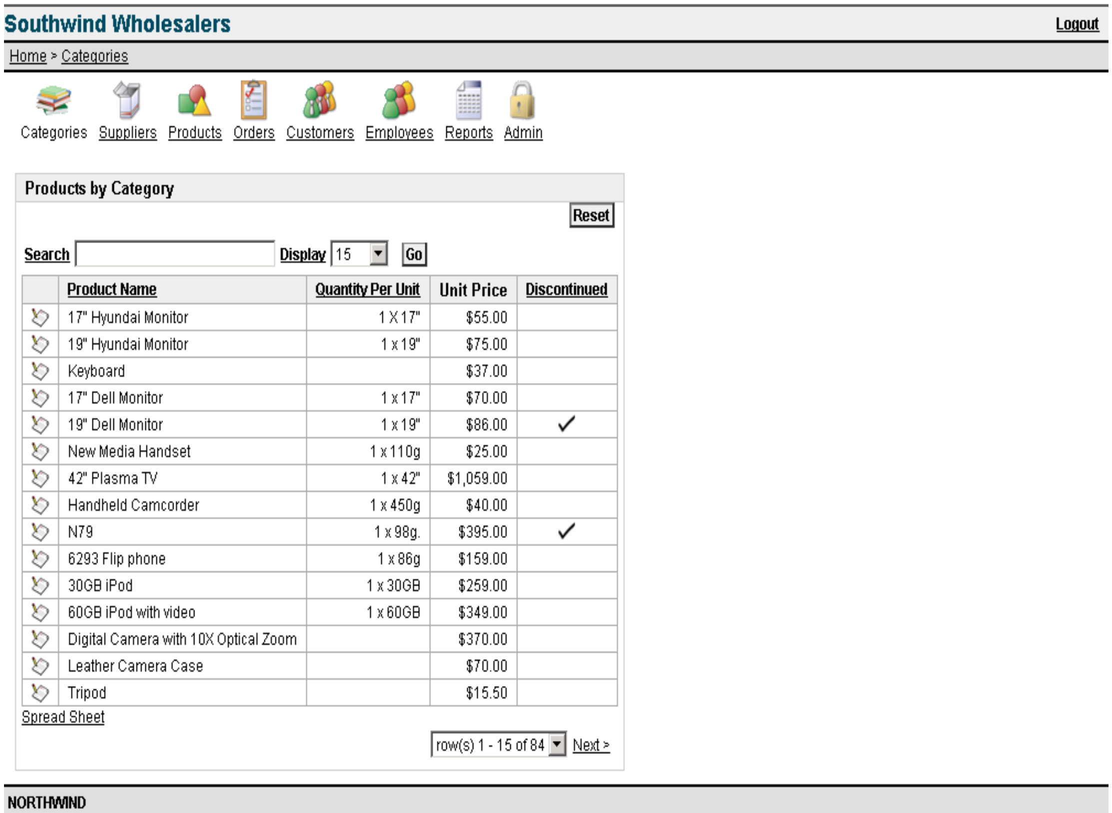
11. Click **Apply Changes**, to save the update. Run the page to view the updated report.

Screenshot a



Note: the Supplier column is visible in Screenshot a above, when connected as user Admin, has Administrator privileges. However, the column is not visible in Screenshot b below, when connected as user Northwind, who has View privileges. These privileges can be defined / modified on the Access Control Administration Page.

Screenshot b



	Product Name	Quantity Per Unit	Unit Price	Discontinued
	17" Hyundai Monitor	1 X 17"	$55.00	
	19" Hyundai Monitor	1 x 19"	$75.00	
	Keyboard		$37.00	
	17" Dell Monitor	1 x 17"	$70.00	
	19" Dell Monitor	1 x 19"	$86.00	✓
	New Media Handset	1 x 110g	$25.00	
	42" Plasma TV	1 x 42"	$1,059.00	
	Handheld Camcorder	1 x 450g	$40.00	
	N79	1 x 98g.	$395.00	✓
	6293 Flip phone	1 x 86g	$159.00	
	30GB iPod	1 x 30GB	$259.00	
	60GB iPod with video	1 x 60GB	$349.00	
	Digital Camera with 10X Optical Zoom		$370.00	
	Leather Camera Case		$70.00	
	Tripod		$15.50	

To add the Select a Category select list:

1. Edit the **Categories** page.

2. In the List of Values section click the create button .

3. Set Create List of Values to **From Scratch**. Click **Next**.

4. Set the LOV Name to **Categories**, with Type of **Dynamic**. Click **Next**.

5. In the Query editor, enter the following syntax:

```
select distinct categoryname d, categoryid r
from   categories
order by 1
```

6. Click **Create List of Values**.

7. In the Regions section, select the create icon and create a new **HTML** region. Click **Next**.

8. Set the Title to **Top Bar**, and set the Report Template to **No Template**.

9. Set the Display Point to **Page Template Body (2)**. Click **Next**, then click **Create Region**.

10. In the Items section, create a new **Select List** item, and then select a control type of **Select List with Submit**. Click **Next**.

11. Set the Item Name to **P2_CATEGORYID**.

12. Set the Region to **Top Bar (1)**. Click **Next**.

13. In the section to identify the list of values, set the following values:

    - Named LOV: **CATEGORIES**
    - Display Null Option: **Yes**
    - Null Text: **– All –**
    - Null Value: 0 (i.e. zero)

    Click **Next**.

14. Set the Label to **Select a Category**.

15. Set the Label Template to **Optional Label**. Click **Next**.

16. Click **Create Item**.

To update the report to be based on the Select a Category selection:

1. Edit the page and in the Items section select the icon to create a new Item.

2. Select to create an item of type **Hidden**. Click **Next**.

3. Set the Item Name to **P2_CATEGORYNAME**, and set the region to **Top Bar (1)**. Click **Next**.

4. Set the Default to **All Categories**. Click **Next**.

5. Set to Derive Item Source to **Only when the value is null (otherwise use cached value)**. Click **Create Item**.

6. Under the Page Rendering section of the Page Definition, in the Computations section select the create icon.

7. Set the Location to **Item on This Page**. Click **Next**.

8. Set the following computation values:

   - Compute Item: **P2_CATEGORYNAME**
   - Computation Point: **Before Header**
   - Computation Type: **SQL Query**

   Click **Next**.

9. In the Computation region, enter the following syntax:

```
SELECT categoryname
from   categories
WHERE  categoryid = :P2_CATEGORYID
```

   Click **Next**.

10. Click **Create**, to create the new computation.

11. In the Regions section, select the **Products by Category** report region.

12. In the Region Source field, update the syntax:

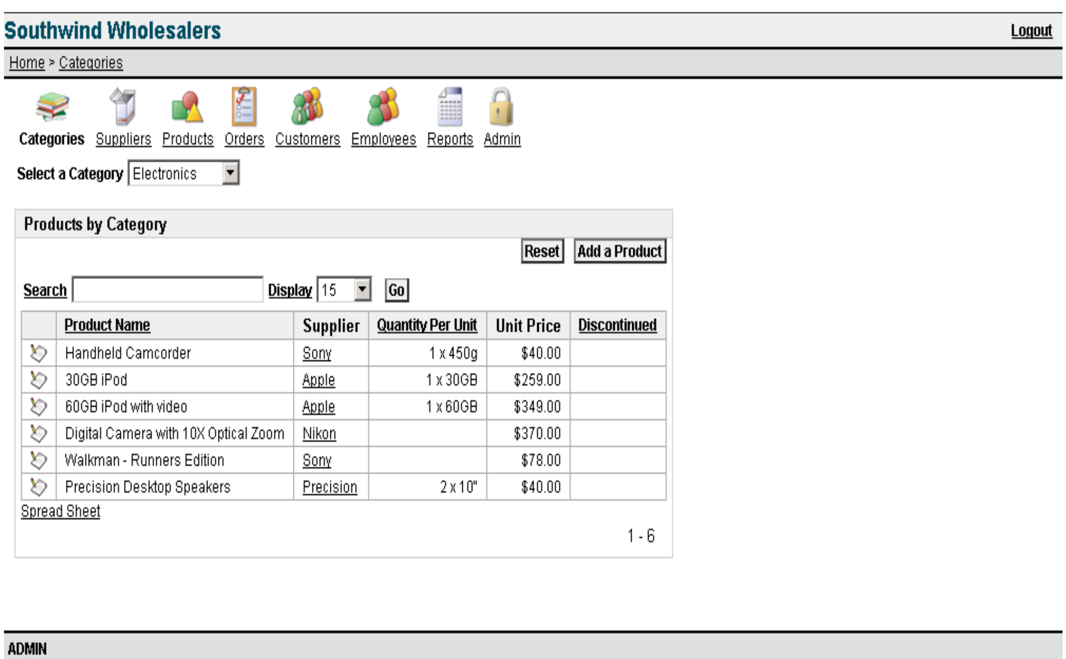
   from:

```
select
a.PRODUCTID,
a.PRODUCTID PRODUCTID_DISPLAY,
a.PRODUCTNAME,
a.SUPPLIERID,
a.CATEGORYID,
a.QUANTITYPERUNIT,
a.UNITPRICE,
a.UNITSINSTOCK,
a.UNITSONORDER,
a.REORDERLEVEL,
b.COMPANYNAME,
decode(a.discontinued,1,'<img
src="#IMAGE_PREFIX#check_small_black.gif"
              alt="Yes"/>',null) "DISCONTINUED"
from PRODUCTS a, SUPPLIERS b
where a.supplierid = b.supplierid
and
(
instr(upper("PRODUCTNAME"),upper(nvl(:P2_REPORT_SEARCH,"PRODUCTNAME"
))) > 0)
```

to:

```
select
a.PRODUCTID,
a.PRODUCTID PRODUCTID_DISPLAY,
a.PRODUCTNAME,
a.SUPPLIERID,
a.CATEGORYID,
a.QUANTITYPERUNIT,
a.UNITPRICE,
a.UNITSINSTOCK,
a.UNITSONORDER,
a.REORDERLEVEL,
b.COMPANYNAME,
decode(a.discontinued,1,'<img
src="#IMAGE_PREFIX#check_small_black.gif"
              alt="Yes"/>',null) "DISCONTINUED"
from PRODUCTS a, SUPPLIERS b
where a.supplierid = b.supplierid
and (a.categoryid = :P2_CATEGORYID or nvl(:P2_CATEGORYID,'0')= '0')
and
(
instr(upper("PRODUCTNAME"),upper(nvl(:P2_REPORT_SEARCH,"PRODUCTNAME"
))) > 0)
```

Click **Apply Changes** to save the update. Run the page to view the updated behavior. Set the Select a Category list to **Electronics**. The page will be submitted and the report updated to only display products for the selected category.



To update the report region title to reflect the selected category:

1. Edit the page and in the Items section select the icon to create a new Item.

2. Select to create an item of type **Hidden**. Click **Next**.

3. Set the Item Name to **P2_DESCRIPTION**, and set the region to **Top Bar (1)**. Click **Next**.

4. Set the Item Source to **SQL Query**, and in the Item Source Value enter the following syntax:

   ```
   select description
   from   categories
   where  categoryid = :P2_CATEGORYID
   ```

   Click **Next**.

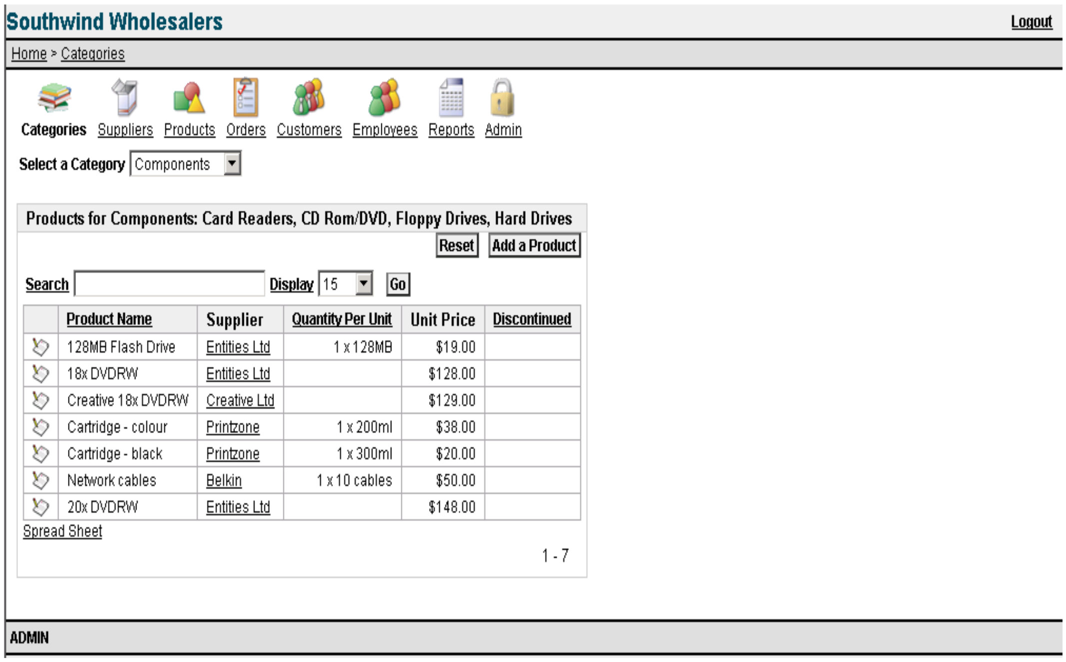
5. Set the Display Item Source to **From source each time item is displayed**. Click **Create Item**.

6. In the Items section, select the new **P2_DESCRIPTION** link.

7. In the Element section, set the HTML Table Cell Attributes to **- #P2_DESCRIPTION#**. Click **Apply Changes**, to save the update.

8. In the Regions section, select the Products by Category link.

9. Set the Title to **Products for &P2_CATEGORYNAME.: &P2_DESCRIPTION.**. Click **Apply Changes**, to save the update. Run the page to view the updated report title, which changes depending on the category selected:



To add buttons to add / edit a Category:

1. Edit the Categories page, and under the Shared Components section select to create a new **List**, by selecting the create icon.

2. Set the Name to **Category_Options**, and set the List Template to **Button List**. Click **Create**. A new list will be created.

3. Click **Create List Entry >** to add an entry to the new list.

4. In the Entry section, set the List Entry Label to **Add Category**.

5. In the Target section, set the following:

   - Target type: **Page in this Application**
   - Page: **3** i.e. the Category Details page
   - Clear Cache: **3**

6. Click **Create and Create Another**.

7. In the Entry section, set the Sequence to **20** and the List Entry Label to **Edit Category**.

8. In the Target section, set the following:

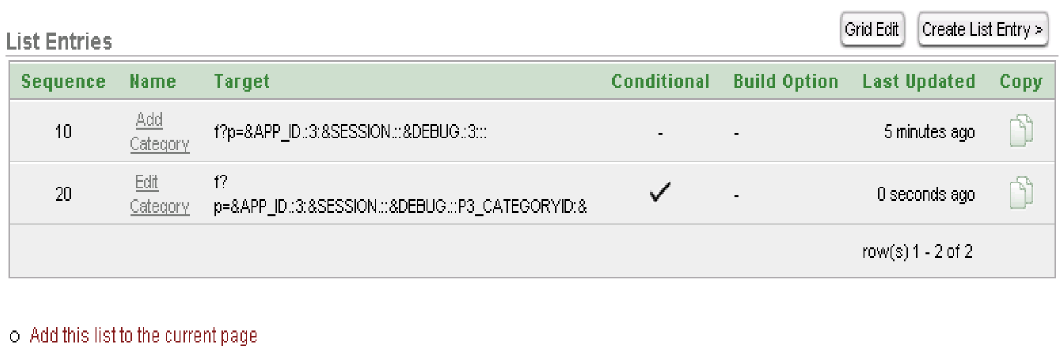
- Target Type: **Page in this Application**
- Page: **3** i.e. the Category Details page
- Set these items: **P3_CATEGORYID**
- With these values: **&P2_CATEGORYID.**

9. In the Conditions section, set the following:

- Condition type: **Value of Item in Expression 1 Is NOT null and the Item Is NOT Zero**
- Expression 1: **P2_CATEGORYID**

10. Click **Create**, to save the updates.

11. On the List Entries page, the two entries should now be visible. Select the **Add this list to the current page** link below the report region.



List Entries

Grid Edit | Create List Entry >

Sequence	Name	Target	Conditional	Build Option	Last Updated	Copy
10	Add Category	f?p=&APP_ID.:3:&SESSION.::&DEBUG.:3:::	-	-	5 minutes ago	
20	Edit Category	f?p=&APP_ID.:3:&SESSION.::&DEBUG.::P3_CATEGORYID:&	✓	-	0 seconds ago	

row(s) 1 - 2 of 2

- Add this list to the current page

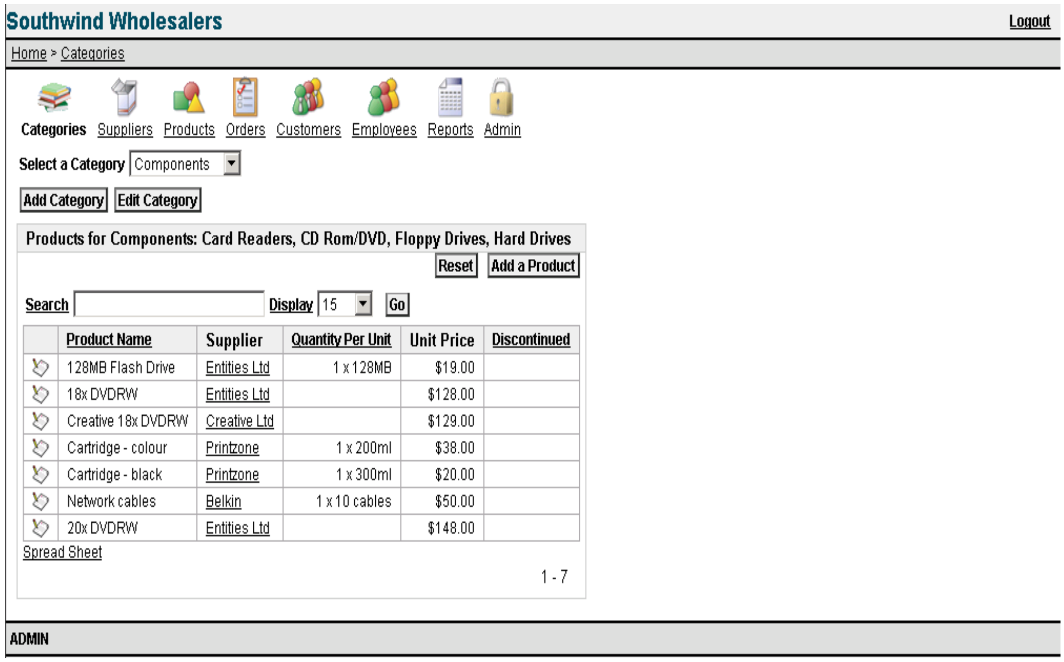
12. Set the Title to **Category Options**.

13. Set the Region Template to **No Template**.

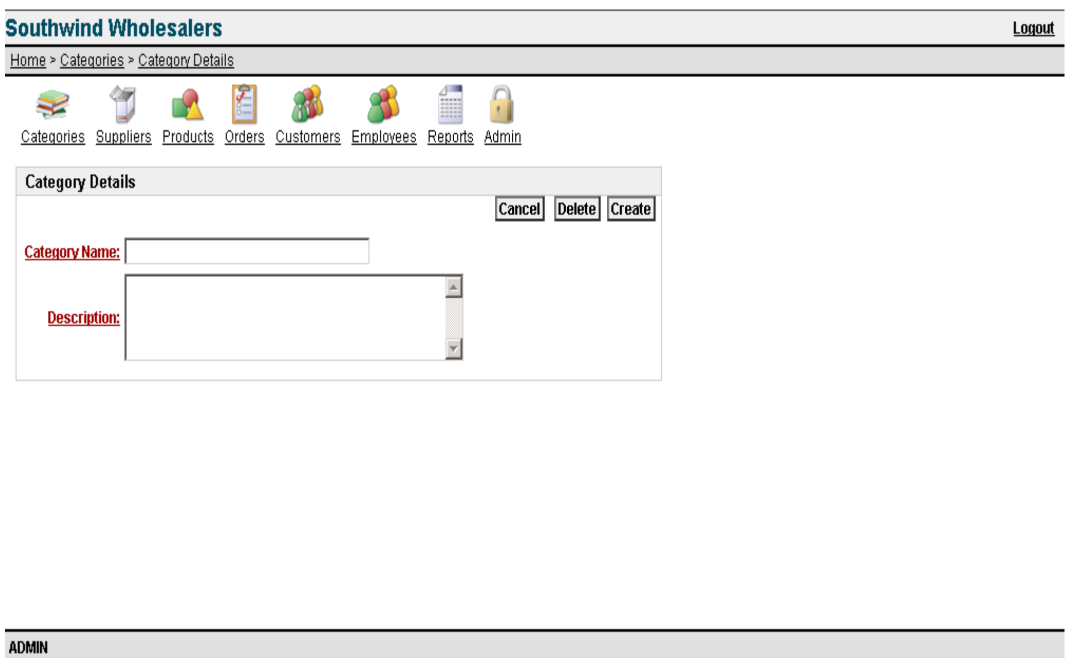
14. Set the Display Point to **Page Template Body (3)**, and the Sequence to **30**. Click **Next**.

15. Set the List to **Category_Options** and click **Next**.

16. Set the Authorization scheme to **access control – edit**. Click **Create Region**. Run the page to view the updated page.



17. Click on the **Add Category** button. This opens the **Category Details** page.



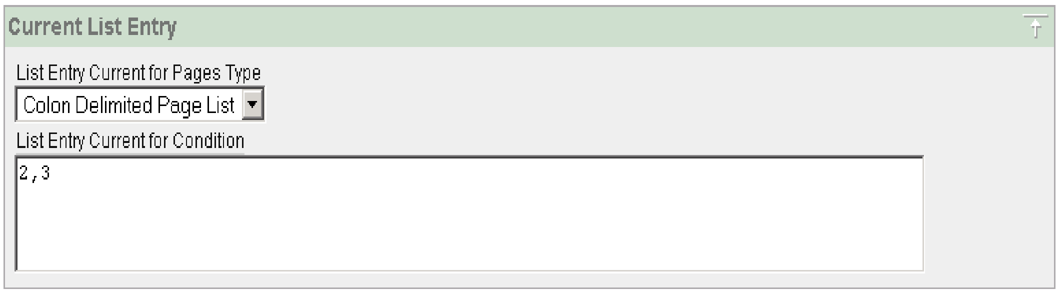
Note: the Categories navigation link text is <u>not</u> highlighted, as currently the Categories navigation item is only associated with page 2, the main Categories page.

18. Edit the application, and navigate to the Shared Components. In the Navigation section select the **Lists** link.

19. Select the **Navigation_1** list.

20. Select the **Categories** link.

21. In the Current List Entry section, update the List Entry Current for Condition to **2,3.**



22. Click the > button to the left of the Apply Changes button, to proceed to the next entry in the list.

23. In the Current List Entry section for the **Suppliers** entry, update the List Entry Current for Condition to **16,17**.

24. Click the > button to the left of the Apply Changes button, to proceed to the next entry in the list.

25. In the Current List Entry section for the **Products** entry, update the List Entry Current for Condition to **13,14**.

26. Click the > button to the left of the Apply Changes button, to proceed to the next entry in the list.

27. In the Current List Entry section for the **Orders** entry, update the List Entry Current for Condition to **6,7**.

28. Click the > button to the left of the Apply Changes button, to proceed to the next entry in the list.

29. In the Current List Entry section for the **Customers** entry, update the List Entry Current for Condition to **4,5**.

30. Click the > button to the left of the Apply Changes button, to proceed to the next entry in the list.

31. In the Current List Entry section for the **Employees** entry, update the List Entry Current for Condition to **8,9**.

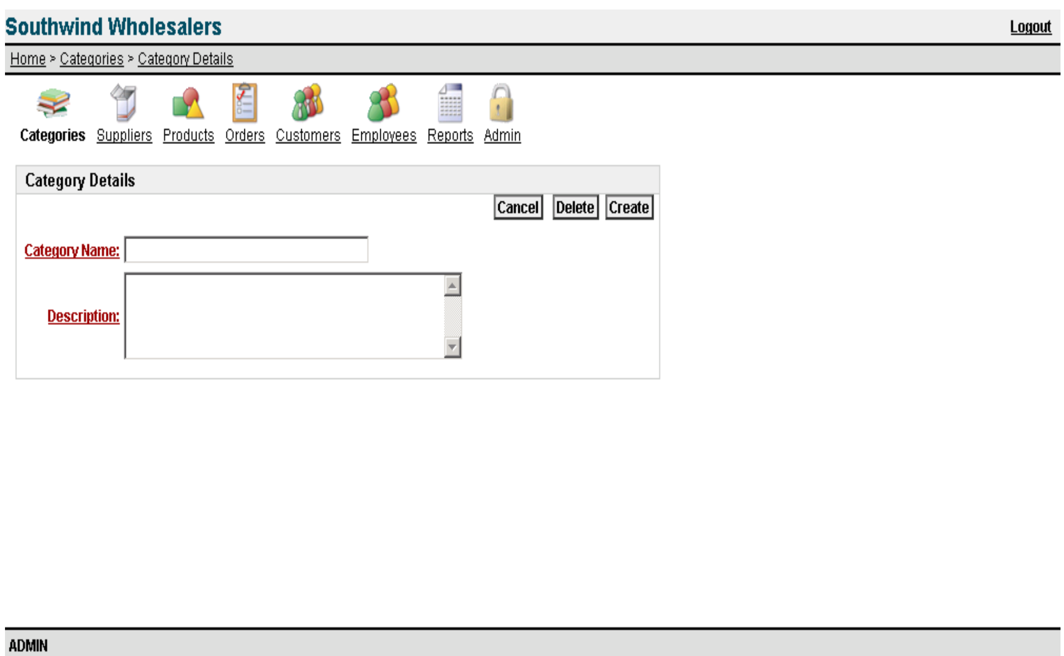
32. Click the **>** button to the left of the Apply Changes button, to proceed to the next entry in the list.

33. In the Current List Entry section for the **Reports** entry, update the List Entry Current for Condition to **18,19,20,21,22,23,24,25,26,27,28**. This associates the Reports navigation icon with all of the reports.

34. Click the **>** button to the left of the Apply Changes button, to proceed to the next entry in the list.

35. In the Current List Entry section for the **Admin** entry, update the List Entry Current for Condition to **29**. Click **Apply Changes**, to save the updates.

36. Run page 2, and select the **Add Category** button to view the changes applied to the navigation list. The **Categories** navigation item text is now highlighted.



Suppliers Report

The Suppliers report displays some high level information about the Southwind Wholesalers suppliers. This report region can be updated to hide some of the information and also to only allow users with Administrator or Edit privileges to access the Supplier Details form, where modifications can be made to the supplier information.

To remove some of the information from the displayed report:

1. Edit the Suppliers main page, page 16.

2. In the Regions section, select the **Suppliers** link.

3. Select the **Region Attributes** tab, and in the Column Attributes section uncheckmark the Show column for the following aliases:

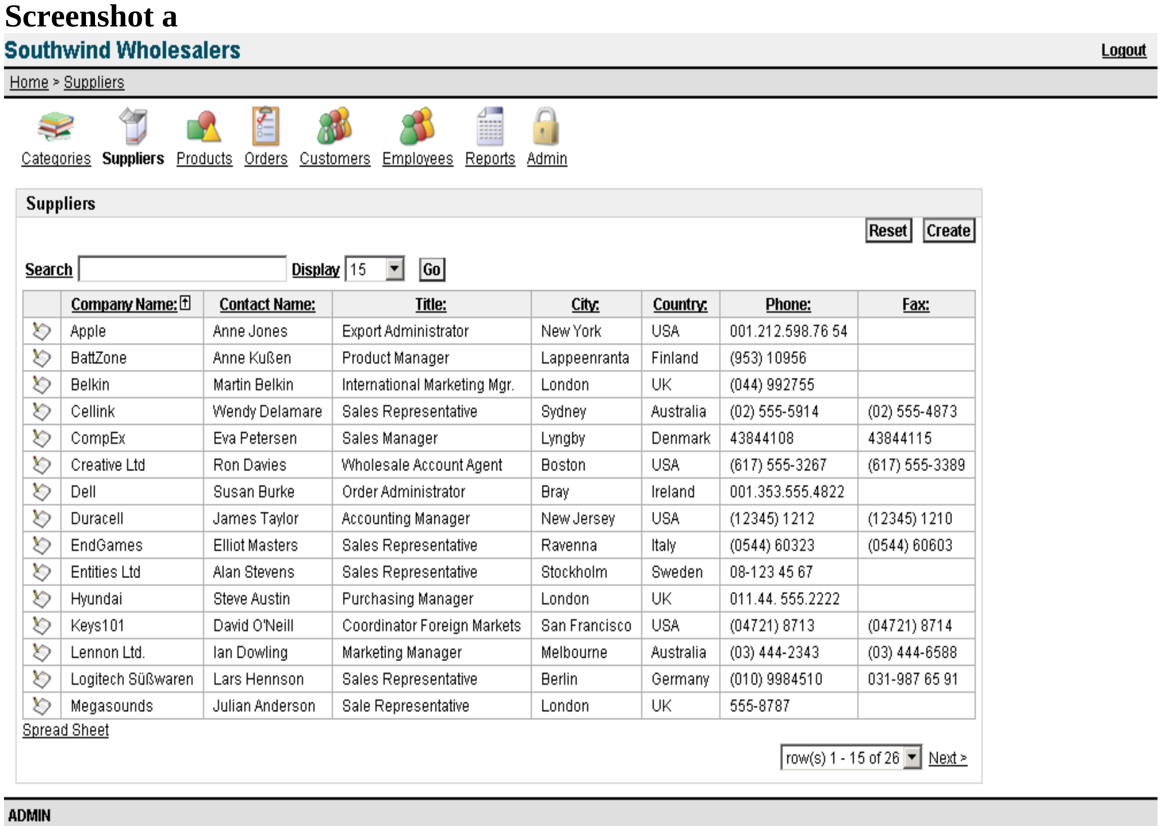
    - ADDRESS
    - REGION
    - POSTALCODE
    - HOMEPAGE

4. Select the edit icon to the left of the **SUPPLIERID** alias.

5. In the Authorization section, set the Authorization scheme to **access control – edit**. Click **Apply Changes**, to save the update.

6. Click **Apply Changes**, to save the updates. Run the page to view the updates.

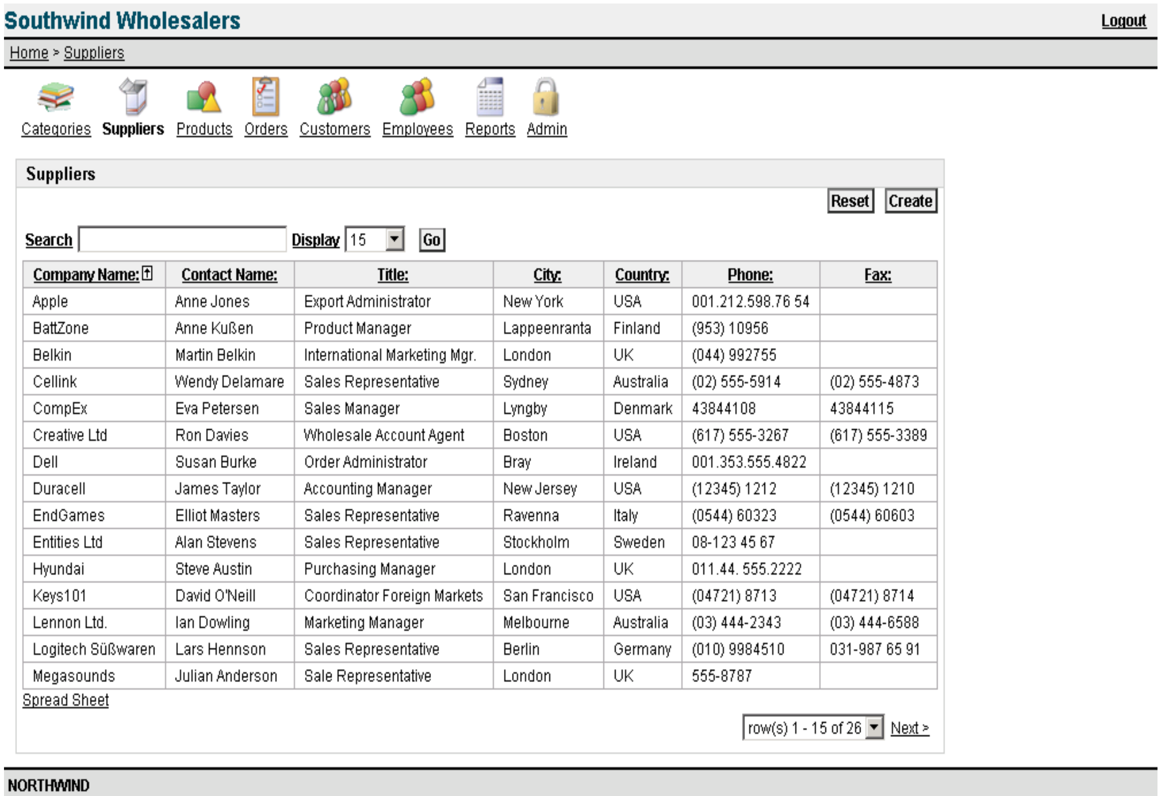
Screenshot a



	Company Name:	Contact Name:	Title:	City:	Country:	Phone:	Fax:
	Apple	Anne Jones	Export Administrator	New York	USA	001.212.598.76 54	
	BattZone	Anne Kußen	Product Manager	Lappeenranta	Finland	(953) 10956	
	Belkin	Martin Belkin	International Marketing Mgr.	London	UK	(044) 992755	
	Cellink	Wendy Delamare	Sales Representative	Sydney	Australia	(02) 555-5914	(02) 555-4873
	CompEx	Eva Petersen	Sales Manager	Lyngby	Denmark	43844108	43844115
	Creative Ltd	Ron Davies	Wholesale Account Agent	Boston	USA	(617) 555-3267	(617) 555-3389
	Dell	Susan Burke	Order Administrator	Bray	Ireland	001.353.555.4822	
	Duracell	James Taylor	Accounting Manager	New Jersey	USA	(12345) 1212	(12345) 1210
	EndGames	Elliot Masters	Sales Representative	Ravenna	Italy	(0544) 60323	(0544) 60603
	Entities Ltd	Alan Stevens	Sales Representative	Stockholm	Sweden	08-123 45 67	
	Hyundai	Steve Austin	Purchasing Manager	London	UK	011.44. 555.2222	
	Keys101	David O'Neill	Coordinator Foreign Markets	San Francisco	USA	(04721) 8713	(04721) 8714
	Lennon Ltd.	Ian Dowling	Marketing Manager	Melbourne	Australia	(03) 444-2343	(03) 444-6588
	Logitech Süßwaren	Lars Hennson	Sales Representative	Berlin	Germany	(010) 9984510	031-987 65 91
	Megasounds	Julian Anderson	Sale Representative	London	UK	555-8787	

Note: in screenshot a, the user Admin is logged into the application, therefore the edit icon is visible in the first column of the report. This is due to the user Admin having Administrator privileges on the application. In screenshot b below, the user Northwind is logged on to the application, and due to authorization settings applied in step 5, the edit icon is not visible to this user has they have not been granted the Edit privilege.

Screenshot b



Company Name:	Contact Name:	Title:	City:	Country:	Phone:	Fax:
Apple	Anne Jones	Export Administrator	New York	USA	001.212.598.76 54	
BattZone	Anne Kußen	Product Manager	Lappeenranta	Finland	(953) 10956	
Belkin	Martin Belkin	International Marketing Mgr.	London	UK	(044) 992755	
Cellink	Wendy Delamare	Sales Representative	Sydney	Australia	(02) 555-5914	(02) 555-4873
CompEx	Eva Petersen	Sales Manager	Lyngby	Denmark	43844108	43844115
Creative Ltd	Ron Davies	Wholesale Account Agent	Boston	USA	(617) 555-3267	(617) 555-3389
Dell	Susan Burke	Order Administrator	Bray	Ireland	001.353.555.4822	
Duracell	James Taylor	Accounting Manager	New Jersey	USA	(12345) 1212	(12345) 1210
EndGames	Elliot Masters	Sales Representative	Ravenna	Italy	(0544) 60323	(0544) 60603
Entities Ltd	Alan Stevens	Sales Representative	Stockholm	Sweden	08-123 45 67	
Hyundai	Steve Austin	Purchasing Manager	London	UK	011.44. 555.2222	
Keys101	David O'Neill	Coordinator Foreign Markets	San Francisco	USA	(04721) 8713	(04721) 8714
Lennon Ltd.	Ian Dowling	Marketing Manager	Melbourne	Australia	(03) 444-2343	(03) 444-6588
Logitech Süßwaren	Lars Hennson	Sales Representative	Berlin	Germany	(010) 9984510	031-987 65 91
Megasounds	Julian Anderson	Sale Representative	London	UK	555-8787	

To change the label of the Create button and make it conditional on privileges:

1. Edit the Suppliers page, page 16.

2. In the Buttons region, select the **Create** link.

3. In the Name section, set the Text Label / Alt to **Add Supplier**.

4. In the Authorization section, set the Authorization scheme to **access control – edit**. Click **Apply Changes**, to save the updates. The **Add Supplier** button will only be visible to users with the Edit privilege.

Products Report

The Products report displays information for each of the products in the online store. This report can be updated to include an option to display products based on the category or supplier selected.

To add a Select a Category select list:

1. Edit the Products page, and in the Regions section select the create icon to create a new region.

2. Select a region of type **HTML** and click **Next**.

3. Select a region container of type **HTML** and click **Next**.

4. Set the Title to **Top Bar**, the Region Template to **No Template**, the Display Point to **Page Template Body (2)**. Click **Next**. Then click **Create Region.**

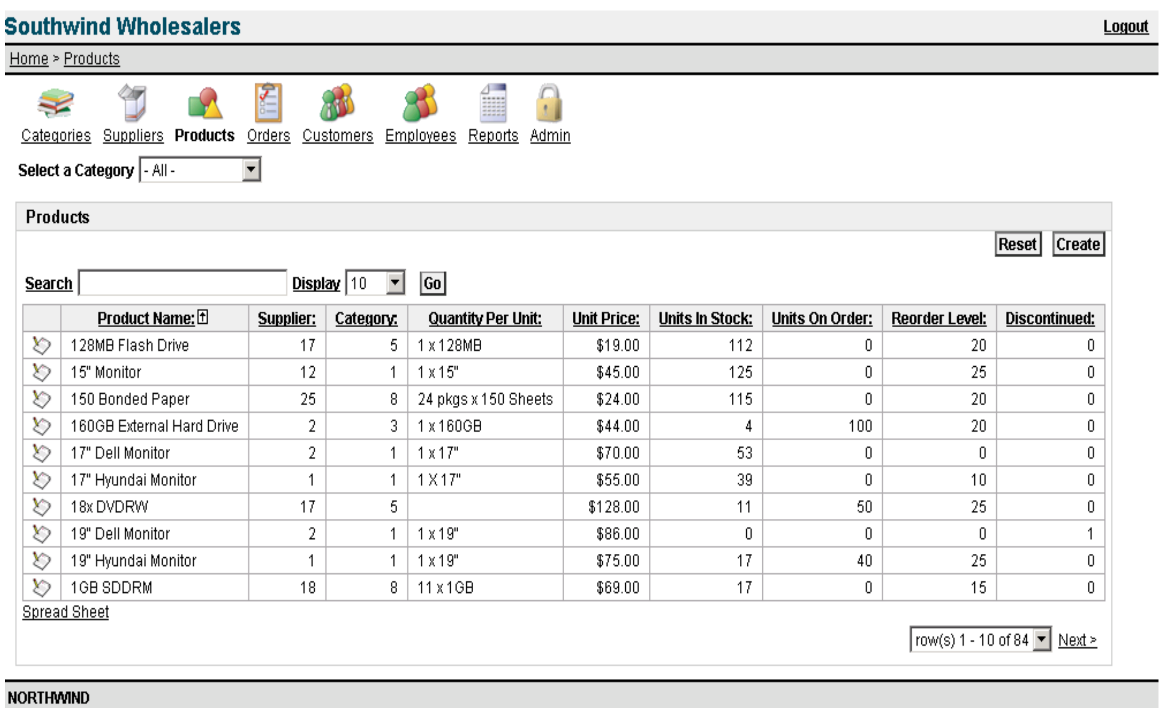
5. Navigate to page 2, **Categories**.

6. In the Items section, select the copy icon to copy an item.

7. Select the **P2_CATEGORYID** link, and set the New Page to **13** i.e. the main Products page. Click **Next**.

8. Set the Item Name to **P13_CATEGORYID**, set the Region to **Top Bar**. Click **Copy Item**.

9. Navigate to page 13, **Products**, and run the page to view the new select list.



	Product Name:	Supplier:	Category:	Quantity Per Unit:	Unit Price:	Units In Stock:	Units On Order:	Reorder Level:	Discontinued:
	128MB Flash Drive	17	5	1 x 128MB	$19.00	112	0	20	0
	15" Monitor	12	1	1 x 15"	$45.00	125	0	25	0
	150 Bonded Paper	25	8	24 pkgs x 150 Sheets	$24.00	115	0	20	0
	160GB External Hard Drive	2	3	1 x 160GB	$44.00	4	100	20	0
	17" Dell Monitor	2	1	1 x 17"	$70.00	53	0	0	0
	17" Hyundai Monitor	1	1	1 X 17"	$55.00	39	0	10	0
	18x DVDRW	17	5		$128.00	11	50	25	0
	19" Dell Monitor	2	1	1 x 19"	$86.00	0	0	0	1
	19" Hyundai Monitor	1	1	1 x 19"	$75.00	17	40	25	0
	1GB SDDRM	18	8	11 x 1GB	$69.00	17	0	15	0

To update the report to display Supplier and Category name instead of the ID values:

1. Edit the page, and select the **Products** link in the Regions section.

2. Select the **Report Attributes** tab, and select the edit icon to the left of the **CATEGORYID** alias.

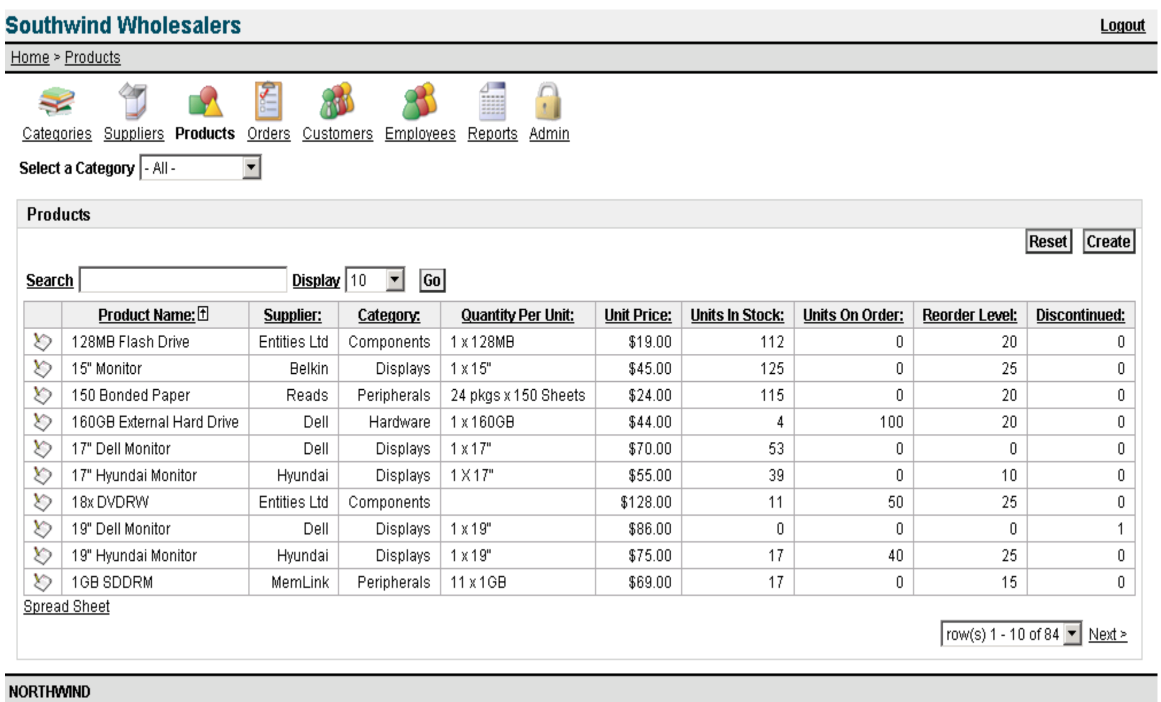
3. In the Tabular Form Element set the Display As to **Display as Text (based on LOV, does not save state)**.

4. In the List of Values section, set the Named LOV to **CATEGORIES**, and set the Display Extra Values to **No**. Click **Apply Changes**, to save the updates.

5. Select the edit icon to the left of the **SUPPLIERID** alias.

6. In the Tabular Form Element set the Display As to **Display as Text (based on LOV, does not save state)**.

7. In the List of Values section, set the Named LOV to **P14_PRODUCTS_SUPPLIERID**, and set the Display Extra Values to **No**. Click **Apply Changes**, to save the updates. Run the page to view the updated report information, now displaying the name for the Supplier and Category fields.



	Product Name:	Supplier:	Category:	Quantity Per Unit:	Unit Price:	Units In Stock:	Units On Order:	Reorder Level:	Discontinued:
	128MB Flash Drive	Entities Ltd	Components	1 x 128MB	$19.00	112	0	20	0
	15" Monitor	Belkin	Displays	1 x 15"	$45.00	125	0	25	0
	150 Bonded Paper	Reads	Peripherals	24 pkgs x 150 Sheets	$24.00	115	0	20	0
	160GB External Hard Drive	Dell	Hardware	1 x 160GB	$44.00	4	100	20	0
	17" Dell Monitor	Dell	Displays	1 x 17"	$70.00	53	0	0	0
	17" Hyundai Monitor	Hyundai	Displays	1 X 17"	$55.00	39	0	10	0
	18x DVDRW	Entities Ltd	Components		$128.00	11	50	25	0
	19" Dell Monitor	Dell	Displays	1 x 19"	$86.00	0	0	0	1
	19" Hyundai Monitor	Hyundai	Displays	1 x 19"	$75.00	17	40	25	0
	1GB SDDRM	MemLink	Peripherals	11 x 1GB	$69.00	17	0	15	0

To change the text of the Create button and make it conditional:

1. Edit the Products page, and select the **Create** link in the Buttons region.

2. Set the Text Label / Alt to **Add a Product**.

3. In the Authorization section, set the Authorization scheme to **access control – edit**. Click **Apply Changes**, to save the updates.

To allow only privileged users to edit the Products information:

1. Edit the Products page, and select the **Products** link in the Regions section.

2. Select the **Report Attributes** tab, and select the edit icon to the left of the **PRODUCTID** alias.

3. In the Authorization section, set the Authorization Scheme to **access control – edit**. Click **Apply Changes**, to save the update.

To add a select list for setting the Supplier:

1. Edit the Products page, and in the Items region select the create icon to add a new item.

2. Select to create a **Select List** item.

3. Set the Select List Control Type to **Select List with Submit**.

4. Set the Item Name to **P13_SUPPLIERID**, and set the Region to **Top Bar**. Click **Next**.

5. Set the Named LOV to **P14_PRODUCTS_SUPPLIERID**.

6. Set the Display Null Option to **Yes**, set the Null Text to **- All –** and set the Null Value to **0** i.e. zero. Click **Next**.

7. Set the Label to **Select a Supplier:**, and set the Label Template to **Optional Label**. Click **Next**.

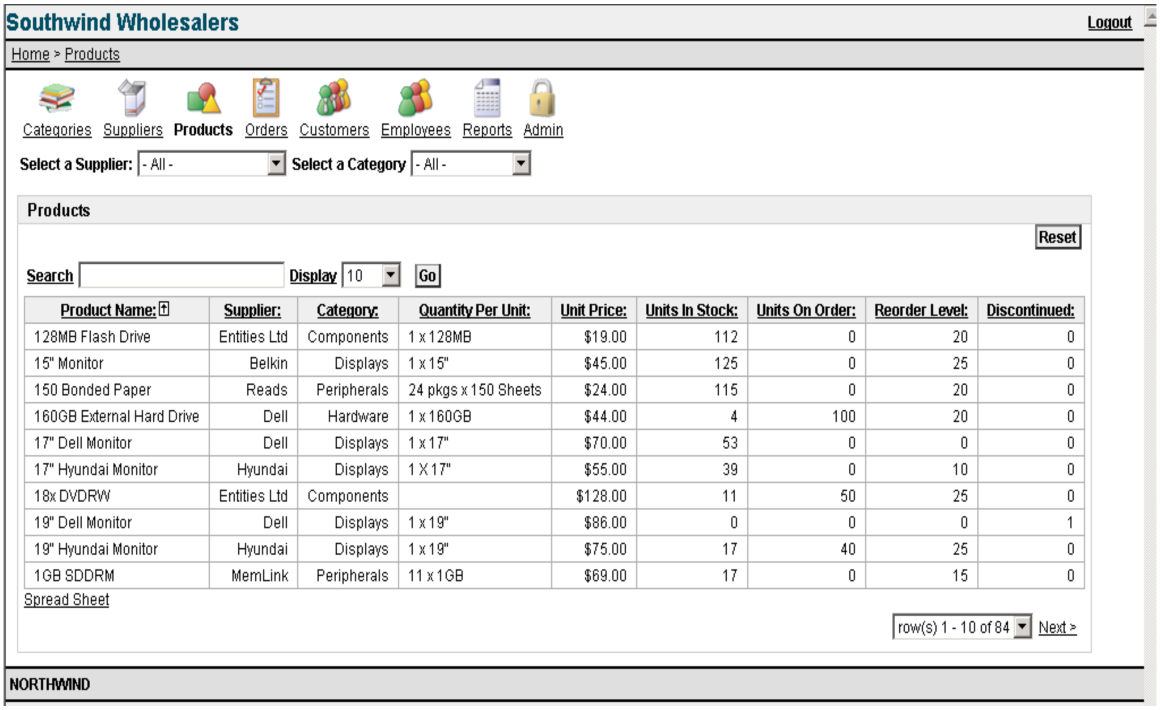
8. Click **Create Item**.

9. Select the new **P13_SUPPLIERID** item in the Items region.

10. Set the Sequence to **30** and click **Apply Changes**.

11. Select the **P13_CATEGORYID** item in the Items region.

12. In the Displayed section, set Begin On New Line to **No**. Click **Apply Changes**, to save the update. Run the page to view the new additions.



Product Name:	Supplier:	Category:	Quantity Per Unit:	Unit Price:	Units In Stock:	Units On Order:	Reorder Level:	Discontinued:
128MB Flash Drive	Entities Ltd	Components	1 x 128MB	$19.00	112	0	20	0
15" Monitor	Belkin	Displays	1 x 15"	$45.00	125	0	25	0
150 Bonded Paper	Reads	Peripherals	24 pkgs x 150 Sheets	$24.00	115	0	20	0
160GB External Hard Drive	Dell	Hardware	1 x 160GB	$44.00	4	100	20	0
17" Dell Monitor	Dell	Displays	1 x 17"	$70.00	53	0	0	0
17" Hyundai Monitor	Hyundai	Displays	1 X 17"	$55.00	39	0	10	0
18x DVDRW	Entities Ltd	Components		$128.00	11	50	25	0
19" Dell Monitor	Dell	Displays	1 x 19"	$86.00	0	0	0	1
19" Hyundai Monitor	Hyundai	Displays	1 x 19"	$75.00	17	40	25	0
1GB SDDRM	MemLink	Peripherals	11 x 1GB	$69.00	17	0	15	0

To update the report to display results based on selection of Supplier and Category:

1. Edit the page, and select the **Products** link in the Regions section.

2. In the Region Source, update the syntax:

   from:

```
select
"PRODUCTID",
"PRODUCTNAME",
"SUPPLIERID",
"CATEGORYID",
"QUANTITYPERUNIT",
"UNITPRICE",
"UNITSINSTOCK",
"UNITSONORDER",
"REORDERLEVEL",
"DISCONTINUED"
 from   "PRODUCTS"
where
(
instr(upper("PRODUCTNAME"),upper(nvl(:P13_REPORT_SEARCH,"PRODUCTNAME"))
) > 0  or
instr(upper("QUANTITYPERUNIT"),upper(nvl(:P13_REPORT_SEARCH,"QUANTITYPE
RUNIT"))) > 0 )
```

to:

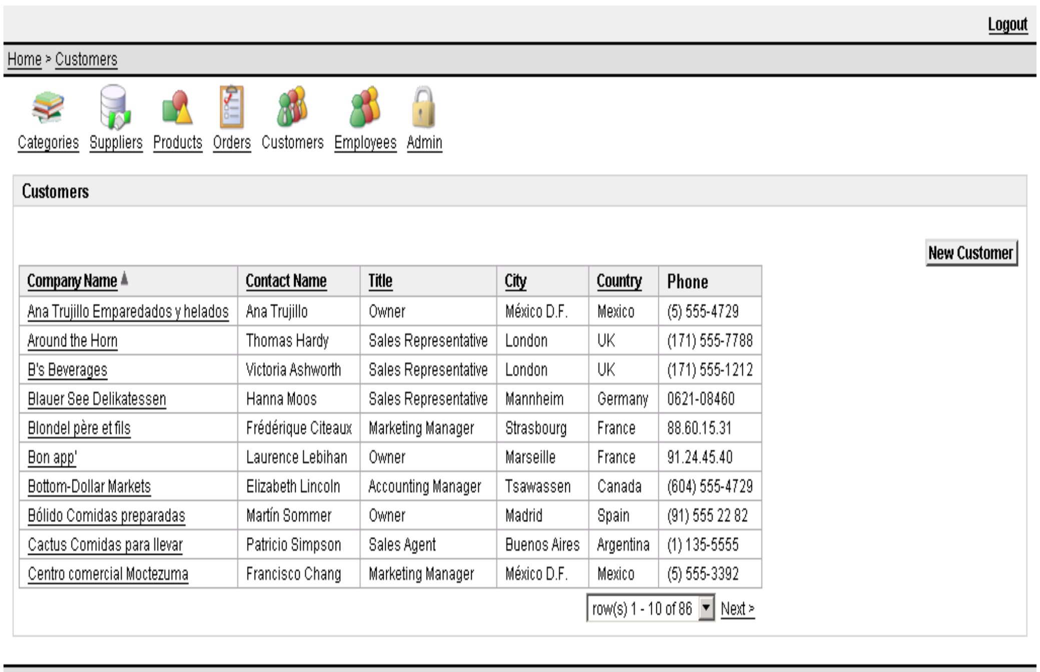
```
select
"PRODUCTID",
"PRODUCTNAME",
"SUPPLIERID",
"CATEGORYID",
"QUANTITYPERUNIT",
"UNITPRICE",
"UNITSINSTOCK",
"UNITSONORDER",
"REORDERLEVEL",
decode(discontinued,1,
              '<img src="#IMAGE_PREFIX#check_small_black.gif"
              alt="Yes"/>',
              null) "DISCONTINUED"
from PRODUCTS
where (supplierid = :P13_SUPPLIERID or nvl(:P13_SUPPLIERID,'0') = '0')
and (categoryid = :P13_CATEGORYID or nvl(:P13_CATEGORYID,'0') = '0')
and
(
 instr(upper("PRODUCTNAME"),upper(nvl(:P13_SEARCH,"PRODUCTNAME"))) > 0
)
```

Note: the highlighted sections of code update the report to display the discontinued column as a checkmark instead of a number, and also to base the returned results on the option chosen by the user with the Select a Supplier and Select a Category lists.

3. Click **Apply Changes**, to save the update.

Customers Report

The Customers report displays all the details for each customer stored in the Customers database table, in read-only mode. This report region can be updated to hide some of this information, and look similar to the following:



12. Edit the main Customer report page.

13. Select the **Create** button in the Buttons region.

14. Update the text in the Text Label / Alt to **New Customer**.

15. Click **Apply Changes** to save the update.

To link the Customers Report to Customers Form via the Company Name:

1. Edit the Customers Report region on the page.

2. On the Report Attributes tab of the report, click the Edit icon for the **COMPANYNAME** column.

3. In the Column Link section set the following:

Link Text:	**#COMPANYNAME#**
Target:	**Page in this Application**
Page:	The Customer Details page number (for example, page **5**)
Item 1:	**P5_COMPANYNAME**

Value: **#COMPANYNAME#**
Item 2: **P5_CUSTOMERID**
Value: **#CUSTOMERID#**

4. Click **Apply Changes**, to save the updates.

To remove information that is not needed from the displayed Customers Report page:

1. In the Customers Report region, and on the Report Attributes tab of the report, uncheck the Show checkbox associated with each of the following report columns: **ADDRESS**, **REGION**, **POSTALCODE** and **FAX**.

2. Click **Apply Changes** to save the updates.

Employees Form

The Employees report displays information on the sales people involved in the sales of the company goods.

To display the full name of the employee:

1. Edit the **Employees** page, and in the Regions section select the **Employees** link.

2. In the Region Source, update the syntax to include the following line in the select statement: **Firstname ||' '|| Lastname "FULLNAME"**

3. Select the **Report Attributes** tab, and update the Column Attributes list to uncheck the following alias item:

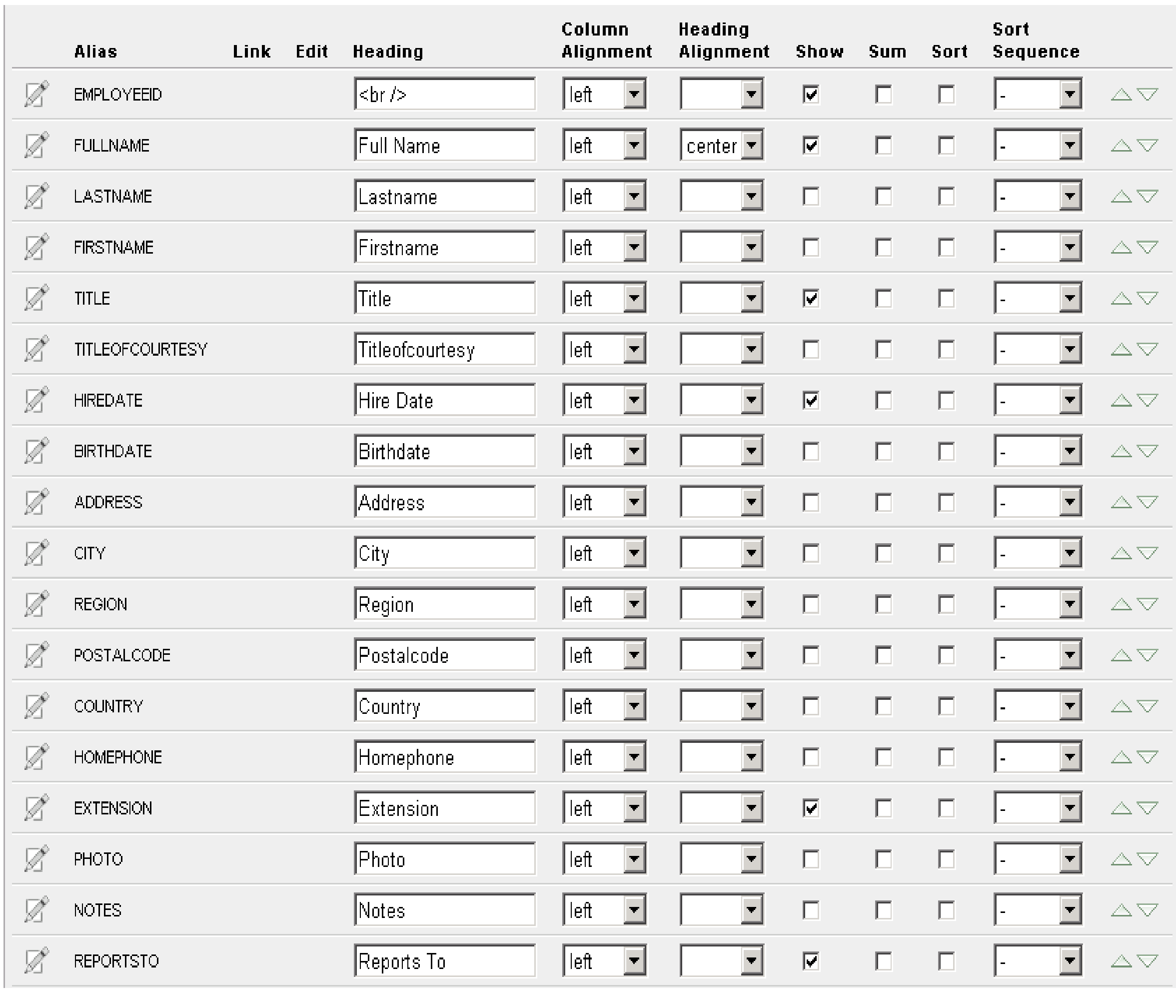
    - LASTNAME
    - FIRSTNAME
    - TITLEOFCOURTESY
    - BIRTHDATE
    - ADDRESS
    - CITY
    - REGION
    - POSTALCODE
    - COUNTRY
    - HOMEPHONE
    - PHOTO
    - NOTES

   Click **Apply Changes**, to save the updates.

To add an edit icon to the EmployeeID field:

1. Edit the Employees page, and in the Regions section select the **Employees** link.

2. Select the **Report Attributes** tab, and set the Headings Type to **Custom**. Update the Heading fields to be similar to the following:



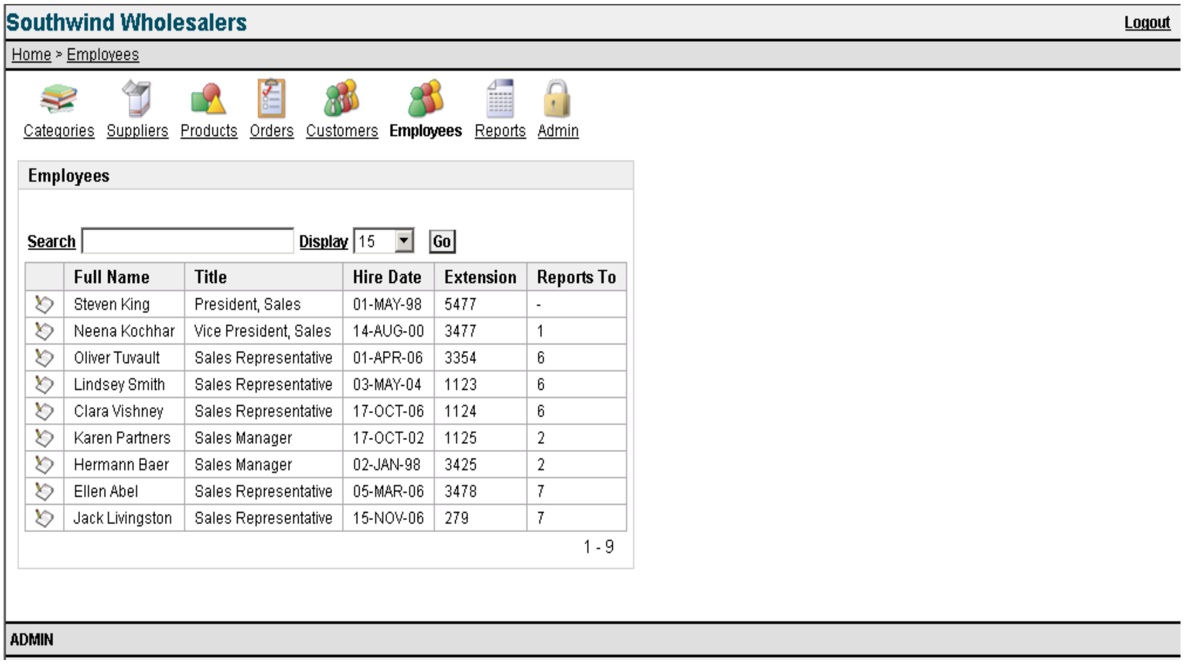
	Alias	Link	Edit	Heading	Column Alignment	Heading Alignment	Show	Sum	Sort	Sort Sequence	
	EMPLOYEEID			 	left		☑	☐	☐	-	
	FULLNAME			Full Name	left	center	☑	☐	☐	-	
	LASTNAME			Lastname	left		☐	☐	☐	-	
	FIRSTNAME			Firstname	left		☐	☐	☐	-	
	TITLE			Title	left		☑	☐	☐	-	
	TITLEOFCOURTESY			Titleofcourtesy	left		☐	☐	☐	-	
	HIREDATE			Hire Date	left		☑	☐	☐	-	
	BIRTHDATE			Birthdate	left		☐	☐	☐	-	
	ADDRESS			Address	left		☐	☐	☐	-	
	CITY			City	left		☐	☐	☐	-	
	REGION			Region	left		☐	☐	☐	-	
	POSTALCODE			Postalcode	left		☐	☐	☐	-	
	COUNTRY			Country	left		☐	☐	☐	-	
	HOMEPHONE			Homephone	left		☐	☐	☐	-	
	EXTENSION			Extension	left		☑	☐	☐	-	
	PHOTO			Photo	left		☐	☐	☐	-	
	NOTES			Notes	left		☐	☐	☐	-	
	REPORTSTO			Reports To	left		☑	☐	☐	-	

3. Select the edit icon to the left of the **EMPLOYEEID** alias.

4. In the Column Link section, set the following:

   - Link Text: ****
   - Target: **Page in this Application**
   - Page: **9** i.e. the Employee Details page
   - Item 1: **P9_EMPLOYEEID**
   - Value: **#EMPLOYEEID#**

5. In the Authorization section, set the Authorization scheme to **access control – administrator**. This will mean that the edit option will only be visible to users with Administrator privileges. Click **Apply Changes**, to save the update. Run the page to view the updates applied.



To change the label of the Create button to add an Employee:

1. Edit the **Employees** page, and in the Buttons region, select the **Create** link.

2. Set the Text Label / Alt to **Add an Employee**.

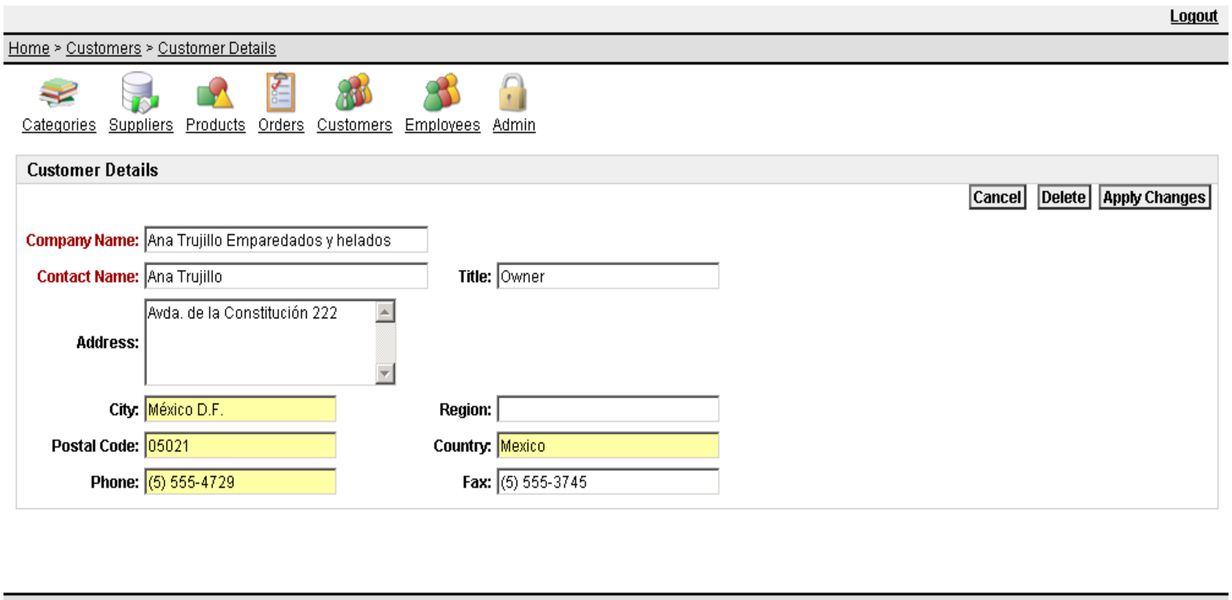
3. In the Authorization section, set the Authorization Scheme to **access control – administrator**. Click **Apply Changes**, to save the updates.

Forms

The following are examples of how you can update your forms, to make the form look more like your original Microsoft Access form, and also to add functionality to your new Oracle Application Express form.

Customer Details Form

The Customers form displays all the details for a selected customer stored in the Customers database table, and the fields are editable. This form region allows the user to update or delete a customer record. The Customer form can be updated to reposition the page level item, and look similar to the following:



To reposition the Title, Region, Country, and Fax page items:

1. Edit the **Customer Details** page.

2. In the Items region of the page, select the **Edit All** icon  to make a mass update of the page items. This opens the Page Items page.

3. Set New Line to No for the following items: CONTACTTITLE, REGION, COUNTRY, and FAX.

4. Click **Apply Changes** to save the settings.

To Change Address item to a Text Area Display Type:

1. Edit the ADDRESS page item.

2. In the Name section, update the Display As field to Textarea.

3. In the Element section, set Width = 37, Maximum Width = 2000, Height = 4.

4. Click Apply Changes to save the settings.

To Set Contact Name to be Required Value:

1. Edit the CONTACTNAME page item.

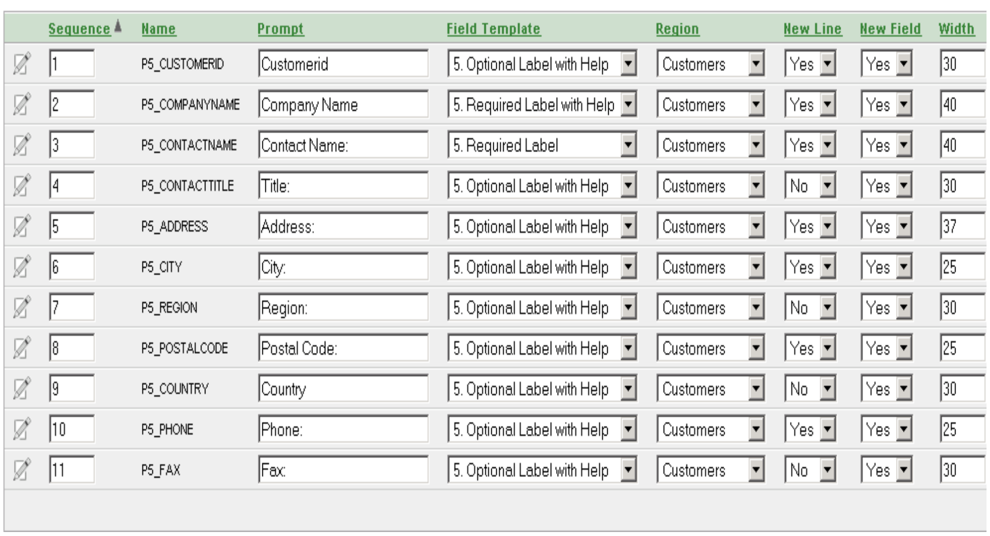
2. In the Label section, set the Template to Required Label.

3. Click Apply Changes to save the update.

To Increase Width of Page Items:

1. In the Items region of the page, select the Edit All icon to make a mass update of the items.

2. Update the Width column for each of the items, according to how wide you want the item to be displayed.



	Sequence	Name	Prompt	Field Template	Region	New Line	New Field	Width
	1	P5_CUSTOMERID	Customerid	5. Optional Label with Help	Customers	Yes	Yes	30
	2	P5_COMPANYNAME	Company Name	5. Required Label with Help	Customers	Yes	Yes	40
	3	P5_CONTACTNAME	Contact Name:	5. Required Label	Customers	Yes	Yes	40
	4	P5_CONTACTTITLE	Title:	5. Optional Label with Help	Customers	No	Yes	30
	5	P5_ADDRESS	Address:	5. Optional Label with Help	Customers	Yes	Yes	37
	6	P5_CITY	City:	5. Optional Label with Help	Customers	Yes	Yes	25
	7	P5_REGION	Region:	5. Optional Label with Help	Customers	No	Yes	30
	8	P5_POSTALCODE	Postal Code:	5. Optional Label with Help	Customers	Yes	Yes	25
	9	P5_COUNTRY	Country	5. Optional Label with Help	Customers	No	Yes	30
	10	P5_PHONE	Phone:	5. Optional Label with Help	Customers	Yes	Yes	25
	11	P5_FAX	Fax:	5. Optional Label with Help	Customers	No	Yes	30

To Remove Label Help:

Note: By default, all page items are created with the Label Field Template set to Optional Label with Help. This creates a link from the label text to a Help dialog.

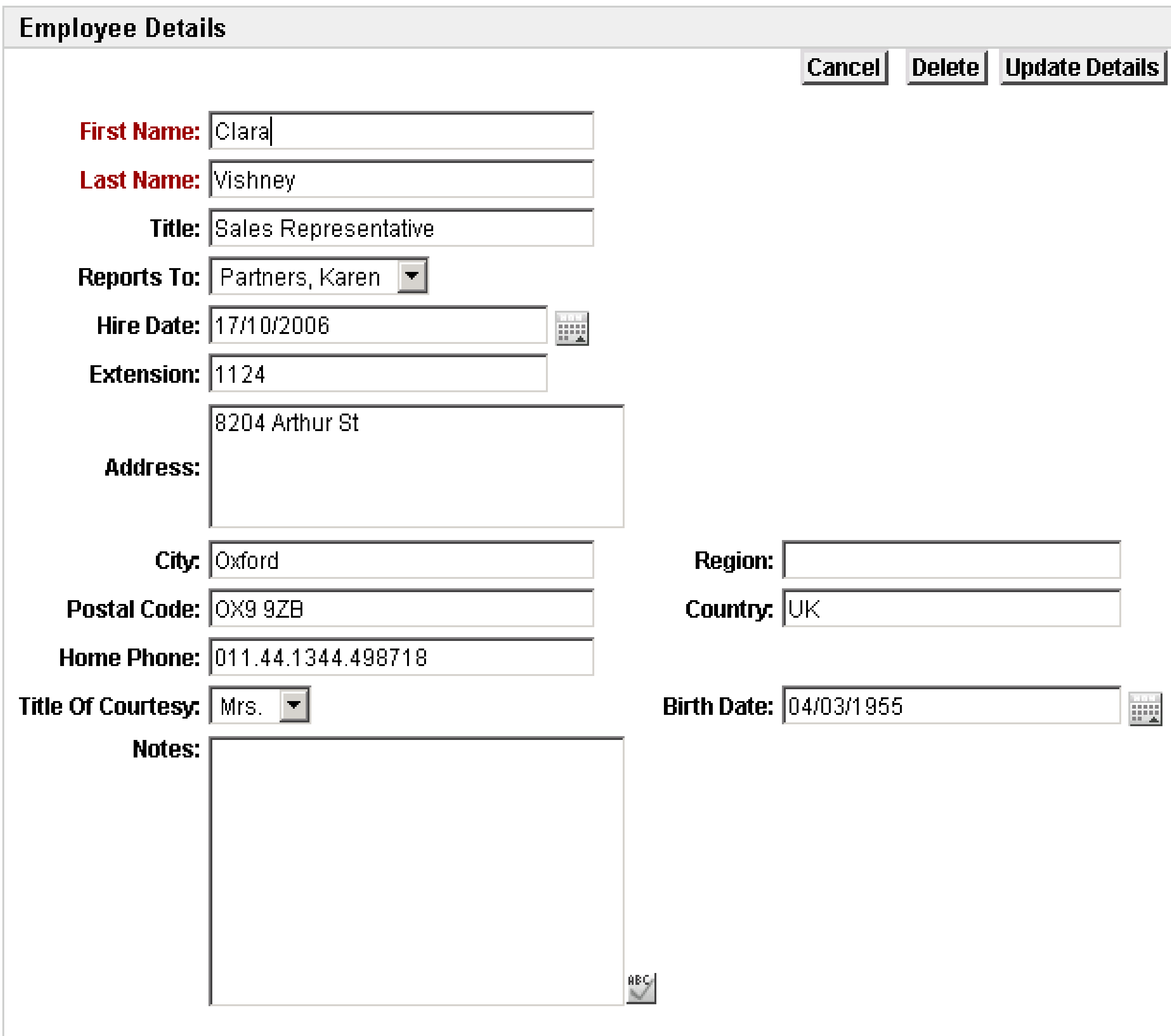
1. In the Items region of the page, select the Edit All icon to make a mass update of the items.

2. Update the Field Template to Optional Label.

3. Click Apply Changes to save the update.

Employees Form

The Employees form displays all the details stored in the Employees database table for a selected employee, and the fields are editable. This form region allows the user to update or delete an employee record. The Employee form can be updated to include an image of the employee and to reposition the page level items, so it looks similar to the following:



To reposition the page level items:

1. Edit the Employee Details page, and in the Items section, select the Edit All icon .
2. For the **REGION** source item, set its New Line value to **No**.
3. For the **COUNTRY** source item, set its New Line value to **No**.
4. For the **BIRTHDATE** source item, set its New Line value to **No**.
5. Click **Apply Changes**, to save the updates. Run the page to view the updated layout of the items on the form.

Categories Form

The original Microsoft Access Categories form displays an image associated with the category.

To display an image from database table via Report SQL Query:

1. Using SQL Workshop/SQL Developer, create the following procedure:

```
CREATE OR REPLACE PROCEDURE image_display (p_image_id
IN NUMBER)
AS
   lob_loc  BLOB;
BEGIN
   SELECT picture INTO lob_loc
   FROM table_name
  WHERE CATEGORYID = p_image_id;

  WPG_DOCLOAD.download_file (lob_loc);
END image_display;
```

2. Grant the following privilege on the procedure:

```
GRANT EXECUTE ON image_display TO PUBLIC;
```

3. Create a public synonym for this procedure:

```
CREATE PUBLIC SYNONYM image_display FOR schema_name.image_display;
```

4. Navigate to the page containing the Report, and edit the Report region.

5. In the Region Source text area, modify the syntax to reference the image_display procedure as follows:

   Original Syntax

```
select
“CATEGORYID”,
“CATEGORYNAME”,
“DESCRIPTION”,
“PICTURE”
from   “CATEGORIES”
```

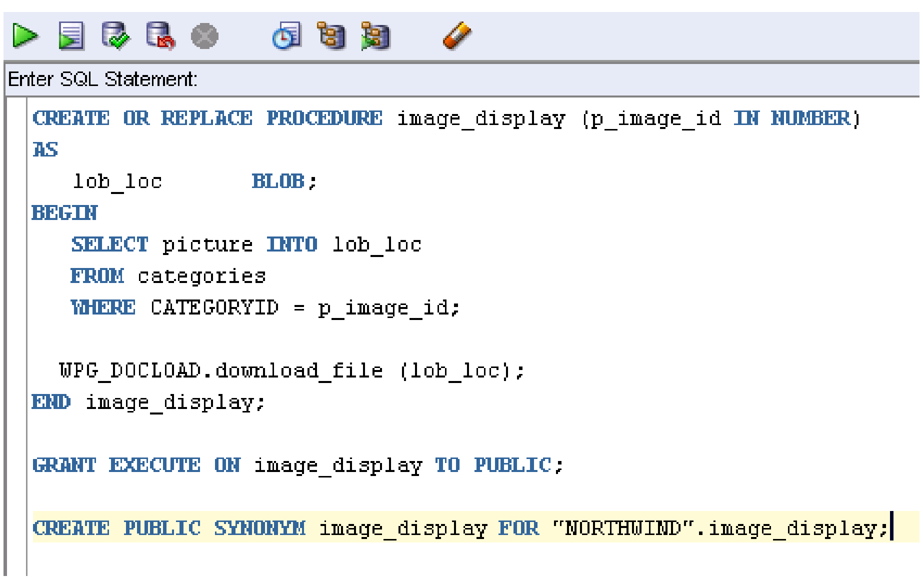
   Modified Syntax

```
select
“CATEGORYID”,
“CATEGORYNAME”,
“DESCRIPTION”,
'<img src="NORTHWIND.image_display?p_image_id='
       || NVL (categoryid, 0)
       || '" height="'
       || 40
       || '" width="'
       || 60
       || '" />' "PICTURE"
from   “CATEGORIES”
```

   Click **Apply Changes** to save the syntax.

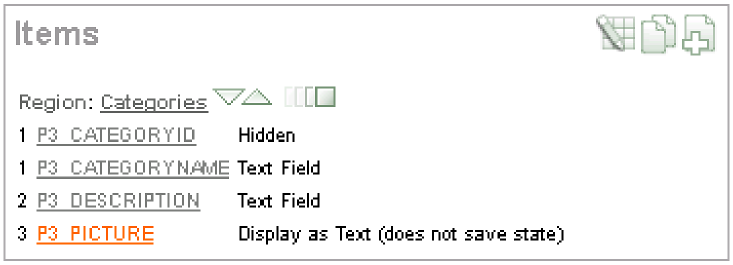
To Display an image from a database table via a Page Item:

1. Using SQL Developer, upload the image file into the BLOB column of the database table Categories.



2. In Application Builder, navigate to the application page containing the page item that will display the image.

3. Edit the page item to display the image:



4. Display the item as “Display as Text (does not save state)”.

5. Set the Label Horizontal/Vertical Alignment to “Top Right”.

6. Under the Source section, set the “Source Type” to “SQL Query”, and update the source text area with the following syntax:

```
SELECT  '<img src="#OWNER#.image_display?p_image_id='
|| NVL (categoryid, 0)
|| '" height="'
|| 100
|| '" width="'
|| 150
|| '" />' img
FROM table_name
WHERE categoryid IN (:P3_CATEGORYID)
ORDER BY categoryid DESC
```

Click **Apply Changes** to save the settings.

A. Display Image on a Form

1. Load the image file (for example, EMPID1.BMP) into the “Shared Components” of the application. Go to the “Images” section of the Shared Components and upload each of the images.

2. In SQL Workshop, create the following procedure:

```
CREATE OR REPLACE PROCEDURE emp_display (p_image_id IN NUMBER)
AS lob_loc BLOB;
BEGIN
SELECT photo INTO lob_loc
FROM employees
WHERE EMPLOYEEID = p_image_id;

WPG_DOCLOAD.download_file (lob_loc);

END emp_display;

GRANT EXECUTE ON emp_display TO PUBLIC;
```

3. Edit the Employees form page, and edit the PHOTO page item.

4. Set the Display As to **Display as Text (does not save state)**.

5. In the Source region, set the following:

- Source Used: **Always, replacing any existing value in session state**.
- Source Type: **SQL Query**.
- In the Source value edit window, enter the following syntax:

```
SELECT
'<img src="NORTHWIND.emp_display?p_image_id='
       || NVL (employeeid, 0)
       || '" height="'
       || 250
       || '" width="'
       || 220
       || '" />' "PHOTO"
FROM EMPLOYEES
WHERE employeeid = :P10_EMPLOYEEID
```

This query retrieves the image name stored in the Employees database, and using its name, it loads the image on the page. Click Apply Changes to save the updates.

B. Resolve Invalid Queries

Oracle SQL Developer Migration Workbench may not successfully migrate your Microsoft Access query to an Oracle view. In a Migration Project, a Microsoft Access query that has not been migrated to an Oracle view will have a status of “Invalid”. A Microsoft Access query must be migrated to an Oracle view, and the view must also have a status of Valid in order to be included in a migration. Oracle Application Express Application Migration Workshop allows the user to create an Oracle view for any query that was not successfully migrated to Oracle. The DDL statements generated by Oracle SQL Developer Migration Workbench during the **Generate** process can be used assist in the creation of an Oracle view.

The following steps use the Northwind **Employee Sales by Country** query as an example of how to generate an Oracle view for a query that failed to be migrated by the Oracle SQL Developer Migration Workbench.

1. In Oracle Application Express 3.0, navigate to the Migration Project page, and select the **Northwind** project.

2. From the Objects table, select the Queries link to view the retrieved query objects.

3. For the Access Query **Employee Sales by Country**, select the “-“ link in the query’s associated Oracle View column. This opens the Oracle View page.
4. In the View Name field enter **EMPLOYEE_SALES_BY_COUNTRY**, and checkmark **Preserve Case**.

5. Click Compile to attempt to compile the syntax in the edit window. The following error will be reported: **ORA-00928: missing SELECT keyword**. This is due to the fact that the original query used parameters. Error/success messages will be reported directly under the Compile button.

6. Using Oracle SQL Developer Migration Workbench, open the DDL statements created by the **Generate** phase of the database migration process, and find the syntax to create the Oracle view **Employee_Sales_by_Country**:

```
CREATE OR REPLACE VIEW Employee_Sales_by_Country AS
/*TODO:PARAMETERS [Beginning Date] DateTime, [Ending Date] DateTime*/


SELECT DISTINCT Employees.Country,
                Employees.LastName,
                Employees.FirstName,
                Orders.ShippedDate,
                Orders.OrderID,
                Order_Subtotals.Subtotal SaleAmount
  FROM Employees
         JOIN ( Orders
                JOIN Order_Subtotals
                   ON Orders.OrderID = Order_Subtotals.OrderID
```

```
                 )
            ON Employees.EmployeeID = Orders.EmployeeID
  WHERE ( ( Orders.ShippedDate BETWEEN Beginning_Date AND Ending_Date ) );
```

7. Omitting the first lines of the above syntax and the closing semi-colon, copy the SELECT syntax to your buffer:

```
SELECT DISTINCT Employees.Country,
                Employees.LastName,
                Employees.FirstName,
                Orders.ShippedDate,
                Orders.OrderID,
                Order_Subtotals.Subtotal SaleAmount
  FROM Employees
         JOIN ( Orders
                JOIN Order_Subtotals
                   ON Orders.OrderID = Order_Subtotals.OrderID
                 )
            ON Employees.EmployeeID = Orders.EmployeeID
  WHERE ( ( Orders.ShippedDate BETWEEN Beginning_Date AND Ending_Date ) )
```

8. On the Oracle View page in Oracle Application Express, click Edit to make the edit region editable, and paste the syntax from the above step into the edit window. Click Compile, to validate the syntax. This query reports the error **ORA-00904: "ENDING_DATE": invalid identifier**, as the syntax is referring to a parameter name that existed in Microsoft Access. To resolve this error, remove the WHERE clause from the syntax i.e. **WHERE ((Orders.ShippedDate BETWEEN Beginning_Date AND Ending_Date))**, then click Compile.

   Note: when this new Oracle view **EMPLOYEE_SALES_BY_COUNTRY** is used in Oracle Application Express to create a report, you will need to modify the Oracle Application Express page to add two new DATE PICKER items, to act as your parameters.

The following steps use the Northwind **Category Sales for 1997** query as an example of how to generate an Oracle view for a query that failed to be migrated by the Oracle SQL Developer Migration Workbench.

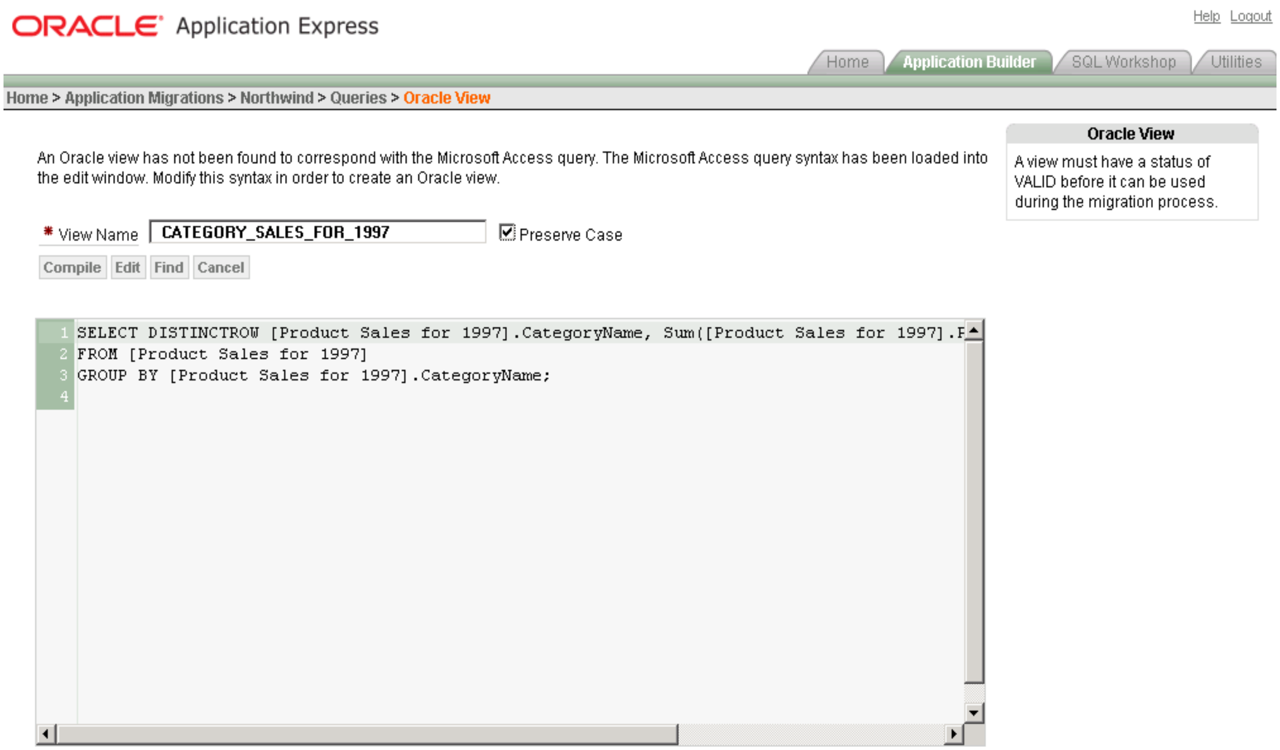
1. In Oracle Application Express 3.0, navigate to the Migration Project page, and select the **Northwind** project.

2. From the Objects table, select the Queries link to view the retrieved query objects.

3. For the Access Query **Category Sales for 1997**, select the "-" link in the query's associated Oracle View column. This opens the Oracle View page.

   Note: the syntax in the edit window is the original Microsoft Access query syntax retrieved. This syntax may need to be modified in order to make it valid Oracle syntax.

4. In the View Name field enter **CATEGORY_SALES_FOR_1997**, and checkmark **Preserve Case**.



5. Click Compile to attempt to compile the syntax in the edit window. The following error will be reported: **ORA-00923: FROM keyword not found where expected**. This error is due to the use of DISTINCTROW in the select statement. Error/success messages will be reported directly under the Compile button.

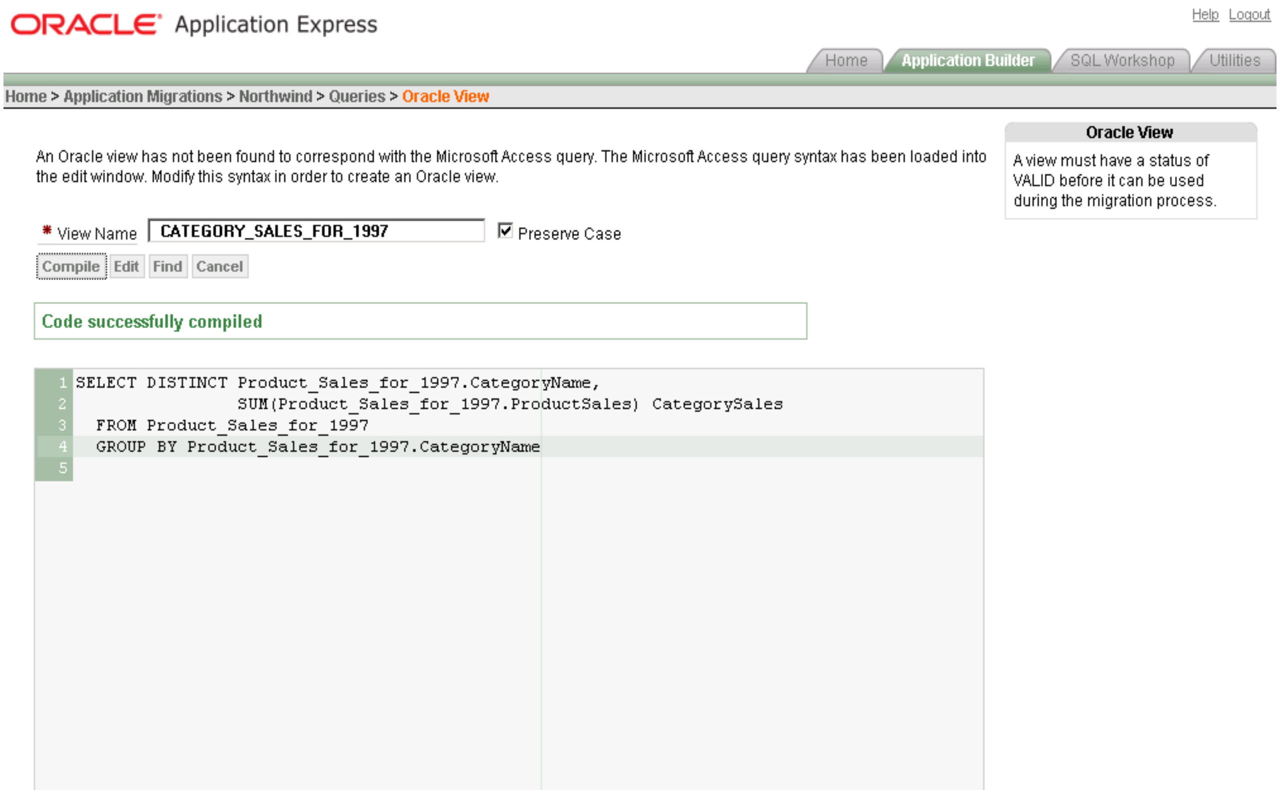
6. Using Oracle SQL Developer Migration Workbench, open the DDL statements generated by the **Generate** of the database migration process, and find the syntax to create the Oracle view "Category_Sales_for_1997":

```
CREATE OR REPLACE VIEW Category_Sales_for_1997 AS
SELECT DISTINCT Product_Sales_for_1997.CategoryName,
       SUM(Product_Sales_for_1997.ProductSales) CategorySales
  FROM Product_Sales_for_1997
 GROUP BY Product_Sales_for_1997.CategoryName;
```

7. Omitting the first line of the above syntax and the closing semi-colon, copy the SELECT syntax to your buffer:

```
SELECT DISTINCT Product_Sales_for_1997.CategoryName,
       SUM(Product_Sales_for_1997.ProductSales) CategorySales
  FROM Product_Sales_for_1997
 GROUP BY Product_Sales_for_1997.CategoryName
```

8. On the Oracle View page in Oracle Application Express, click Edit to make the edit region editable, and paste the syntax from the above step into the edit window. Click Compile, to validate the syntax and create the new Oracle view:



Note: The Microsoft Access query **Category Sales for 1997** was not migrated successfully via the Oracle SQL Developer Migration Workbench due to a dependency issue during creation. This error will be resolved in the production release of Oracle SQL Developer Migration Workbench.

Modifying Navigation Lists

To remove an entry from the navigation list:

1. Navigate to the **Shared Components** for the application, and under the Navigation section, select the **Lists** link.

2. Select the **Navigation_1** list.

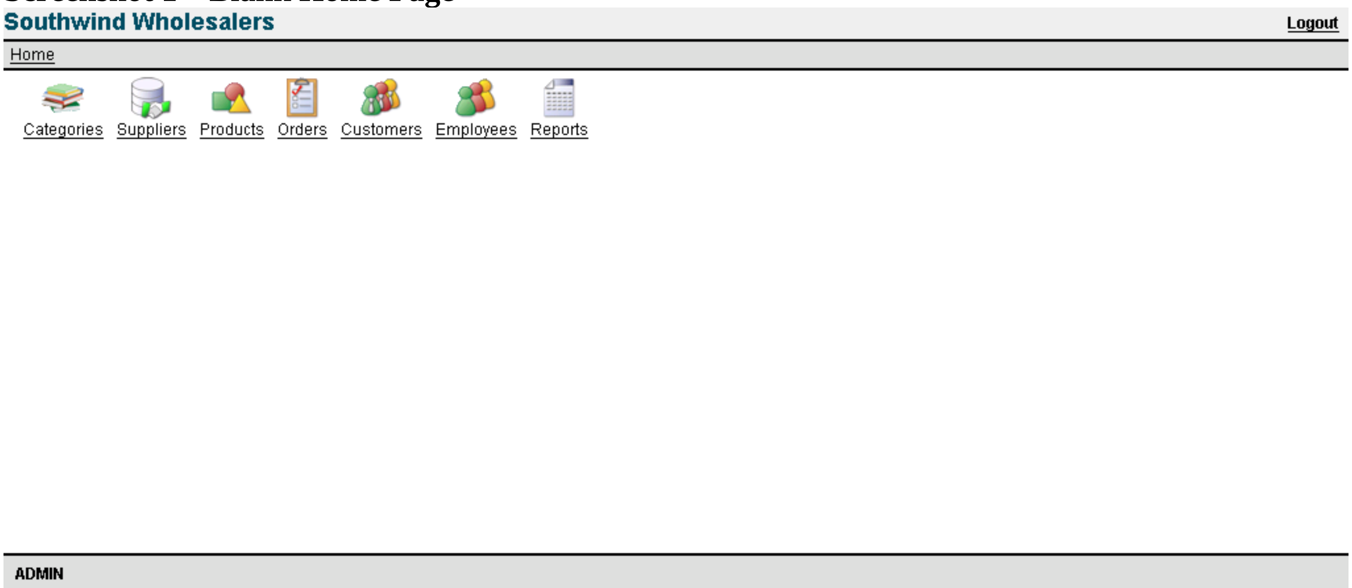
3. Select the **Orders2** link.

4. In the Conditions section, set the Condition Type to **Never**.

5. Click **Apply Changes** to save the update.

C. Screenshots

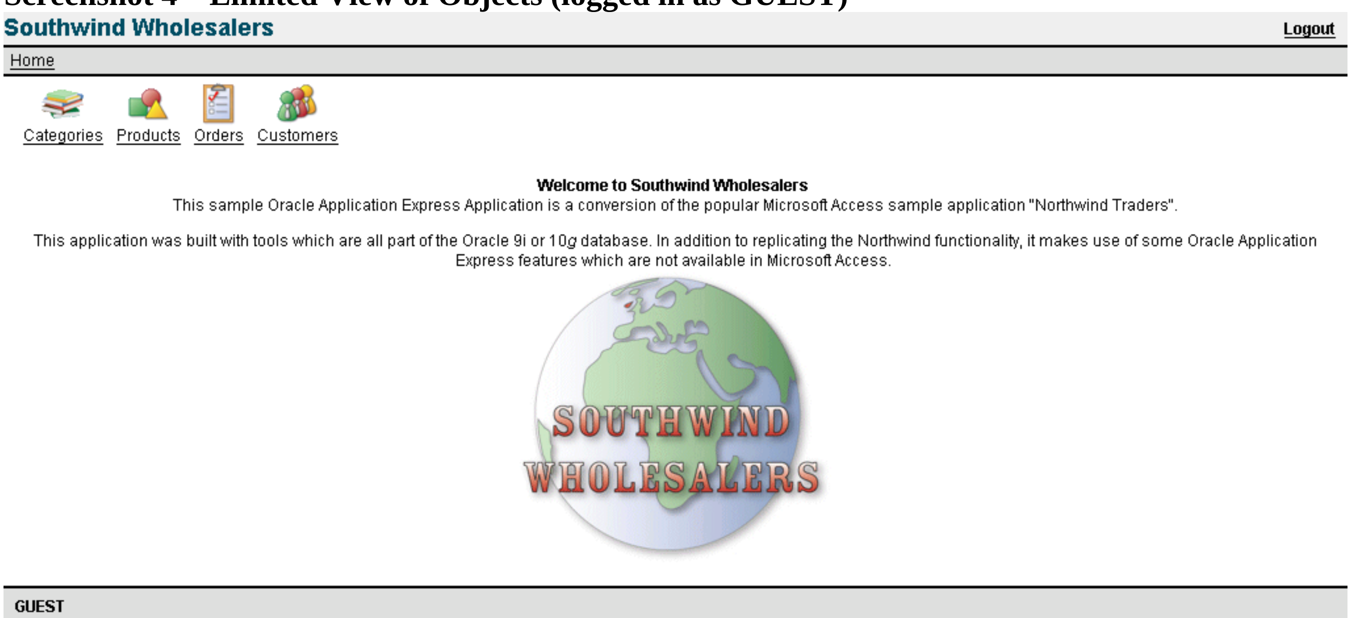
Screenshot 1 – Blank Home Page



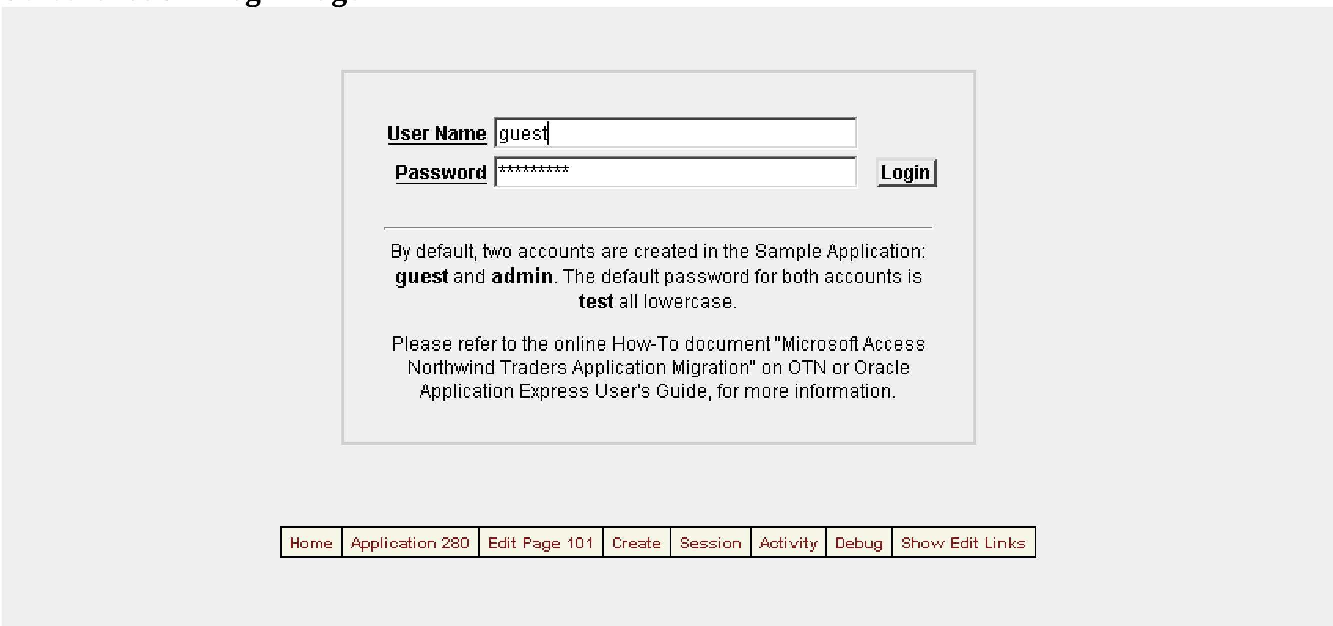
Screenshot 2 – Text and Icon added to Home Page

Screenshot 3 – Added Access Control "Admin" Icon to Menu List

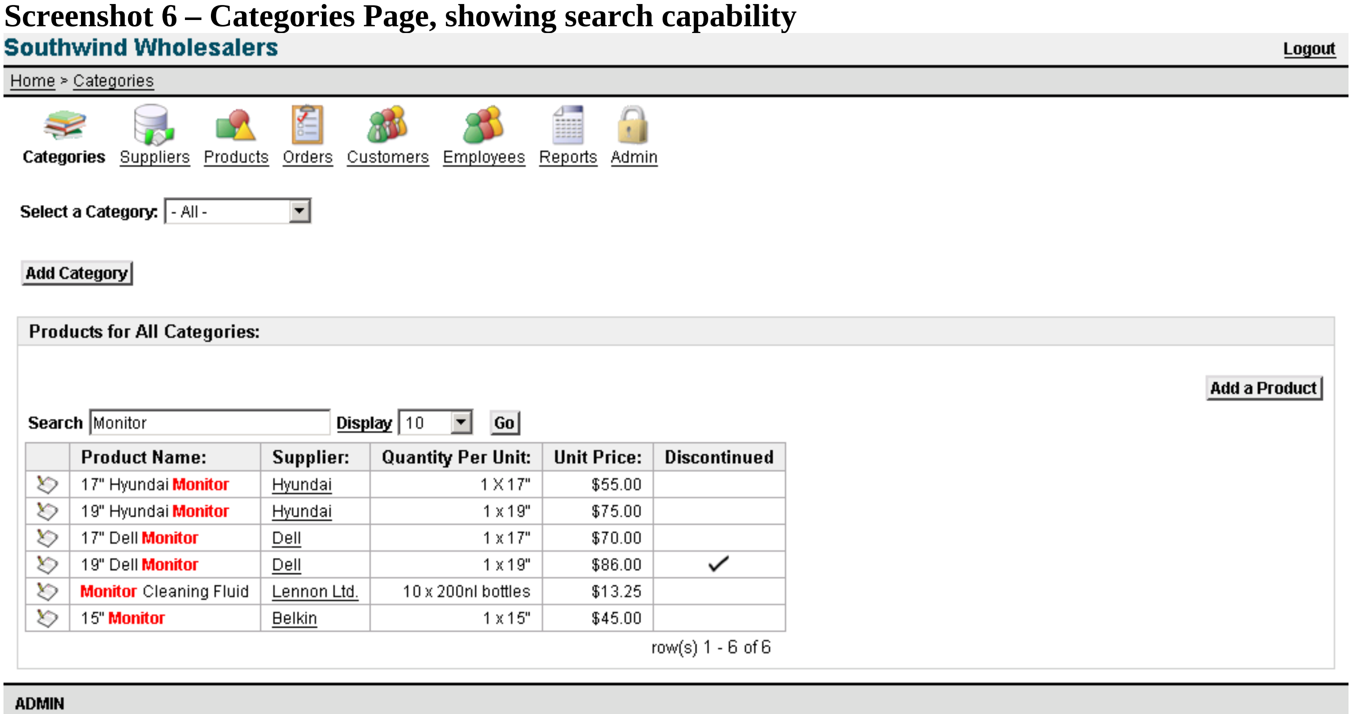
Screenshot 4 – Limited View of Objects (logged in as GUEST)



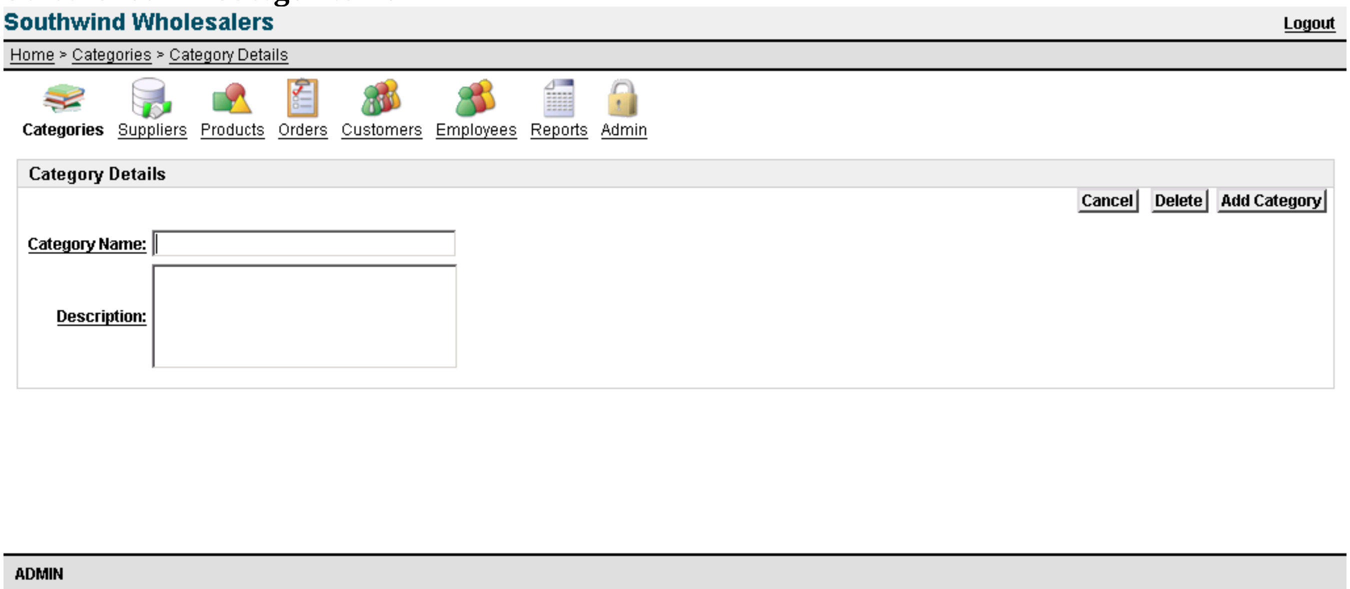
Screenshot 5 – Login Page



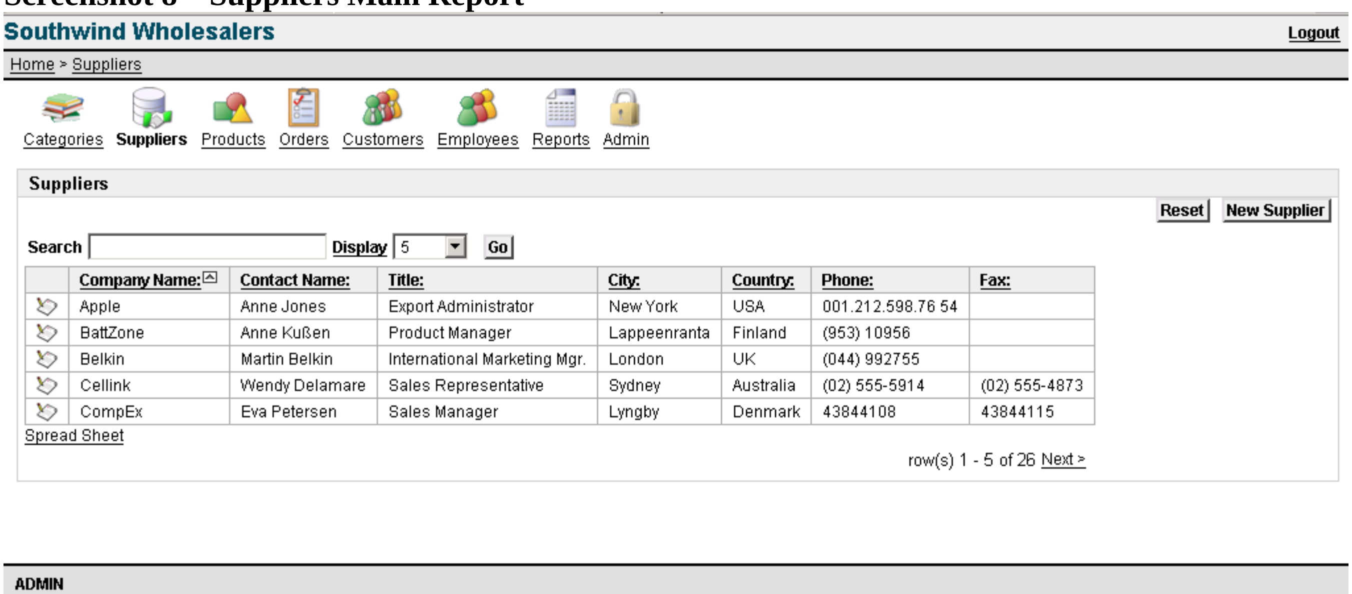
Screenshot 6 – Categories Page, showing search capability



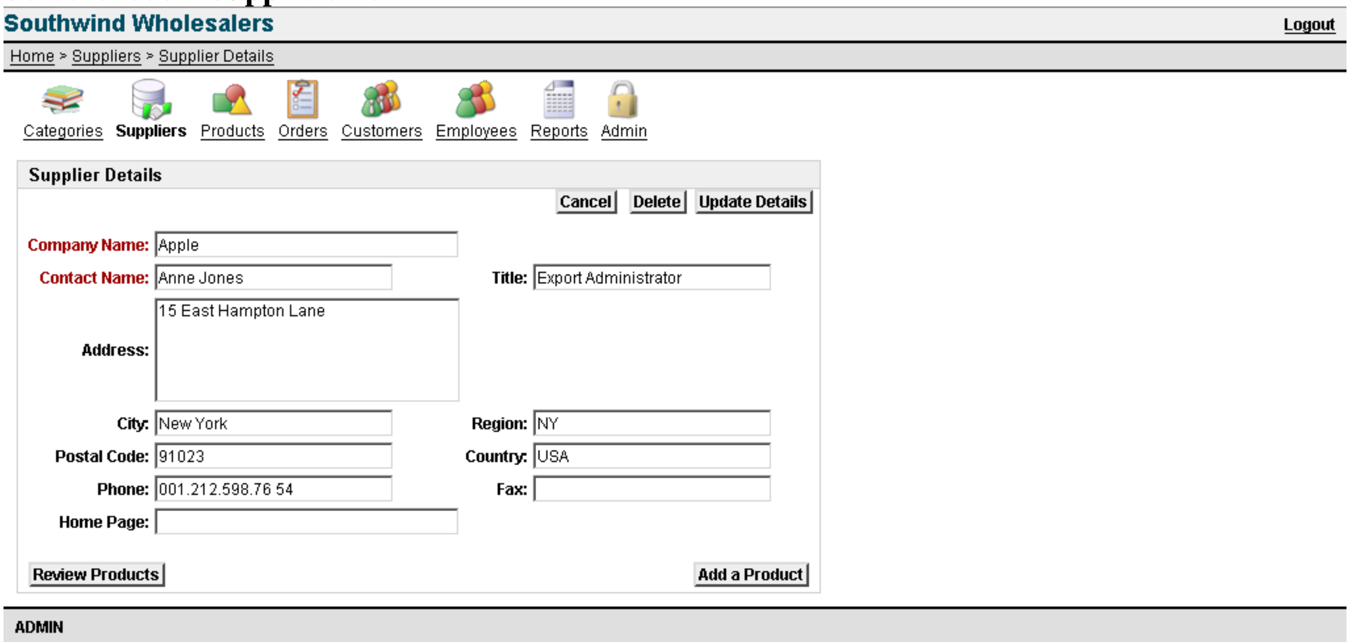
Screenshot 7 – Categories Form



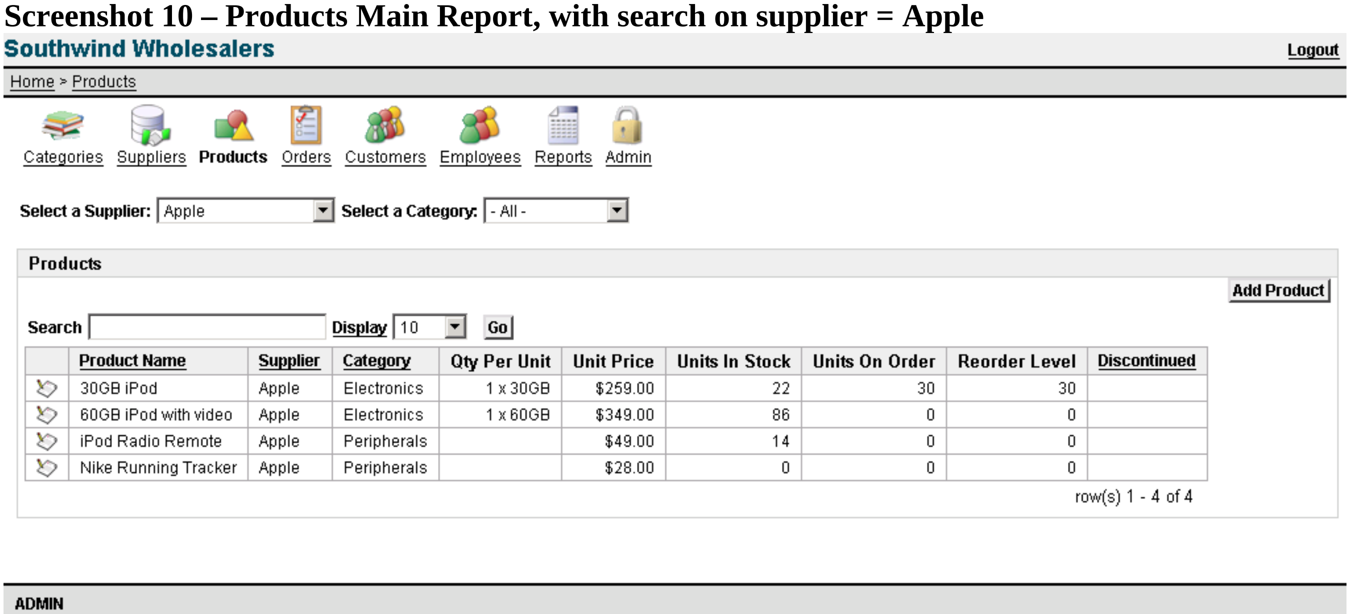
Screenshot 8 – Suppliers Main Report



Screenshot 9 – Suppliers Form



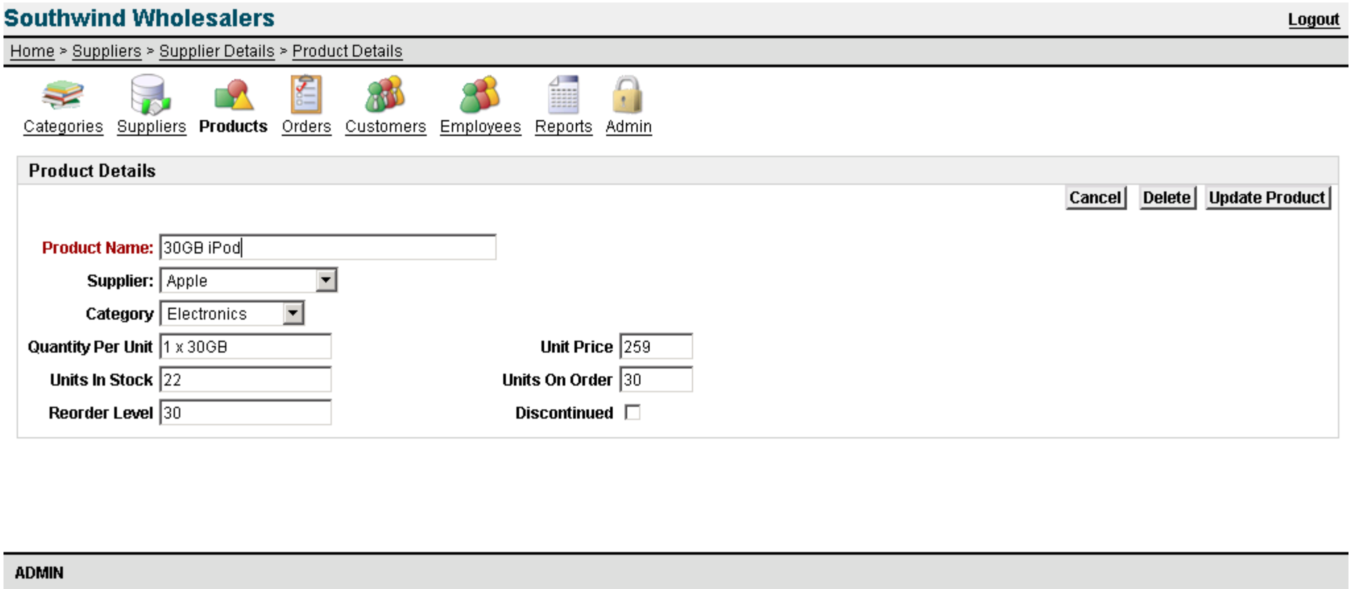
Screenshot 10 – Products Main Report, with search on supplier = Apple



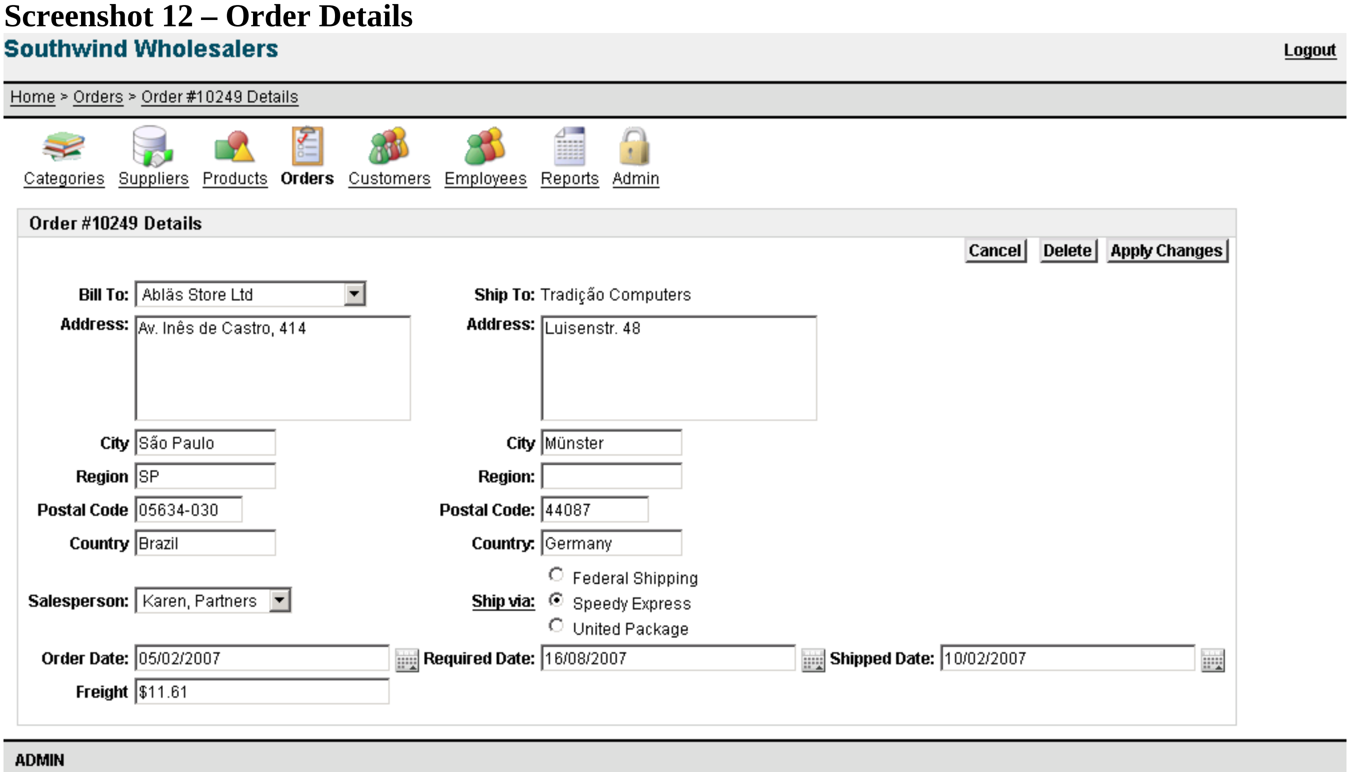
	Product Name	Supplier	Category	Qty Per Unit	Unit Price	Units In Stock	Units On Order	Reorder Level	Discontinued
	30GB iPod	Apple	Electronics	1 x 30GB	$259.00	22	30	30	
	60GB iPod with video	Apple	Electronics	1 x 60GB	$349.00	86	0	0	
	iPod Radio Remote	Apple	Peripherals		$49.00	14	0	0	
	Nike Running Tracker	Apple	Peripherals		$28.00	0	0	0	

row(s) 1 - 4 of 4

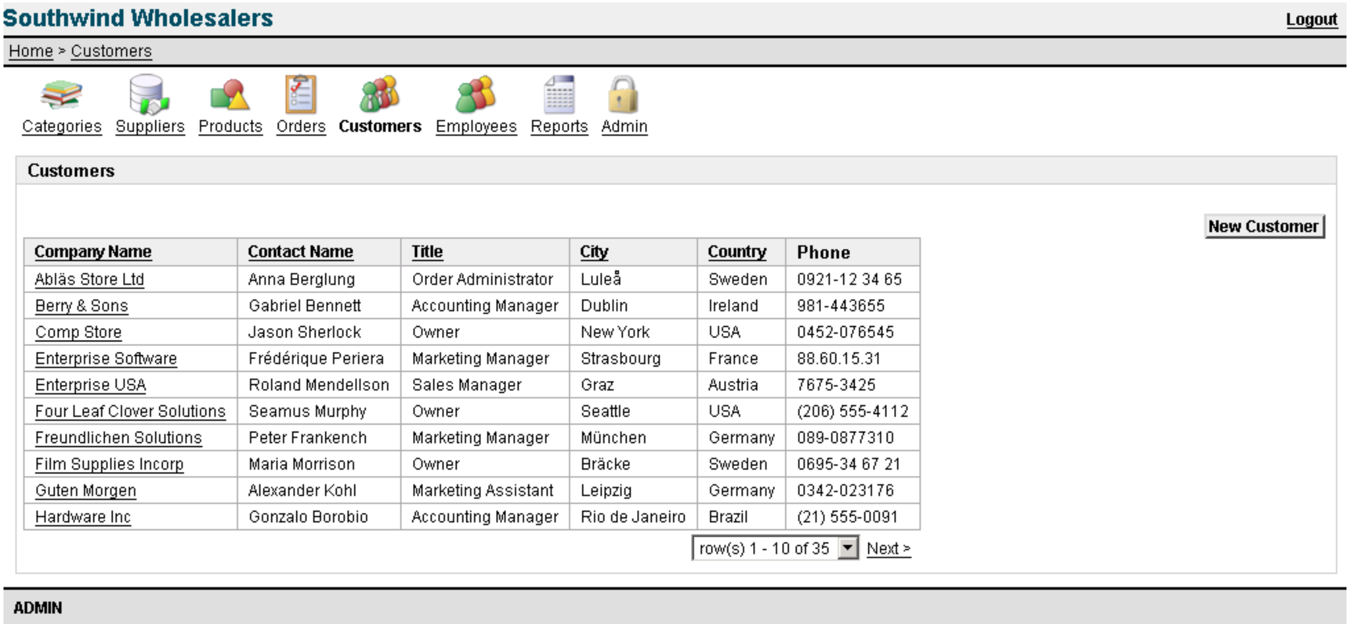
Screenshot 11 – Products Form



Screenshot 12 – Order Details



Screenshot 13 – Customer Main Form



Southwind Wholesalers

Logout

Home > Customers

Categories Suppliers Products Orders **Customers** Employees Reports Admin

Customers

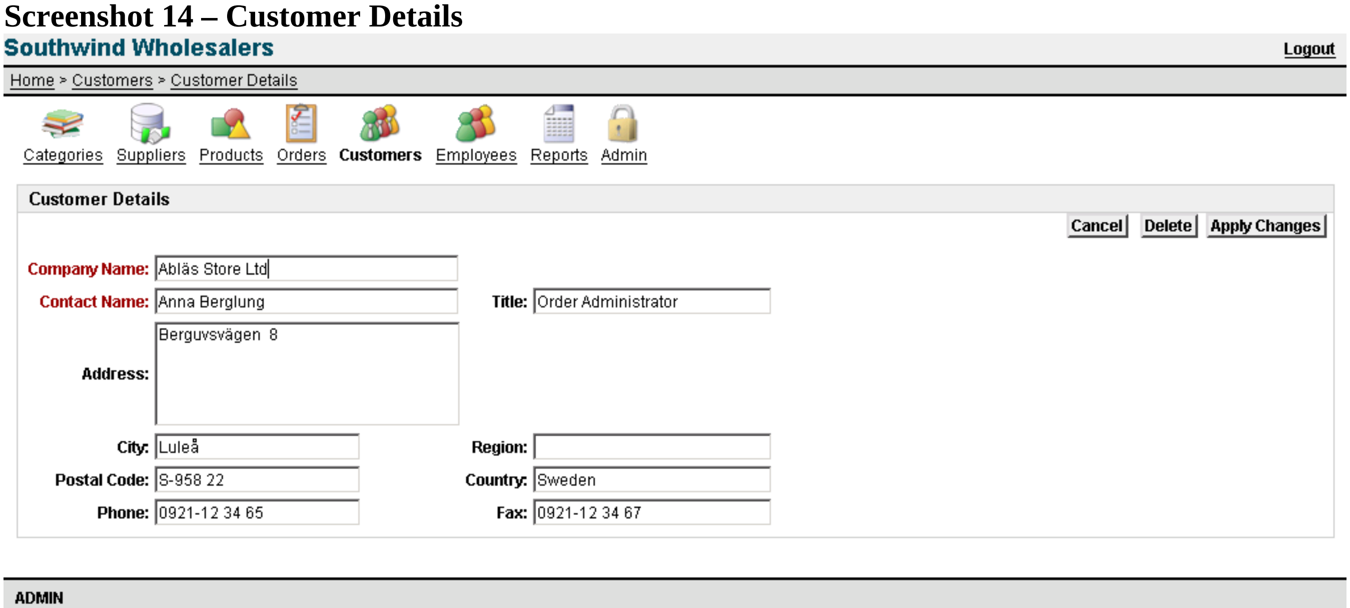
New Customer

Company Name	Contact Name	Title	City	Country	Phone
Abläs Store Ltd	Anna Berglung	Order Administrator	Luleå	Sweden	0921-12 34 65
Berry & Sons	Gabriel Bennett	Accounting Manager	Dublin	Ireland	981-443655
Comp Store	Jason Sherlock	Owner	New York	USA	0452-076545
Enterprise Software	Frédérique Periera	Marketing Manager	Strasbourg	France	88.60.15.31
Enterprise USA	Roland Mendellson	Sales Manager	Graz	Austria	7675-3425
Four Leaf Clover Solutions	Seamus Murphy	Owner	Seattle	USA	(206) 555-4112
Freundlichen Solutions	Peter Frankench	Marketing Manager	München	Germany	089-0877310
Film Supplies Incorp	Maria Morrison	Owner	Bräcke	Sweden	0695-34 67 21
Guten Morgen	Alexander Kohl	Marketing Assistant	Leipzig	Germany	0342-023176
Hardware Inc	Gonzalo Borobio	Accounting Manager	Rio de Janeiro	Brazil	(21) 555-0091

row(s) 1 - 10 of 35 Next >

ADMIN

Screenshot 14 – Customer Details



Southwind Wholesalers

Logout

Home > Customers > Customer Details

Categories Suppliers Products Orders **Customers** Employees Reports Admin

Customer Details

Cancel Delete Apply Changes

Company Name: Abläs Store Ltd

Contact Name: Anna Berglung Title: Order Administrator

Address: Berguvsvägen 8

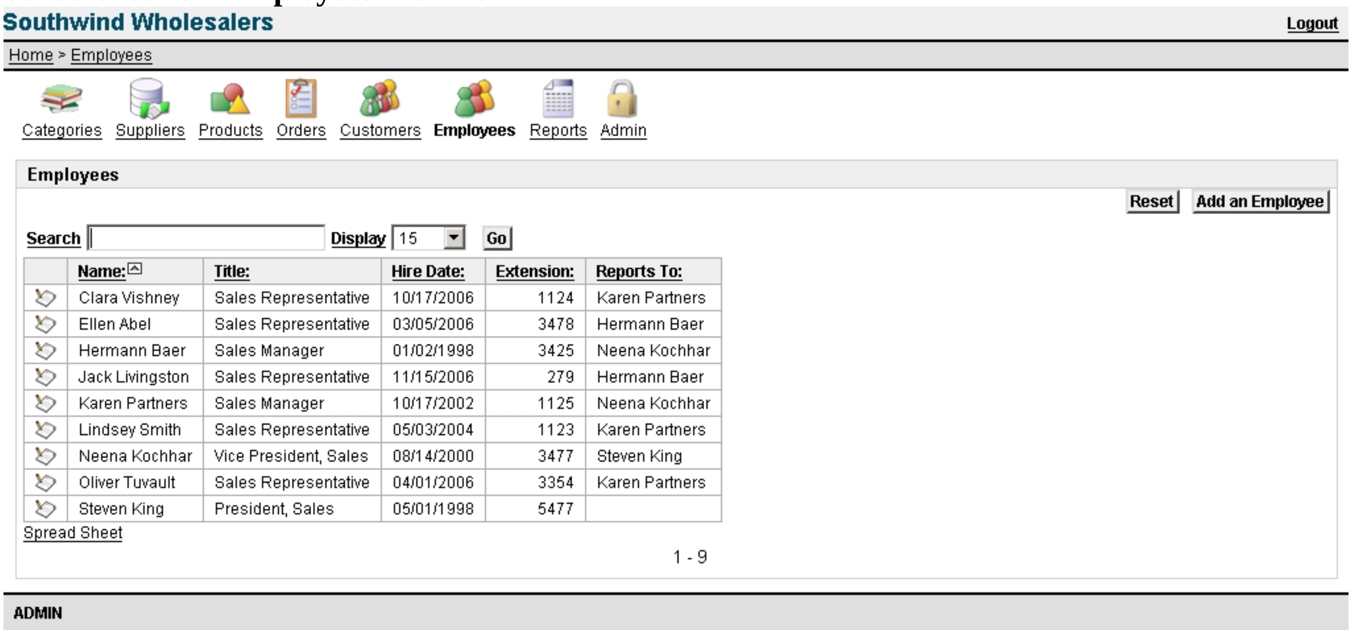
City: Luleå Region:

Postal Code: S-958 22 Country: Sweden

Phone: 0921-12 34 65 Fax: 0921-12 34 67

ADMIN

Screenshot 15 – Employees Main form


Southwind Wholesalers
Logout
Home > Employees
Categories Suppliers Products Orders Customers **Employees** Reports Admin

Employees

Reset | Add an Employee

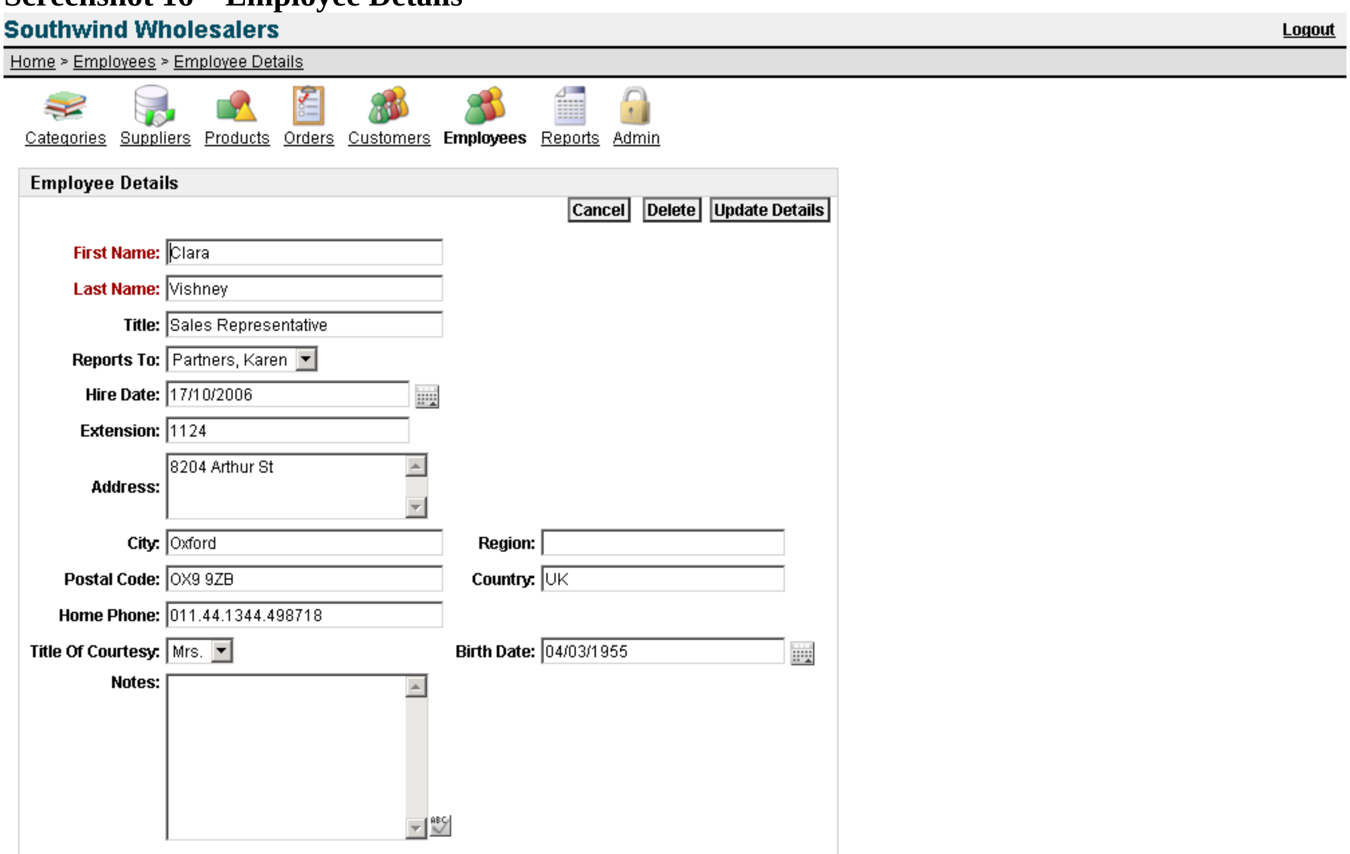
Search: ____ Display: 15 | Go

	Name:	Title:	Hire Date:	Extension:	Reports To:
	Clara Vishney	Sales Representative	10/17/2006	1124	Karen Partners
	Ellen Abel	Sales Representative	03/05/2006	3478	Hermann Baer
	Hermann Baer	Sales Manager	01/02/1998	3425	Neena Kochhar
	Jack Livingston	Sales Representative	11/15/2006	279	Hermann Baer
	Karen Partners	Sales Manager	10/17/2002	1125	Neena Kochhar
	Lindsey Smith	Sales Representative	05/03/2004	1123	Karen Partners
	Neena Kochhar	Vice President, Sales	08/14/2000	3477	Steven King
	Oliver Tuvault	Sales Representative	04/01/2006	3354	Karen Partners
	Steven King	President, Sales	05/01/1998	5477	

Spread Sheet
1 - 9

ADMIN

Screenshot 16 – Employee Details

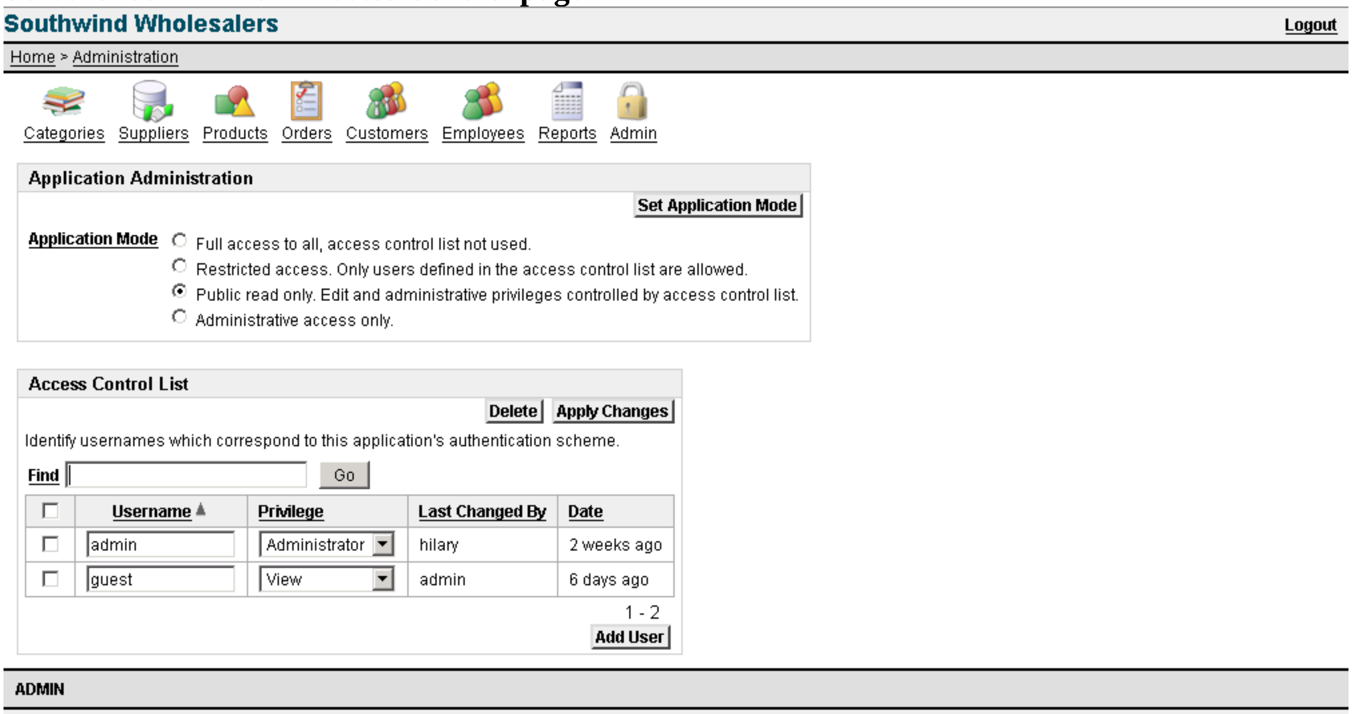

Southwind Wholesalers
Logout
Home > Employees > Employee Details
Categories Suppliers Products Orders Customers **Employees** Reports Admin

Employee Details

Cancel | Delete | Update Details

First Name: Clara
Last Name: Vishney
Title: Sales Representative
Reports To: Partners, Karen
Hire Date: 17/10/2006
Extension: 1124
Address: 8204 Arthur St
City: Oxford
Region:
Postal Code: OX9 9ZB
Country: UK
Home Phone: 011.44.1344.498718
Title Of Courtesy: Mrs.
Birth Date: 04/03/1955
Notes:

Screenshot 17 – Main Access Control page



Screenshot 18 – Guest User Login