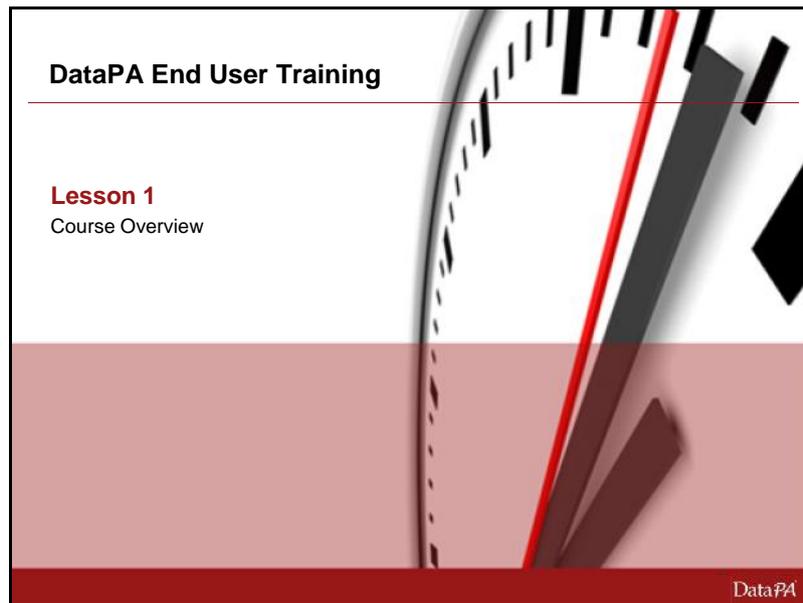


DataPA  
OpenAnalytics

PA

DataPA OpenAnalytics  
End User Training



## Chapter 1 – Course Overview

### Introduction

This course covers the skills required to use DataPA OpenAnalytics to obtain data in Excel, create Dashboards with the DataPA Enterprise Dashboard and generate Reports using DataPA's own report design tool. Although the course will cover the basics of using DataPA OpenAnalytics with other applications, the emphasis is on DataPA OpenAnalytics and how it interacts with these applications, rather than necessarily how to use the data within those applications.

### Audience

The course is intended for end users who will use DataPA OpenAnalytics as a stand-alone application to generate Dashboard, reports and use the Excel add-in.

### Prerequisites

Users should be familiar with the Microsoft GUI Interface and have working knowledge of Microsoft Excel.

**What are your goals?** 

- Think about what you would like to learn from this course
- Introduce yourself

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### Student Goals

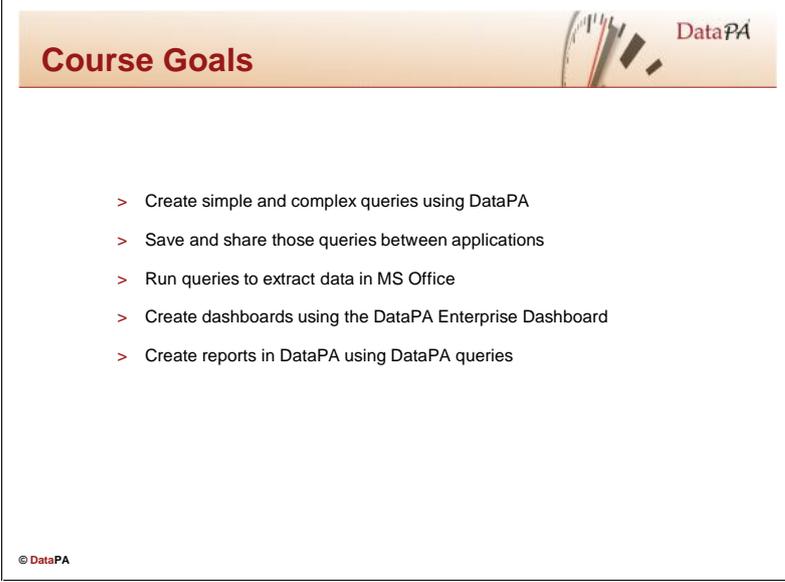
Please take a few moments to document your own goals for this course. What will you need to know and/or produce when you return to work?

What are the three things you most want to know about DataPA OpenAnalytics?

- 
- 
- 

Please introduce yourself by answering the following questions

1. Your Name and Job
2. Your experience with Excel and reports design software
3. What you would like to learn from this course



**Course Goals**

- > Create simple and complex queries using DataPA
- > Save and share those queries between applications
- > Run queries to extract data in MS Office
- > Create dashboards using the DataPA Enterprise Dashboard
- > Create reports in DataPA using DataPA queries

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## Course Goals

When you complete this course you should be able to:

Create simple and complex queries using DataPA  
Save and share those queries between applications  
Run queries to extract data in MS Office  
Create dashboards using the DataPA Enterprise Dashboard  
Create reports in DataPA using DataPA queries

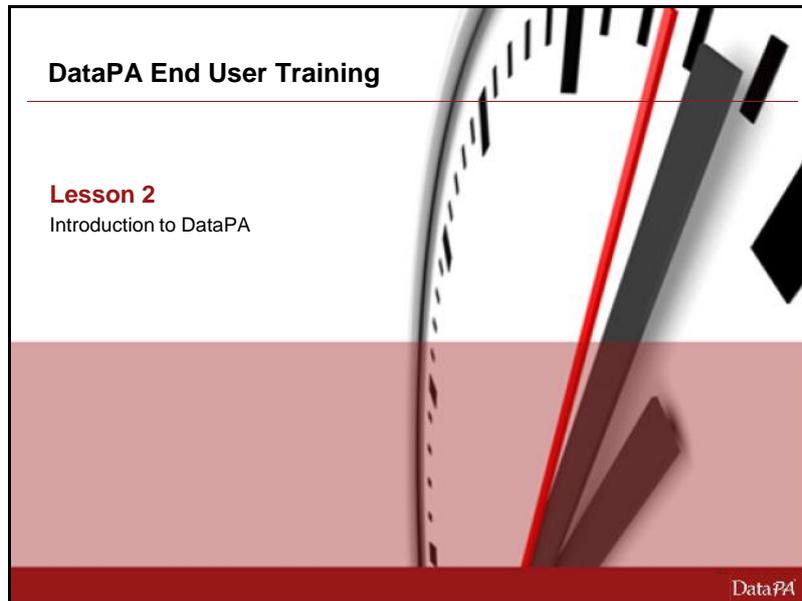
Lesson Overview

<b>Lesson 1:</b>	<b>Course Overview</b>
<b>Lesson 2:</b>	<b>Introduction to DataPA</b>
<b>Lesson 3:</b>	<b>Creating Queries</b>
<b>Lesson 4:</b>	<b>Building Dashboards</b>
<b>Lesson 5:</b>	<b>Designing Reports</b>
<b>Lesson 6:</b>	<b>Using Drill down and Sub Reports</b>
<b>Appendix A:</b>	<b>Scripting</b>
<b>Appendix B:</b>	<b>Creating Subjects</b>

© DataPA

### Lesson Overview

Lesson	What is covers
Lesson 1 - Course Overview	Introductory material about this course
Lesson 2 - Introduction to DataPA	Introduces the DataPA file concepts. Covers using DataPA in Excel, the Enterprise Dashboard and DataPA Reports.
Lesson 3 - Creating Queries	A detailed look at creating queries with the query wizard. Includes a detailed discussion of creating query conditions in addition to covering the creation of complex queries.
Lesson 4 – Building Dashboards	A detailed look at using the DataPA Enterprise Dashboard application to build dashboards. Includes a detailed discussion of the application interface, building tabs, objects and drill downs, and applying filters.
Lesson 5 - Designing Reports	A detailed look at designing reports with DataPA Reports. Covers creating reports, grouping, formatting, special fields, printing and exporting.
Lesson 6 - Using Drill down and Sub Reports	A detailed look at the concepts behind drill down and sub reports, what they are used for and how to create them.
Appendix A - Scripting	A detailed look at using scripting behind reports to achieve more complex tasks such as conditional formatting and inclusion of ActiveX controls.
Appendix B - Creating Subjects	A detailed look at creating each of the three types of subject used in DataPA.



## Chapter 2 - Introduction to using DataPA

### Introduction

DataPA allows users to easily access and manipulate information from your business systems. In this chapter we will explain operating system files that DataPA uses to define and store information, and introduce the interfaces that allow us to use those files to extract data into Windows applications.

### Learning Objectives

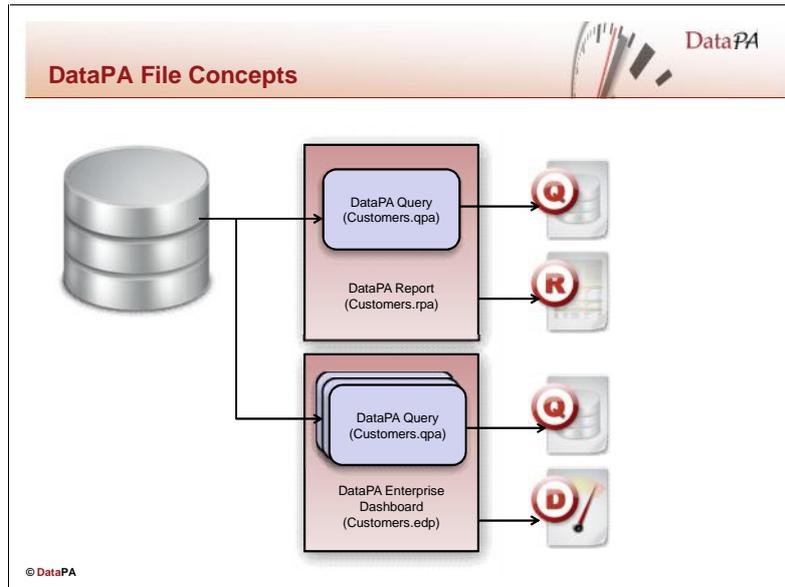
When you complete this lesson you should be able to:

- Explain DataPA file concepts.
- Use DataPA in Excel. Open and run a query.
- Use DataPA Enterprise Dashboard to open and view a dashboard.
- Use DataPA Reports. Open and run a report.
- Manipulate data in a report.

### Prerequisites

Before you begin this lesson you should be able to:

- Open a copy of Excel



### DataPA Queries

In order to define the data extracts we will use from a given system, DataPA uses the concept of a query. The query defines the following:

- The system we wish to extract data from
- The type of data we want to extract
- Any conditions or parameters used to limit the data we receive
- Which fields from the data set we wish to receive
- The sort order the data will be received in

Queries are stored on disk in the form of qpa files, for example we might save a file as C:\MyQueries\customer.qpa.

### DataPA Dashboards

A dashboard can potentially contain many queries. In addition to the data extract information defined by these queries, we need to store the dashboard layout, formatting and behaviour definitions. As such, DataPA dashboards are stored in a different file format, edp files. For example we might save our customer dashboard as C:\MyReports\customers.edp. This dashboard file contains both the query, and layout, formatting and behaviour information for the dashboard.

### DataPA Reports

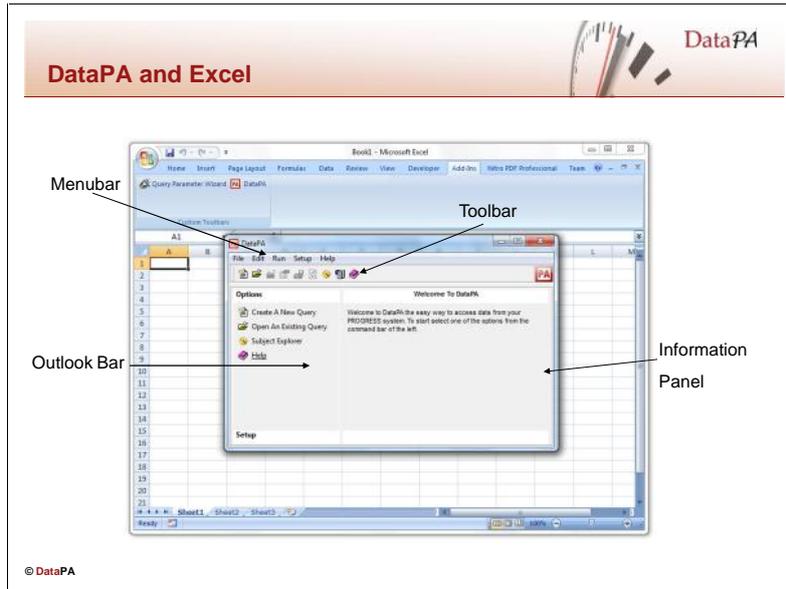
Like dashboards, in a report we need to store the data formatting and layout information in addition to the data extract definition. As such, DataPA reports are stored in a different file format, rpa files. For example we might save our customer report as C:\MyReports\customers.rpa. This report file contains both the query, and formatting and layout information for the report.

### Sharing Queries

We will see later in this course how we can share queries between applications such as Microsoft Excel, DataPA Enterprise Dashboard and DataPA Reports.

You can create reports, and add queries to a dashboard by copying an existing query. Any subsequent changes to the query in the dashboard or report do not affect the existing query, as the changes are made to a copy of the query stored independently in the dashboard or report.

Similarly, you can share a query from an existing dashboard or report, and use it in Excel or a different dashboard or report. The shared query is a copy of the original, and as such any changes to it do not affect the original query stored in the original dashboard or report.



## Opening the DataPA Excel Add-In

When DataPA is installed it adds a button to the Excel toolbars to open the DataPA Add In. If the button is missing, follow these steps:

1. From the Excel tools menu, select Add Ins
2. Make sure DataPA is checked
3. Press OK

If DataPA is not available in the Add Ins Dialog box, follow these steps:

1. From the Excel Add Ins Dialog box, press *Browse*
2. Browse to C:\Program Files\DataPA\Excel
3. Select DataPA.xla
4. Follow the instructions above from step 2

To open DataPA in Excel, press the DataPA button on the toolbar.

## Accessing the Online Help

DataPA includes a context sensitive help system.

To access help from the main screen, select *Contents* from the help menu.

There are three ways to locate information in help; these correspond to the three tabs in the Help Topics window.

Tab	Description
Contents	Expandable table of contents that allows you to search through topics in a hierarchical arrangement.
Index	An alphabetic listing of topics. You can either browse to a topic or enter a keyword to search.
Find	Uses a keyword-searchable database to find topics.

You can also access help topics relevant to the screen you are currently focused on by pressing the F1 key.

### Opening a Query in Excel

To open a query, follow these steps:

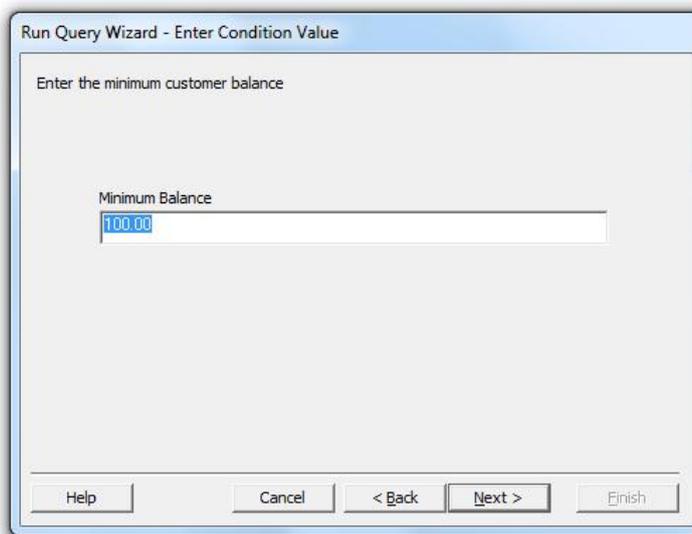
- From the *File* menu, select *Open an Existing Query*
- Select the query file in the Open File dialog and press ok.

Notice the query name and description now appear in the Information panel.

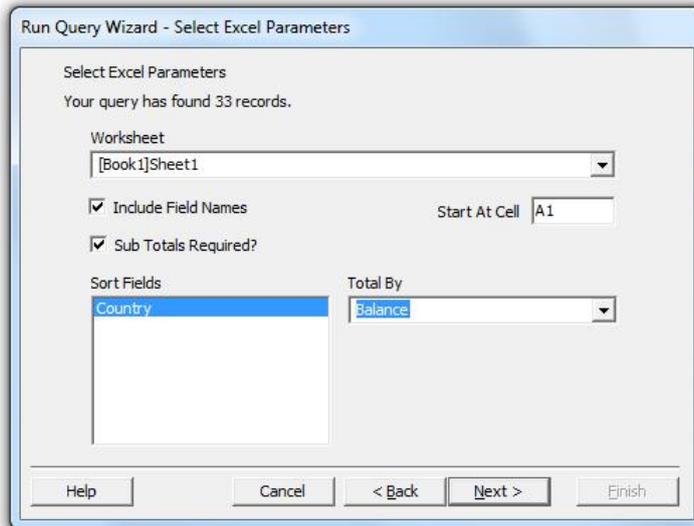
### Running a Query in Excel

To run a query, follow these steps:

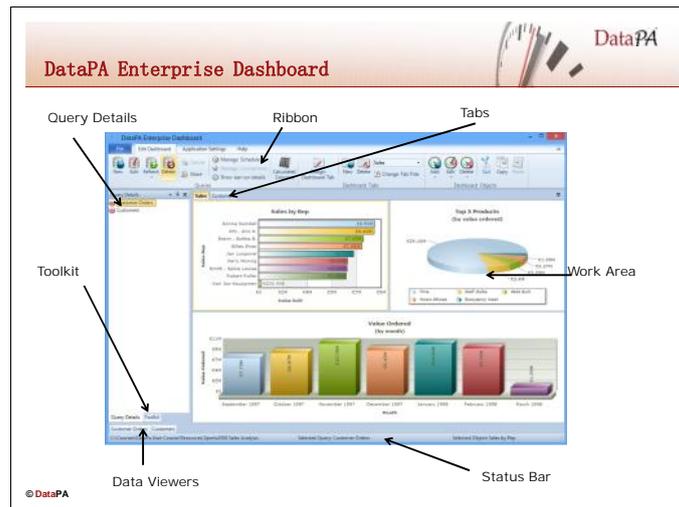
- From the *Run* menu, select *Run Query*
- Select *Next* to move past the introduction screen.
- Enter appropriate parameter values and press *Next*



- Continue pressing next to run the query until you reach the *Select Excel Parameters* screen.



- Select the workbook you require, the starting cell and any sub-total options.
- Press *Next* then *Finish* to complete the wizard.



## Opening a Dashboard

To open the DataPA Enterprise Dashboard, click on the DataPA Enterprise Dashboard icon from the start menu or on the desktop.

To open a dashboard, follow these steps:

- Select *Open an Existing Dashboard* from the *File* menu of DataPA Enterprise Dashboard.
- Select the dashboard file you wish to open and press ok.

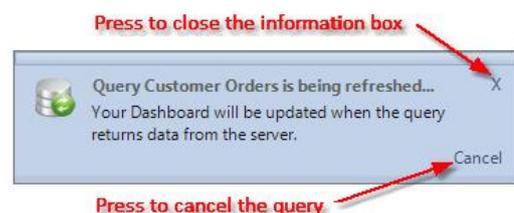
## Refreshing data in a Dashboard

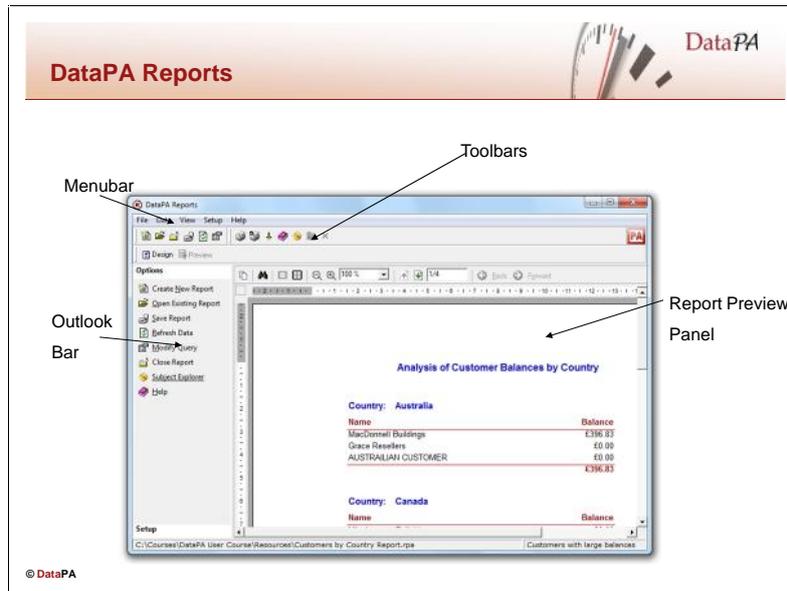
To refresh the data in an open dashboard in the DataPA Enterprise Dashboard, follow these steps:

- Press the left mouse button over the arrow below the *Refresh* button in the *Edit Dashboard* tab of the ribbon.
- Select the individual query you wish to refresh, or *Refresh All Queries* if you wish to refresh all queries.



Whilst a query is being refreshed, DataPA Enterprise Dashboard displays an information box. You can cancel the query by pressing the *cancel* button on this information box.





## Opening a Report

To open the DataPA Report Designer, click on the DataPA Reports icon from the start menu or on the desktop. To open a report, follow these steps:

- Select *Open an Existing Report* from the *File* menu of the report designer.
- Select the report file you wish to open and press ok.

## Running a Report

To run an open report in the DataPA Report Designer, follow these steps:

- Select *Refresh Data* from the *Data* menu of the report designer.
- Select *Next* to move past the introduction screen.
- Enter appropriate parameter values and press *Next*

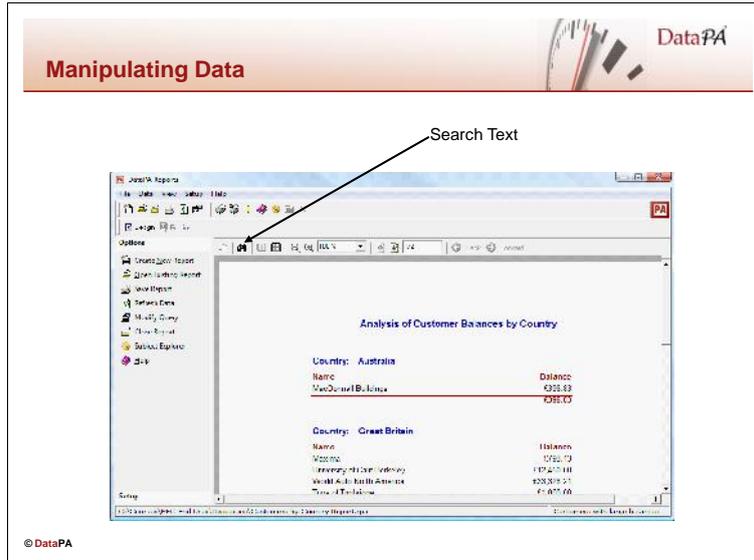
Run Query Wizard - Enter Condition Value

Enter the minimum customer balance

Minimum Balance

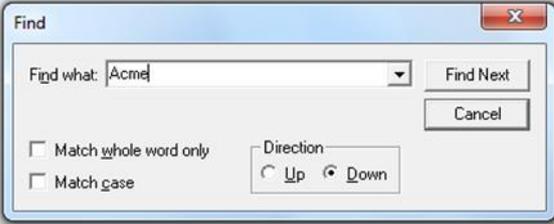
Help Cancel < Back Next > Finish

- Press *Next* to retrieve the data for your report.



### Search for data in a report.

The Report Preview panel in the DataPA Reports provide a way for searching for data within a report.

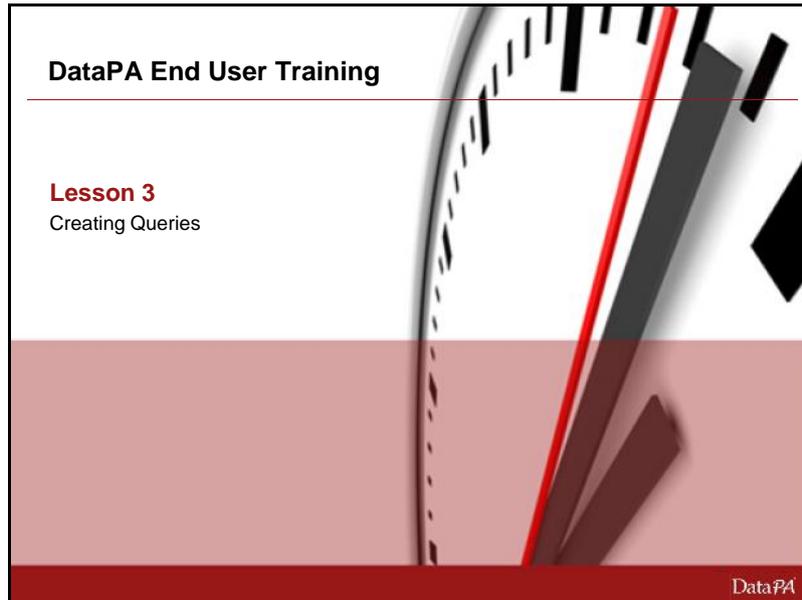
Method	Description
Search Text	<p>Provides a simple dialog box to search for a text string in the report.</p>  <p>Follow these steps to search:</p> <ol style="list-style-type: none"> <li>1. Press the <i>Search Text</i> button to open the search dialog box.</li> <li>2. Enter the text you wish to search for.</li> <li>3. Press <i>Next</i> to find the next instance of the text you are searching for.</li> </ol>

### Using the Multiple Page Viewer

The DataPA Reports Preview panel allows you view several pages of the report at once.

Follow these steps to view multiple pages:

1. Click the Multiple Pages button on the top of the DataPA Reports Preview panel. The icon for this is 
2. Drag the mouse to highlight the number of pages you want to have in the viewer.
3. Release the mouse and view the report.



## Chapter 3 – Creating Queries

### Introduction

DataPA uses queries to define and control data extracts from your business systems. In this lesson you will learn to create and maintain these queries, and to share them between different applications.

### Learning Objectives

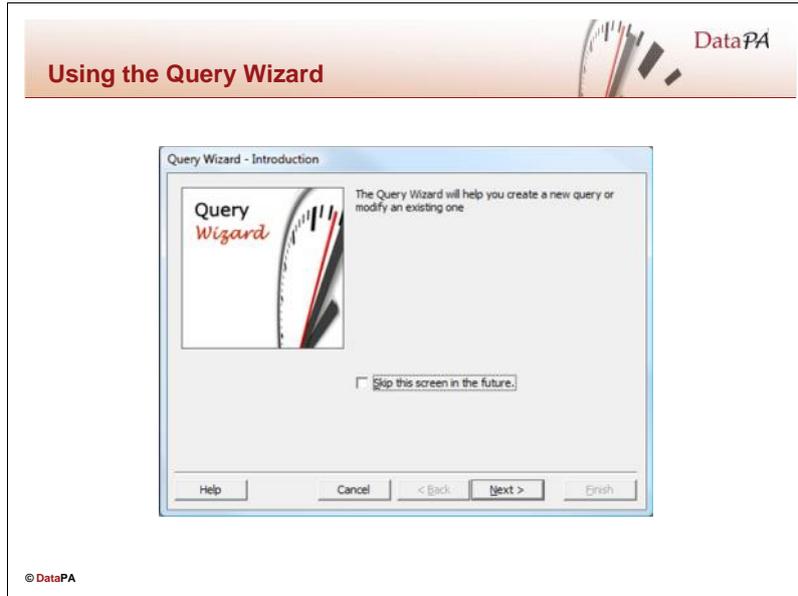
When you complete this lesson you should be able to:

- Use the query wizard to create a new query.
- Use the query wizard to modify a query.
- Create conditions on a query.
- Combining more than one subject in a complex query.

### Prerequisites

Before you begin this lesson you should be able to:

- Access DataPA in Excel and DataPA Reports.
- Open a query in Excel.
- Open a report in the DataPA Report designer.
- Run a query in Excel.
- Refresh a report in the DataPA Report designer.
- Publish a query to a DataPA Enterprise Service.



### Creating a query with the query Wizard

To open the query wizard to create a new query follow these steps:

1. Open DataPA in Excel
2. From the *File* menu, select *Create a New Query*

You can create two different types of query, described in the table below:

Query Type	Description	When to use
Standard	Returns a simple listing of the data set created by the query.	If you are creating a report, dashboard or query for Excel where you will want to display the record level detail of the query data. For instance, if you were creating a query on orders, use a standard query if you will want to display each order line of the orders.
Summary	Returns a summarised listing of the data set created by the query.	If you are creating a report, dashboard or query for Excel where you are only interested in the data summarised by one or more columns. For instance, if you were creating a query on orders, and you were only interested in the total value ordered each month.

The following section describes how to create each type of query:

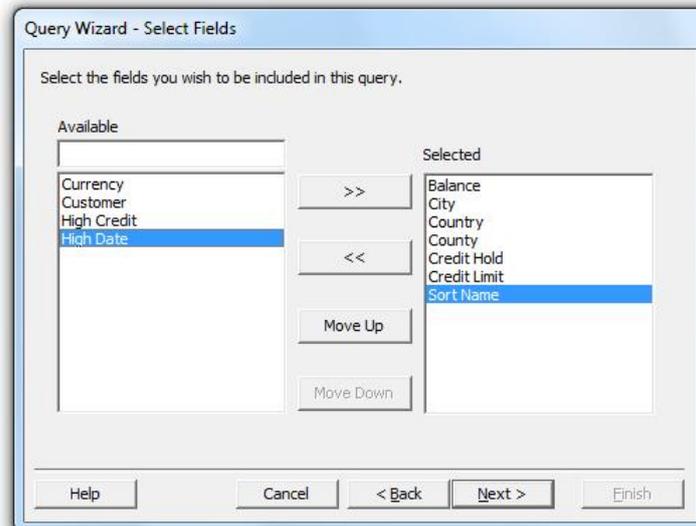
## DataPA OpenAnalytics End User Training

Follow these steps to create an unfiltered standard query using the query wizard, and save it to disk:

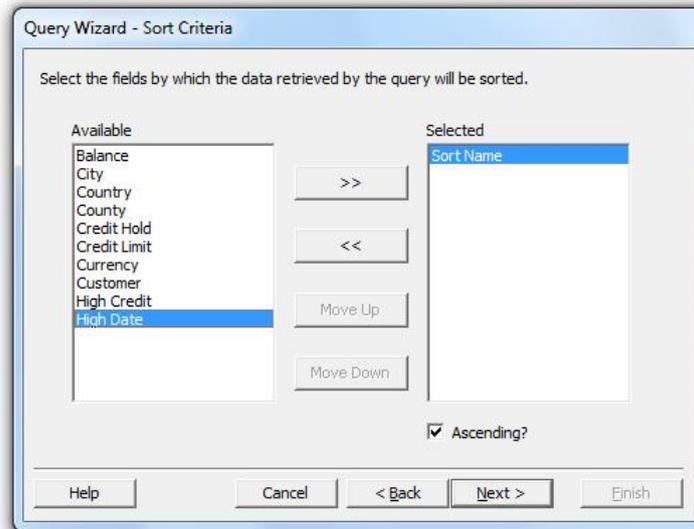
1. Press *Next* to step past the introduction screen.
2. Enter a name and description for the query and press *Next*.
3. Select the subject you wish to create a query from and press *Next*.



4. Press *Next* to bypass the *Define Filter Conditions* Screen.
5. Select the field(s) you wish to be retrieved by the query and press *Next*.



6. Select the field(s) you wish to sort the query by and press *Next*.



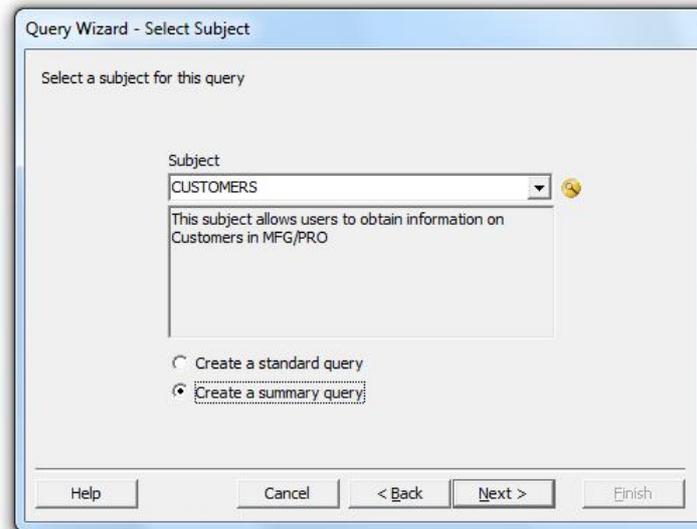
7. Press *Next* to bypass the *Add Multiple Subjects to Query* screen.
8. Press *Finish* to create your query.



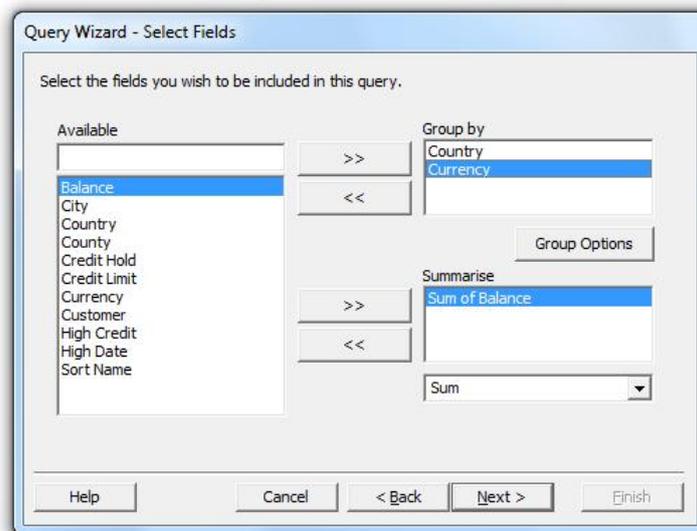
9. From the *File* menu select *Save Query*.
10. Browse to the directory you wish to save your query to and press *Save*.

Follow these steps to create an unfiltered summary query using the query wizard, and save it to disk:

1. Press *Next* to step past the introduction screen.
2. Enter a name and description for the query and press *Next*.
3. Select the subject you wish to create a query from, select *Create a summary query* and press *Next*.



4. Press *Next* to bypass the *Define Filter Conditions* Screen.
5. Select the field(s) you wish to group by, the fields you wish to summarise and how you want each summary field to be calculated

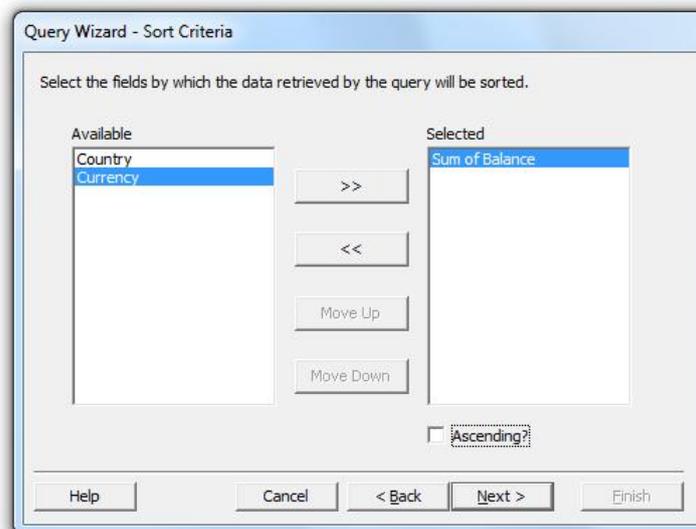


6. For each field in the *Group by* list, select the field and press the *Group Options*.

7. Select the appropriate group options for each group and press *OK*.



8. Select the field(s) you wish to sort the query by and press *Next*.

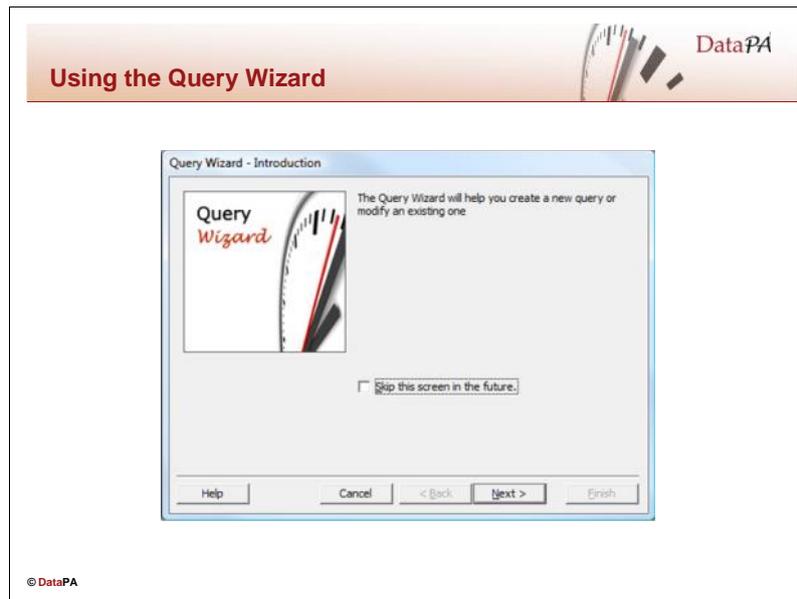


9. Press *Finish* to create your query.



10. From the *File* menu select *Save Query*.

11. Browse to the directory you wish to save your query to and press *Save*.

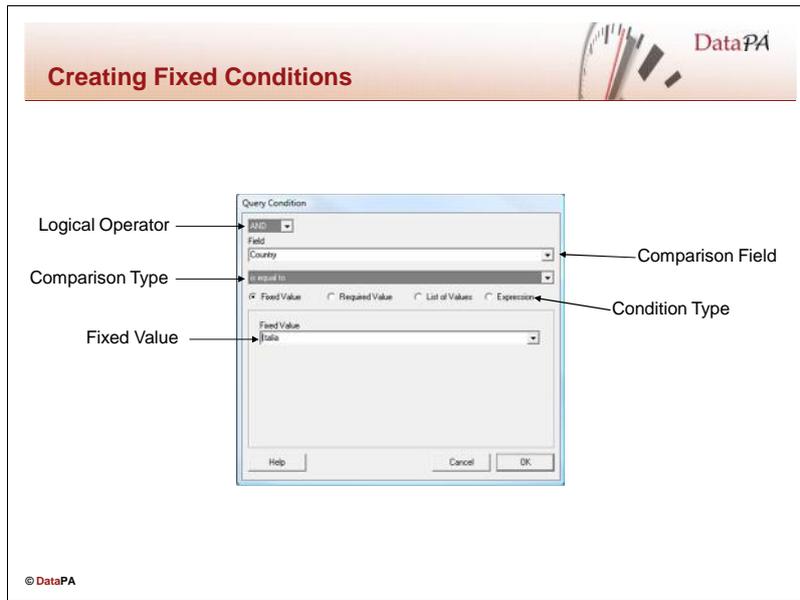


### Modifying a query with the query Wizard

To start the query wizard to modify an existing query follow these steps:

1. Open DataPA in Excel
2. Open the query you wish to modify in DataPA
3. From the *Edit* menu, select *Modify Query*

Follow the Query Wizard steps as you would to create a new query to modify your existing query.



### Creating Query Conditions

Conditions allow you to filter the data that is returned by a query. There are two distinct types of conditions you can add to a query:

Type	Description
Fixed Value	The value for the condition is fixed at the time the query is created.
Required Value	The user will be prompted for a value for the condition each time they run the query, or a report based on the query.

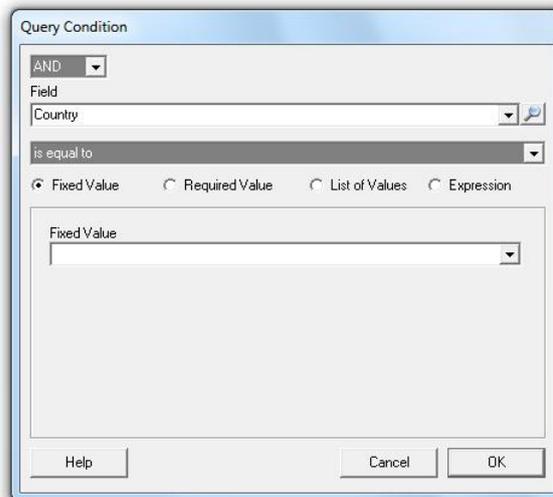
### Creating a Fixed Value Condition

Follow these steps to create a fixed value condition on a query:

1. Open the query in the DataPA Query Wizard and move to the *Define Filter Condition* screen.



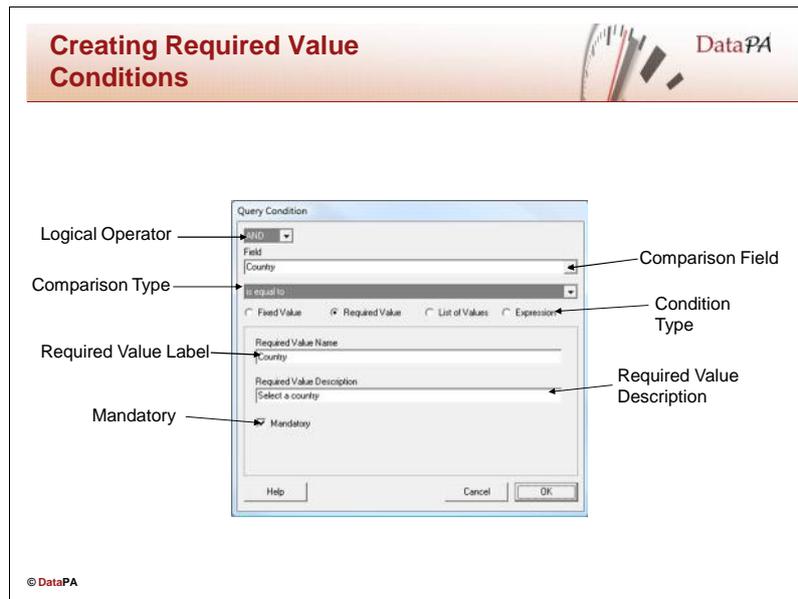
2. Press *Add* to open the query condition builder dialog box.



3. Select *AND* as logical operator.
4. Select the field you wish to create a condition on.
5. Select *Fixed Value* as the condition type.
6. Select the type of comparison you wish to use in your condition.
7. Enter or select the value you wish to use for your condition.
8. Press *OK* to save your condition.

Note, as you select different fields for your condition, the comparison types will change. If your field is a character, you will be able to select the comparison matches. This will return any data rows where the field contains the fixed value as all or part of its value.

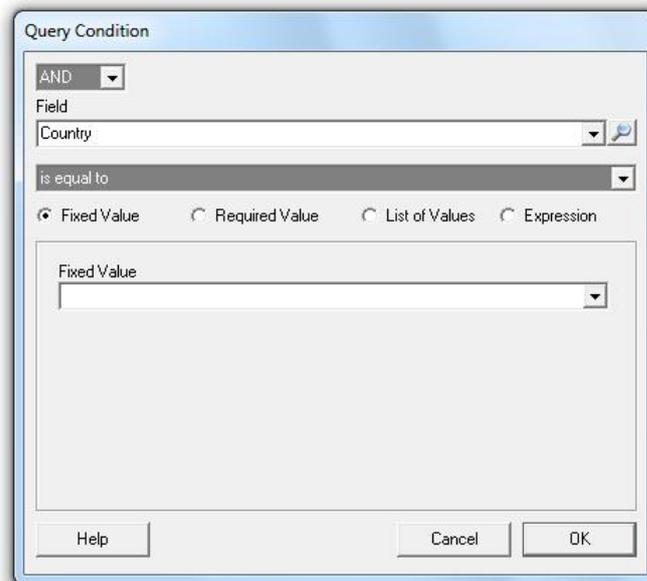
If your field is a date, you can also select the options *current day* and *not set* as values for a date. If you select *current day* this will return all data rows where the field contains the date at the time the query was run. If you select *not set* this will return all data rows where the date has not been set in the business application, i.e. all data rows where the value of this field is “?”.



## Creating a Required Value Condition

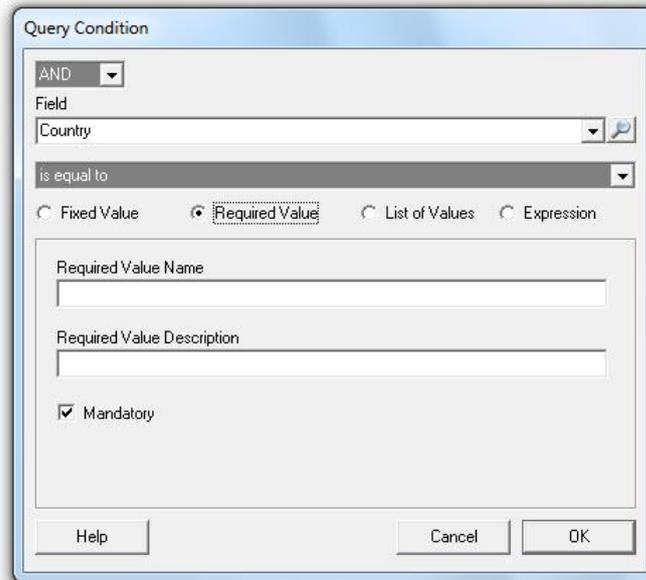
Follow these steps to create a required value condition on a query:

1. Open the query in the DataPA Query Wizard and move to the *Define Filter Condition* screen.  
Press *Add* to open the query condition builder dialog box.



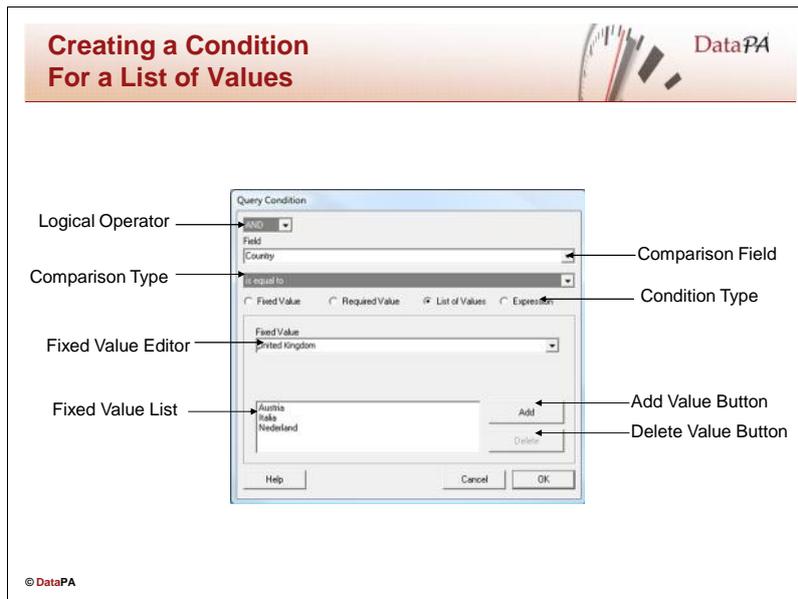
2. Select *AND* as logical operator.
3. Select the field you wish to create a condition on.
4. Select the type of comparison you wish to use in your condition.

5. Select *Required Value* as the condition type.



The screenshot shows a 'Query Condition' dialog box. At the top, there is a dropdown menu set to 'AND'. Below it is a 'Field' dropdown menu with 'Country' selected. Underneath is another dropdown menu set to 'is equal to'. There are four radio buttons: 'Fixed Value', 'Required Value' (which is selected), 'List of Values', and 'Expression'. Below the radio buttons are two text input fields: 'Required Value Name' and 'Required Value Description'. There is a checked checkbox labeled 'Mandatory'. At the bottom, there are three buttons: 'Help', 'Cancel', and 'OK'.

6. Enter a label to be displayed when the user is prompted for a value for this condition.
7. Enter a description that will be displayed when the user is prompted for a value for this condition.
8. Select whether or not the condition is mandatory. If you indicate that this condition is not mandatory, the user can choose to skip the condition and return all data rows.

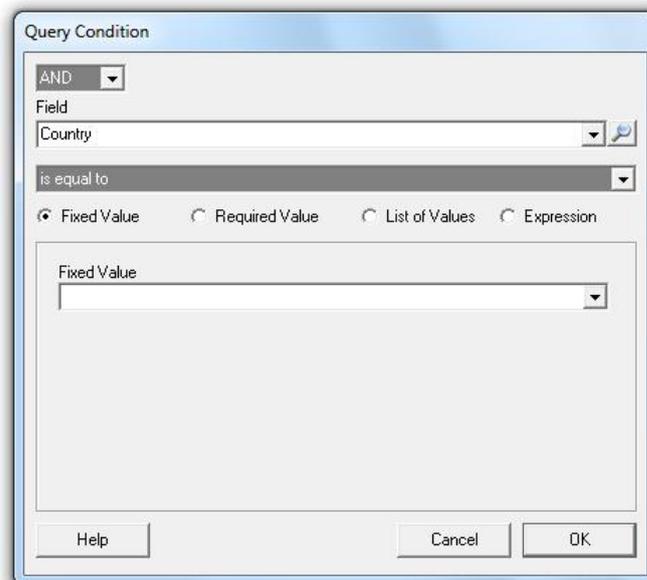


### Creating a Condition For a List of Values

You can also create a condition for a list of values. This actually creates a collection of conditions grouped together and using the OR logical operator.

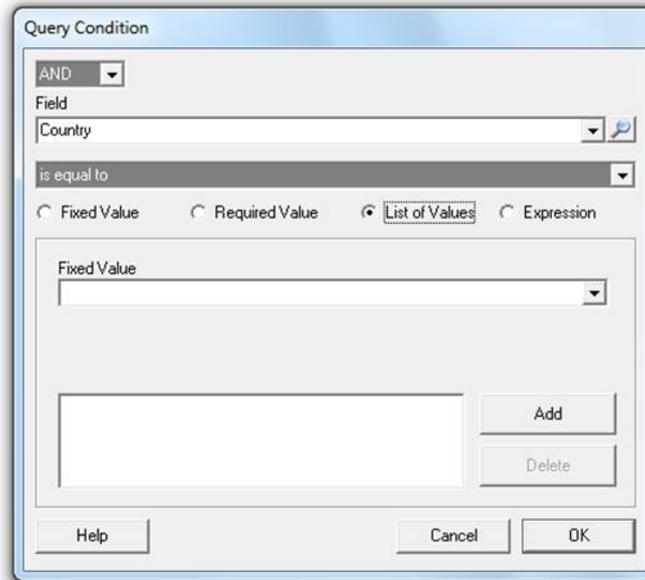
Follow these steps to create a condition for a list of values:

1. Open the query in the DataPA Query Wizard and move to the *Define Filter Condition* screen.
2. Press *Add* to open the query condition builder dialog box.



3. Select *AND* as logical operator.
4. Select the field you wish to create a condition on.
5. Select the type of comparison you wish to use in your condition.

6. Select *List of Values* as the type of condition to create.



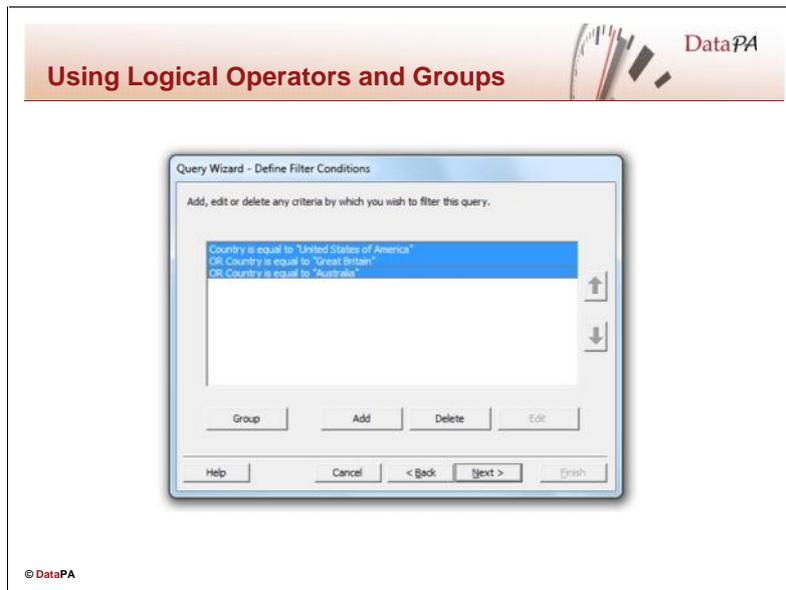
The screenshot shows the 'Query Condition' dialog box. At the top, there is a dropdown menu set to 'AND'. Below it, the 'Field' is set to 'Country'. The operator is 'is equal to'. There are four radio buttons: 'Fixed Value', 'Required Value', 'List of Values' (which is selected), and 'Expression'. Below the radio buttons, there is a 'Fixed Value' field with a dropdown arrow. To the right of this field are 'Add' and 'Delete' buttons. At the bottom of the dialog are 'Help', 'Cancel', and 'OK' buttons.

7. Add values to the *Fixed Value List* by following these steps:
  - i. Enter the value in the *Fixed Value* field.
  - ii. Press *Add* to add the value to the list.
8. If you wish to delete any values, follow these steps:
  - i. Select the value in the *Fixed Value List*
  - ii. Press *Delete* to delete the value from the list.
9. Press *OK* to create your condition.

Note in the *Define Filter Conditions* screen, you have now created a collection of conditions grouped together and separated by the *OR* logical operator.



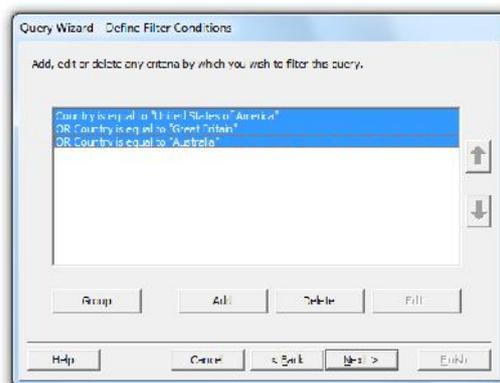
The screenshot shows the 'Query Wizard - Define Filter Conditions' dialog box. It has a title bar and a main area with the text: 'Add, edit or delete any criteria by which you wish to filter this query.' Below this text is a list box containing three lines: '(Country is equal to "United States of America"', 'OR Country is equal to "Great Britain"', and 'OR Country is equal to "Australia")'. To the right of the list box are up and down arrow buttons. Below the list box are 'Group', 'Add', 'Delete', and 'Edit' buttons. At the bottom of the dialog are 'Help', 'Cancel', '< Back', 'Next >', and 'Finish' buttons.



## Using Logical Operators and Groups

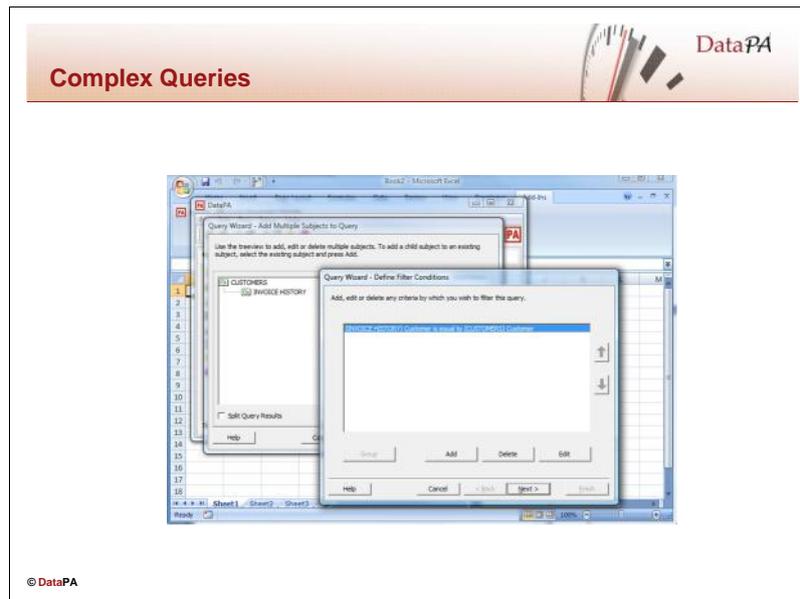
You could also create the list of values we saw in the last example manually using logical operators and groups. Follow these steps to create the same list of values manually:

1. Open the query in the DataPA Query Wizard and move to the *Define Filter Condition* screen.
2. Create single fixed value condition using the first value of the list of values and the logical operator “AND”.
3. Create a fixed value condition for each of the subsequent values in the list using the logical operator “OR”.
4. Select all the new conditions in the *Define Filter Condition* screen and press *Group*.



Using combinations of the logical operators and grouping, you can create sets of filter conditions for even the most complex requirements.

On some subjects, using conditions with the *OR* logical operator can cause the query to run much slower. As a result it is recommended you only use the *OR* logical operator where necessary.

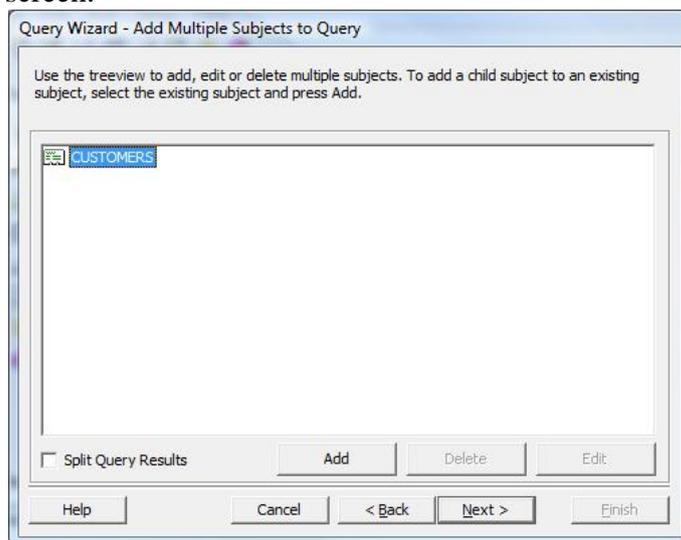


## Combining more than one subject in a Complex Query

Occasionally, all the fields that you require for a report or query cannot be found in a single subject. If this is the case, you can combine more than one subject in a single query to build a complex query. We will also see later on how a complex query can be used to create sub-reports.

Follow these steps to convert the simple query we created in the previous example into a complex query:

Open the query in the *Query Wizard* and move to the *Add Multiple Subjects to Query* screen.

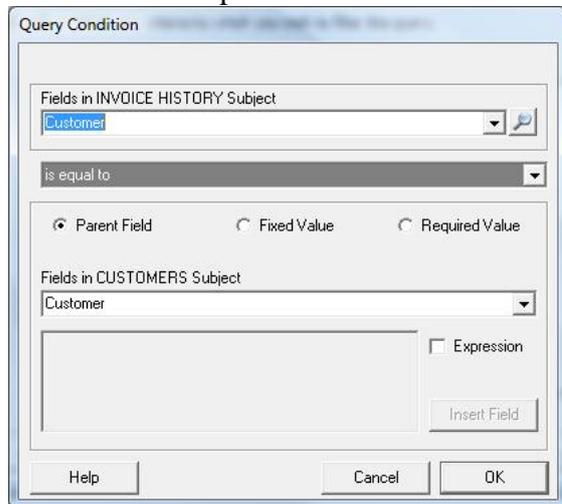


Press the *Add* button to add a subject to the query, this opens the a second copy of the query wizard dialog box.

Select the subject you wish to add to the query, and press *Next*.

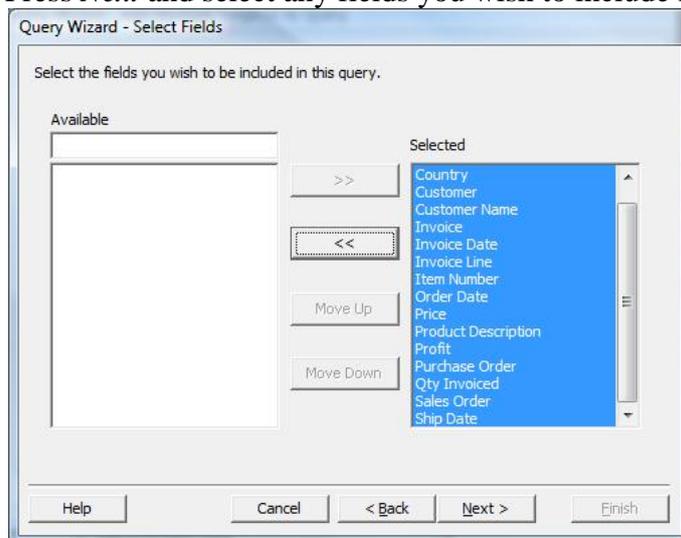
In the *Define Filter Conditions* screen, select *Add* to add a condition.

In the *Query Condition* dialog box, ensure the *Parent Field* option is selected, then select a field from the parent and child subjects to link the two subjects. Repeat steps 4 and 5 for each pair of fields that link the two subjects.



Add any other conditions to your child query.

Press *Next* and select any fields you wish to include from the child subject.



Press *Next* and select any sort fields for the child query.

Press *Next* and *Finish*.

The *Split Query Results* option allows you to return a data set for each subject in the query, rather than a single combined dataset. We will see later in the course how this is used in creating sub-reports.



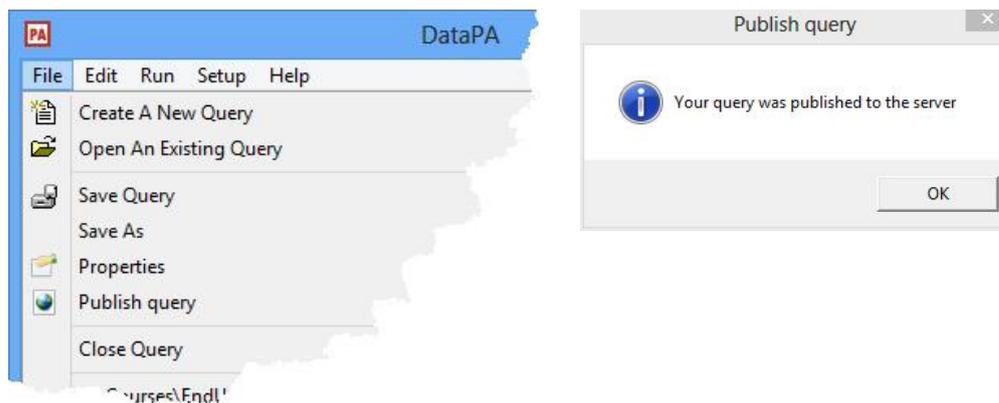
## Publishing a Query

To publish a query, select *Publish* from the *File* menu on the toolbar.

Please note that, if security is enabled in your DataPA environment, then you need to be logged in as a user belonging to a group with the "Members of this group can publish content" permission item checked before you can access this screen

**Note:** To be able to publish a query to the DataPA Enterprise Service, a valid Title and Category must be set within the Query Properties window.

If the query is correctly defined, you will see a publish information box informing you that the application has published your query.



### Managing Published Content

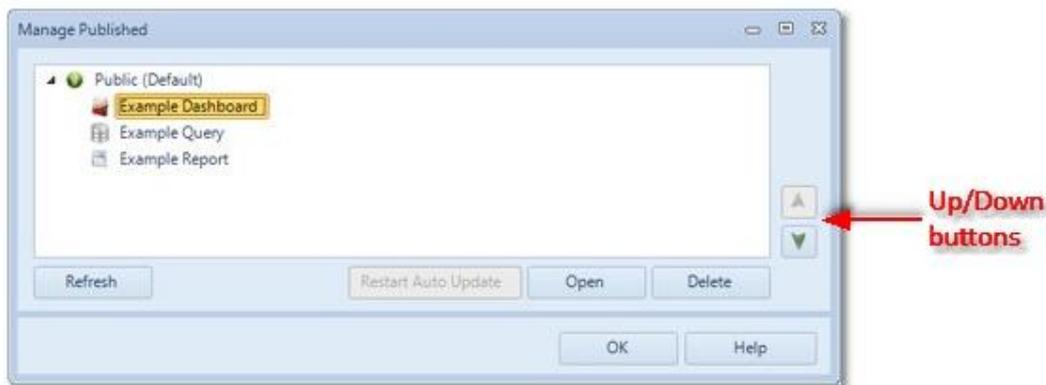
The Manage Published screen is intended to maintain content which has been published to the DataPA Enterprise Service.

Please note that, if security is enabled in your DataPA environment, then you need to be logged in as a user belonging to a group with the "Members of this group can publish content" permission item checked before you can access this screen.

To manage published content, select *Manage Publish* from the *Setup* menu on the toolbar.

There are currently three types of content that may be published from the various components of the DataPA product suite to the DataPA Enterprise Service:

- Queries from the MS Excel or Access add-ins
- Dashboards from the DataPA Dashboard Designer
- Reports from the DataPA Report Designer



The **Refresh** button will query the DataPA Enterprise Service and rebuild the list of content in case it has been changed.

The **Restart Auto Update** button is only applicable for dashboards whose queries have been set to refresh automatically. Selecting this option refreshes the query and sets the start time in the Refresh Schedule screen to the current time.

The **Open** button will open the selected content, however this is context sensitive, it will only be enabled if

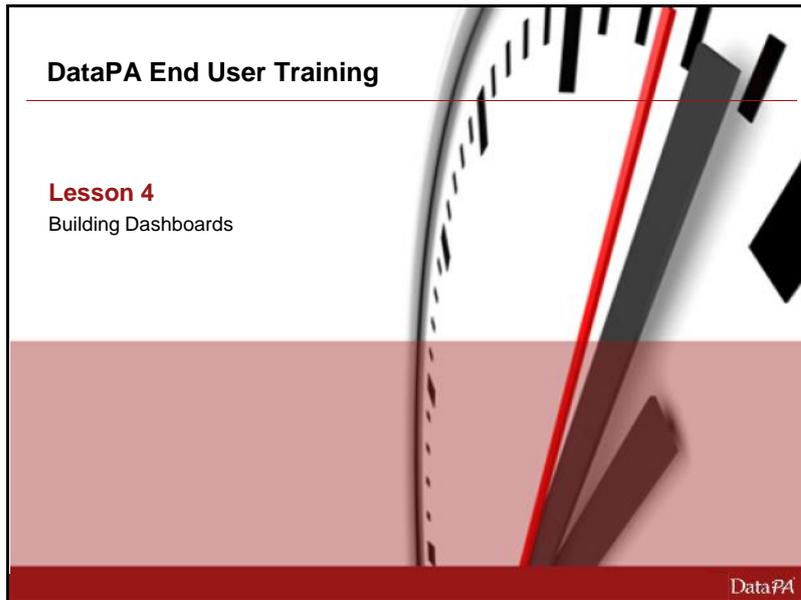
- You have a dashboard selected and the screen was launched from the Dashboard Designer
- You have a query selected and the screen was launched from the Excel / Access add-in
- You have a report selected and the screen was launched from the Report Designer.

The **Delete** button will remove the selected content from the DataPA Enterprise Service.

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The *Up* and *Down* buttons can be used to reorder the content.

If you right click on a dashboard, report or query on this screen when you will have the option **Copy Enterprise URL to Clipboard** which will copy the URL you need to view that content directly in DataPA Enterprise. This is particularly useful if you are embedding content in a third party web application.



## Chapter 4 – Building Dashboards

### Introduction

In this lesson you will learn about the DataPA Enterprise Dashboard application, and how to use it to create and view dashboards. We will also look at how you can import existing queries into a dashboard, and share queries from a dashboard to be used elsewhere.

### Learning Objectives

When you complete this lesson you should be able to:

- Understand and work with the different components of the DataPA Enterprise Dashboard interface
- Create a new dashboard.
- Create, modify and refresh queries in a dashboard.
- Understand, work with and create the different objects that make up a dashboard.
- Use and create drill downs within a dashboard.
- Apply data filters to objects on a dashboard.
- Create and work with treeview filter panels in the dashboard.
- Create and work with pivot tables in the dashboard.
- Create calculated columns in a dashboard.
- Set the properties of a dashboard.
- Save, publish and print dashboards.

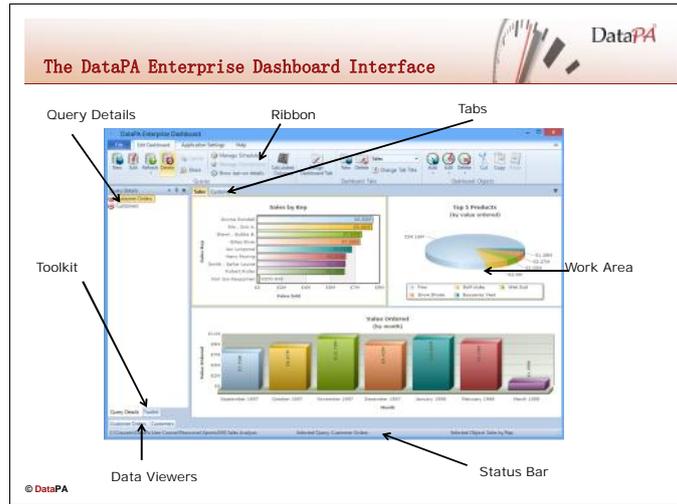
### Prerequisites

Before you begin this lesson you should be able to:

- Open a dashboard in the DataPA Enterprise Dashboard.

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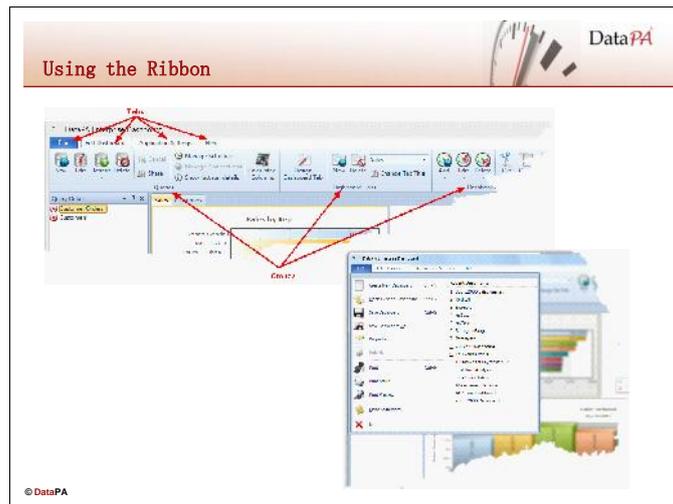
- Refresh data in the DataPA Enterprise Dashboard.
- Create and save a query in Excel.



## The DataPA Enterprise Dashboard Interface

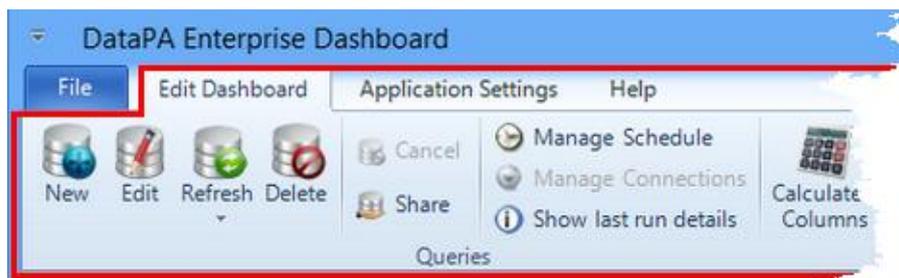
The DataPA Enterprise dashboard interface comprises a number of key elements that allow you to view and modify dashboards. The interface includes docking functionality that allows the size and position of each of these elements to be modified depending on the type of the element. The different elements are listed below, along with their type, and the docking functionality is explained thereafter.

Element	Type	Description
Ribbon	Fixed Object	The ribbon is the primary interface to access functionality in the DataPA Enterprise Dashboard. It can be hidden, but its position cannot be changed from the top edge of the window.
Work Area	Fixed Object	The Work Area is used to render the currently open dashboard. It cannot be explicitly moved or resized, but it will take all the remaining space below the ribbon once the docking windows and status bar have been rendered.
Tabs	Fixed Object	The tabs represent the different tabs in the open dashboard. The size and position of the tabs are fixed by the work area, however you can re-order the tabs by dragging them.
Query Details	Docking Window	The query details window is a docking window. This means its size and position can be modified using the docking interface described below.
Toolkit	Docking Window	The toolkit window is a docking window. This means its size and position can be modified using the docking interface described below.
Data Viewers	Docking Window	The data viewer windows are docking windows. This means their size and position can be modified using the docking interface described below.
Status Bar	Fixed Object	The status bar is a fixed information panel at the bottom of the DataPA Enterprise Dashboard window. It can be shown or hidden by selecting the <i>Hide the status bar</i> button on the <i>Application Settings</i> tab of the ribbon.



## Using the Ribbon

The Ribbon is designed to help you quickly find the commands that you need to complete a task. Commands are organized in logical groups, which are collected together under tabs. Each tab relates to a type of activity, such as managing queries or managing tabs.



## Minimizing the ribbon

1. Click *Customize Quick Access Toolbar* .
2. In the list, click *Minimize the Ribbon*.
3. To use the Ribbon while it is minimized, click the tab you want to use, and then click the option or command you want to use.

For example, with the Ribbon minimized, you can select an object in your dashboard, click the *Edit Dashboard* tab, and then in the *DashboardObjects* group, click the edit button. When the *Dashboard Object Definition* dialog opens, the ribbon is once again minimized.

As an alternative, you can double click on a tab in the ribbon, check the *Minimize the Ribbon* button in the *Appearance Group* of the *Application Settings* tab or press the minimize button  on the right hand side of the ribbon to minimize it.

## Restoring the ribbon

1. Click *Customize Quick Access Toolbar* .
2. In the list, click *Minimize the Ribbon*.

As an alternative, you can double click on a tab in the ribbon, uncheck the *Minimize the Ribbon* button in the *Appearance Group* of the *Application Settings* tab or press the maximize button  on the right hand side of the ribbon to restore it.

## The Quick Access Toolbar

The Quick Access Toolbar is a customizable toolbar that contains a set of commands that are independent of the tab currently displayed. You can move the Quick Access Toolbar from one of the two possible locations, and you can add buttons that represent commands to the Quick Access Toolbar.

## Configuring the commands on the Quick Access Toolbar

To add or remove commands from the Quick Access Toolbar, follow these steps:

1. Click *Customize Quick Access Toolbar*  at the far top right of the Window.
2. In the list, click the item that represents the command you wish to add or remove from the Quick Access Toolbar.

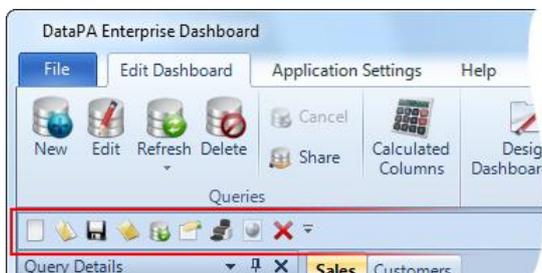
## Moving the Quick Access Toolbar

The Quick Access Toolbar can be located in one of two places:

Upper left corner, above the Ribbon (default location)



Below the Ribbon



Follow these steps to move the Quick Access Toolbar to the other of the two places:

1. Click *Customize Quick Access Toolbar* .
2. In the list, click on *Show Below the Ribbon* or *Show Above the Ribbon*.



## The Docking Interface

The DataPA Enterprise Dashboard Interface contains two types of objects, fixed objects and docking windows. You can adjust the viewing and editing space for the dashboard depending on how you arrange the windows in the Interface. The following options are just some of the ways windows can be arranged:

1. Dock docking windows to the edge of a frame in the Interface
2. Float docking windows over or outside the Interface.
3. Minimize docking windows along the edge of the Interface.
4. Hide docking windows altogether.
5. Reset docking window placement to the default layout.

Docking windows can be arranged by dragging, using commands on the ribbon and by right clicking the title bar of the window to be arranged.

## Floating Windows

Any docking window can be undocked from the Interface and moved anywhere on the desktop. You can undock a docking window from the Interface in two different ways:

### Method 1

1. Press and hold the left mouse button over the title bar of the docked window.
2. Drag the window to a free area of the desktop.
3. Release the left mouse button

### Method 2

1. Double click the left mouse button over the title bar of a docked window.

## Auto Hiding Windows

Docking windows support a feature called Auto Hide. Auto Hide causes a window to slide out of the way when you use a different window. When a window is Auto Hidden, its name is displayed on a tab at the edge of the Interface. To use the window,

move the mouse over the tab so that it slides into view. By default, any data viewer windows will be auto-hidden at the bottom of the Interface.

### To turn Auto Hide on

1. Press the right mouse button on the title bar of the window you want to hide to open the context menu.
2. Select Auto Hide.

As an alternative, you can click the pushpin icon on the title bar of the window.

### To turn Auto Hide off

1. Press the right mouse button on the title bar of the window you want to hide to open the context menu.
2. Select Dock.

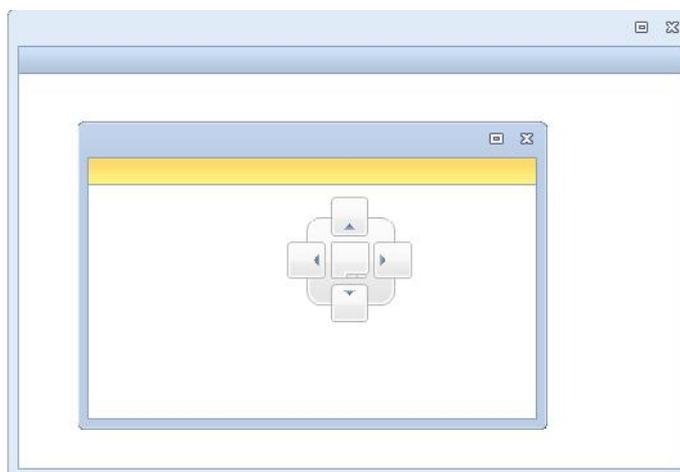
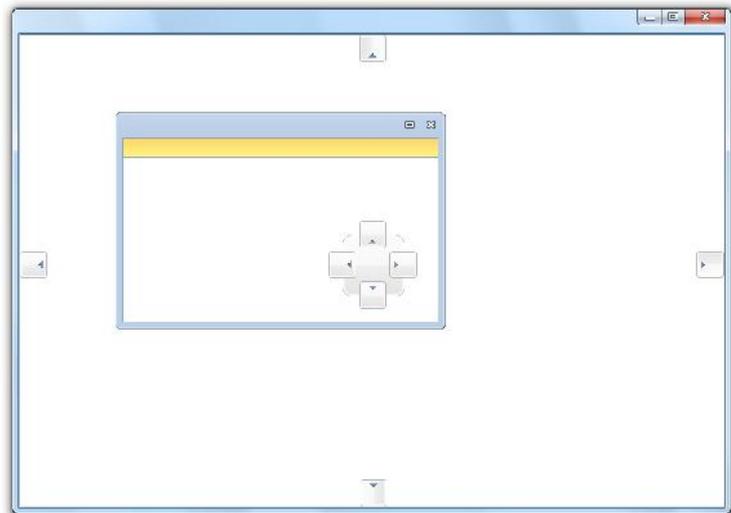
As an alternative, you can click the pushpin icon on the title bar of the window.

## Docking Windows

You can dock any docking window relative to the Interface, Work Area or another window. The Interface displays guide icons that appear when you start dragging a docking window.

The guide icon in the centre of the image on the right allows you to dock a window above, to the left, to the right and below the work area.

The guide icons around the edges of the image on the right allow you to dock a window on each edge of the Interface.



When you drag a docking window over another docking window, the guide icon in the centre of the image on the right appears.

This guide icon allows you to dock the window above or below, or to the left or right of the window. It also gives the option to stack the docking windows, giving a single tabbed docking window.

To dock windows in the Interface, follow these steps:

1. Click and hold the left mouse button over the title bar of a non Auto Hidden docking window.
2. Drag the window until an appropriate guide icon appears, then continue dragging until the mouse is over the appropriate guide icon.
3. Release the mouse button.

### Hiding Docking Windows

If you are short of space on your desktop, you can hide docking windows altogether and re-establish them when required.

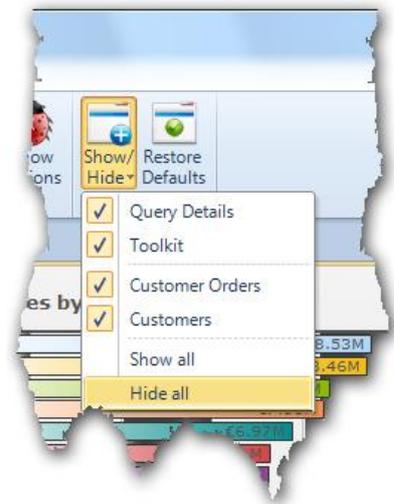
Follow these steps to hide docking windows:

1. Select the *Show/Hide* button from the *Application Settings* tab on the ribbon.
2. Uncheck the menu item that relates to the window you wish to hide, or press *Hide All* to hide all docking windows.

As an alternative, you can press the close icon in the top right corner of the docking window.

To re-establish a window that has previously been hidden, follow these steps:

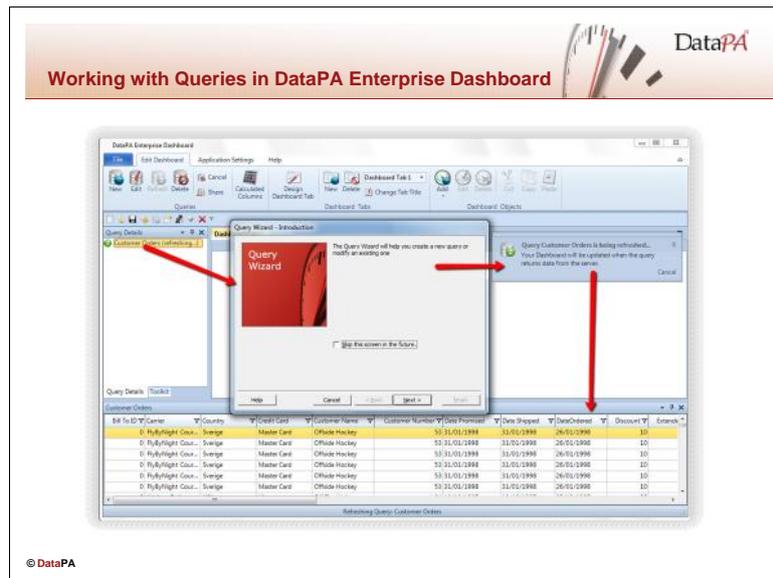
1. Select the *Show/Hide* button from the *Application Settings* tab on the ribbon.
2. Check the menu item that relates to the window you wish to show, or press *Show All* to show all docking windows.



### Resetting the default docking layout

To reset the default docking layout, follow these steps:

1. Press the *Restore Defaults* button from the *Application Settings* tab on the ribbon.



### Working with Queries in the DataPA Enterprise Dashboard

Queries define the data that is retrieved from a business application to allow a dashboard to be rendered. A single dashboard can contain any number of queries. When refreshed, each query will retrieve one or more datasets from live data in the business application. The datasets are stored in the dashboard and can be used to build objects on the dashboard. When you save a dashboard, both the queries and the data they have retrieved are stored on disk in a single file. When a dashboard is open in the DataPA Enterprise Dashboard, the queries it contains and any child datasets are listed in the *Query Details* docking windows.

### Creating queries in DataPA Enterprise Dashboard

When you create a new dashboard, the query wizard (described in detail in lesson 3) will be shown automatically to allow you to create a first query for the dashboard. Once you have completed the query wizard the query will be automatically refreshed to retrieve some data so you can create a dashboard. To add further queries to your dashboard, follow these steps:

1. Select the *New* command from the *Queries* group of the *Edit Dashboard* tab on the Ribbon.
2. Complete the query wizard to create the query.

As an alternative, you can press the right mouse button over the *Query Details* docking window, then select *Create A New Query* from the list.

### Copying an existing query in DataPA Enterprise Dashboard

Follow these steps to copy an existing query in DataPA Enterprise Dashboard:

1. Select the *New* command from the *Queries* group of the *Edit Dashboard* tab on the Ribbon.
2. Press *Next* to bypass the Introduction Screen.

### 3. Select *Copy an Existing Query*.



4. Press *Browse* and select the query file on disk.
5. Complete the query wizard, making any changes to the query as required.

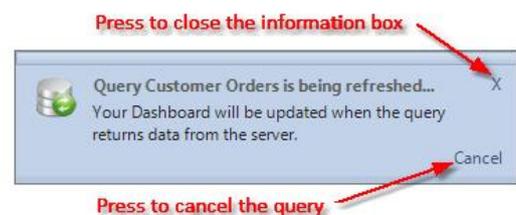
## Refreshing queries in DataPA Enterprise Dashboard

To refresh queries in the dashboard in the DataPA Enterprise Dashboard, follow these steps:

1. Press the left mouse button over the arrow below the *Refresh* button in Queries group of the *Edit Dashboard* tab of the ribbon.
2. Select the individual query you wish to refresh, or *Refresh All Queries* if you wish to refresh all queries.



Whilst a query is being refreshed, DataPA Enterprise Dashboard displays an information box. You can cancel the query by pressing the *cancel* button on this information box.



### Modifying queries in DataPA Enterprise

To modify an existing query in the dashboard, follow these steps:

1. Select the query in the *Query Details* docking window.
2. Press the *Edit* command in the *Queries* group of the *Edit Dashboard* tab on the Ribbon.
3. Complete the query wizard.

As an alternative, you can double click on the query on the *Query Details* docking window, or select the query in the *Query Details* docking window, press the right mouse button and select *Edit* from the list.

### Sharing queries from the dashboard

To share a query from the dashboard, so it can be used in another dashboard, report or in Excel, follow these steps:

1. Select the query in the *Query Details* docking window.
2. Press the *Share* command in the *Queries* group of the *Edit Dashboard* tab on the Ribbon.

As an alternative, you can press the right mouse button on the query in the *Query Details* docking window, and select *Share* from the list.

### Showing the last run details for a query in the dashboard

You may wish to see the details of the last run operation of a query, particularly if the query was refreshed automatically by the server rather than manually in the client. To view the last run details of a query from the dashboard, follow these steps:

1. Select the query in the *Query Details* docking window.
2. Press the *Show last run details* command in the *Queries* group of the *Edit Dashboard* tab on the Ribbon.
3. If the query was refreshed against multiple connections, select the connection you wish to see the last run details for.

### Showing the query string from the dashboard

Occasionally you may have a query in a dashboard that takes longer than expected to complete, or does not return the data expected. To help understand the behaviour of the query, you can view the raw query string that is being executed on the server. (NB. This is only applicable to queries built using a freeform subject). To show the query string of a query from the dashboard, follow these steps:

4. Select the query in the *Query Details* docking window.
5. Press the right mouse button.
6. Select *Show query string*.

### Working with data viewers

When a query is successfully refreshed, a data viewer docking window is created as an Auto Hidden docking window against the bottom edge of the Interface. You can use this window to view, export and navigate through the data the query has returned.

### Sorting data in the data viewers

To sort data in the data viewers by a particular column, simply click on the header for that column. To reverse the sort order, simply click on the column header a second time.

### Filtering data in the data viewers

You can apply filters to any number of columns in the data viewer. To apply a filter to a particular column, follow these steps:

1. Press the filter button ▼ in the column header.
2. Select the value in the list you wish to filter by.

You can create more complex filters by selecting *Custom* from the list.

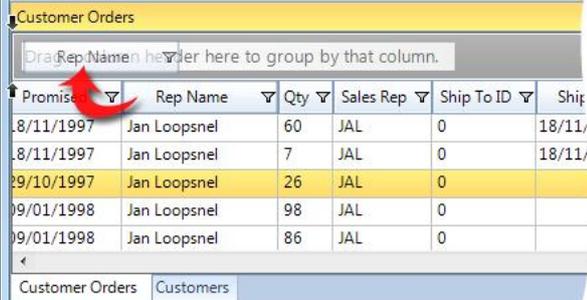
To remove a filter from a column, follow these steps:

1. Press the filter button ▼ in the column header.
2. Select the *All* in the list.

### Grouping data in the data viewers

You can group data in the data viewer using the values in one or more columns. To group data in the data viewer, follow these steps:

1. Press the right mouse button over the data viewer and select *Allow Grouping* from the list.
2. Drag the header of the column you wish to group by into the box labelled *Drag a column header here to group by that column.*



Promise	Rep Name	Qty	Sales Rep	Ship To ID	Ship
8/11/1997	Jan Loopsnel	60	JAL	0	18/11/
8/11/1997	Jan Loopsnel	7	JAL	0	18/11/
9/10/1997	Jan Loopsnel	26	JAL	0	
9/01/1998	Jan Loopsnel	98	JAL	0	
9/01/1998	Jan Loopsnel	86	JAL	0	

You can group by further columns by following these steps:

1. Click on the + symbol for one of the groups in the data viewer so you can see the column headers in that group.
2. Drag a second column into the group heading section at the top of the data viewer.

To remove groupings, simply drag the column header from the group heading section at the top of the data viewer back into the columns section of the data viewer.

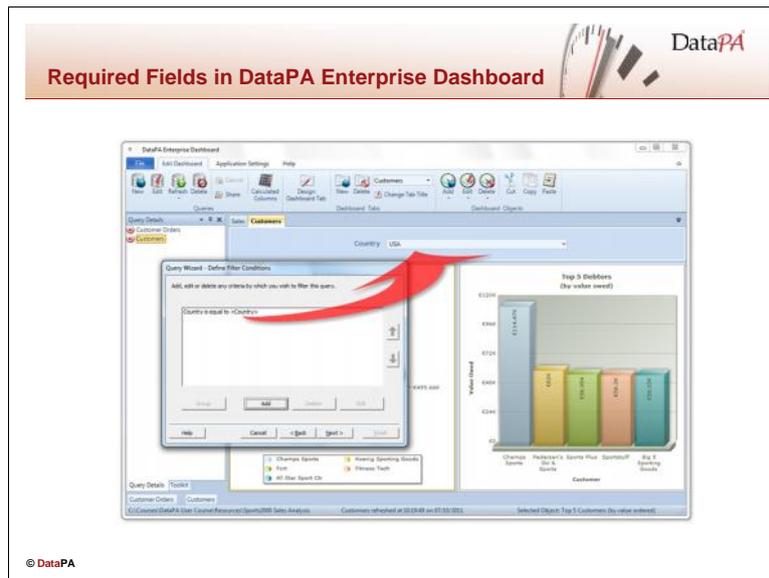
### Summarising data in the data viewers

To summarise data in the data viewers, follow these steps:

1. Press the right mouse button over the data viewer and select *Allow Summary* from the list.
2. From the header of the column you wish to summarise, press the summary button  $\Sigma$ .
3. Select the type of summary you wish to see, and press OK.

To remove summaries in the data viewer, follow these steps:

1. Press the right mouse button over the data viewer and select *Allow Summary* from the list.
2. From the header of the column you wish to summarise, press the summary button  $\Sigma$ .
3. Uncheck the summaries you wish to remove, and press OK.



## Required fields in DataPA Enterprise Dashboard

It is often the case that queries will be refreshed automatically and unattended in a dashboard. As such, the dashboard does not display the *Run Query Wizard* when a query is refreshed, as this screen requires user input to complete. This means required fields in a query must be handled differently.

To resolve this, appropriate user interface elements to prompt for required fields are added to the dashboard itself as *Query Parameters* on a control panel. The DataPA Enterprise Dashboard will add these objects to the dashboard automatically when a query that has required fields is refreshed for the first time.

If you attempt to refresh a query which has orphaned required fields, that is required field without an associated *Query Parameter* object on the dashboard, the DataPA Enterprise Dashboard will warn you there are missing objects, and ask if you would like them to be added to your dashboard. If you do not allow these objects to be added to the dashboard, the query will not refresh.

## Removing query parameters from a dashboard

Query parameters are added to objects on the dashboard called *Control Panels*. When the DataPA Enterprise Dashboard automatically creates *Query Parameters* for a query it first tries to find a control panel on the dashboard that contains at least one query parameter or query refresh button relating to the current query.

If it cannot find an existing control panel in this way, it will create a new one on the currently selected tab. The query parameter objects will be added to this control panel.

You may wish to move the query parameters to another control panel. To do this you must remove, then add them.



You can remove query parameters in one of two ways, by deleting the control panel altogether, or by removing the query parameter from the control panel.

To delete the control panel altogether, follow these steps:

1. Click on the control panel in the dashboard.
2. Press the *Delete* button in the *Dashboard Objects* group of the *Edit Dashboard* tab.

To delete the Query Parameter in the Control Panel, follow these steps:

1. Click on the control panel in the dashboard.
2. Press the *Edit* button in the *Dashboard Objects* group of the *Edit Dashboard* tab.
3. Click on the Query Parameter in the control panel dialog box to select it.
4. Press the *Delete* button in the *Edit* group of the *Panel* tab in the Ribbon on the control panel dialog box.
5. Press *OK*.

### **Adding a query parameter to a control panel**

To add a Query Parameter to a Control Panel, follow these steps:

1. Click on the control panel in the dashboard.
2. Press the *Edit* button in the *Dashboard Objects* group of the *Edit Dashboard* tab.
3. Press the *Query Parameter* button from the *Add* group of the *Panel* tab in the Ribbon, then select the query, then the required field you wish to create the parameter for.
4. Press *OK*.



### Working with Tabs

A dashboard is a visual display of the most important information that a user needs. The information is consolidated and arranged on a single screen so that it can be monitored at a glance.

However, it is not unusual to want a single dashboard to convey a number of different types of information. As such, a single dashboard can contain several screens, allowing the user navigating between these screens using tabs.

When you first create a new dashboard, DataPA Enterprise Dashboard creates a single tab. The *Dashboard Tabs* group in the *Edit Dashboard* tab on the Ribbon allows you to add, remove and change the name tabs in the dashboard. You can re-order tabs by dragging them.

### Adding a new tab to the Dashboard

To add a new tab to your dashboard, follow these steps:

1. Press the *New* command in the *Dashboard Tabs* group in the *Edit Dashboard* tab of the Ribbon.

### Deleting a tab from the dashboard

To delete a tab from the dashboard, follow these steps:

2. Select the tab.
3. Press the *Delete* command in the *Dashboard Tabs* group in the *Edit Dashboard* tab of the Ribbon.
4. Press *Yes* in the message box.

### Changing the tab title

To change the title of a tab, follow these steps:

1. Select the tab.
2. Press the *Change Tab Title* command in the *Dashboard Tabs* group in the *Edit Dashboard* tab of the Ribbon.
3. Enter the new title for the tab
4. Press *OK*.

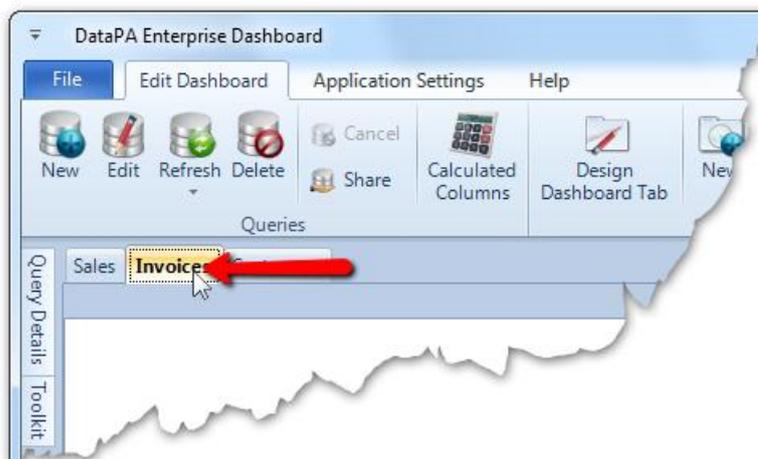
As an alternative, you can edit the tab title directly in the tab selection list in the *Dashboard Tabs* group of the *Edit Dashboard* tab in the Ribbon.

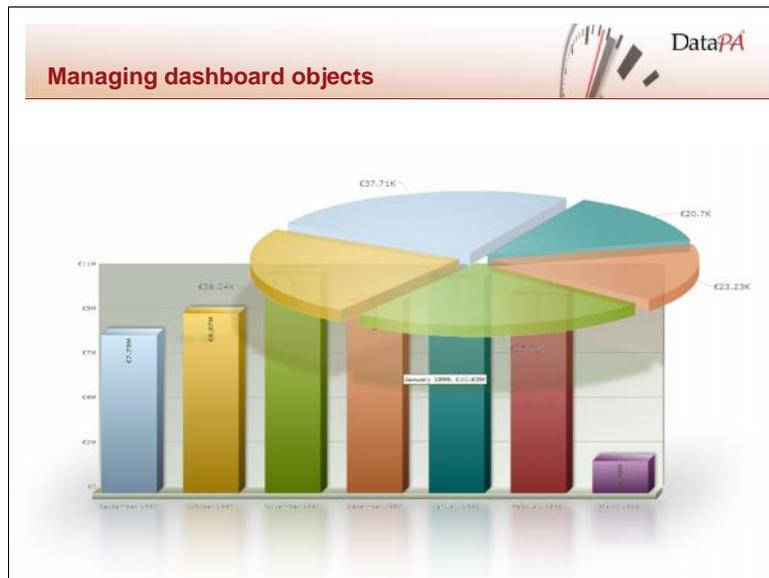


### Changing the tab order

To change the tab order, follow these steps:

1. Press and hold the left mouse button over the header of the tab you wish to move.
2. Drag the tab into the position you require.
3. Release the left mouse button.





### Managing dashboard objects

Dashboard objects are the objects that provide the visual display and control elements of the dashboard. The objects can be grouped into five broad categories, each of which is described in the following sections.

#### Data and Control Objects

The Data and Control objects contain data listing and control objects which allow you to filter the data on the dashboard.

The **control panel** is a container object for labels, query parameters, filter parameters, images and refresh buttons. The control panel will be described in detail later in this lesson.

The **tree view selection panel** allows the user to apply complex filtering to a dashboard using a simple tree view interface. The tree view selection panel will be described in detail later in this lesson.

The **pivot table** is a tabular representation of data that can automatically sort, count, total or give the average of data quickly creating unweighted cross tabulations. The pivot table will be described in detail later in this lesson.

The **data grid** allows you to display a simple listing of data in a dashboard. It also gives the user the ability to group, summarise and sort the data. The data grid will be described in more detail later in this lesson.

Finally, the **legend** allows you to display a simple listing of data in a dashboard, with a colour key that can match the colours in a chart. The data grid will be described in more detail later in this lesson.

#### Single Series Charts

Single series charts are charts that display data visually by mapping a single set of textual values (series) against a single numeric value.

This is either in the form of a circular area chart (pie and doughnut charts), where the numeric values are represented by the area of segments in the circle, or two dimensional charts where the numeric values are plotted on a y axis against the textual values on the x axis.

Use this type of chart when you are interested in the value of a single variable across a single group. Two examples might be plotting the value of sales by sales representative, or the value of sales each month this year.

### Multi Series Charts

Multi series charts are charts that display data visually by mapping one or more sets of textual values (series) against one or more numeric values. This is in the form of a two dimensional chart where the numeric values are plotted on a y axis against the textual values on the x axis.

Use this type of chart when you are interested in the value of one or more variables across one or more groups. One example might be plotting the values of sales and the value discounted by sales representative. Another might be plotting the value of orders shipped, and the value of orders delivered in each month this year.

### Stacked Charts

Stacked charts are a variation on multi-series charts that display data visually by mapping one or more sets of textual values (series) against one or more numeric values. This is in the form of a two dimensional chart where the numeric values are plotted on a y axis against the stacked textual values on the x axis, giving not only an indication of the individual values for each series, but also an indication of the summed values across all series.

Use this type of chart when you are interested in the value of one or more variables across one or more groups, but also wish to see the summed total of the different values. One example might be plotting the total order value for each month, but seeing the total order value broken down by the order status.

### Combination Charts

Combination charts are a variation of multi-series charts and stacked charts that allow different types of values to be displayed on a single chart. The different types of values can be differentiated by giving them a different visual appearance, for instance displaying them as a column, line or area. In addition, different values that have a significantly different scale can be plotted on a second Y axis, allowing them to be scaled independently to fit neatly on to the chart.

A good example of a combination chart might be to plot the value of orders and quantity ordered each month.

### Scroll Charts

Scroll charts are a variation on single series, multi-series, stacked and combination charts that cater for a large number of series values by scrolling or allowing zooming.

### Gauges

Gauges are objects that show a single value. Gauges are useful when you have a single value that you want to be measured quickly against a particular range. Some gauges will allow you to show the value against a number of coloured ranges (such as a traffic light or dial), and others will allow you to show the value only against a total range (such as a cylinder or thermometer).

A good example of when a gauge may be useful is to show the total ordered value against the target, for a specific month or year.

### Adding dashboard objects to your Dashboard

You can add dashboard objects to your dashboard in one of two ways, by dragging the required object from the Toolkit docking window or by selecting the required object from the *Add* button of the *Dashboard Objects* group of the *Edit Dashboard* tab on the ribbon. Both these methods are described in more details below.

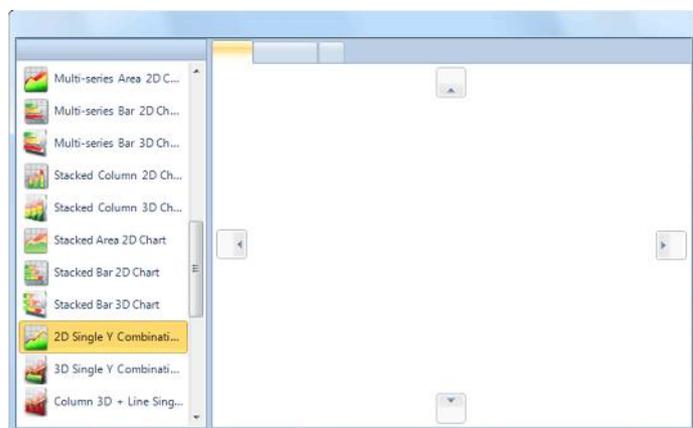
### Adding dashboard objects from the toolkit

Using the toolkit to drag a new object on to the dashboard has the advantage of allowing you to decide where the new object is placed in the tab, relative to the other objects already present. To add an object by dragging it from the toolkit, follow these steps:

1. Press and hold the left mouse button over the appropriate object in the Toolkit docking window.
2. Move the mouse until it is over the guide icon that represents the location you want to place the new object (the guide icons are explained in more detail below).
3. Release the left mouse button.
4. Define the details of the dashboard object in the *Dashboard Object Definition* dialog box (explained in more details below).

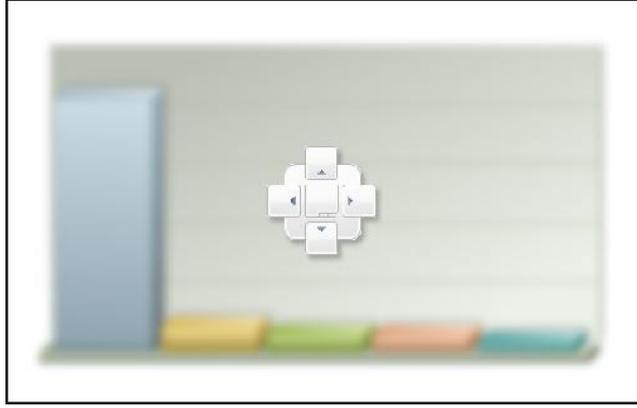
When you are dragging a new dashboard object on to the chart, the mouse cursor will change to the chart dragging cursor (🖱️). As you drag the mouse over the tab, two types of guide icon will appear.

Guide icons around the edge of the tab allow you to place the new dashboard object against the left, top, right or bottom edge of the tab.



When you drag the mouse over an existing object in the dashboard, guide icons appear

that allow you to drop the new object to the left, top, right, bottom of the existing object, or stacked on top of the existing object. If objects are stacked, tabs will appear to allow the user to display each object.



### Adding dashboard objects from the ribbon

Using the *Add* button of the *Dashboard Objects* group of the *Edit Dashboard* tab on the ribbon to add objects to the dashboard has the advantage of allowing you to select the object type from an ordered list of objects. To use the ribbon to add a dashboard object to the dashboard, follow these steps:

1. Press the *Add* button in the *Dashboard Objects* group in the *Edit Dashboard* tab in the ribbon.
2. Select the type of object you wish to add to your dashboard from the list.
3. Define the details of the dashboard object in the *Dashboard Object Definition* dialog box (explained in more details below).

### Defining the details of objects in the dashboard

The Dashboard Object Definition window allows you to specify the appearance and behaviour of dashboard objects that have been added to your dashboard tabs. The window is opened when you add a new dashboard object to your dashboard, or select the *Edit* button in the *Dashboard Objects* group in the *Edit Dashboard* tab in the ribbon. The table below gives an overview of the different tabs in the window, which will be described in more detail below:

Tab	Description
Data	Allows you to define the data that will populate the dashboard object.
Appearance	Allows you to specify settings that will govern the appearance of the dashboard object.
Numeric Format	Allows you to specify the numeric format used to display numbers in the dashboard object.
X Axis	Allows you to specify settings that govern the appearance of the X axis on the dashboard object.
Y Axis	Allows you to specify settings that govern the appearance of the Y axis on the dashboard object.
Drill Down	Allows you to add and define a drill down to the dashboard object
Alerts	Allows you to add and define alerts for this dashboard objects
Colour	Allows you to specify the colours used to render the object
Advanced	Allows you to add advanced XML definitions to your dashboard object.

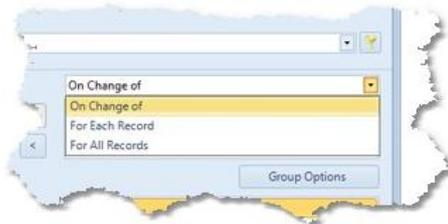
## Defining data for a dashboard object

Follow the steps below to specify the data;

1. First select the Query data set that you wish to base your dashboard object;

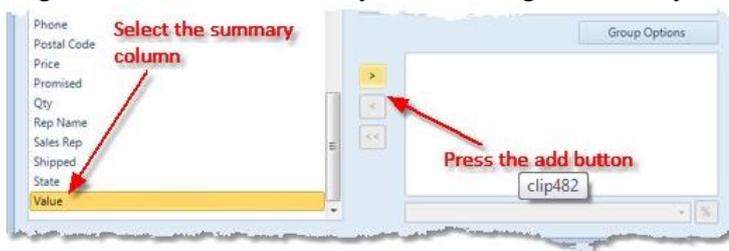


2. If you wish to, press the filter button to apply a filter to your data set (applying filters will be described in more detail below). Next, decide how you want to group your data, and select the appropriate option;



The three options are

- a. **On Change of:**  
Create a record for each distinct combination of the group values selected.
  - b. **For Each Record:**  
Creates a record for each record in the source data set, regardless of the group values selected.
  - c. **For All Records:**  
Creates a single record regardless of the group values selected.
3. Add the group columns you require (some object types, such as single series charts, will only allow a single group column).
  4. Next, select which summary columns you require (some object types, such as single series charts, will only allow a single summary column).



5. For each summary column, select the summary operation you wish to be applied. Distinct count is the number of distinct values in the column for the group selected.
6. If you want a summary column to be calculated as a percentage, select the percentage button (%) whilst that column is selected.

## Managing group options

The group options dialog allows you to manage how groups are collated and sorted. To open the Group Options dialog box, follow these steps:

1. Select the group you want to manage in the *Data* tab of the object definition dialog.
2. Press the *Group Options* button.



Once the *Group Options* dialog is open, you can change the group you are managing by selecting the appropriate value in the *Group* dialog box.



## Managing how groups are collated

The Group Selection tab in the Group Options window allows you control how group values are collated. This can change the number and value of the groups created. If your group value is a date, or date-time value, you can choose which time interval is used to create your group. Follow these steps to define data and date-time groups:

Select the time interval you want the group to be created from.



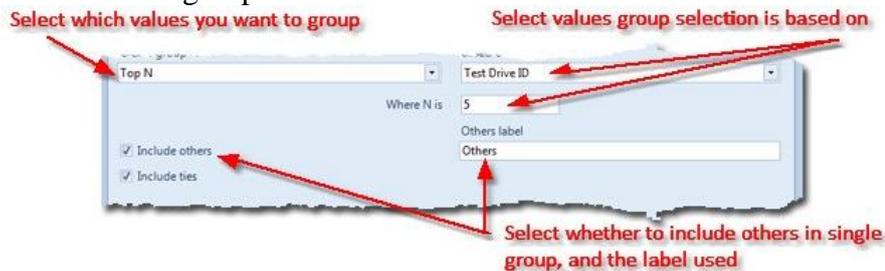
If you selected *Quarter*, you need to select the month that the first quarter begins with.

Often, there may be too many group values to fit comfortably on the chart, and you may only be interested in the groups that have either the largest or smallest values. To resolve this, you can limit the number of group value using one of the group limiting options. The table below describes each of these group limiting options:

Group limiting option	Description
All	Shows all groups
Top N	Shows a specified number of groups with the highest summary value.
Bottom N	Shows a specified number of groups with the lowest summary value.
Top Percentage	Shows groups where a specified summary value is in the top percentage specified.
Bottom Percentage	Shows groups where a specified summary value is in the bottom percentage specified.

To apply one of the group filtering options, follow these steps:

1. Select one of the group limiting option (top n, bottom n, top percentage, bottom percentage)
2. Select the summary column that will be used as the value to determine the top or bottom values.
3. Enter a value for the number of groups (N) or percentage.
4. If you want to include all other groups summarised into a single group on the chart, select Include Others and enter a label for the extra group.
5. If you want to include ties, select the include ties option. For instance, if you select top N, where N is 5, and the values of group 5 and 6 are identical, the chart will include 6 groups.



### Managing the sort order of Groups

The *Group Sorting* tab in the *Group Options* window allows you to define the order in which the groups are shown in the dashboard object. You can sort each group based on the group value, or one of the summary values. Follow these steps to define the sort order:

1. First, select which column the group sorting is going to be based on. This may be the same column that the group itself is based on, or a summary column.
2. Select how you want the sort column value to be applied to sort the group. The options are described in the table below:

Option	Description
Ascending	Groups will be sorted in ascending order using the value of the column selected.
Descending	Groups will be sorted in descending order using the value of the column selected.
Original Order	Groups will be sorted in the original order the data is returned by the query.
Specified Order	Groups will be sorted based on an arbitrary order specified.

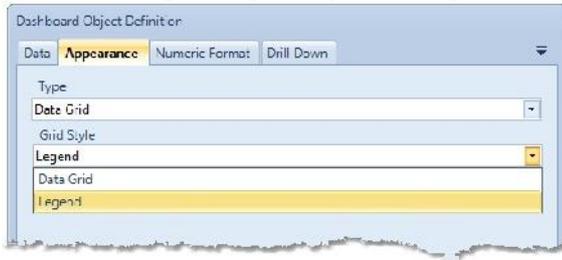
3. If you select specified order, you must define the order by selecting each group value in turn and pressing the add button to add it to the list on the right.

Once you have defined a specified order, you can change the order by dragging the columns up or down in the list.

## Defining the appearance of your dashboard object

The Dashboard Object Definition window Appearance tab allows you to specify settings that will govern the appearance of the dashboard object. The options shown are dependant on the type of dashboard object you are defining. To define the appearance of a data grid, follow these options:

1. Select *DataGrid* in the *Type* list.
2. Select the required grid style (the options are described in the table below).



Option	Description
Data Grid	The data grid will appear as a standard data grid (identical to the data viewer dockable windows). This style of data grid allows the user maximum functionality to apply filters, groupings and summaries.
Legend	The data grid will have an appearance similar to the legend dashboard object. Although this style does not allow the same grouping, filtering and summary functionality as the data grid style, it provides an appearance more in keeping with the other dashboard objects, whilst maintaining the ability to add hyperlinks, drill downs and multiple group and summary columns.

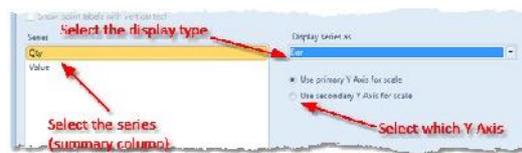
To define the appearance of legends and charts on your dashboard, follow these steps:

1. Select the type of chart or legend you wish to display.
2. Enter a title and second title (the second title will appear on a second line).
3. Select if you want point labels on the chart, whether those labels should (if possible) be drawn inside the chart, whether they should be shown with vertical text, whether to show a legend on the chart and whether to use the glass effect (slightly transparent bars, columns or slices) when rendering the chart.



4. For certain chart types, you can also select whether to display a series as a line, bar or area, and if the object type has a dual Y axis, which Y axis to display the series on.

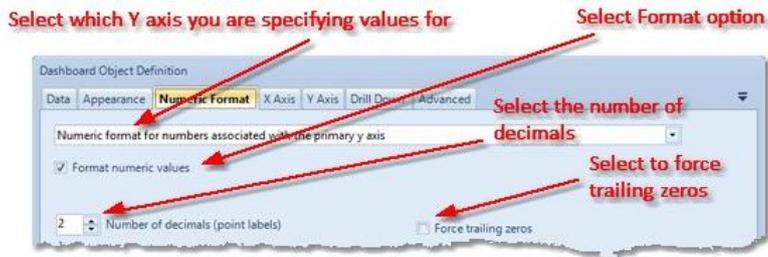
Dual Y Axis charts allow you to display multiple values with very different scales on a single chart.



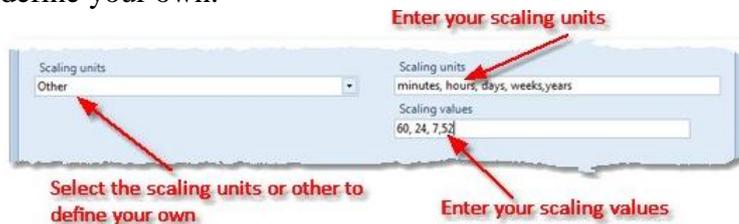
## Defining the numeric format for dashboard objects

The numeric format tab of the dashboard object definition screen allows you to specify the numeric format of numeric values in a data grid, and the point labels and (if they have not been defined separately) the labels on the Y axis of your charts. Follow these steps to define the numeric format for the dashboard object:

1. If you are configuring a dashboard object with a dual Y axis, you can specify a different numeric format for each Y axis. As such, you need to select which Y axis you are specifying the details for.



2. If you want to format the numeric values, select the format option.
3. Select the maximum number of decimal places you want to show.
4. Select whether you want to force trailing zero (for instance, the values are currency and you always want two values after the decimal point).
5. Decide what scaling units to apply to your numeric values in a dashboard object. Scaling provides notation for large values, so for instance 1340 can be displayed as 1.34K, and 2345263 can be displayed as 2.35M. There are a number of scaling units pre-defined for you, however if these do not fit your requirements you can define your own.



To define your own scaling units, select other from the scaling units list. Next supply a comma separated list for the scaling units and the scaling values. Each entry in the scaling units list will be displayed as a suffix to your values. Each entry in the scaling values represents the amount the value will be divided by from the previous scaling unit to achieve the display value.

For instance, you could set your scaling units to "Thousands,Millions,Billions" and your scaling values to "1000,1000,1000". In this example, 1340 will be displayed as 1.34Thousands, and 2345263 will be displayed as 2.35Millions.

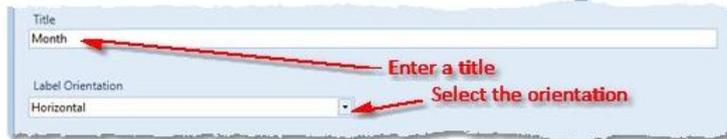
If the scaling units list has one more entry than the scaling values, units will be given the first entry in the list as a suffix. For instance, for time scaling units, you could set your scaling units to "minutes,hours,days,weeks,years" and your scaling values to "60,24,7,52".

6. If required, select a currency symbol (value that will be displayed before your numeric values). If the value you want is not in the list, select *other* and enter your desired value. You can also enter a number suffix, a string that will be displayed after numeric values.

## Managing the X Axis for dashboard objects

The Dashboard Object Definition window X Axis tab allows you to specify settings that govern the appearance of the X axis on the dashboard object. Follow the steps below to specify the X Axis details on your dashboard object;

1. Enter a title for the X Axis.
2. Select the orientation of the labels on the X Axis.



## Managing the Y Axis for dashboard objects.

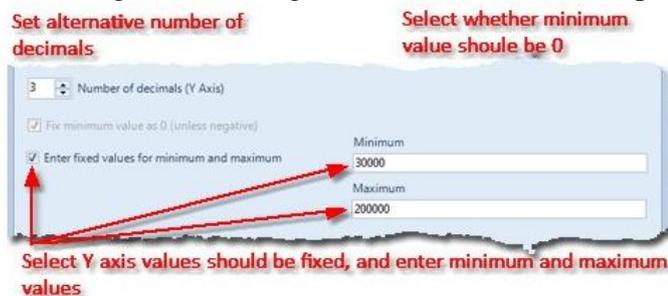
The Dashboard Object Definition window Y Axis tab allows you to specify settings that govern the appearance of the Y axis on the dashboard object. Follow the steps below to specify the Y Axis details on your dashboard object;

1. If you are configuring a dashboard object with a dual Y axis, you can specify a configuration for each Y axis. As such, you need to select which Y axis you are specifying the details for.



2. Enter a title for your y axis. If you want, you can specify an alternative number of decimal places for this Y axis, that will override the value specified in the *Numeric Format* tab.
3. If all the values to be plotted on a Y Axis are either positive, or all negative, by default the Y Axis will always have a minimum value (or maximum if all your values are negative) or zero. If all your values are well above (or well below) zero it might be sensible to uncheck the "fix minimum value as zero" option so it is easier to differentiate values plotted against your Y Axis.

Alternatively, you can override that automatic calculation of the Y Axis range, by selecting that Y Axis values should be fixed, and specifying the minimum and maximum values. (NB. If the values in your chart cannot be plotted on the range you have given, the range will be extended to compensate).



## Managing the Colour for dashboard objects.

The Dashboard Object Definition window colour tab allows you to specify the colours used to render the object. There are two distinct appearances for this tab, if you are editing a single series line or area chart, and editing any other type of chart.

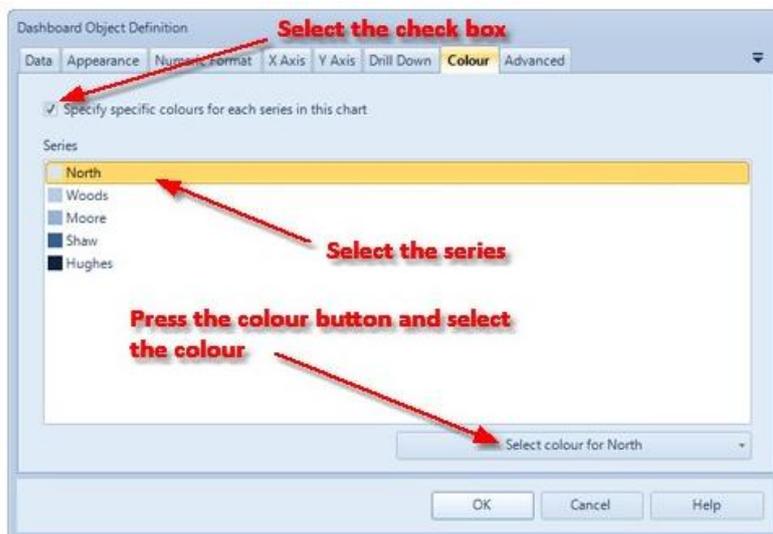
Follow the steps below to specify the colours for a single series area or line chart;

Press the *Line or area colour* button and select the desired colour. If you select *No colour* the chart will use a default colour.

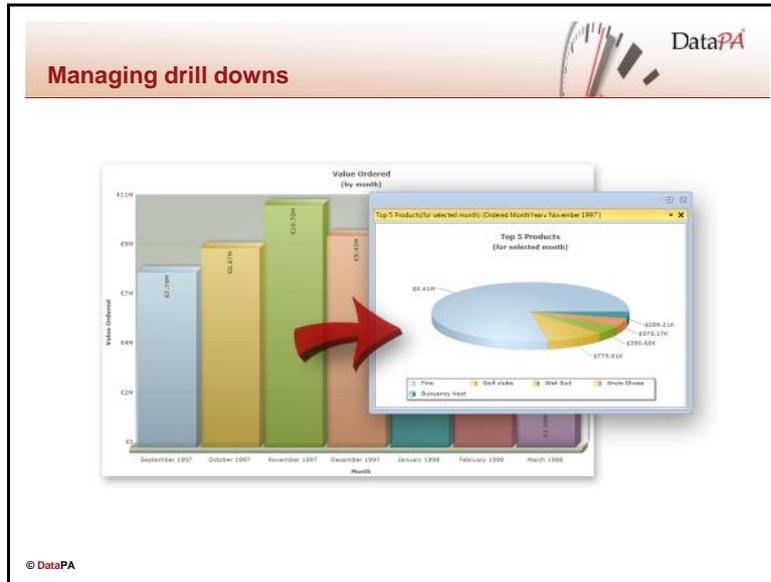


Follow the steps below to specify the colours for all other chart types;

First select the *Specify specific colours for each series in this chart* check box. Then, select a series in the series list, and press the *Select colour for <series>* button. If you select *No colour* the chart will use a default colour for the selected series.



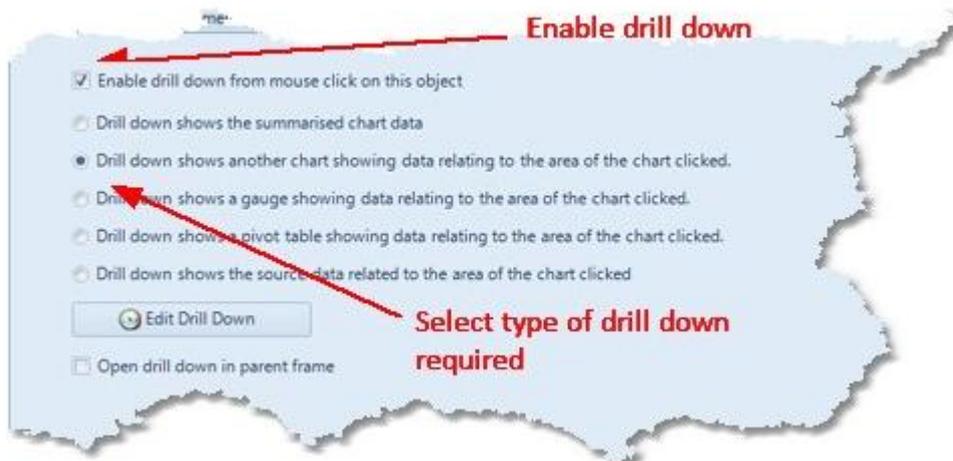
**NB:** Series colours are consistent across the whole dashboard. This means any series with the same name, on an object that also has the *Specify specific colours for each series in this chart* option checked will appear the same colour.



## Managing drill downs for your dashboard object

A drill down allows the user to click on an area of a dashboard object, to open another display that shows more detail. For instance, a user might click on a month in a chart showing the value ordered each month, to open a chart that shows the top 5 products ordered in that month. Drill down objects will always be built using the same data set as their parent objects, but will often display a subset of that data, filtered by the area of the parent object the user clicked. Follow these steps to define a drill down for a dashboard object:

If you want the dashboard object to have a drill down, select the enable drill down checkbox in the *Drill Down* tab of the *Dashboard Object Definition* window.

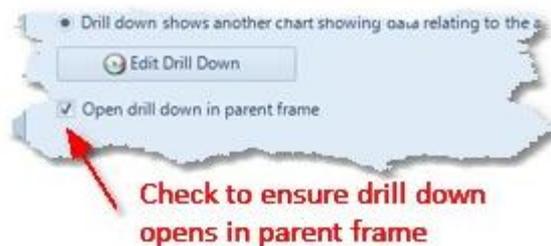


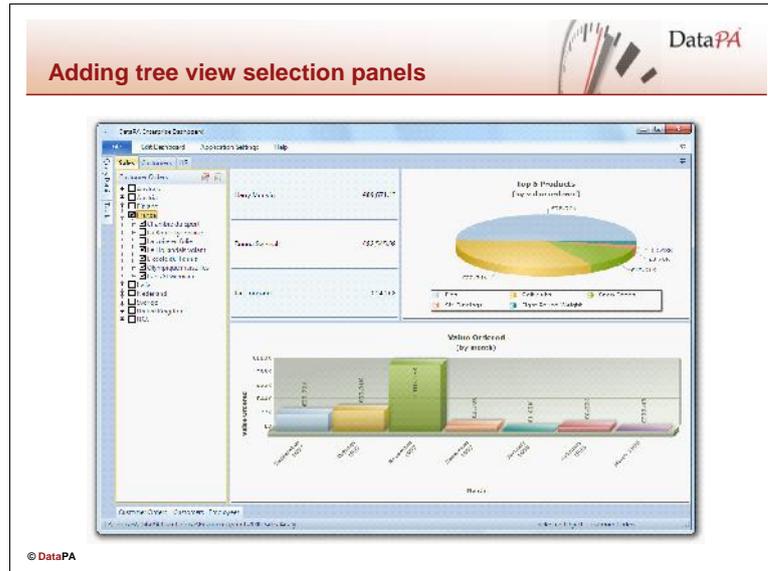
Next, select which type of drill down you want. The options are described in detail below;

Type	Description
Drill down shows the summarised chart data	The drill down will show a data grid containing the summarised chart data as defined in the Data Tab and as used to render the chart.
Drill down shows another chart showing data relating to the area of the chart clicked	The drill down will show another chart that summarises data filtered to show only the data relating to the group represented by the area of the chart that was clicked
Drill down shows a gauge showing data relating to the area of the chart clicked	The drill down will show a gauge that summarises data filtered to show only the data relating to the group represented by the area of the chart that was clicked
Drill down shows a pivot table showing data relating to the area of the chart clicked	The drill down will show a pivot table that summarises data filtered to show only the data relating to the group represented by the area of the chart that was clicked
Source data related to the area of the chart clicked	The drill down will show a data grid with the query data selected in the data tab, filtered to show only the data relating to the group represented by the area of the chart that was clicked.

If you select to drill down into another chart, gauge or pivot table, press the *Edit Drill Down* button, to open the appropriate window to define the object that will be displayed.

If you select the Open drill down in parent frame, the drill down will be opened in the same panel as the parent object. If this option is not checked, the drill down will be opened in a popup window.





## Adding tree view selection panels

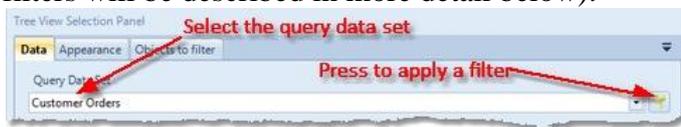
Tree View Selector Panels allow users to quickly apply complex hierarchical filtering to objects on a dashboard. Follow these steps to add a tree view filter panel to your dashboard:

1. Drag a tree view panel from the toolkit on to your dashboard, or select *Tree View Selection Panel* from the list that appears when you press the *Add* button in the *Dashboard Objects* group of the *Edit Dashboard* tab.
2. Define the tree view selection panel settings in the *Tree View Selection Panel* window (described in more detail below).

## Defining data for a tree view selection panel

The *Tree View Selection Panel* window *Data* tab allows you to specify the data that will be used to display and build the filters for your tree view selection panel. Follow these steps to specify the values that will appear in the tree view:

1. Select the query data set that you wish to base your dashboard object.
2. If you wish to, press the filter button to apply a filter to your data set (applying filters will be described in more detail below).



3. Select a column in the *Available Columns* list, and press the *Add Column* button to add the column as the root group item.
4. Select a different column as the child filter column in the *Available Columns* list, and press the add child column button (  ).
5. Repeat the steps above to add all the columns you require.
6. If you wish to, you can change the way group values are grouped, sorted and displayed by selecting the group options button to open the group options window.

### Defining the appearance of a tree view selection panel

The *Tree View Selection Panel* window *Appearance* tab allows you to specify settings that will govern the appearance of the tree view selection panel. Follow the steps below to specify the appearance of your dashboard object;

1. Enter a title for your tree view selection panel.

### Defining which objects a tree view selection panel applies to

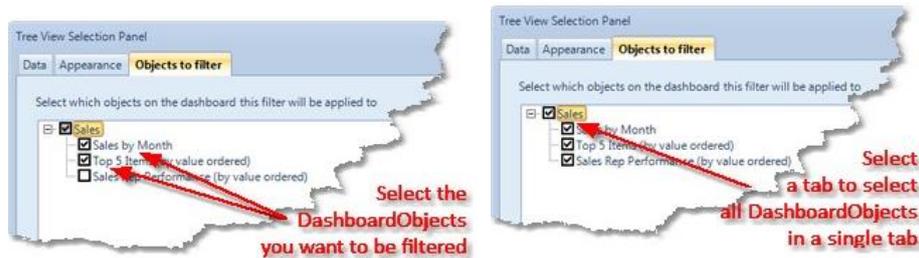
The *Tree View Selection Panel* window *Objects to filter* tab allows you to specify which objects on your dashboard the panels filter will be applied to.

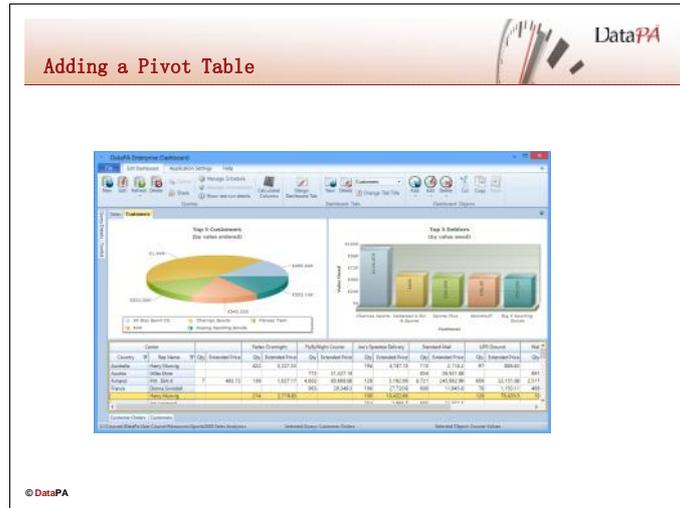
The *Objects to filter* tab contains a root node for all tabs in your dashboard that contain at least one object that has the same columns as the tree view filter panel. Each root node contains a child node for each dashboard object in that tab that has the same columns as the tree view filter panel.

Follow the steps below to apply the filter to objects on the dashboard;

1. Select the node that represents the object.

Alternatively, to select all the objects on a single tab, select node that represents the tab.



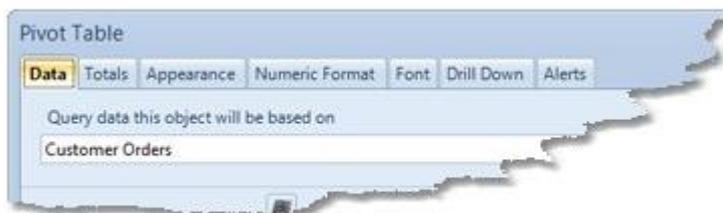


## Adding a Pivot Table

The Pivot Table editor window allows you to specify the appearance and behaviour of pivot tables that have been added to your dashboard tabs. A pivot table is a tabular representation of data that can automatically sort, count, total or give the average of data quickly creating un-weighted cross tabulations.

The Pivot Table editor window consists of the following tabs;

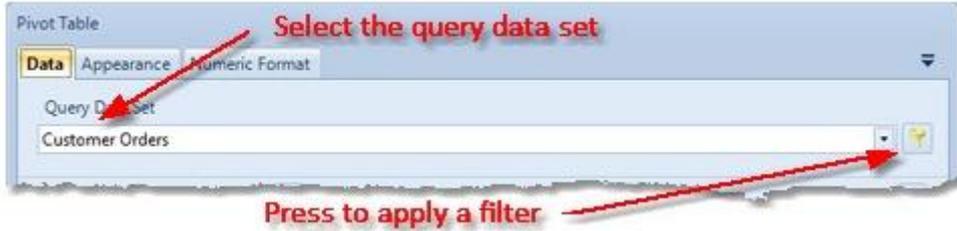
Option	Description
Data	Allows you to define the data that will populate the pivot table.
Appearance	Allows you to specify settings that will govern the appearance of the pivot table.
Numeric Format	Allows you to specify the numeric format used to display numbers in the dashboard object
Font	Allows you to specify the font used to display data in the pivot table
Drill Down	Allows you to add and define a drill down for the pivot table
Alerts	Allows you to define alerts for your pivot table



## Defining the data for a Pivot Table

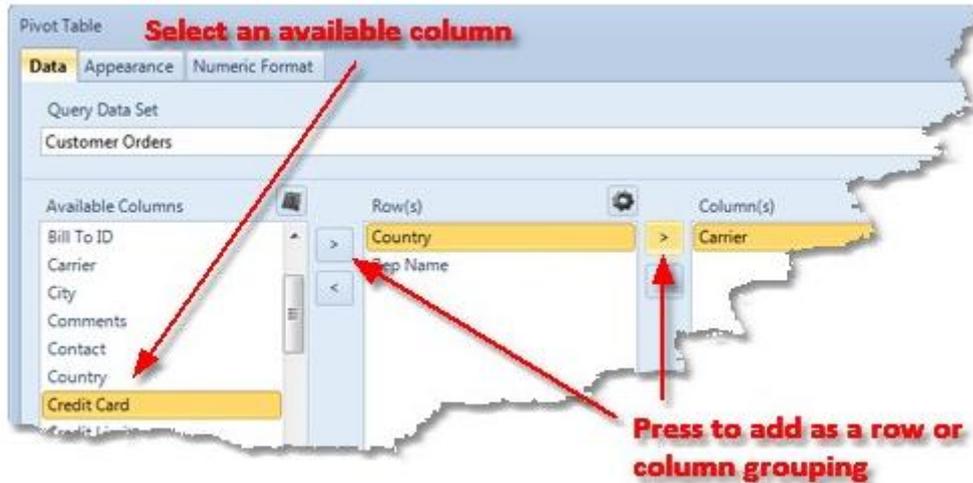
Follow the steps below to specify the data;

1. First select the Query data set that you wish to base your dashboard object

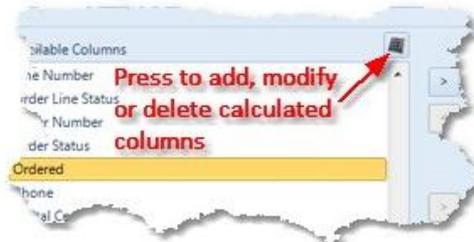


If you wish to, press the filter button to *apply a filter* to your data set. Next, decide how you want to group your data, and select the appropriate option;

2. Next, add the row and column groupings you require. You can do this by selecting the appropriate available column and pressing the add button to the left of the row(s) list or the add button to the left of the column(s) list, or simply dragging columns from the available columns list to the row(s) list or column(s) list.



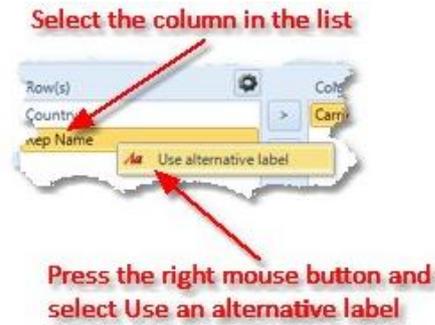
If the value you require is not directly available from the columns listed, press the Calculated Column button to open the *Calculated Column Editor* which allows you to add, modify or delete calculated columns.



If you wish to, you can change the way group values are grouped, sorted and displayed by selecting the group options button to open the *group options window*.



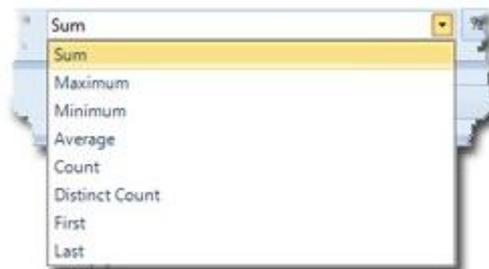
You can specify an alternative column label for the row and column groupings if required. To specify an alternative label, select the row or column grouping in the list, press the right mouse button and select *Use alternative label* from the drop down menu. This will open the *edit label* dialog box to allow you to edit the label.



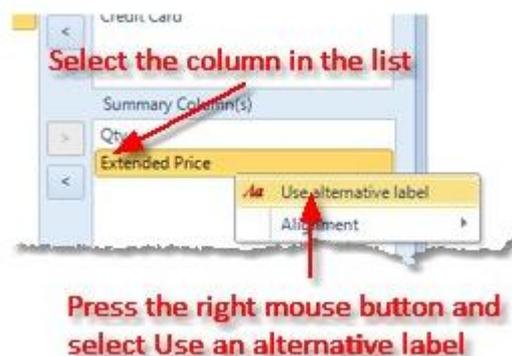
3. Next, select which summary columns you require.



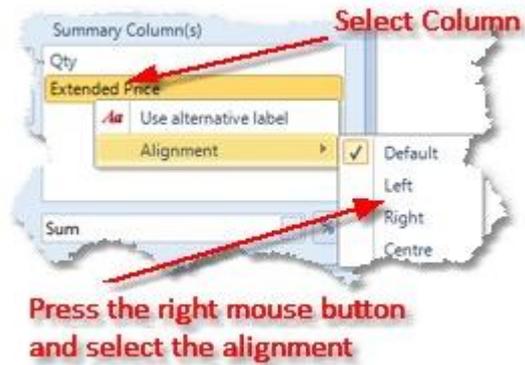
For each summary column, select the summary operation you wish to be applied. Distinct count is the number of distinct values in the column for the group selected.



You can specify an alternative column label for the summary column if required. To specify an alternative label, select the summary column in the list, press the right mouse button and select *Use alternative label* from the drop down menu. This will open the *edit label* dialog box to allow you to edit the label.



The pivot table will automatically align numeric columns to the right, and non-numeric columns to the left. You can override this behaviour by selecting the column in the list, pressing the right mouse button then selecting either *left*, *right* or *centre* in the *Alignment* sub menu.



Finally, if you want your summary column to be displayed as a percentage, select the percentage button. (  )

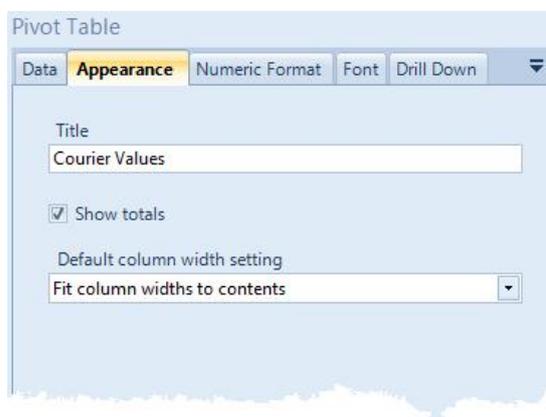
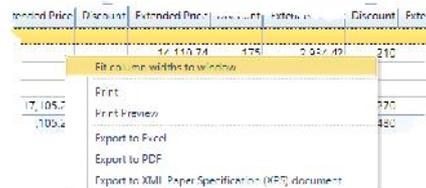
### Defining the appearance for a Pivot Table

The Pivot Table editor window Appearance tab allows you to specify settings that will govern the appearance of the pivot table.

The available options are:

- Enter a title for the pivot table.
- Choose to Show totals
- Set the default column width

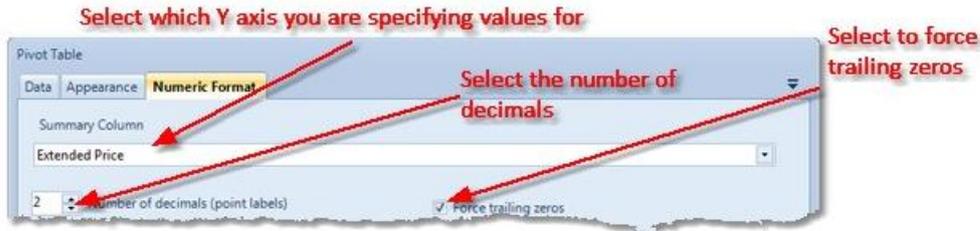
The default column width can either be to fit to the contents, or to the window. This default value can be overridden by performing a *right-click* on the pivot table.



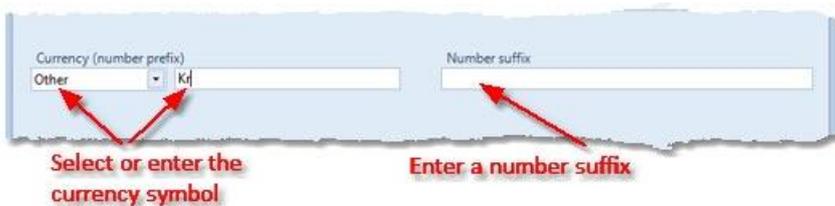
## Defining the Numeric Format for a Pivot Table

The Pivot Table editor window Numeric Format tab allows you to specify settings that will govern the formatting of numeric information of the pivot table.

You can specify a different numeric format for each summary value in the pivot table. As such, you need to select which summary you are specifying the details for.



Next, select the maximum number of decimal places you want to show. If your values are currency values, select force trailing zeros.

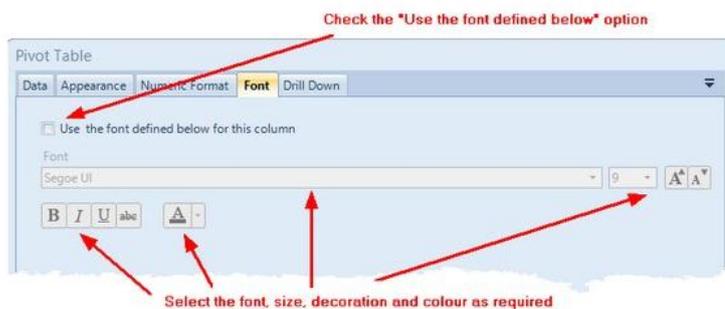


Finally, if you require it, select a currency symbol (value that will be displayed before your numeric values). If the value you want is not in the list, select *other* and enter your desired value. You can also enter a number suffix, a string that will be displayed after numeric values.

## Defining the Font for a Pivot Table

The Pivot Table editor window Font tab allows you to specify the Font to use within the pivot table.

When the checkbox 'Use the font defined below' is checked then the selected font can be set for the pivot table.

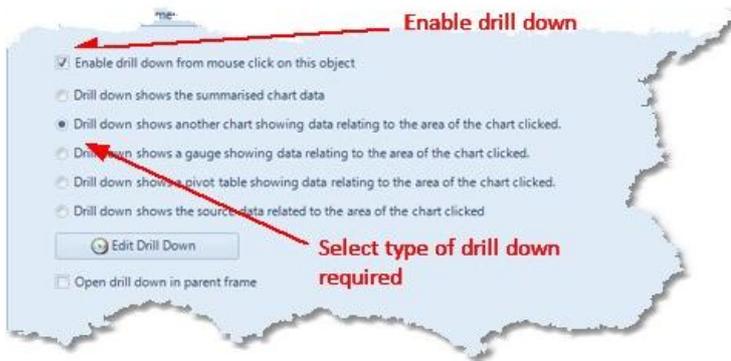


## Defining a Drill down a Pivot Table

The Pivot Table editor window Drill down tab allows you to specify a Drill Down selection, as described above.

A drill down allows the user to click on a cell in the pivot table, to open another display that shows more detail. Drill down objects will always be built using the same data set as their parent objects, but will often display a subset of that data, filtered by the area of the parent object the user clicked. Follow these steps to define a drill down for a dashboard object:

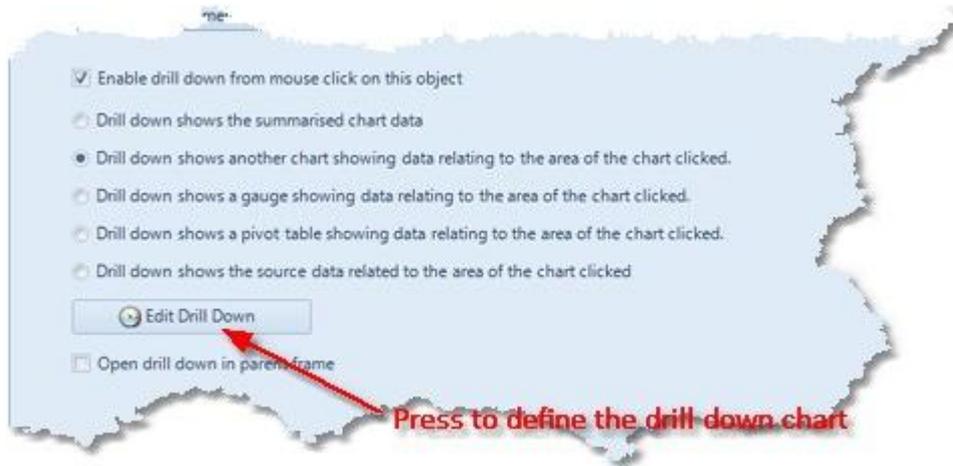
First, if you want the Pivot Table to have a drill down, select the enable drill down checkbox.



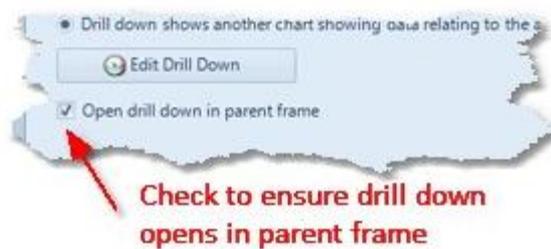
Next, select which type of drill down you want. The options are described in detail below;

Type	Description
Drill down shows the summarised chart data	The drill down will show a data grid containing the summarised chart data as defined in the Data Tab and as used to render the pivot table.
Drill down shows another chart showing data relating to the area of the chart clicked	The drill down will show a chart that summarises data filtered to show only the data relating to the pivot table cell that was clicked
Drill down shows a gauge showing data relating to the area of the chart clicked	The drill down will show a gauge that summarises data filtered to show only the data relating to the pivot table cell that was clicked
Drill down shows a pivot table showing data relating to the area of the chart clicked	The drill down will show a pivot table that summarises data filtered to show only the data relating to the pivot table cell that was clicked
Source data related to the area of the chart clicked	The drill down will show a data grid with the query data selected in the data tab, filtered to show only the data relating to the group represented by the pivot table cell that was clicked.

If you select to drill down into another chart, gauge or pivot table, press the *Edit Drill Down* button, to open the appropriate window to define the object that will be displayed.



If you select the Open drill down in parent frame, the drill down will be opened in the same panel as the parent object. If this option is not checked, the drill down will be opened in a popup window.





### Adding a Gauge

The Gauge Editor window allows you to specify the appearance and behaviour of gauges that have been added to your dashboard tabs.



The editor window consists of the following windows;

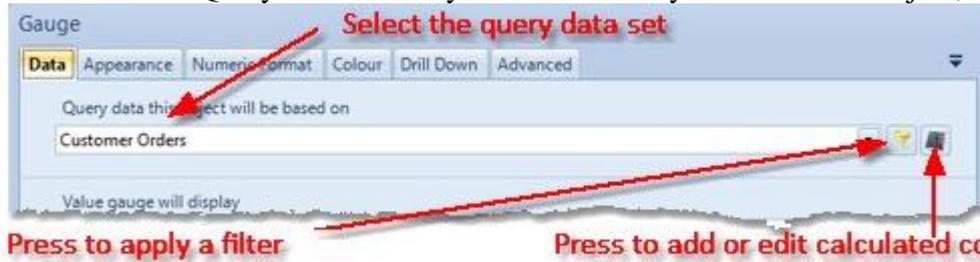
Tab	Description
Data	Allows you to define the data that will populate the gauge.
Appearance	Allows you to specify settings that will govern the appearance of the gauge.
Numeric Format	Allows you to specify the numeric format used to display numbers on the gauge.
Colour	Allows you to specify colours for the gauge
Drill Down	Allows you to add and define a drill down to the gauge
Alerts	Allows you to define alerts for the gauge
Advanced	Allows you to add advanced XML definitions to your gauge.

### Specifying Data for your Gauge

The Gauge Definition window Data tab allows you to specify the data that will be used to render your gauge.

Follow the steps below to specify the data;

First select the Query data set that you wish to base your dashboard object;

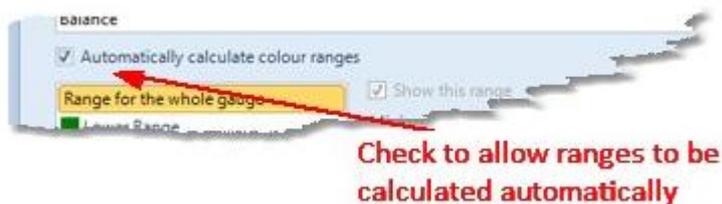


If you wish to, press the filter button to apply a filter to your data set. If the values you require for your gauge are not directly available from the columns listed, press the Calculated Column button to open the Calculated Column Editor which allows you to add, modify or delete calculated columns.

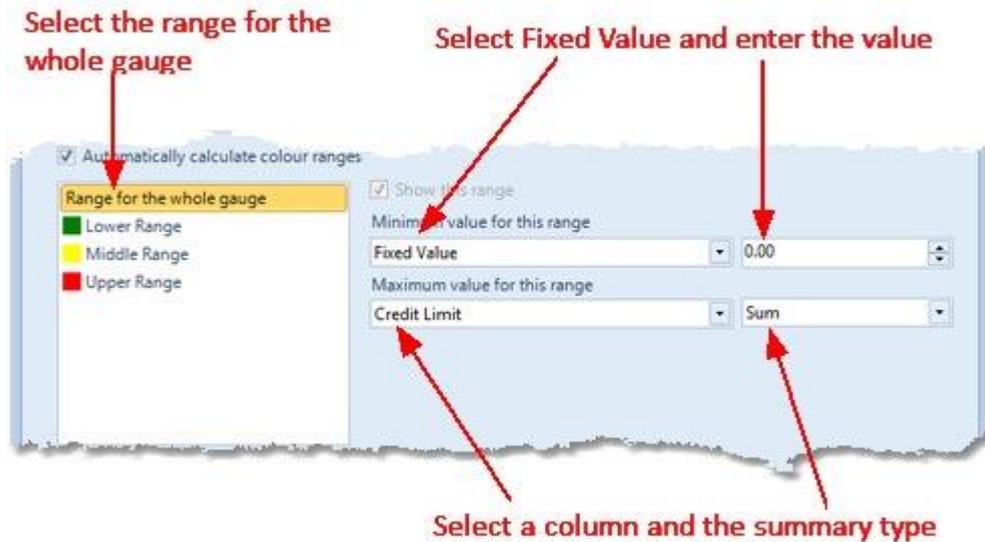
Next, you need to define the value that the gauge will display. First, select the column that represents the value that will be displayed. Next select the summary operation that will be used to calculate the value for the gauge. Finally, if you want the values on the gauge to be displayed as a percentage, select the percentage button. (%)



If the gauge object you are defining supports colour ranges, you can choose to allow the minimum and maximum values for each colour range to be calculated automatically, or set manually. If you opt to allow the colour ranges to be automatically calculated, each colour range will represent exactly a third of the range for the whole gauge.



To define the range for the whole gauge (the minimum and maximum values that will be displayed on the range), first select the Range for the whole gauge option in the list of ranges.



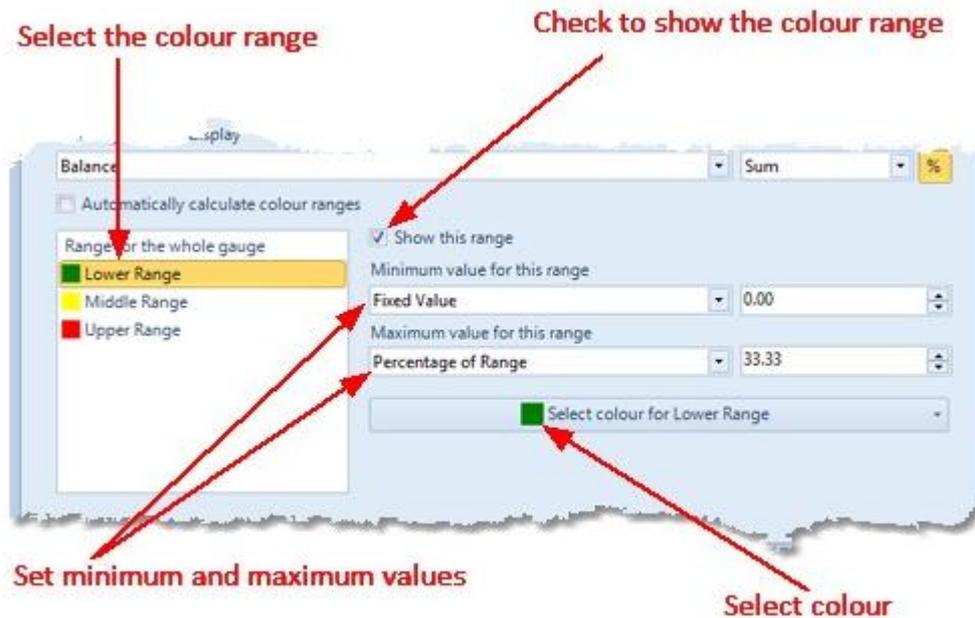
Next we need to define a value for the minimum and maximum values. The value can be a fixed value, or a dynamic value derived from one of the columns in the data set.

To set a range value to a fixed value, select Fixed Value, then enter the value.

To set a range value to be dynamic, select the column, then the summary type that will be used to calculate the range value.

Just be aware, if the value the gauge displays is smaller than the minimum value you have defined, or larger than the maximum value you have defined the range will be automatically extended to allow the value to be represented on the gauge.

Next, if the gauge object we are defining supports colour ranges, we can choose whether to show each colour range and define how it will appear.



To show or hide a particular colour range, select the colour range in the list of ranges and check or uncheck the *Show this range* option.

The minimum and maximum values for a colour range can be a fixed value, or a dynamic value based on a percentage of the whole gauge range, or a summary calculation on a column in the [data set](#).

To set a colour range value to a fixed value, select *Fixed Value*, then enter the value.

To set a range value to be dynamic based on a percentage of the whole gauge range, select *Percentage of Range*, then enter the percentage value.

To set a range value to be dynamic based on a column, select the column, then the summary type that will be used to calculate the range value.

Finally, select a colour for the colour range.

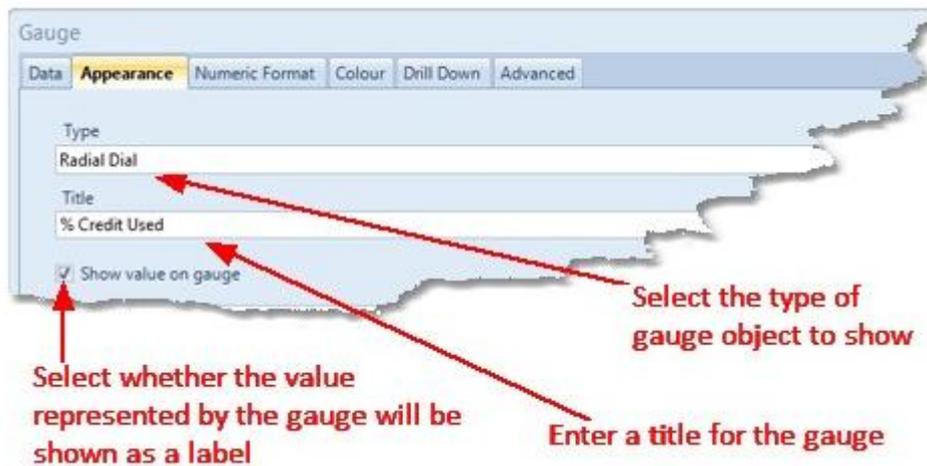


If you are defining a Traffic Light gauge object, you can enter a label for each of the colour ranges. You can choose to display these labels rather than the value on the gauge.

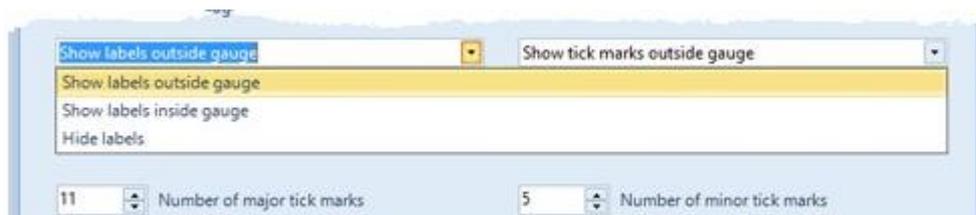
### Defining the Appearance of the Gauge

The Gauge Editor window Appearance tab allows you to specify the appearance of the gauge. Follow the steps below to specify the appearance of your gauge;

First, select the type of gauge object you wish to display, enter a title and select whether or not you wish the value represented by the gauge to be added as a label to the gauge.



Next, if your gauge object supports labels, choose whether you want the labels for the gauge shown inside the gauge, outside the gauge or not shown at all.



If your gauge object supports tick marks choose whether tick marks should be shown inside the gauge, outside the gauge or not at all.

If your gauge object supports tick marks choose whether tick marks should be shown inside the gauge, outside the gauge or not at all. Next enter the number of major and minor tick marks, and the frequency of labels on the gauge.



If you are defining a Traffic Light gauge you can choose to display *range labels* rather than the value on the gauge. You can also select whether to show the label or value below the gauge, inside the gauge or not at all.



### Defining Numeric Formats for a Gauge object

The Gauge Editor window Numeric Format tab allows you to specify the numeric format used to display numbers in on the gauge. Follow the steps below to specify the numeric format on your gauge;

First, select the maximum number of decimal places you want to show. If your values are currency values, select force trailing zeros.



You can apply scaling to your numeric values in a gauge. Scaling provides notation for large values, so for instance 1340 can be displayed as 1.34K, and 2345263 can be displayed as 2.35M. There are a number of scaling units pre-defined for you, however if these do not fit your requirements you can define your own.

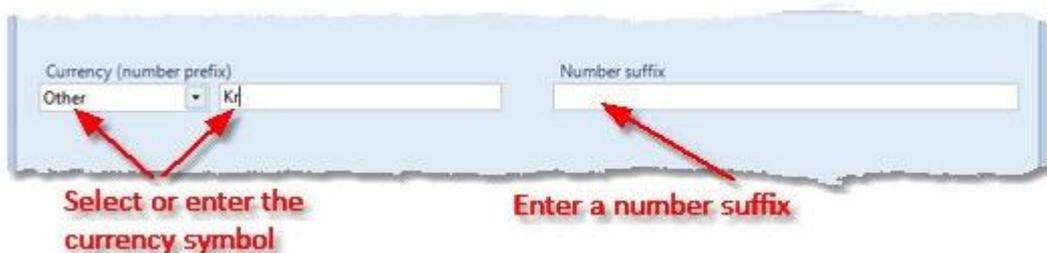


To define your own scaling units, select *other* from the *scaling units* list. Next supply a comma separated list for the scaling units and the scaling values. Each entry in the scaling units list will be displayed as a suffix to your values. Each entry in the scaling values represents the amount the value will be divided by from the previous scaling unit to achieve the display value.

For instance, you could set your scaling units to "Thousands,Millions,Billions" and your scaling values to "1000,1000,1000". In this example, 1340 will be displayed as 1.34Thousands, and 2345263 will be displayed as 2.35Millions.

If the scaling units list has one more entry than the scaling values, units will be given the first entry in the list as a suffix. For instance, for time scaling units, you could set your scaling units to "minutes,hours,days,weeks,years" and your scaling values to "60,24,7,52".

If you require it select a currency symbol (value that will be displayed before your numeric values). If the value you want is not in the list, select *other* and enter your desired value. You can also enter a number suffix, a string that will be displayed after numeric values.



Finally, if you wish to suppress the thousand separator for numbers, select the *Suppress thousand separator* check box.

### Selecting Colours for your Gauge

If your gauge supports colour ranges the screen allows you to change the colour for each colour range.

To define colours for the colour ranges, select the colour range then press the button to choose the colour for this range.

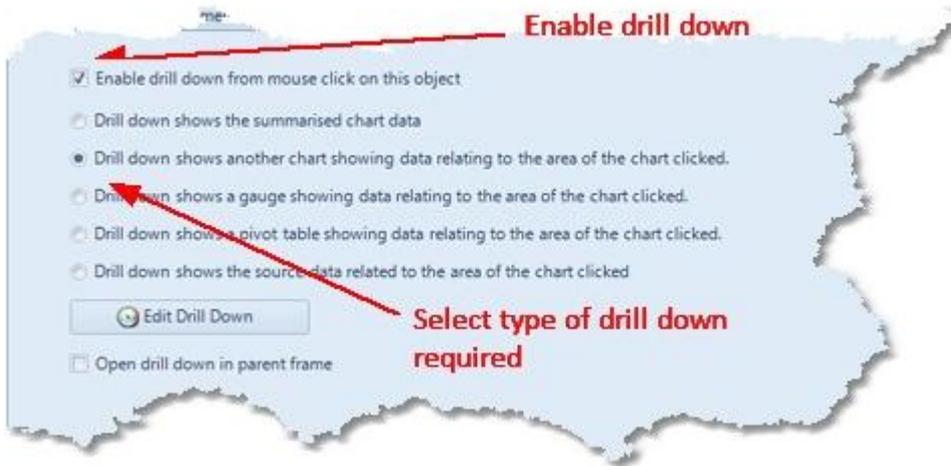
If your gauge does not support colour ranges, simply select the colour to be used when rendering your gauge.

## Defining Drill Downs for a Gauge

A drill down allows the user to click on your gauge, to open another display that shows more detail. For instance, a user might click on a gauge showing sales against forecast, to open a chart showing sales by sales rep. Drill down objects will always be built using the same data set as their parent objects. Unlike charts and pivot tables, the data will not be filtered on drill down from a gauge, as the gauge does not define any groups or series. Follow these steps to define a drill down for a gauge:

If you want the gauge to have a drill down, select the enable drill down checkbox in the *Drill Down* tab of the *Gauge Definition* window.

Select the type of drill down you wish to define. The types are described below:



Type	Description
Drill down shows the summarised chart data	The drill down will show a data grid containing the summarised gauge data as defined in the Data Tab and as used to render the gauge.
Drill down shows another chart showing data relating to the area of the chart clicked	The drill down will show a chart that summarises gauge data
Drill down shows a gauge showing data relating to the area of the chart clicked	The drill down will show a gauge that summarises gauge data
Drill down shows a pivot table showing data relating to the area of the chart clicked	The drill down will show a pivot table that summarises gauge data
Source data related to the area of the chart clicked	The drill down will show a data grid with the query data selected in the data tab, filtered to show only the data relating to the gauge.

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If you select to drill down into another chart, gauge or pivot table, press the *Edit Drill Down* button, to open the appropriate window to define the object that will be displayed.

If you select the Open drill down in parent frame, the drill down will be opened in the same panel as the parent object. If this option is not checked, the drill down will be opened in a popup window.





## Managing control panels

We have already been introduced to control panels when we discussed how they were added to the dashboard to provide an input control for query parameters earlier in this lesson. You can also add your own control panels to a dashboard to provide titles, images, filter parameters, query parameters and query refresh buttons.

## Adding a control panel to a dashboard

Follow these steps to add a control panel to your dashboard:

1. Drag a control panel from the toolkit on to your dashboard, or select *Control panel* from the list that appears when you press the *Add* button in the *Dashboard Objects* group of the *Edit Dashboard* tab.
2. Define the control panel selection panel settings in the *Control Panel* window (described in more detail below).

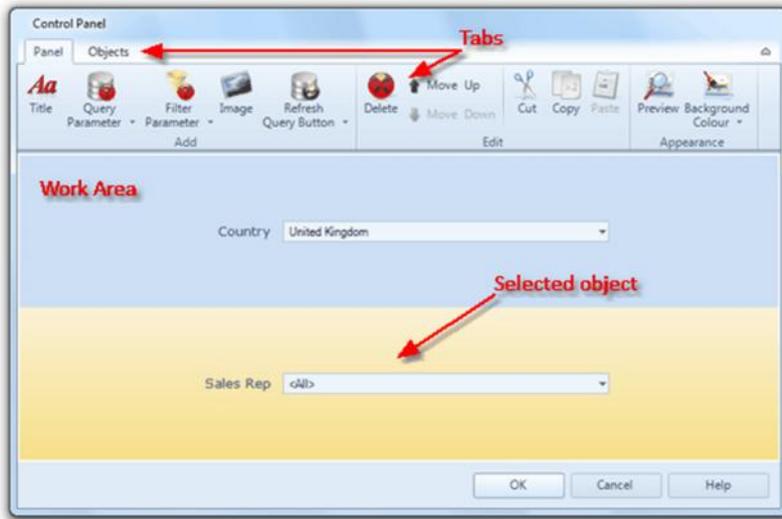
## Deleting a control panel from a dashboard

To delete the control panel from a dashboard, follow these steps:

1. Click on the control panel in the dashboard.
2. Press the *Delete* button in the *Dashboard Objects* group of the *Edit Dashboard* tab.

## Managing control panel objects

Each control panel contains one or many control panel objects. The *Control Panel* window allows you to manage these objects on a particular control panel.



The *Control Panel* window has a ribbon at the top of the window, and a work area at the bottom of the window.

The ribbon has two tabs, the *Panel* tab that contains buttons to add, delete and move control panel objects in the control panel. The *Objects* tab allows you to edit properties of a single control panel object in the control panel.

The work area displays the control panel you are currently working on, and allows you to select a single control panel object on the control panel. To select a control panel object on the control panel, simply press the left mouse button over the control panel object. The selected control panel object is highlighted in the work area.

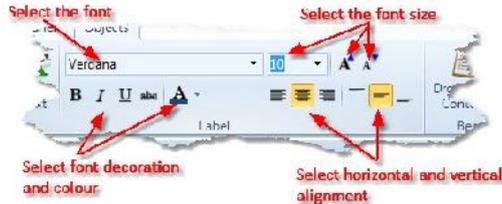
The different control panel objects that you can add to a control panel are described in the table below:

Object Type	Description
Title	Allows you to add a text title to your control panel object.
Query Parameter	Provides values for query required fields, allowing data to be filtered on the server when the query is refreshed.
Filter Parameter	Provides an object to input a filter value that can be used to filter objects on the dashboard.
Image	Allows you to add an image to the control panel.
Refresh Query Button	Provides a button to refresh a query and draw the live information from the server.

### Adding a title to a control panel object

Titles allow you to add a text title to your control panel object. To add a title to your control panel object follow these steps:

1. Press the *Title* button in the *Add* group of the *Panel* tab.
2. Enter the text you want to appear as your title in the *Label* dialog box and press *OK*.
3. Modify the font and font appearance using the *Label* group of the *Objects* tab.



### Adding query parameters to the control panel

We have already seen how Query Parameters provide values for query required fields, allowing data to be filtered on the server when the query is refreshed. Query parameters are automatically added to a control panel when you create a query that has required fields. However, you may want to add the query parameters to an additional or different control panel. To add a Query Parameter to a Control Panel, follow these steps:

1. Press the *Query Parameter* button from the *Add* group of the *Panel* tab in the Ribbon, then select the query, then the required field you wish to create the parameter for.
2. Press *OK*.

### Adding filter parameters to the control panel

Filter parameters provide an object to input a filter value that can be used to filter objects on the dashboard. Applying the filter to objects on a dashboard is described in detail in the *Applying Filters to Objects* section below. The different types of filter objects you can add to a control panel are described in the table below:

Type	Description
Drop down list	Allows the user to select a value from a pre-defined list of values.
Date Picker	Allows the user to select a date value.
Slider	A slider control allows the user to select a numeric value between a predefined minimum and maximum.
Check Box	Allows a user to select a true or false value.

Follow these steps to add a filter parameter to the control panel:

1. Press the *Filter Parameter* button in the *Add* group from the *Panel* tab.
2. Select the type of object from the drop down list.
3. Define the details of the object using the *Object* tab (described in more detail below).

## Defining the details of a drop down list

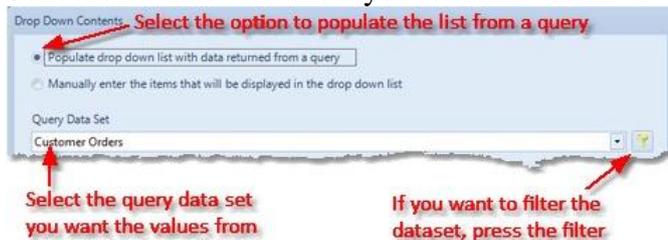
To define the details of a drop down list filter parameter, follow these steps:

1. Press the *Edit Text* button of the *Label* group in the *Objects* tab, enter the text for the drop down list label and press *OK*.
2. Modify the font and font appearance using the *Label* group of the *Objects* tab.
3. Press the *Drop Down Contents* button in the *Behaviour* group of the *Objects* tab.
4. Define the drop down list contents (described in more detail below) and press *OK*.

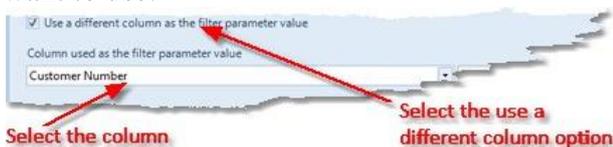
You can define the contents of the drop down list using data returned from a query, or manually. Both methods are described below.

**To define the contents of the drop down list using data returned from a query,** follow these steps:

1. Select the option to populate the drop down list from a query, then select the query data set you want the values to be drawn from.
2. If you want to filter the query data set (perhaps to filter the contents based on another filter parameter), select the filter button to open the Define Filter Condition window to allow you to define the filter.



3. Select the column you want to use to build a list of values to be displayed in the drop down list.
4. If the column is a date field, select which time interval you want to be used to build the display values.
5. You may wish to use a value from column other than the display column in your filter condition. To define a different column as the filter parameter value, select the use a different column check box and select the column you want to use.



6. Finally, select whether you want the values sorted (by the display value, rather than shown in the original order), whether you want to ignore duplicate items, and whether you want to include an option for all (if all is selected any filter condition based on this filter parameter will be ignored).

(NB. if you have opted to use different columns for the display and value columns, two items are only considered duplicate if both columns have the same value).

To define the contents of a drop down list manually, follow these steps:

1. Select the manual option, then repeatedly enter an item and press *Add* to add it to the list.
2. To change the order of values in the list, select the value, then press the green up or down arrows to move its position in the list.
3. To delete an item from the list, select it in the list then press the *Delete* key.
4. When all items are in the list, press *OK*.



### Defining the details of a date picker

Follow these steps to define the details of a date picker:

1. Press the *Edit Text* button of the *Label* group in the *Objects* tab, enter the text for the date picker label and press *OK*.
2. Modify the font and font appearance using the *Label* group of the *Objects* tab.

### Defining the details of a slider

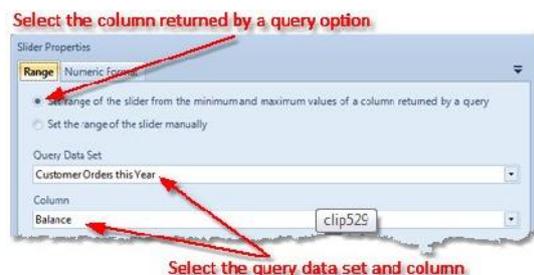
Follow these steps to define the details of a slider:

1. Press the *Edit Text* button of the *Label* group in the *Objects* tab, enter the text for the slider label and press *OK*.
2. Modify the font and font appearance using the *Label* group of the *Objects* tab.
3. Press the *Slider Scale* button in the *Behaviour* group of the *Objects* tab.
4. Define the slider scale (described in more detail below).
5. Define the numeric format (described in more details below) and press *OK*.

There are two ways you can define the slider scale, using data returned from a query or manually entering the values. Both of these methods are described in details below.

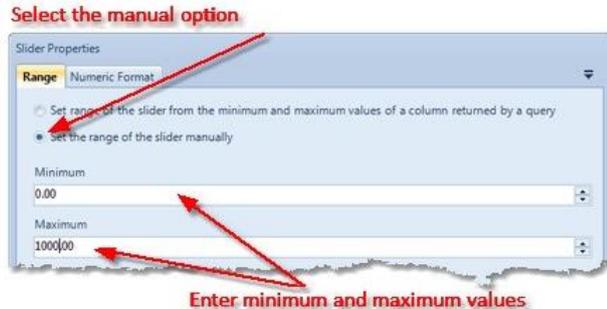
To define the scale of the slider using data returned from a query, follow these steps:

1. Select the *set range of the slider from the minimum and maximum values of a column returned by a query* check box.
2. Select the query data set, and the column you wish to use to calculate the range.
3. Finally, select whether the slider should show labels and major and minor tick marks.



To define the scale of the slider manually, follow these steps:

1. Select the *set range of the slider manually* check box.
2. Enter a minimum and maximum value for the scale.
3. Finally, select whether the slider should show labels and major and minor tick marks.



To define the numeric format for a slider, follow these steps:

1. Select the *Numeric Format* tab of the *Slider Properties* window.
2. Select the maximum number of decimal places you want to show.
3. Select whether you want to force trailing zero (for instance, the values are currency and you always want two values after the decimal point).
4. Decide what scaling units to apply to your numeric values on the slider. Scaling provides notation for large values, so for instance 1340 can be displayed as 1.34K, and 2345263 can be displayed as 2.35M. There are a number of scaling units pre-defined for you, however if these do not fit your requirements you can define your own.



To define your own scaling units, select other from the scaling units list. Next supply a comma separated list for the scaling units and the scaling values.

5. If required, select a currency symbol (value that will be displayed before your numeric values). If the value you want is not in the list, select *other* and enter your desired value. You can also enter a number suffix, a string that will be displayed after numeric values.

### Defining the details of a check box

Follow these steps to define the details of a check box:

1. Press the *Edit Text* button of the *Label* group in the *Objects* tab, enter the text for the check box label and press *OK*.
2. Modify the font and font appearance using the *Label* group of the *Objects* tab.

### Moving control panel objects on a control panel

To move a control panel item up or down in the control panel, follow these steps:

1. Select the control panel object in the work area of the *Control Panel* window.
2. Press the *Move Up* or *Move Down* button in the *Edit* group of the *Panel* tab in the ribbon.

### Deleting control panel objects

To remove a control panel object from a control panel, follow these steps:

1. Select the control panel object in the work area of the *Control Panel* window.
2. Press the *Delete* button in the *Edit* group of the *Panel* tab in the ribbon.

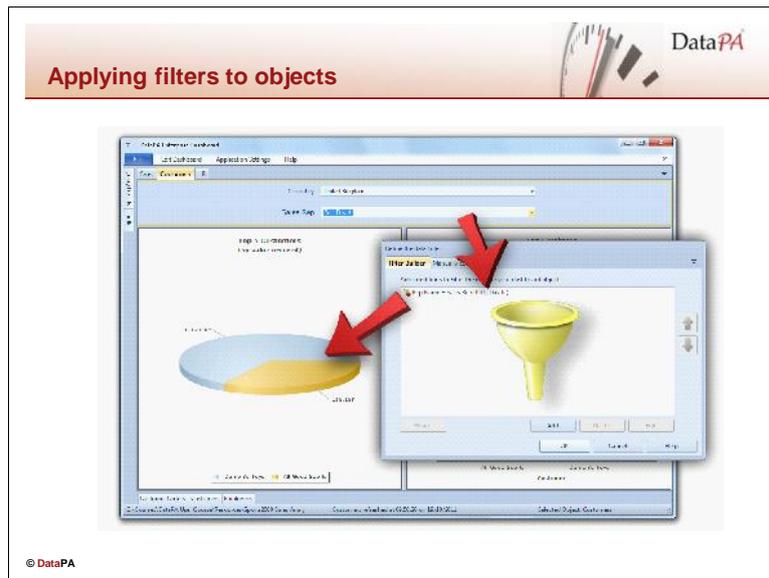
### Previewing a control panel

The *Preview* button in the *Appearance* group of the *Panel* tab removes the selection highlight from the selected control panel object in the work area. This means the control panel in the work area appears exactly as it will in the dashboard.

### Changing the background colour of the control panel

Follow these steps to change the background colour of the control panel

1. Press the *Background Colour* button in the *Appearance* group of the *Panel* tab.
2. Select the colour.



## Applying filters to objects

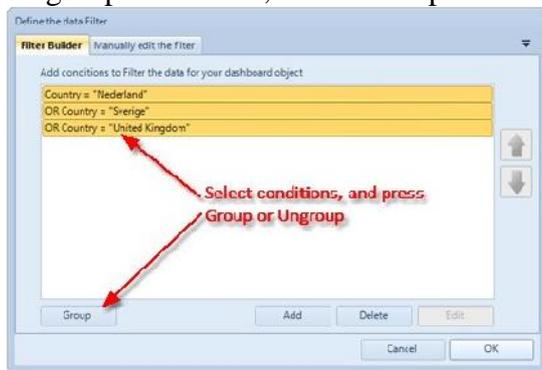
Wherever you can select a query data set to apply to an object on the dashboard, you can also apply a filter by pressing the data filter button (🔍). Filters can be static, for instance if you want to create a chart that shows orders for a specific country, or linked to a filter parameter or tree view panel, in which case the user can change the filter dynamically by changing the selection in objects on the dashboard.

There are three ways you can define a filter for an object on the dashboard, by using the filter builder, by assigning a tree view selection panel or manually editing the filter. Each of the three methods is described in detail below.

## Using the filter builder

To define a filter using the filter builder, follow these steps:

1. Select the *Filter Builder* tab.
2. Press Add to open the define filter condition window and create a new condition (described in more detail below).
3. Repeatedly add conditions until your filter is complete
4. To group conditions, select multiple conditions and press the *Group* button.

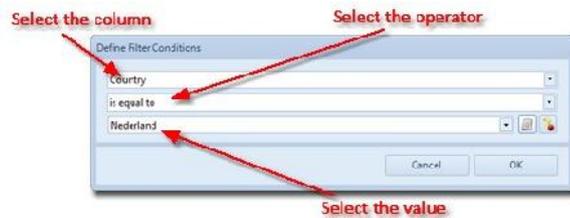


5. Press OK to finish.

The *Define Filter Condition* window allows you to define three types of condition, a simple fixed value condition, a list of fixed values condition or a filter parameter condition. Each is described in more detail below.

**To define a simple fixed value condition**, follow these steps:

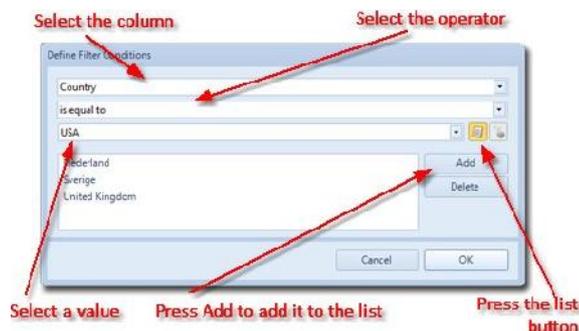
1. Select the column you want to apply the condition to.
2. Select the operator to use to compare the column.
3. Select or enter the value to compare the column to.



NB. The list of values offered in the drop down list will include all the values available in the current dataset, and two additional values, the user name and the user group. These two values allow you to create dashboards that are filtered based on the user, or group that the user belongs to. To use these values, your data will need to contain a column that includes the user name or user group to be filtered against. This column can be a calculated column, generating these values from other columns. See [Knowledge Base article 123](#) for more details.

**To define a list of fixed values condition**, follow these steps:

1. Select the column you want to apply the condition to.
2. Select the operator to use to compare the column.
3. Press the list button
4. Repeatedly select or enter a value and press *Add* to add it to the list.



**To define a filter parameter condition**, follow these steps:

1. Select the column you want to apply the condition to.
2. Select the operator to use to compare the column
3. Press the filter parameter button (🎛️).

4. Select the filter parameter you want to use.

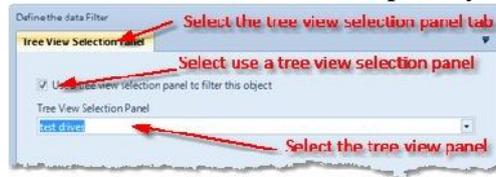


NB. If you create a condition that is linked to a filter parameter, and the filter parameter object is deleted from the dashboard, the condition is changed to be a fixed value condition with the fixed value being the last known value of the filter parameter.

### Applying a tree view filter panel filter

As we described earlier in this lesson, tree view filters can be applied to objects from the *Tree View Filter Panel Editor* window. We can also apply tree view filters to objects from the *Define the data Filter* window. If an appropriate tree view filter panel (one for which all the columns in the tree view are represented in the objects data set) exists, the *Tree View Selection Panel* tab will be offered in the *Define the data Filter* window. Follow these steps to apply a tree view filter to an object:

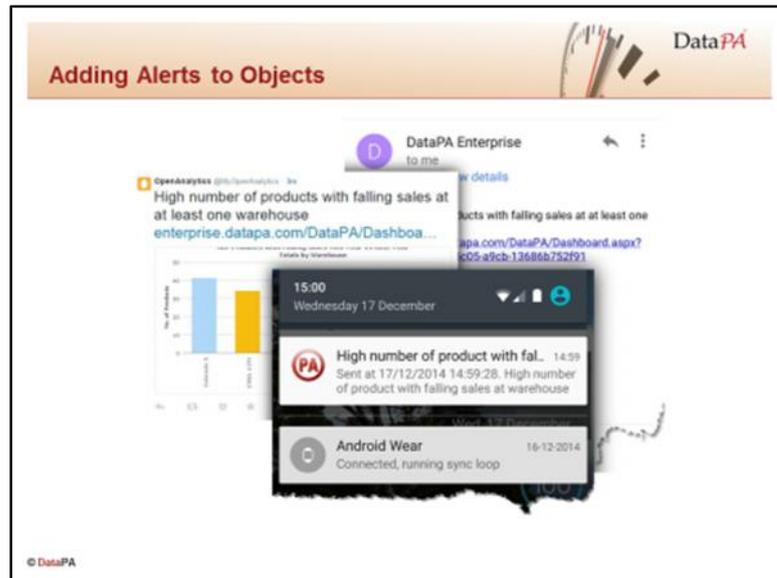
1. Selection Panel tab.
2. Check the Use a tree view selection panel to filter this object check box.
3. Select the tree view selection panel you wish to use.



### Manually entering a filter

Filters are applied to the data using the Microsoft ADO.NET RowFilter property. Follow these steps to manually enter a filter for your objects:

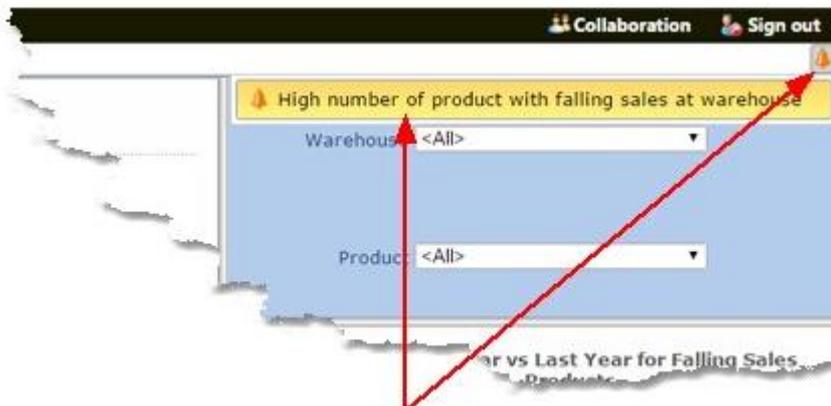
1. Select the Manually edit the filter tab.
2. Select the Edit the filter manually checkbox.
3. Enter the required filter string and press OK to confirm.



### Defining alerts for a dashboard

Alerts allow you to notify stakeholders when a particular event occurs. For instance, if demand in a production environment exceeds a certain threshold, you may want to notify a shift manager so he can make sure enough staff are available. Alerts can be added to most objects on a dashboard (details of which are described below). The user can be notified when an alert is triggered in a number of different ways;

Alerts will be highlighted by the alert icon, and can be opened from the alert menu when the dashboard is opened (in the client application or web) and the alert conditions resolve to true.



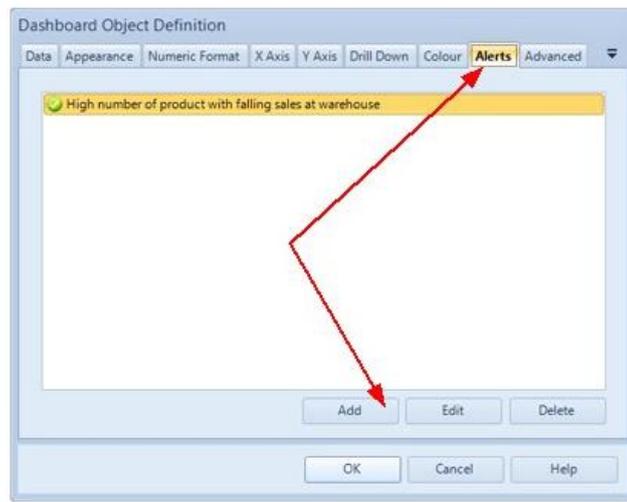
If the dashboard is set to refresh automatically on the server, an alert can be sent by email when the dashboard refreshes and the resulting data causes the alert conditions to resolve to true. Similarly, if the dashboard is set to refresh automatically on the server, a message can be tweeted when the dashboard refreshes and the resulting data causes the alert conditions to resolve to true. Finally, if the dashboard is set to refresh automatically on the server, a notification will be raised on any mobile or wearable device with access to that dashboard through the relevant DataPA app when the dashboard refreshes and the resulting data causes the alert conditions to resolve to true.

## Adding alerts to a dashboard object

The object definition, pivot table and gauge windows all include an alert tab that allow you to manage alerts for that particular object.

Alerts defined for that specific object will be listed on this tab. A green tick next to the alert indicates the alert currently resolves to true.

To add an alert, press the add button. To edit or delete the alert, select the alert in the list, then press the edit or delete button.

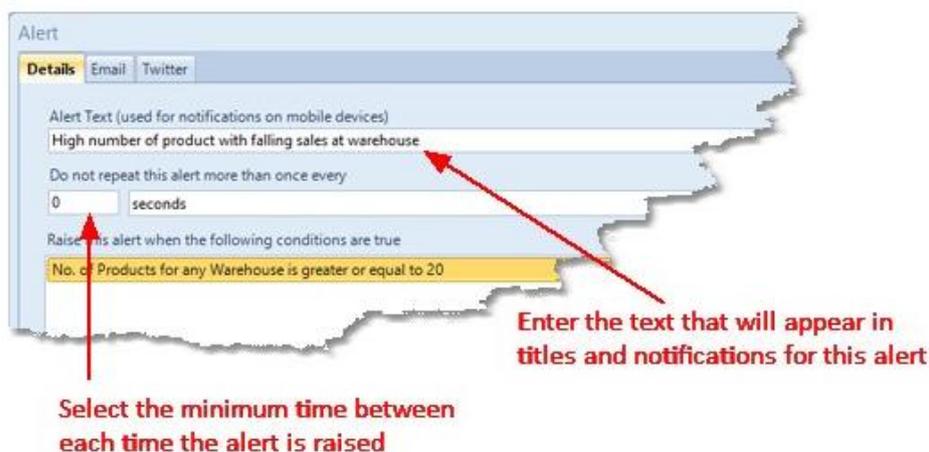


Adding or editing an alert, will open the alerts window, which contains 3 tabs;

Tab	Description
Details	Allows you to define the alert details (text and conditions).
Email	Allows you to specify whether the alert will trigger an email when raised on the server.
Twitter	Allows you to specify whether the alert will trigger a tweet when raised on the server.

## Defining Alert Details

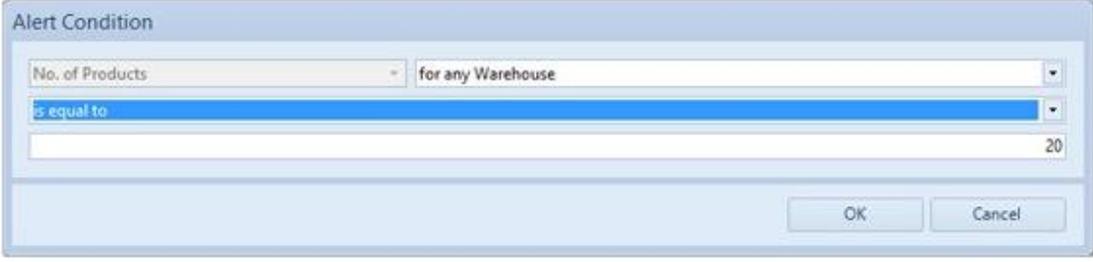
Follow the steps below to define the details for your alert;



First, enter the text that will appear in titles and notifications for this alert. Next, you may wish to ensure the alert is not raised too often. For instance, if a dashboard was scheduled to refresh automatically every minute and the alert conditions remained true, the alert would send notifications, (and tweets and emails if so configured) every

minute. To prevent this without reducing the refresh interval of the dashboard, you can set a minimum time interval before which a repeat alert will be raised.

Next you need to define the conditions that will determine when this alert is raised. To add a condition, press the Add button and select the series values, group values, operator and value as appropriate. The alert condition screen looks at the summary data defined by your dashboard object. As such its appearance and options change significantly depending on the parent object, however they will be fairly intuitive.



The image shows a dialog box titled "Alert Condition". It contains a dropdown menu with "No. of Products" selected, followed by a minus sign and another dropdown menu with "for any Warehouse" selected. Below this is a dropdown menu with "is equal to" selected. To the right of this dropdown is a text input field containing the number "20". At the bottom right of the dialog are two buttons: "OK" and "Cancel".

You can add multiple conditions to an alert, linking them with logical *Ands* and *Ors* to build the appropriate expression.

### Adding and email to an alert

The Alerts window Email tab allows you to specify whether the alert will trigger an email when raised on the server, and if so, the details of that email. If a dashboard is scheduled to refresh automatically and you would like an email sent if the new data results in the alert conditions resolving to true, follow the steps below;

First ensure the checkbox labelled *Send an email when this alert is raised* is checked, then enter the email address or addresses you want the email to be sent to. Add the text you want in the body of the email, and finally choose whether to include an image of the chart by selecting whether or not the checkbox labelled *Attach an image of the object to the email* is checked.



The image shows a window titled "Alert" with three tabs: "Details", "Email", and "Twitter". The "Email" tab is selected. It contains a checkbox labeled "Send an email when this alert is raised" which is checked. Below this is a text field for "Email recipients" containing "alerts@datapa.com". Below that is a text area for "Email Body" containing the text "There is a high number of product with falling sales at a single warehouse."

For emails to be delivered, the server needs to be correctly configured to use an appropriate SMTP server to send the emails on your behalf. If you are a member of a group that has permission to manage the server you can configure the server so it has access to your mail server by pressing the Server Settings button (details on how to configure the server are covered in the DataPA Administration Course).

## Posting to Twitter with Alerts

The Alerts window Twitter tab allows you to specify whether the alert will trigger a tweet when raised on the server, and if so, the details of that tweet. If a dashboard is scheduled to refresh automatically and you would like a tweet sent if the new data results in the alert conditions resolving to true, follow the steps below;

First ensure the checkbox next to each Twitter account you want the tweet to appear on is checked (see below for details on adding Twitter accounts), then enter the text for the tweet. Choose whether to include an image of the chart by selecting whether or not the checkbox labelled Include image with tweet is checked, and finally choose whether to add a link to the dashboard to the tweet by selecting whether the checkbox labelled Include link to dashboard with tweet is checked.



If you are a member of a group that has permission to manage the server you can add, edit and remove Twitter accounts by pressing the button to the top left of the list of Twitter accounts.

Details of managing twitter accounts and groups are covered in the DataPA Administration course.





### Editing dashboard objects

To edit a dashboard object in your dashboard, follow these steps:

1. Select the dashboard object you want to edit in the tab.
2. Press the *Edit* button in the *Dashboard Objects* group in the *Edit Dashboard* tab.
3. Complete the required changes in the *Dashboard Object Definition* window.

### Moving dashboard objects

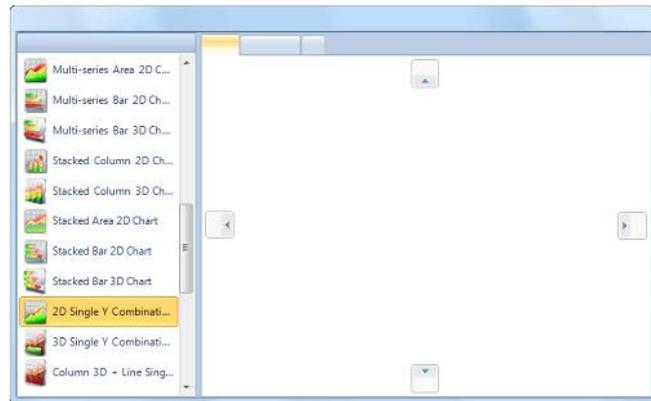
You can move dashboard objects either within the tab they are currently displayed, or between the tabs in a dashboard.

**To move dashboard objects within a tab,** follow these steps:

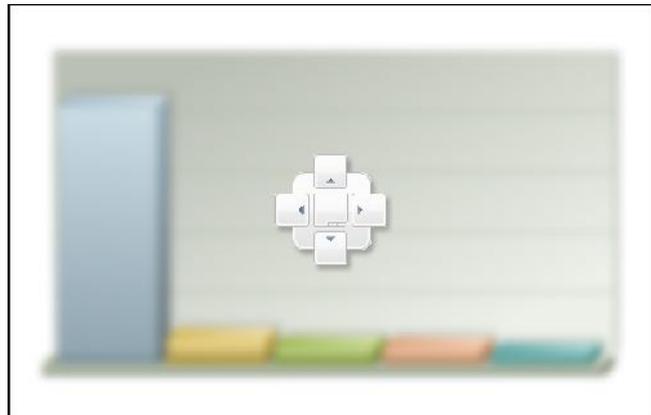
1. Select that tab that contains the object you want to move.
2. Press the *Design Dashboard Tab* button in the *Dashboard Tab* in the *Edit Dashboard* tab.
3. Press and hold the tab header of the dashboard object you want to move.
4. Drag the object over the appropriate drag icon (described in detail below).
5. Release the left mouse button.
6. Press the *Preview Dashboard Tab* button in the *Dashboard Tab* in the *Edit Dashboard* tab.

As you drag the object over the tab, two types of guide icon will appear.

Guide icons around the edge of the tab allow you to place the dashboard object against the left, top, right or bottom edge of the tab.

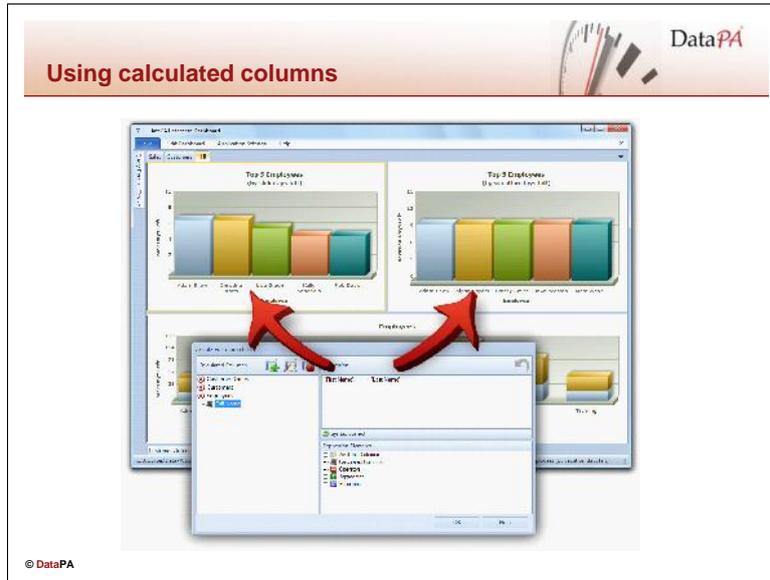


When you drag the mouse over an existing object in the dashboard, guide icons appear that allow you to drop the object to the left, top, right, bottom of the other object, or stacked on top of the other object. If objects are stacked, tabs will appear to allow the user to display each object.



**To move a dashboard object from one tab to another**, follow these steps:

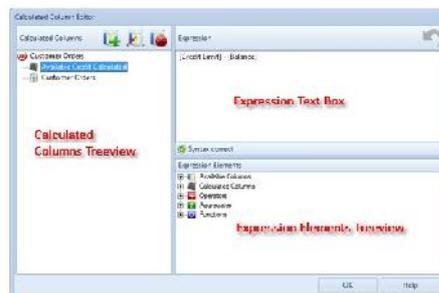
1. Select the dashboard object in the tab.
2. Press the *Cut* button in the *Dashboard Objects* group in the *Edit Dashboard* tab.
3. Select the tab you want to move the dashboard object to.
4. Press the *Paste* but button in the *Dashboard Objects* group in the *Edit Dashboard* tab.



### Using calculated columns

Calculated columns allow you to add your own columns to the data sets returned by a query, and use those columns in your dashboard. The *Calculated Column Editor* allows you to Add, Modify and Delete calculated columns to your available data sets. To open the *Calculated Column Editor* press the *Calculated Columns* button in the *Queries* group of the *Edit Dashboard* tab on the ribbon.

**The Calculated Column Editor** consists of three panels, the Calculated Columns Treeview, the Expression Text Box and the Expression Elements Treeview.



**The Calculated Column Treeview** displays the available queries, data sets and calculated columns. Each icon in the treeview are described below:

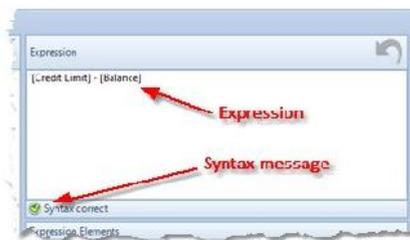
	<p>The Query icon indicates a query. To add a Calculated Column to the root dataset of the query, select the query then press the add calculated column button (  ).</p>
	<p>The data set icon indicates a child data set of a multi level query where split results has been selected to indicate you want the query to produce multiple data sets. To add a calculated column to the dataset, select the dataset then press the add calculated column button (  )</p>
	<p>The Calculated column buttons indicates a calculated column. To modify the name or data type of the calculated column, select the calculated column then press the edit calculated column button (  ). To change the calculated columns expression, select the calculated column, then edit the expression using the expression text box. To delete the calculated column, select the calculated column then press the delete calculated column button (  ).</p>

To create a new calculated column, follow these steps:

1. Select the query or data set you would like to add the calculated column to in the *Calculated Columns Treeview*.
2. Press the the add calculated column button (  ).
3. Enter the name of the calculated column you wish to create.
4. Select the type for the calculated column you wish to create.
5. Enter the expression for your calculated column (described in more detail below).
6. Press *OK*.

### Writing calculated column expressions

The expression text box is a free text editor that allows you to enter the expression for the calculated column. You can also use the Expression Elements Treeview to add pre-defined text to your expression.



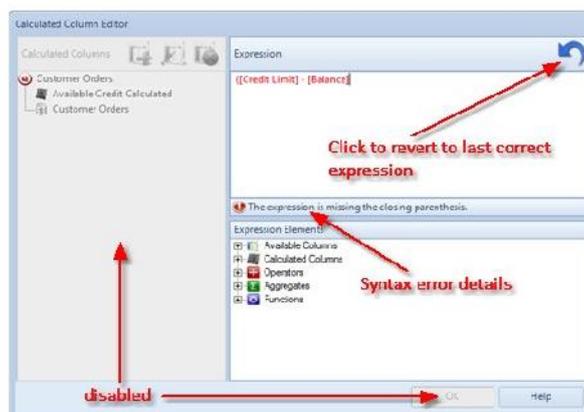
The expression is calculated using the .NET DataColumn Expression property. For details on the syntax of the expression, lookup DataColumn.Expression at [msdn.microsoft.com](http://msdn.microsoft.com).

Each time you make a change to the expression, the syntax of the expression is checked, and the results displayed in the syntax message below the expression text box.

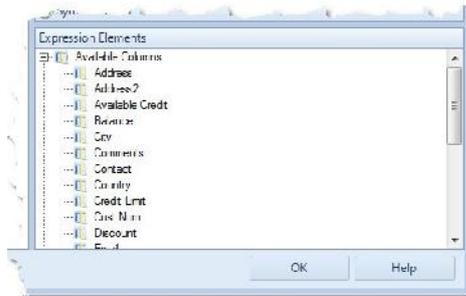
If the syntax of the expression you have entered is incorrect, the Calculated Columns Treeview and OK button will be disabled and the details of the syntax error will be displayed in the syntax message below the expression text box.

You cannot exit the Calculated Column Editor until you have entered a valid expression for the selected calculated column.

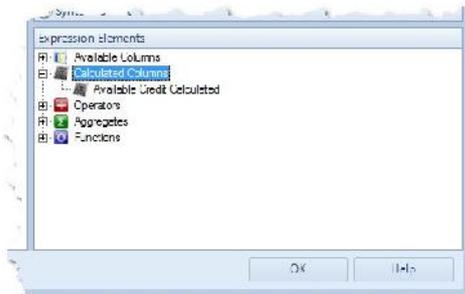
You can do this by either changing the text to a correct expression, or press the undo button (  ) to revert to the last correct expression.



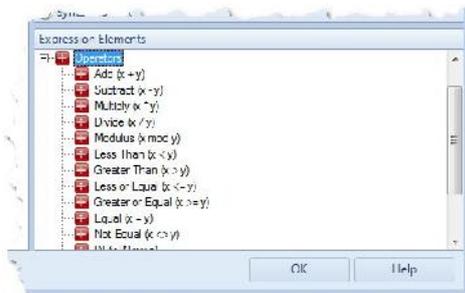
The Expression Elements Treeview provides access to a wide range of expression elements, described below, that you can add to your expression. To add an element from the expression elements treeview to your expression, press the + symbol on the element category to expand the category, then click on the element you want to add to your expression. The current selected text in the expression text box will be replaced with the text of the expression element you have selected.



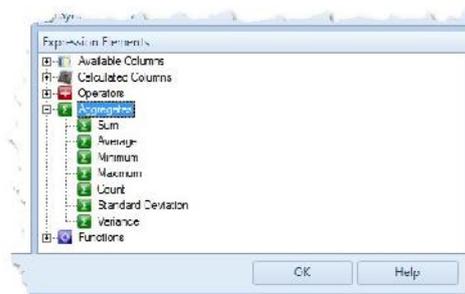
The Available Columns expression elements allow you to add existing columns returned by the query to your expression.



The Calculated Columns expression elements allow you to add other calculated columns that you have already defined for this query or dataset to the expression.

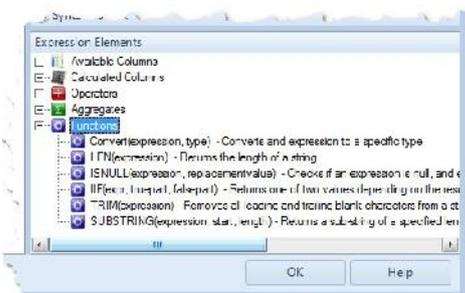


The Operators expression elements allow you to add operators to your expression. For details on the behaviour of each operator, lookup `DataColumn.Expression` at [msdn.microsoft.com](http://msdn.microsoft.com).



The Operators expression elements allow you to add aggregates to your expression. For details on the behaviour of each aggregate, lookup `DataColumn.Expression` at [msdn.microsoft.com](http://msdn.microsoft.com).

Beware of defining calculated columns that use aggregates on large datasets as they can cause your dashboard to be slow to render.



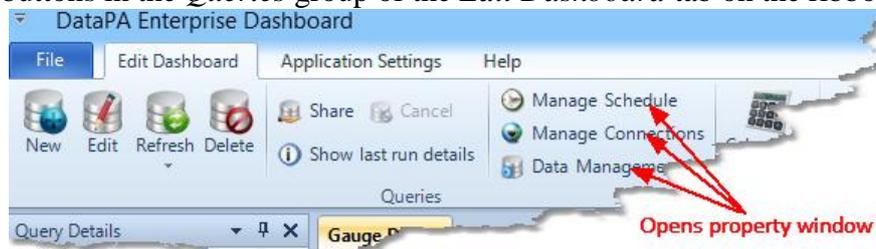
The Functions expression elements allow you to add functions to your expression. For details on the behaviour of each function, lookup `DataColumn.Expression` at [msdn.microsoft.com](http://msdn.microsoft.com).



## Managing dashboard properties

The dashboard properties allow you to define the identity, refresh schedule, how connections are managed and how data is managed for a dashboard. The dashboard properties screen is opened in the following ways

1. Select *Properties* from the *File* menu on the ribbon, then select the *Refresh Schedule* Tab, or
2. Press the *Manage Schedule*, *Manage Connections* or *DataManagement* buttons in the *Queries* group of the *Edit Dashboard* tab on the ribbon.



## Managing the identity of your dashboard

The identity of the dashboard can be used to provide descriptive elements for your dashboard that aid in identifying and search for it in DataPA Enterprise. Follow these steps to define the identity of your dashboard:

1. Select *Properties* from the *File* menu on the ribbon, then select the *Dashboard Identity* Tab or press the *Manage Schedule* button in the *Queries* group of the *Edit Dashboard* tab on the ribbon.
2. Enter a *Title* for your dashboard.
3. Enter a *Description* for your dashboard.
4. Enter a comma separated list of keywords for your dashboard.
5. Enter a *Category* for your dashboard.
6. Enter any *comments* you wish to be assigned to your dashboard.
7. Enter the *Author* of your dashboard.

## Managing the refresh schedule of your dashboard

Defining a refresh schedule for your dashboard allows you to control if, and when the queries in your dashboard are automatically refreshed. You can set the refresh schedule for all queries in your dashboard, or each query individually.

**To define a refresh schedule for all queries in your dashboard**, follow these steps:

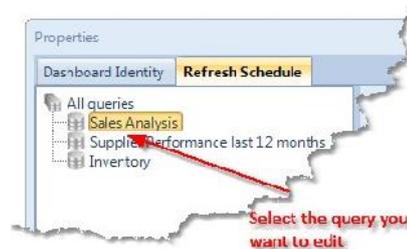
1. Select *Properties* from the *File* menu on the ribbon or press the *Manage Schedule* button in the *Queries* group of the *Edit Dashboard* tab on the ribbon.
2. Select the *Refresh Schedule* tab.
3. Select *All Queries* in the tree view.
4. Define the refresh schedule options (described below).



NB. If the screen does not allow you to define all the refresh schedule settings for all queries, it is because some queries have unique settings defined. To enable all the settings for all queries, make sure all queries have the same settings. You can do this quickly by pressing the *Reset Defaults* button.

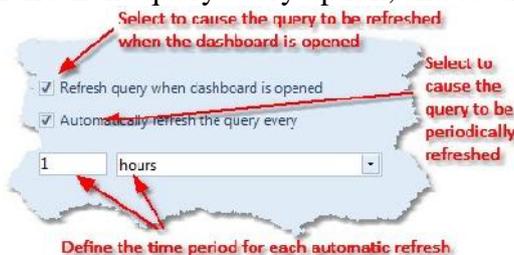
**To define a refresh schedule for a single query**, follow these steps:

1. Select *Properties* from the *File* menu on the ribbon or press the *Manage Schedule* button in the *Queries* group of the *Edit Dashboard* tab on the ribbon.
2. Select the *Refresh Schedule* tab.
3. Select the query you wish to edit in the tree view.
4. Define the refresh schedule options (described below).



**To define the schedule options**, follow these steps:

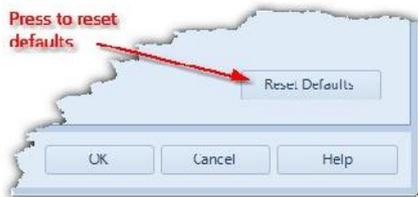
1. If you want the query to be automatically refreshed when you open the dashboard, select the *Refresh query when dashboard is opened* option.
2. If you want the query to be periodically refreshed, select the *Automatically refresh the query every* option, and set the time interval.



If you set the refresh interval for a particular query to a short period, and the period expires while the particular, or another query is refreshing, the query is queued for refresh at the next possible interval.

The last refresh time is stored within the query. This means if you save and close a dashboard, then re-open it, the refresh interval will be calculated from the last time the query was refreshed.

If you cancel a query refresh, or the refresh fails, the query will not be automatically refreshed until the query is either manually refreshed successfully or you re-open the dashboard.



To reset the default settings for all queries, press the Reset Defaults button. This will set the refresh on open and auto refresh options to false, and the time interval to 5 minutes for all queries.

### Managing Connections

The Dashboard Properties Connections Tab allows you to define whether your query will refresh against the default connection, a specified alternative connection or against multiple connections. This last option, to refresh a query against multiple connections, allows users to construct dashboards that collate data across multiple installations of an application. A column is automatically added to the query results containing the connection name.



#### **Refresh the selected queries against the default connection.**

Selecting this option, which is the default, causes the selected queries to refresh against the default connection for the system.

#### **Refresh the selected queries against the connection selected below.**

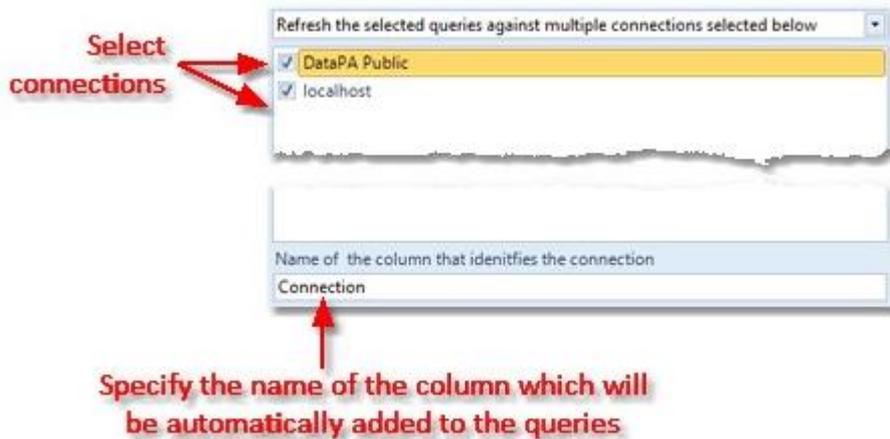
Selecting this option, enables the list of available connections for the system used by the query, in *single* select mode. You can then select which connection the query should refresh against.

#### **Refresh the selected queries against multiple connections selected below.**

Selecting this option, enables the list of available connections for the system used by the query, in *multi*-select mode. You can then select which connections the query should refresh against.

When multiple connections are selected, these will all refresh *concurrently*. This means the time taken to refresh against all queries will only be the time taken to refresh against the slowest connection.

If the query is refreshed against multiple connections, an extra column will be added to the resulting dataset that identifies which connection the data was retrieved from. This extra column by default will be called *Connection*, but you can change its name on this screen.

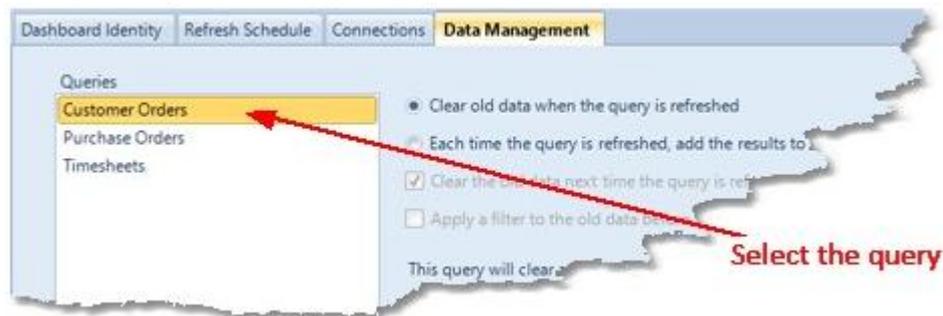


### Data Management

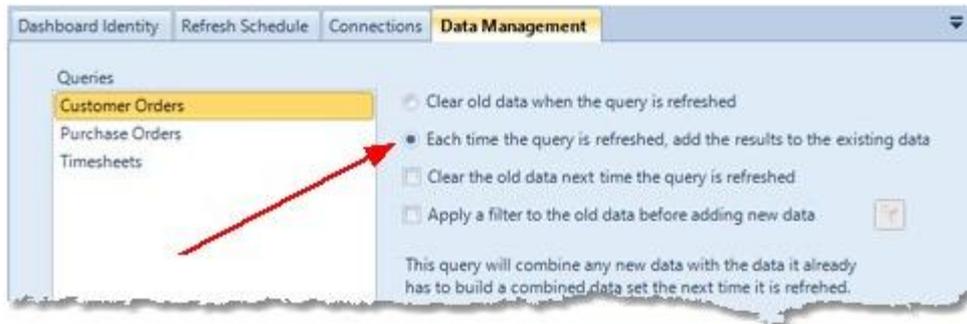
By default, when a query retrieves new data from the server, it will completely clear the old data and build the dashboard with only the data returned in the last refresh. However, on occasions you may want to alter this behaviour. For instance, if you are building a dashboard that shows sales for the last three years, you could build your query to only return order data that has been created since the last time the query was returned. In this case, you want the query to add the new order data to the data previously returned, that shows orders from the last three years.

To change a query to accumulate data on the next refresh, follow these steps;

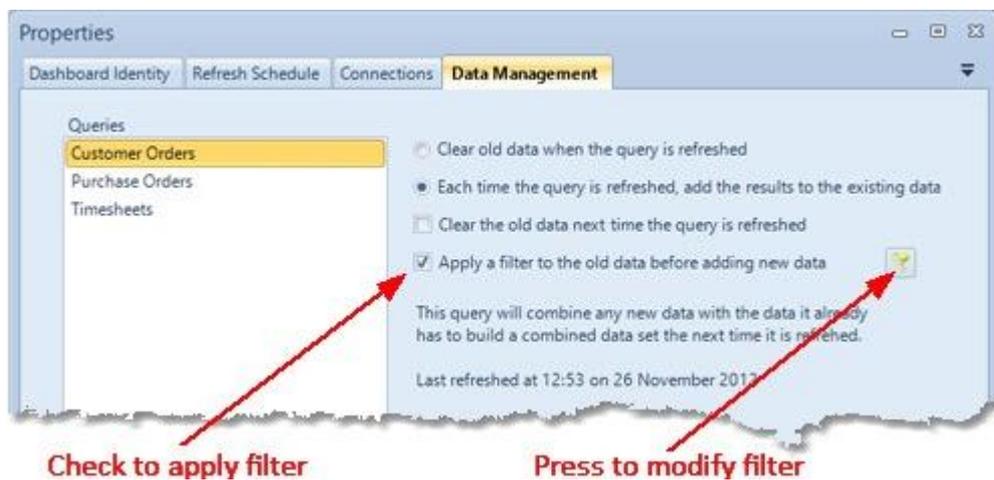
Select the query you wish to accumulate data in the queries list



Select the *Each time the query is refreshed, add the results to the existing data* option. You can optionally request that the data is cleared the next time the query is refreshed (and then accumulated thereafter) by checking the *Clear old data next time the query is refreshed* option. If you edit the query, the data will be cleared next time it is refreshed.

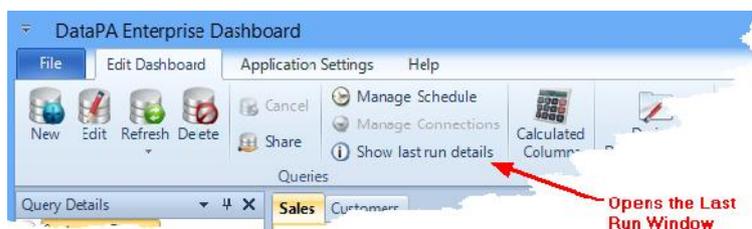


You can optionally apply a filter to the existing data before any new data is added. For instance, if the query is returning this month's orders, you may wish to filter out any existing values for this month's orders to ensure the figures are not greater than they should be. To apply a filter, check the *Apply a filter to the old data before adding new data* option. This will open the *Define the Data Filter* screen to allow you to define the filter to apply to the data. You can modify an existing filter by pressing the filter button.



### Last Run Details

Last Run Details gives details of the date and time a query was last refreshed, and any error messages returned by the refresh process. The Last Run Details screen is opened by pressing the *Last Run Details* button in the *Queries* group of the *Edit Dashboard* tab on the ribbon.

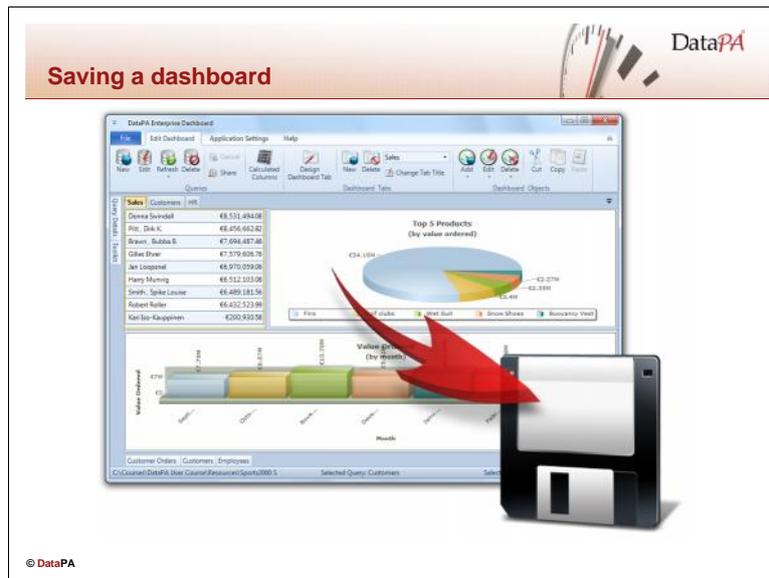


**The Last refresh details screen** consists of a query selector, a connection list and a details box that displays information on the last time a query was run against a connection. This information can be particularly useful for queries set to refresh automatically by the DataPA Enterprise Service.

There are also buttons to

- initiate a further refresh of the query, and
- to open the connection tab of the Dashboard Properties Screen





## Saving a dashboard

Saving a dashboard saves the queries in the dashboard, the data returned by the queries and the definitions of the tabs and dashboard objects in a dashboard. Follow these steps to save a dashboard:

1. Select *Save* or *Save As* from the *File* menu on the ribbon.
2. If prompted, enter the name of the file you wish to save the dashboard as.

NB. There may be circumstances where you wish to save the dashboard, but do not want the data that it contains to be available when it is opened. You can ensure that all the queries in the dashboard are refreshed when it is opened and before the dashboard is rendered by selecting the *Refresh query when dashboard is opened* option for all queries in the dashboard properties window.



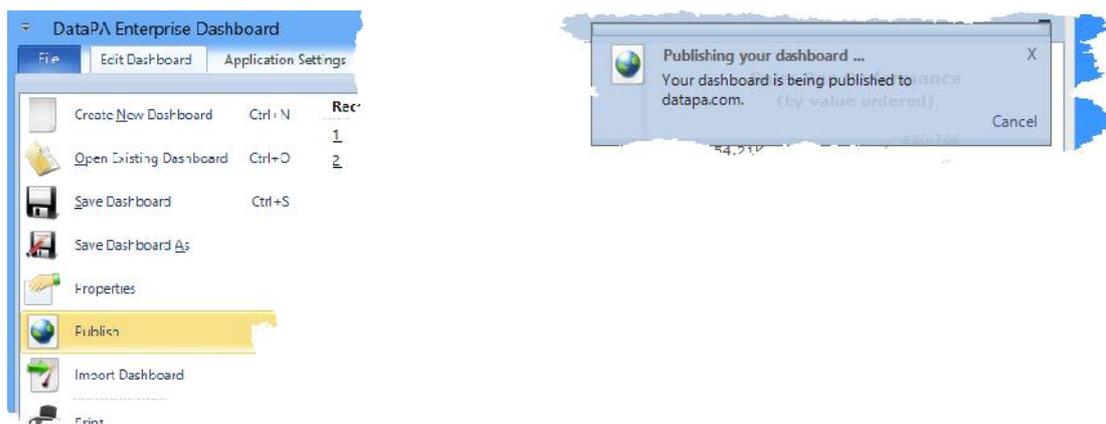
## Publishing a Dashboard

To publish a dashboard, select *Publish* from the *File* menu on the ribbon.

Please note that, if security is enabled in your DataPA environment, then you need to be logged in as a user belonging to a group with the "Members of this group can publish content" permission item checked before you can access this screen

Note: To be able to publish a Dashboard to the DataPA Enterprise Service, a valid Category and Title must be set within the Dashboard Properties window.

If the dashboard is correctly defined, you will see an information box informing you that the application is publishing your dashboard. During this process, you can press the *Cancel* button on the information box to cancel the publish process.



### Managing Published Content

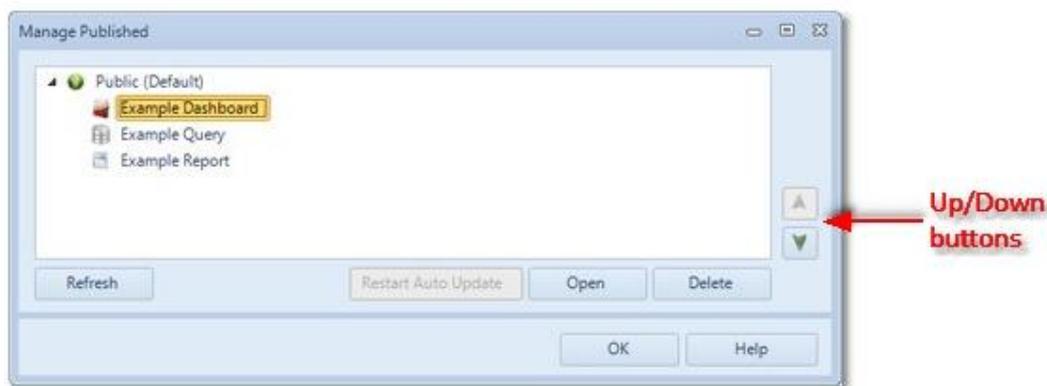
The Manage Published screen is intended to maintain content which has been published to the DataPA Enterprise Service.

Please note that, if security is enabled in your DataPA environment, then you need to be logged in as a user belonging to a group with the "Members of this group can publish content" permission item checked before you can access this screen.

To manage published content, press *Manage Publish* command in the *Settings* group in the *Application Settings* tab of the Ribbon

There are currently three types of content that may be published from the various components of the DataPA product suite to the DataPA Enterprise Service:

- Queries from the MS Excel or Access add-ins
- Dashboards from the DataPA Dashboard Designer
- Reports from the DataPA Report Designer



The **Refresh** button will query the DataPA Enterprise Service and rebuild the list of content in case it has been changed.

The **Restart Auto Update** button is only applicable for dashboards whose queries have been set to refresh automatically. Selecting this option refreshes the query and sets the start time in the Refresh Schedule screen to the current time.

The **Open** button will open the selected content, however this is context sensitive, it will only be enabled if

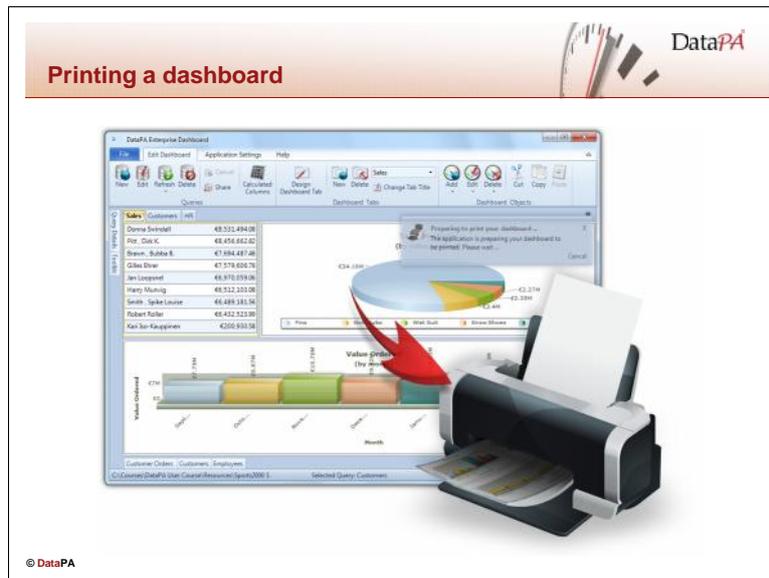
- You have a dashboard selected and the screen was launched from the Dashboard Designer
- You have a query selected and the screen was launched from the Excel / Access add-in
- You have a report selected and the screen was launched from the Report Designer.

## DataPA OpenAnalytics End User Training

The *Delete* button will remove the selected content from the DataPA Enterprise Service.

The *Up* and *Down* buttons can be used to reorder the content.

If you right click on a dashboard, report or query on this screen when you will have the option **Copy Enterprise URL to Clipboard** which will copy the URL you need to view that content directly in DataPA Enterprise. This is particularly useful if you are embedding content in a third party web application.



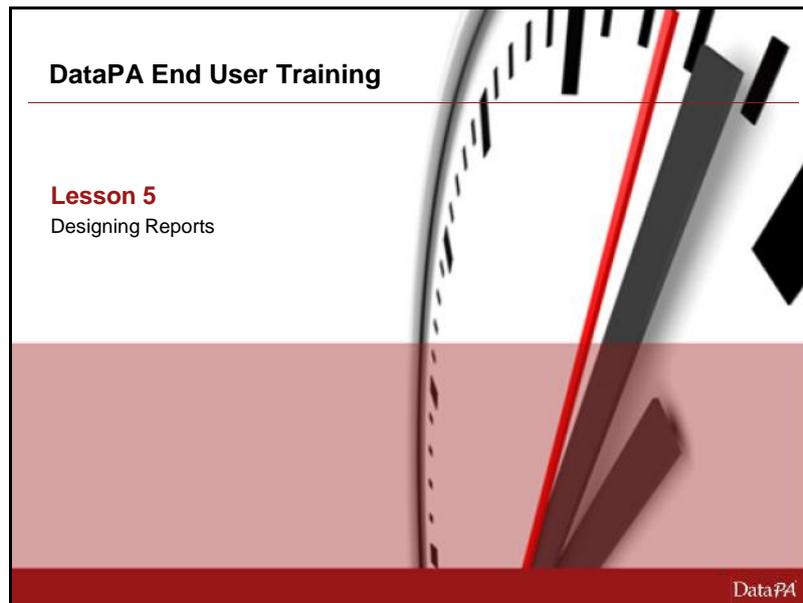
## Printing a dashboard

Follow these steps to print a dashboard:

1. Select *Print* from the *File* menu on the ribbon.
2. Select your print preferences. Each tab of your dashboard will be printed on a separate page. As such, you can print specific tabs by opting to print specific pages in the print dialog.
3. Press *OK*

Once a dashboard is opened, the tabs are rendered on demand. This means if you have not printed a dashboard since it was opened, and not viewed all the tabs, the dashboard may need to render one or more tabs before the dashboard can be printed. If this is the case, you will see a print information box informing you that the application is preparing your dashboard for printing, and the application will render each tab that that requires rendering. During this process, you can press the *Cancel* button on the information box to cancel the print process.





## Lesson 5 – Designing Reports

### Introduction

In this lesson you will learn to create and modify the physical layout and formatting of reports. We will also look at building reports from queries created in Excel, and sharing queries created in the DataPA Reports Designer so they can be used in Excel.

### Learning Objectives

When you complete this lesson you should be able to:

- Create a new report in the DataPA Reports Designer.
- Import and share queries to and from reports.
- Identify the different elements of the report designer.
- Create a simple report and format the layout.
- Add groups to a report.
- Add special fields to a report.
- Add graphical elements to a report.
- Add calculated fields to a report.
- Add drill downs to a report
- Creating a report with sub-reports
- Publish a report to a DataPA Enterprise Service
- Print and Export a report.

### Prerequisites

Before you begin this lesson you should be able to:

- Open a report in the DataPA Report designer.
- Refresh a report in the DataPA Report designer.
- Create and save a query in Excel.

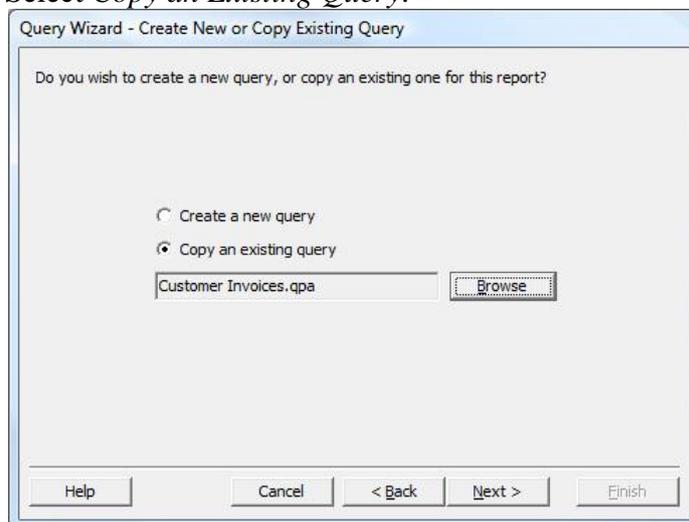


### Creating a Report

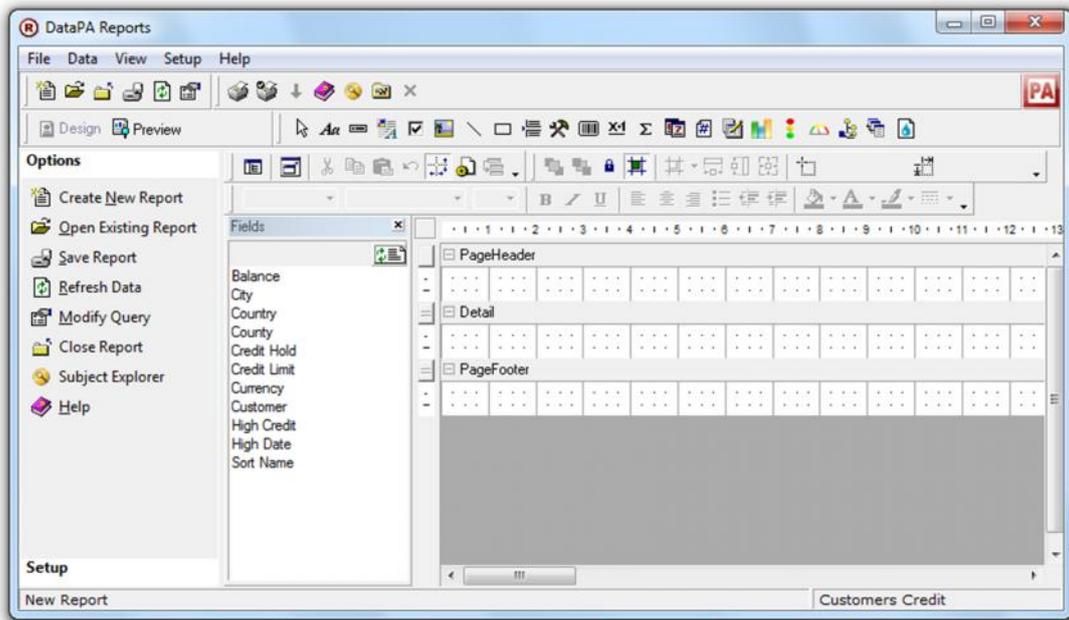
As we discussed in the lesson above, a DataPA Report is built using a DataPA query. When we create a report we can either create a new query for the report, or import an existing query to use as the basis for the new report.

Follow these steps to create a new report from an existing query:

1. From the *File* menu select *Create a New Report*.
2. Press *Next* to bypass the Introduction Screen.
3. Select *Copy an Existing Query*.



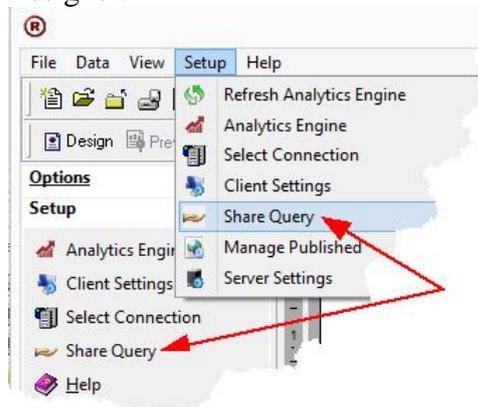
4. Press *Browse* and select the query file on disk.
5. Complete the query wizard, making any changes to the query as required.
6. Complete the *Run Query Wizard* to retrieve data for the report.



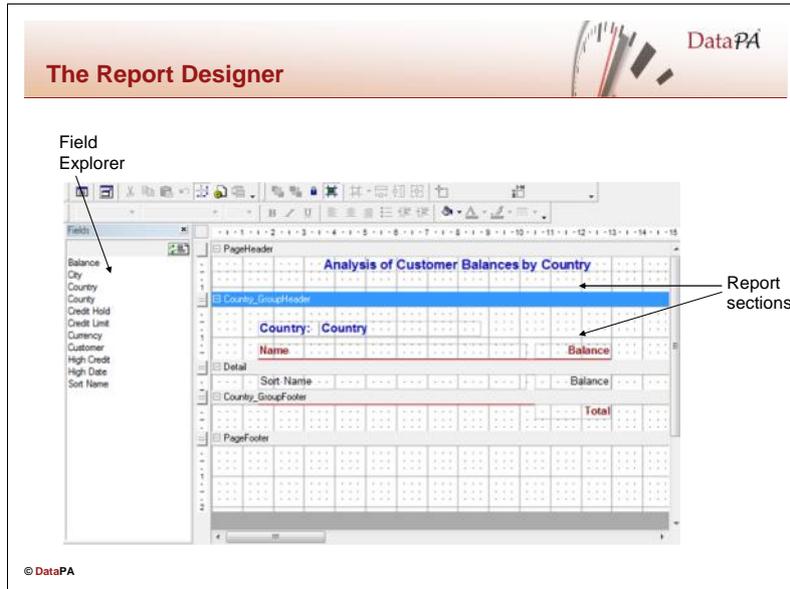
To create a report from a new query, follow the steps above but select *Create a New Query* instead of *Copy a Existing Query*.

To share a query from a report, so it can be opened and used in Excel follow these steps:

1. Select *Share Query* from the *Setup* menu of the DataPA Reports Designer.



2. Browse to the required directory, enter the name of the query and press *Save*.



## The Report Designer

When you first enter the Report Designer panel, you will see the following sections:

Section	Description
Fields	This section allows you to browse and select fields and drag and drop them onto sections of the report.
Page Header	This section represents the page header of the report. Anything added to this section will be repeated at the top of every page of the report.
Details	This section represents the details section of the report. Anything added to this section will be repeated for each row of data returned by the query.
Page Footer	This section represents the page footer of the report. Anything added to this section will be repeated at the top of every page of the report.

The following sections can be added by following the steps below:

1. Press the *Group* button on the toolbar in design mode.



2. Select the *Section Options* tag.
3. Select *Include Report Header/Footer*

Section	Description
Report Header	This section represents the report header. Anything added to this section will appear once at the top of the report.
Report Footer	This section represents the report footer. Anything added to this section will appear once at the bottom of the report.

### Adding fields to a Report

To add fields from the query to a report, follow these steps:

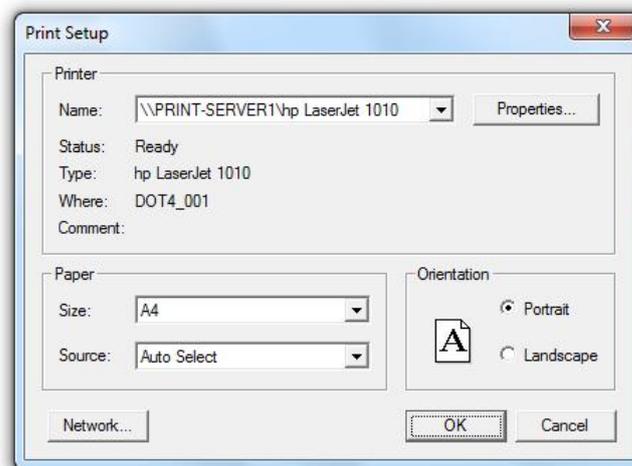
1. In the Fields box click the field you wish to add to the report, and drag it to the required position in the details section of the report. Column Headers will be automatically added to the Page Header Section.
2. Repeat step (1) for each field you wish to add to the report. You can select multiple fields at once

You can preview the results of changes at any time by switching between design and preview modes.

### Changing the Orientation of the Report

Sometimes you will want to change the page size or orientation of the report from Portrait to Landscape. Follow these steps to do this:

1. From the *File* menu, select *Print Setup*.
2. Select the page size and orientation from the *Print Setup* dialog box.



### Changing the Height of Report Sections

Follow these steps to change the height of a report section:

1. Press and hold the right mouse button over the bar at the bottom of the section
2. Drag it to the required size.

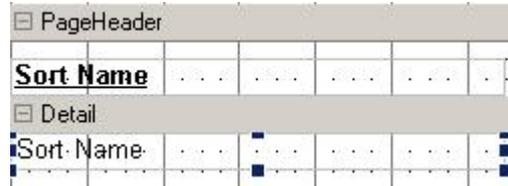
You can also automatically resize a section to fit the contents. To achieve this, follow these steps:

1. Press the right mouse button over the bar at the bottom of the section.
2. Select *Section Fit* then *Height* from the popup menu. (N.B Selecting *Section Fit* then *Width* will fit the width of the whole report to the contents of the section).

## Resizing and Moving Fields in a Report

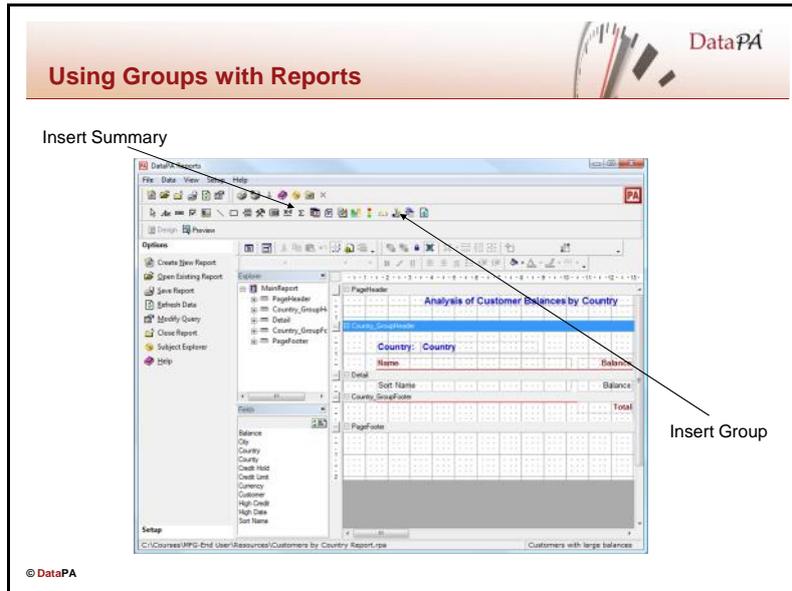
To resize a field on the report, follow these steps:

1. Press the left mouse button over the field to select it.



2. Move the mouse over one of the blue squares round the field, press the left mouse button and drag it to the size you require.

To move a field, click the left mouse button over the field and drag it to the position you require.



## Grouping Data

Often you will want to group your report data by one or more of the fields. The DataPA Reports designer provides functionality to allow us to group data easily and add summary fields for these groups.

To add a grouping to your data, follow these steps:

1. Click the *Group Options* button at the top of the report designer. The icon for this is .
2. Select the field you wish to group your report by.
3. Select whether you want the groups to be sorted in ascending or descending order.

Notice this adds two new sections to your report.

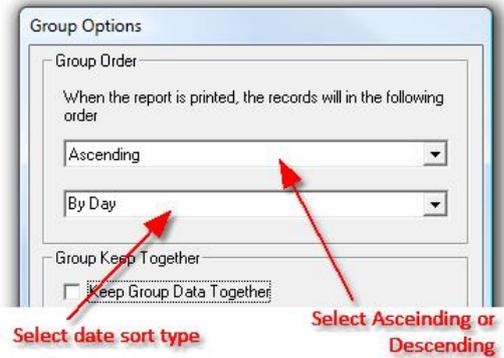
Section	Description
<Field Name>_GroupHeader	This section represents the group header. Anything added to this section will be repeated for each group in the specified grouping, and displayed above the group.
<Field Name>_GroupFooter	This section represents the group footer. Anything added to this section will be repeated for each group in the specified grouping, and displayed below the group.

### Group options

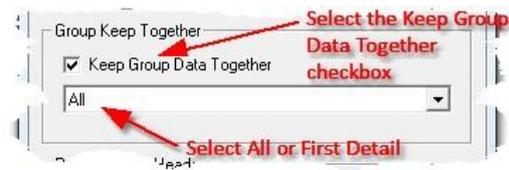
To access the Group Options screen, select a group field in the *Group Sections* list, then press options. Group Options allow set properties for your group that manage the behaviour of the group sections in your report. You can determine the sort order of your group, set whether or not the report attempts to keep each section for a particular group item on one page, and if and when the group header is repeated.

Groups are sorted by the field they are based on. You can choose the sort the field in either Ascending or Descending order by selecting the appropriate group order.

For Date fields, you can choose to group your data by day, month, year or quarter..

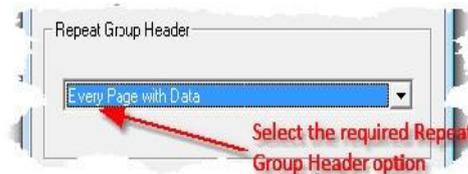


You can use the Group Keep Together options to set whether or not the report attempts to keep each section for a particular group item on one page.



If Keep Group Data Together is checked, selecting All means the group header, detail and group footer will print together on the same page. If Keep Group Data Together is checked, selecting First Detail means the group header will print with the first detail section on the same page or column.

The *Repeat Group Header* option determines whether a group header section should be printed again before its associated detail section when the detail section is broken across multiple pages or columns.



The table below details the values you can choose for this option.

Value	Description
None	Do not reprint the group header.
Every Page with Data	Print the group header at the top of each page within the group's detail sections.
Every Column	Print the group header at the top of each column within the group's detail sections.
All	Print the group header at the top of each column and page within the group's detail sections.
Every Page	Print the group header at the top of each page within the group's detail section even if there is no data in the section.

### Adding a Summary Field to the Report

The DataPA Reports designer allows you to easily add summary fields to your report. To add a summary field, follow these steps:

1. Click the *Summary Field* button at the top of the DataPA Report Designer. The icon for this button is 
2. Draw the summary field on the report.
3. Enter a name for the summary field.
4. Select the data field you wish to summarize.
5. Select the type of summary you require.
6. Select either *Grand Total* or the group by which you want to summarize the data.

### Adding Text Objects to the Report

Often you will want to add fixed text objects to a report, as labels or titles. To add a fixed text object, follow these steps:

1. Click the *Label* button at the top of the DataPA Report Designer. The icon for this button is 
2. Draw the label on the report.
3. Enter the text for your text object.

Text objects can be arranged and formatted in the same way as any other field or object on the report.

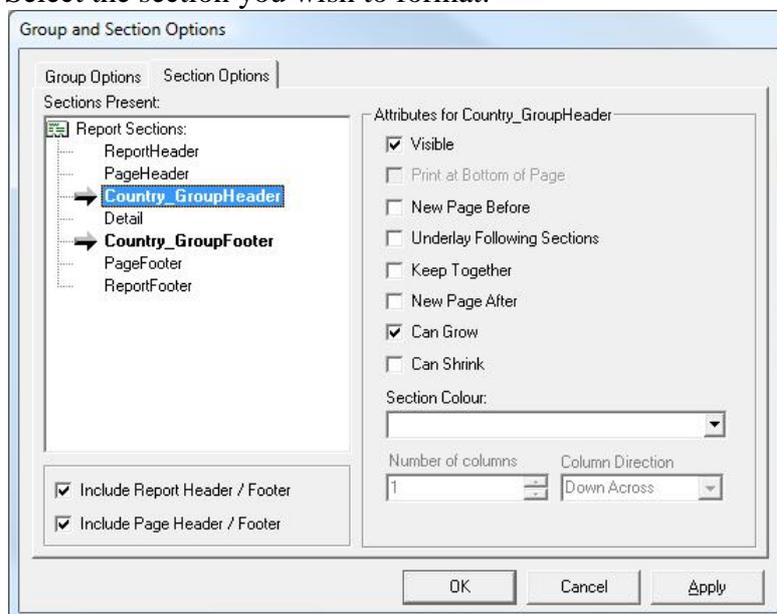


## Using the Section Expert

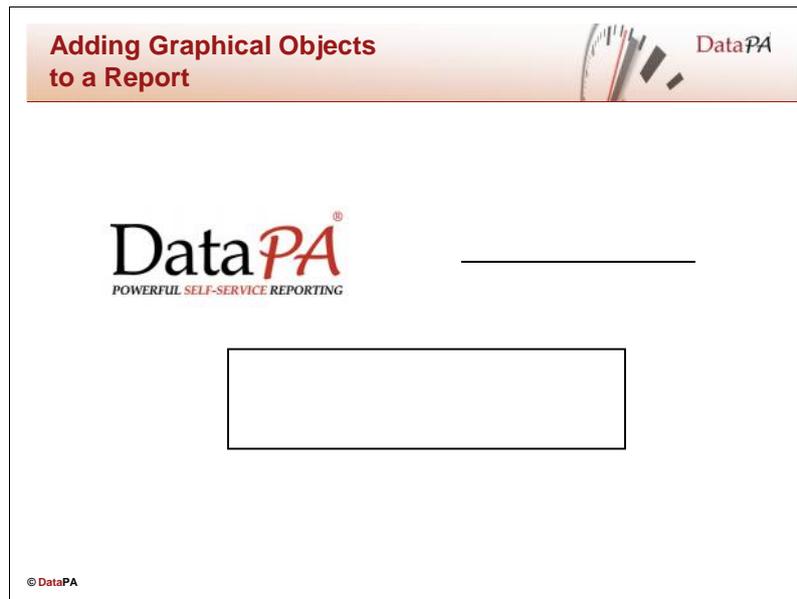
The section expert allows you to change the appearance and behaviour of sections within a report.

Follow these steps to access the section expert:

1. Select the *Group Options* button and then click on the *Section Options* tab.
2. Select the section you wish to format.



3. Select the required options.
4. Press *OK* to save your changes.



### Adding Images to a Report

To add an image to a report, follow these steps:

1. Select the *Image* button from the toolbar above the DataPA Report designer. The icon for this button is .
2. Draw the image onto the report where you would like it to appear
3. Browse to and select the picture you wish to insert into the report.

The image can be moved and resized in the report in the same way as any other object.

### Adding Lines or Boxes to a Report

To add a line or box to a report, follow these steps:

1. Select the *Line* button to insert a line (icon is ) or the *Shape* button to insert a box (icon is .
2. Draw the line or box onto the report and select the options you want for the line or box.

The line or box can be moved and resized in the report in the same way as any other object. To change the appearance of the line or box, follow these steps:

1. Press the left mouse button over the line or box to select it.
2. Press the right mouse button over the line or box and select *Edit* from the popup menu.
3. Select the format options you require and press *OK* to save your changes.



### Adding Special Fields to a Report

The DataPA Report designer provides some special fields such as page numbers, and today's date that you can use in your report.

Follow these steps to add a page number field to your report:

1. Select the *Page Number* button from the toolbar above the DataPA Report designer. The icon for this button is .
2. Draw the *Page Number* field onto the report to where you require it.
3. Select the type of page number you require.
4. Resize, position and format the *Page Number* field in the same way as you would with an ordinary field.

Follow these steps to add a current date and time field to your report:

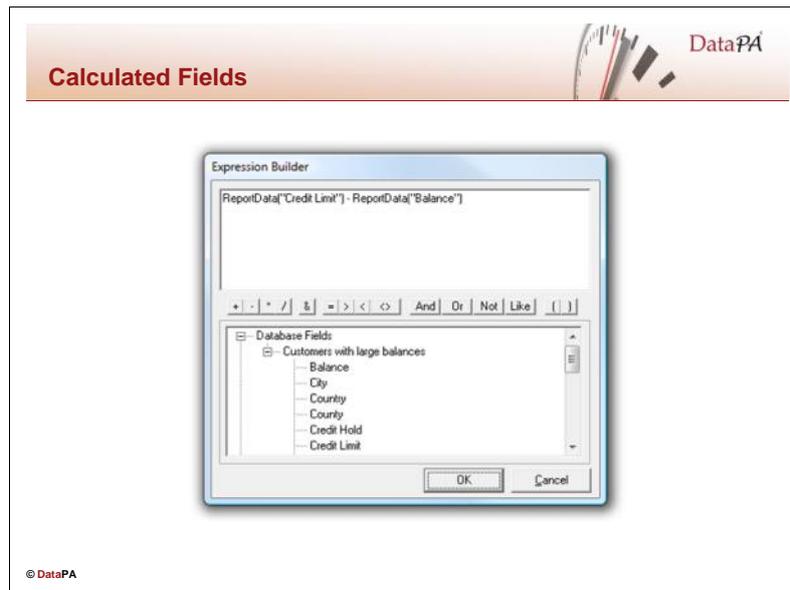
1. Select the *Date & Time* button from the toolbar above the DataPA Report designer. The icon for this button is .
2. Draw the *Date & Time* field onto the report to where you require it.
3. Select the type of date and time you require.
4. Resize, position and format the *Date & Time* field in the same way as you would with an ordinary field.

### Adding Query Condition Parameters to a Report

If the Report Query contains Condition Parameters then DataPA provides query condition descriptions in the DataPA Report Designer for each required field condition you added to your query.

Follow these steps to add query condition descriptions to your report:

1. Select the *Query Fields* button from the toolbar above the DataPA Report designer. The icon for this button is 
2. Draw the *Query Fields* field onto the report to where you require it.
3. Select the *Query Field* you want on your report.
4. Resize, position and format the query condition description in the same way as you would with a normal field.

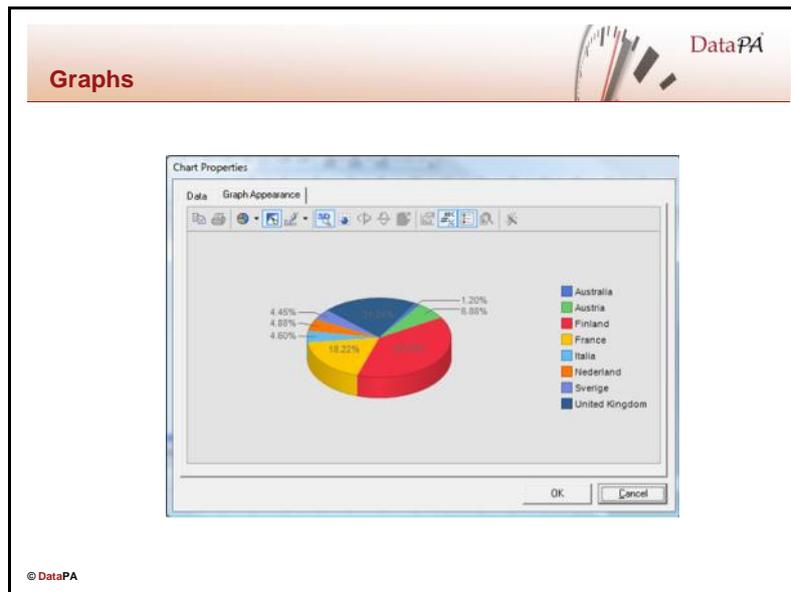


### Adding Calculated Fields to your Report

The DataPA Report Designer provides a rich array of functionality for creating calculated fields from the data, summary and other calculated fields in your report. A detailed look at how to build calculated fields is not covered in this course, however we will cover the basics of how to access the calculated fields editor and use calculated fields in your report.

To add a calculated field to your report, follow these steps:

1. Select the *Calculated Fields* button from the toolbar above the DataPA Report designer. The icon for this button is .
2. Draw the calculated field onto the report to where you require it.
3. Enter a name for the calculated field.
4. Enter the calculation you require for the field.
5. Resize, position and format the calculated field in the same way as you would with a normal field.

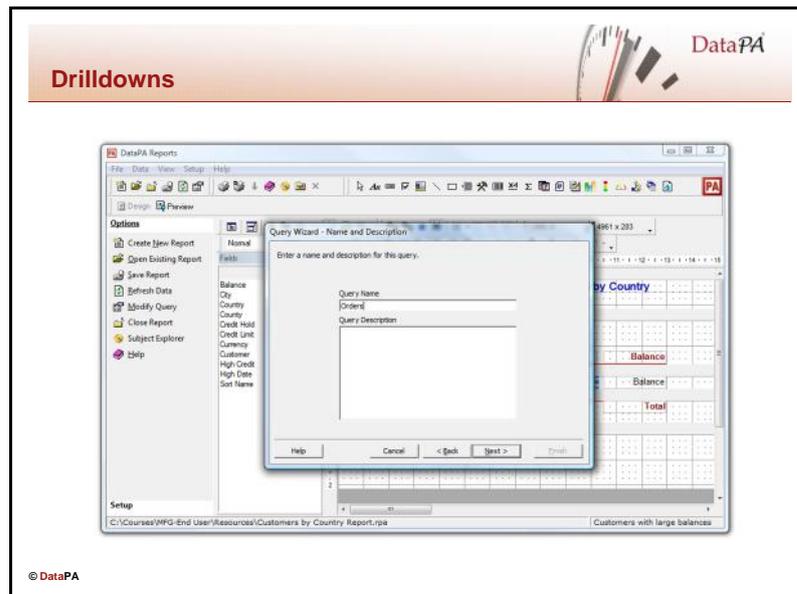


### Adding Graphs to your report

The DataPA Report Designer provides a rich array of functionality for creating graphs and charts from the data in your report.

To add a graph to your report, follow these steps:

1. Select the *Graph* button from the toolbar above the DataPA Report designer. The icon for this button is 
2. Select the field you want to use to summarise the data from the list tree view on the left and select the top > button to move that field into the 'On change of' box.
3. Select the field you want to be summarised the list from the tree view on the left and select the bottom > button to move that field into the 'Show values' box.
4. Select the Graph Appearance tab.
5. Select the graph type you want to use in this case using the *Gallery* button 
6. Set any other chart options as required
7. Click OK

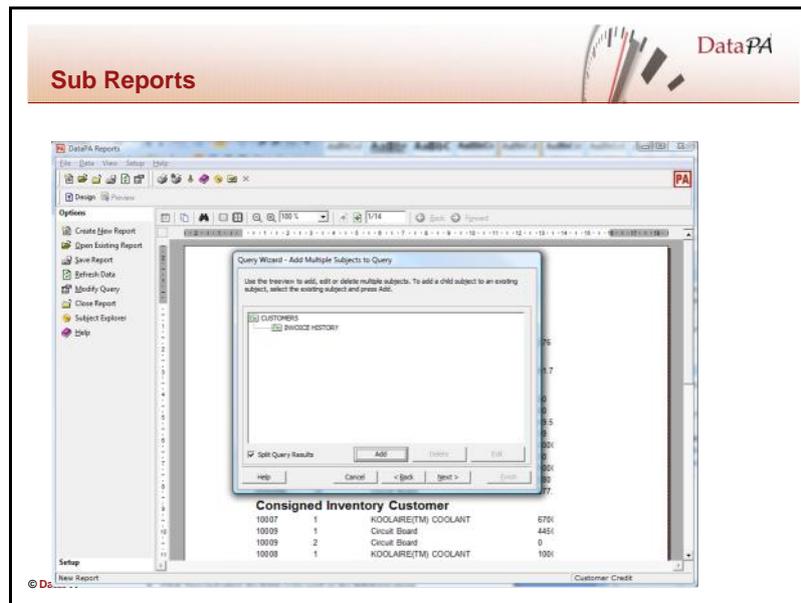


### Adding Drilldowns to your report

The DataPA Report Designer allows users to add drilldowns to fields in their reports. This allows users to create interactive reports with users able to move easily from level of information to another. For example, a user might want to be able to drill into customer information to see invoices or order for that customer on a separate report.

To add a drilldown to your report, follow these steps:

1. Highlight the field you want to drilldown on and right click
2. Select *'Add Drill Down'*
3. Enter a name for the query the drilldown will use
4. Click *Next* and select the subject to be used for the drilldown
5. Click *Next* and add the conditions which will be used to joining the drilldown report with it's parent report
6. Click *Next* and select the fields to be used on the drilldown report
7. Click *Next* and select the fields that the data on the drilldown report should be sorted by.
8. Click *Next* and then *Finish*
9. Design the drill down report just as you would a normal report
10. When finished designing the report use the *'Close Drill Down'* button to return to the parent report

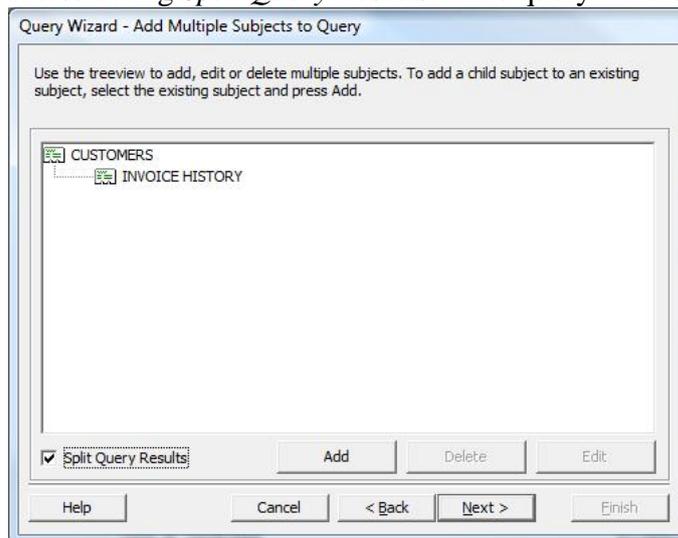


## Adding sub reports to your report

DataPA allows reports to contain any number of child reports called sub reports. Child reports, or Sub reports, are executed each time their parent section (the section in which the Sub report is placed) is printed. Sub reports can be based on the same data as the parent report, or child data based on a query containing multiple subjects, with split results selected so the query returns more than one recordset.

To add a sub reports to your report, follow these steps:

1. If required, add one or more child subjects to the query your report is based on, ensuring that any fields used to link subjects are included in the fields (These fields will be used by the report designer to filter the sub reports, so you will get unexpected grouping results without them), and selecting *Split Query Results* in the query wizard.

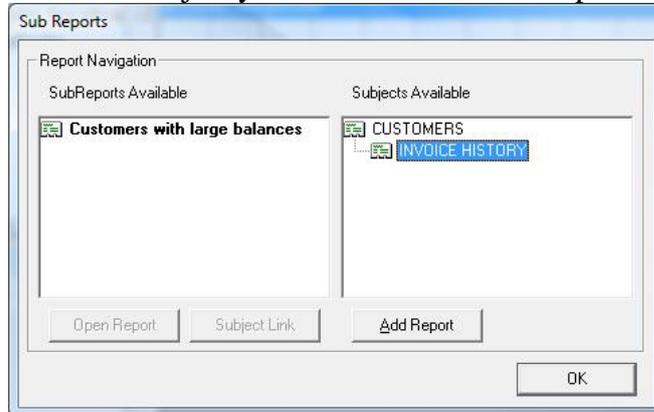


2. Refresh the query. (This will be done for you when you finish the query wizard).

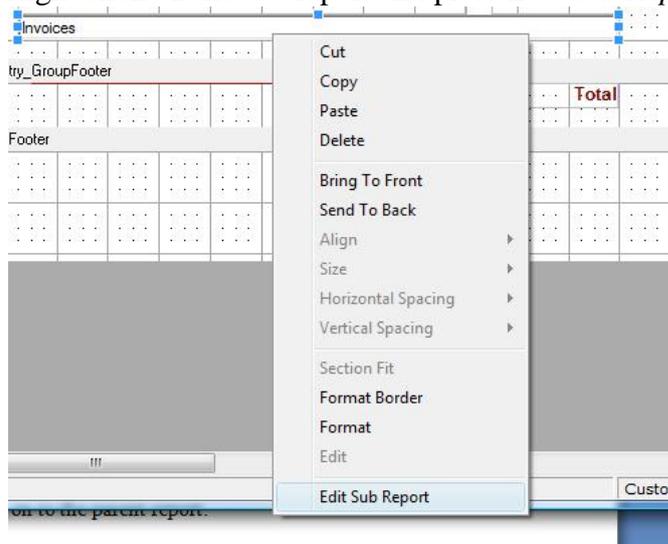
3. In design mode, select the sub reports button.



4. Select the subject you wish to add the sub report for and press *Add*.



5. Draw the sub report on to the parent report.
6. Right click on the sub report and press *Edit Sub Report*



7. Design the sub report (you can preview it as you go).
8. Close the sub report with the close report button



9. Preview the main report.



### Preparing Your Report to Print

Before you print your report, you should check the print setup as this will effect the appearance and layout of your report.

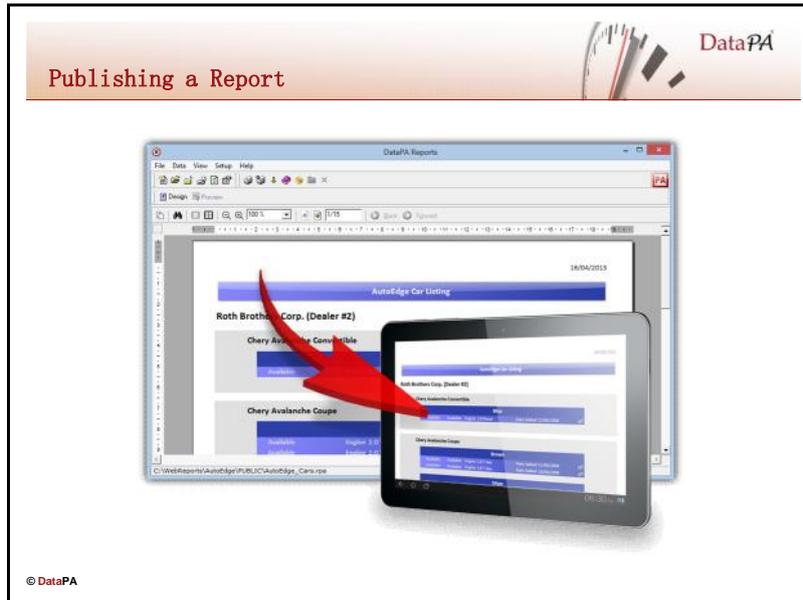
To check your print setup, follow these steps:

1. Select *Print Setup* from the *File* menu.
2. Select the print options you require.
3. Press *OK* to save your changes.
4. Check your report in the Preview panel to see if the layout has changed.

### Printing Your Report

Follow these steps to print your report:

1. Select *Print* from the *File* menu.
2. Select the number of copies and pages you want to print.
3. Press *OK* to print the report.



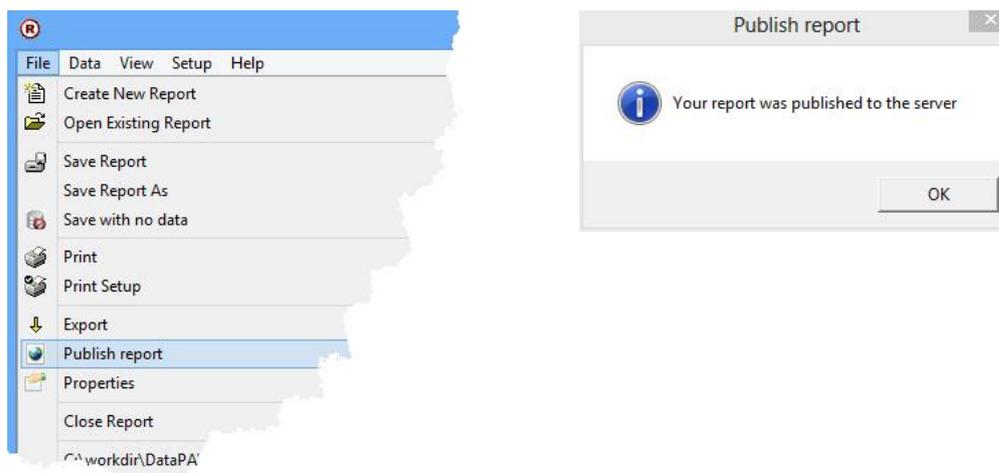
## Publishing a Report

To publish a report, select *Publish* from the *File* menu on the toolbar.

Please note that, if security is enabled in your DataPA environment, then you need to be logged in as a user belonging to a group with the "Members of this group can publish content" permission item checked before you can access this screen

**Note:** To be able to publish a report to the DataPA Enterprise Service, a valid Category must be set within the Report Properties window.

If the report is correctly defined, you will see a publish information box informing you that the application has published your report.



### Managing Published Content

The Manage Published screen is intended to maintain content which has been published to the DataPA Enterprise Service.

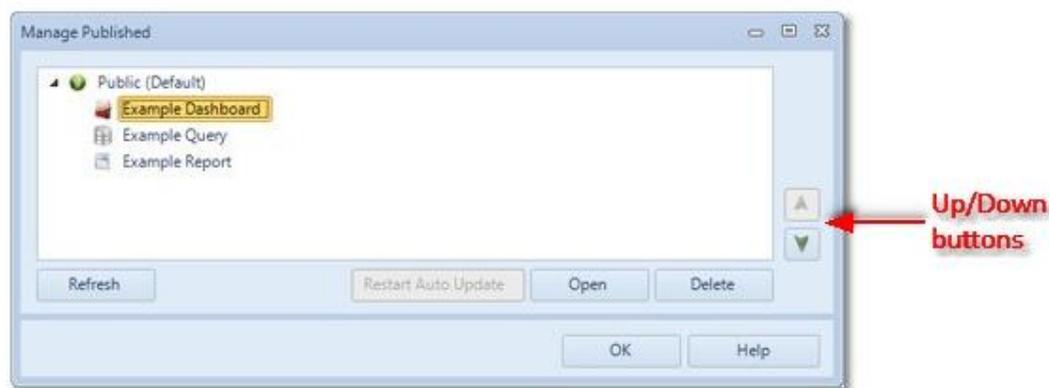
Please note that, if security is enabled in your DataPA environment, then you need to be logged in as a user belonging to a group with the "Members of this group can publish content" permission item checked before you can access this screen

To manage published content, select *Manage Publish* from the *Setup* menu on the toolbar.

Please note that, if security is enabled in your DataPA environment, then you need to be logged in as a user belonging to a group with the "Members of this group can publish content" permission item checked before you can access this screen.

There are currently three types of content that may be published from the various components of the DataPA product suite to the DataPA Enterprise Service:

- Queries from the MS Excel or Access add-ins
- Dashboards from the DataPA Dashboard Designer
- Reports from the DataPA Report Designer



The **Refresh** button will query the DataPA Enterprise Service and rebuild the list of content in case it has been changed.

The **Restart Auto Update** button is only applicable for dashboards whose queries have been set to refresh automatically. Selecting this option refreshes the query and sets the start time in the Refresh Schedule screen to the current time.

The **Open** button will open the selected content, however this is context sensitive, it will only be enabled if

- You have a dashboard selected and the screen was launched from the Dashboard Designer

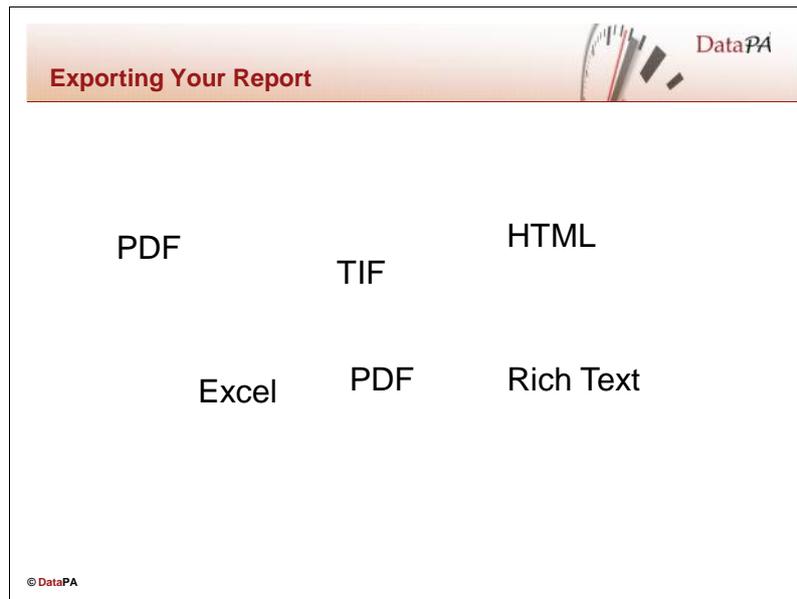
## DataPA OpenAnalytics End User Training

- You have a query selected and the screen was launched from the Excel / Access add-in
- You have a report selected and the screen was launched from the Report Designer.

The **Delete** button will remove the selected content from the DataPA Enterprise Service.

The **Up** and **Down** buttons can be used to reorder the content.

If you right click on a dashboard, report or query on this screen when you will have the option **Copy Enterprise URL to Clipboard** which will copy the URL you need to view that content directly in DataPA Enterprise. This is particularly useful if you are embedding content in a third party web application.



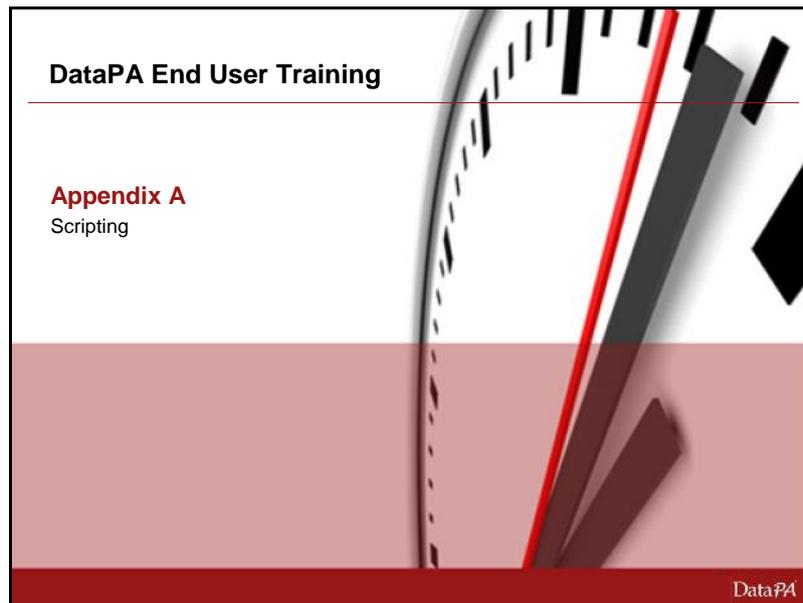
### Exporting Your Report

The DataPA Report designer provides functionality to export your report to a host of different formats so you can view it from other applications.

To export your file, follow these steps:

1. Select *Export* from the *File* menu.
2. Select the type of export you want.
3. Enter the destination for the export.
4. Press *OK* to start the export.

NB. The Export option becomes enabled when a report's query has been run to generate data.



## Appendix A - Scripting

### Introduction

In this lesson you will learn how to use scripting in DataPA reports for more complex tasks such as conditional formatting and adding ActiveX controls. The lesson will not cover VBScript syntax in any depth.

### Learning Objectives

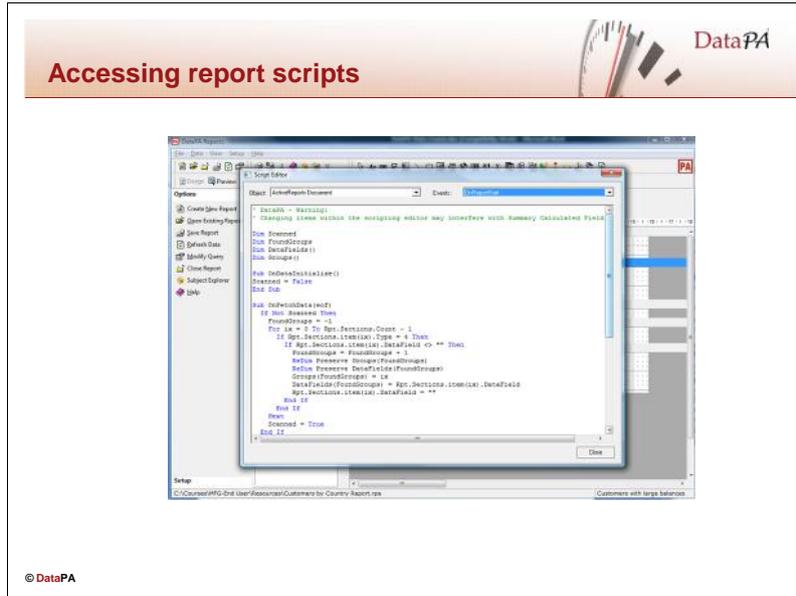
When you complete this lesson you should be able to:

- Accessing report scripts
- The script structure
- Adding ActiveX controls to a report
- Accessing object properties
- Referencing report objects in scripts
- Referencing data in scripts

### Prerequisites

Before you begin this lesson you should be able to:

- Open and design report in the DataPA Report designer.
- Refresh a report in the DataPA Report designer.
- A familiarity with VBScript is an advantage.



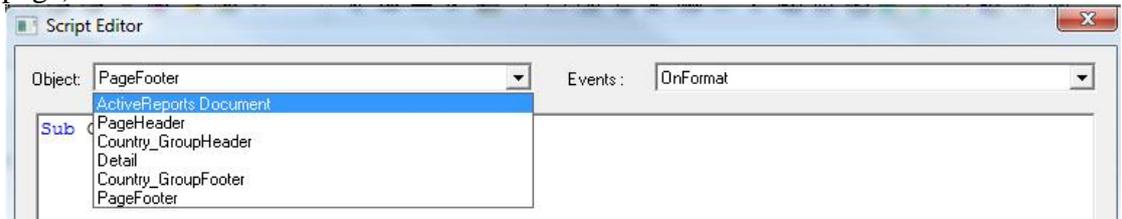
## Accessing Report Scripts

All DataPA reports have scripts behind them that control the behaviour of the report when it is rendered. To access the scripts follow these steps:

1. Open a report.
2. Select *design*
3. Click on the *View Script* button.

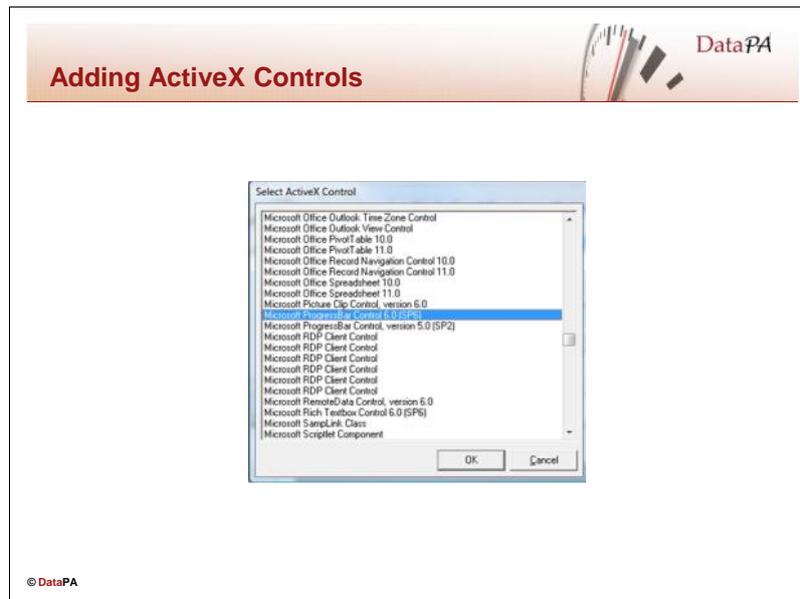


4. Select the appropriate *object*, and *event* in the combo boxes, then enter your code. (Objects and events are detailed in the table on the next page).



Object	Description
<b>ActiveReports Document</b>	There is a single active reports object in each report. This object refers to the report itself, and has related events that can be used to modify properties or behaviour for the whole report.
<b>Section</b>	There is a section object for each section of the report. The section events allow you to modify behaviour or properties for each instance of the section.

Event	Object	Description
OnDataInitialize	Report	Event fired before ReportStart to add custom fields to report fields collection. In a DataPA report, the recordset is opened and the recordset fields are added to the custom Fields collection then the DataInitialize event is fired so that new custom fields can be added.
OnReportStart	Report	Occurs before a report starts processing.
OnReportEnd	Report	Occurs when report finishes processing
OnPageStart	Report	During the report's processing, this even Occurs before a page is rendered.
OnPageEnd	Report	Occurs after each page in the report is rendered.
OnHyperLink	Report	This event fires when a hyperlink is clicked. It can be used to redirect a hyperlink or prevent the link from activating.
OnfetchData	Report	Event is fired every time a new record is processed. Use to set the values of custom fields that were added in the Data Initialize event.
OnNoData	Report	Occurs when the reports recordset is empty. There is no data to be processed.
OnPrintProgress	Report	Fired for each page during a print job.
OnError	Report	Occurs as the result of a DataPA Reports error.
OnFormat	Section	Fired after the data is loaded and bound to the fields, but before the section is laid out for printing. You can use this event to modify the layout of the section or any of the controls on it. This is the only event in which you can modify the height of the section.
OnBeforePrint	Section	Fired before the section is rendered. You can use this event to modify the values of the controls before they are printed. Any changes that are made here will not affect the height of the section.
OnAfterPrint	Section	Fired after the section is Printed. You can use this event to update any counters that you need to use after the report is completed.



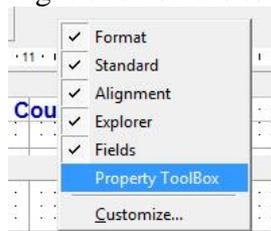
## Adding ActiveX Controls

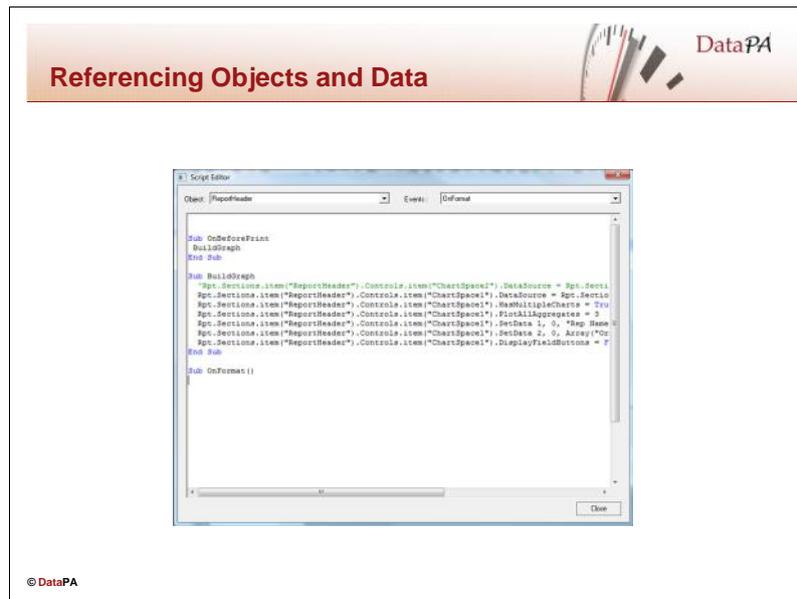
You can add any registered ActiveX control to a DataPA report. Follow the steps below to add an ActiveX control to a report:

1. Open a report.
2. Select design mode.
3. Select the ActiveX control button (  )
4. Select the control you want to add to the report.
5. Draw the control on to the report.

To view the properties of an ActiveX, or any object, follow these steps:

1. Select the object.
2. Right click on the toolbar and select *Property ToolBox*





## Referencing Objects and Data

In order to achieve anything useful with report scripting, we need to be able to reference objects on the report, their properties and the data of the report.

### Referencing Objects

Reports can be referenced in the script using the identifier `Rpt`. Each report has a sections collection that contains each section on that report. Each section on a report has a controls collection that contains every object in the section. As such, the syntax to reference a control in a report is:

```
Rpt.Sections.item("<SectionName>").Controls.item("<ControlName>")
```

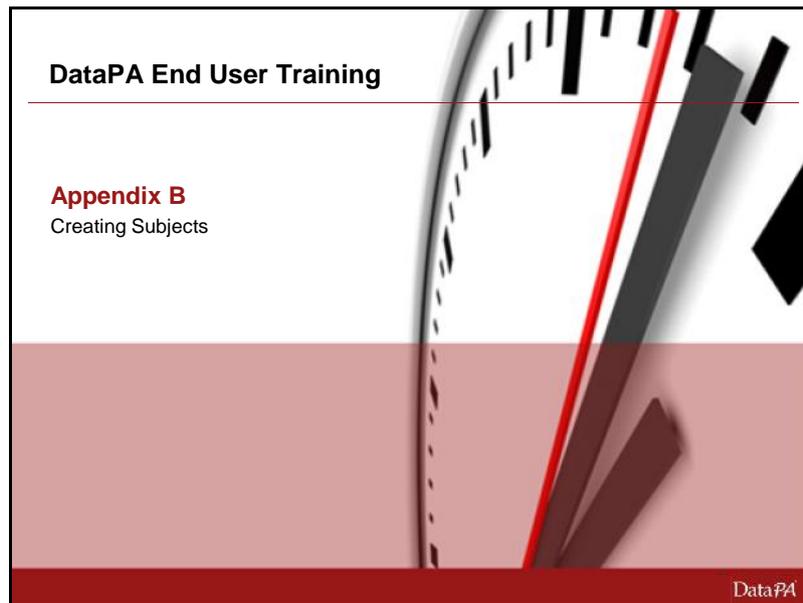
Where `<SectionName>` is the name of the section and `<ControlName>` is the name of the control as referenced in the *Property Toolbox*.

### Referencing Data

Reports can be referenced in the script using the identifier `Rpt`. Each report has a fields collection that contains the value of each field on the report when referenced. As such, the syntax to reference a field value in a report is:

```
Rpt.Fields.Item("<FieldName>")
```

Where `<FieldName>` is the name of the field.



### Introduction

Subjects are the foundation for all queries users will create with DataPA. As such they define the scope, structure and efficiency of the information that is available through the product. This lesson shows in detail how build subjects by combining the DataPA subject wizard with Progress ABL business logic structures.

### Learning Objectives

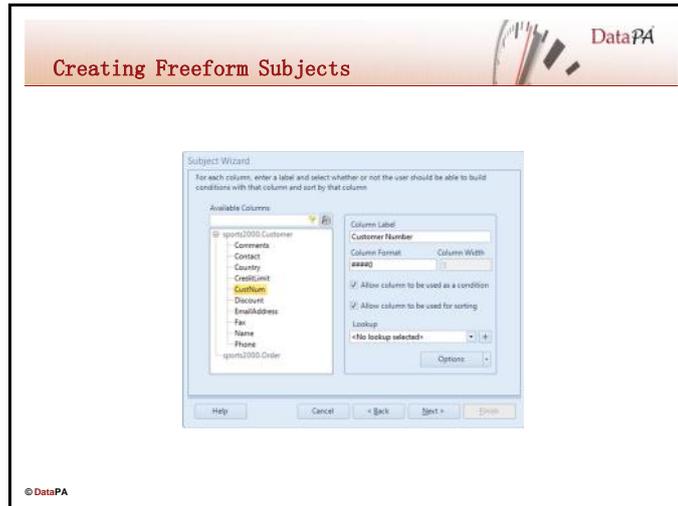
When you complete this lesson, you should be able to:

- Create freeform subject using the subject wizard.
- Modify and delete existing subjects
- Add calculated columns to a freeform subject.
- Create, administer and use dynamic functions with a freeform subject.
- Create Business Logic subjects from Progress Dynamic Functions
- Create SDO subjects

### Prerequisites

Before you begin this lesson you should be able to:

- Use DataPA to create and run queries and reports
- Write ABL business logic.
- Understand the use of Dynamic functions and super procedures.



## Introduction

Users create queries with DataPA to extract data for their reports and exports. Subjects are the basic building blocks for queries and all DataPA Queries are based on one or more Subjects. As such, Subjects are a way of hiding the underlying database complexity and controlling the Query building process. They provide a user friendly view of the data and prevent the use of unrelated tables, inefficient sorting on non-index fields, inefficient finds on non-index columns and the display of sensitive or system data. Each subject is related to a single system. Subjects can either be built using the links created for a system, in which case it is a freeform query, or using some bespoke ABL business logic on the server, in which case it is a Business Logic or SDO subject. First we will look at creating, modifying and deleting a simple freeform subject.

## Creating a freeform subject

Follow these steps to create a freeform subject:

1. Open the DataPA Analytics Engine screen and ensure your System is selected.
2. Select *File* → *New* or Click on the *New System* button on the Ribbon
3. Press *Next*, then enter a name and description for the subject.
4. Press *Next*, then select the system you wish to create a subject for
5. Press *Next*, press *Next* again to create a freeform subject

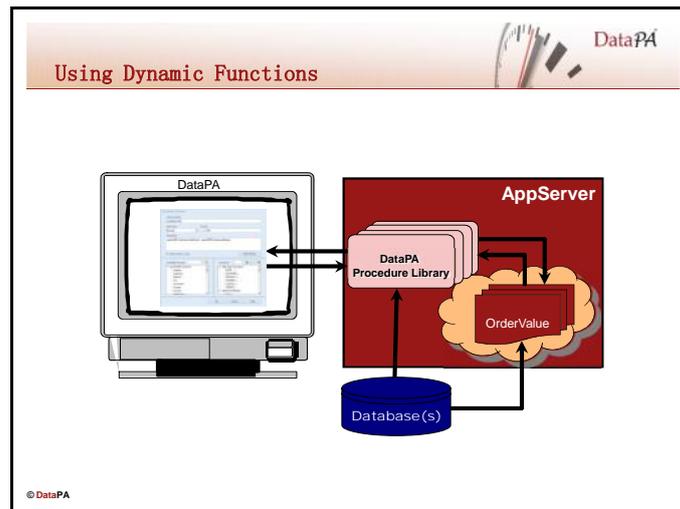


6. Select the tables you require for the subject (if you do not want to use the default link for a table, press *Modify Link* to modify the link for this subject only) and press *Next*
7. Enter any filter conditions to filter the subject. These filter conditions are similar to those that can be entered when creating a query described in lesson 2, however they are not visible to the end user and are included with any query created using this subject. Press *Next*.
8. Select the columns you wish to be available for this subject.

## DataPA OpenAnalytics End User Training

9. Press *Next* (we will cover calculated columns later in this lesson), then for each column, specify a user friendly name, whether or not it can be used as a condition and whether or not it can be used for sorting. **NB** By default, only indexed fields will be allowed as conditions and sort columns.





### Introduction

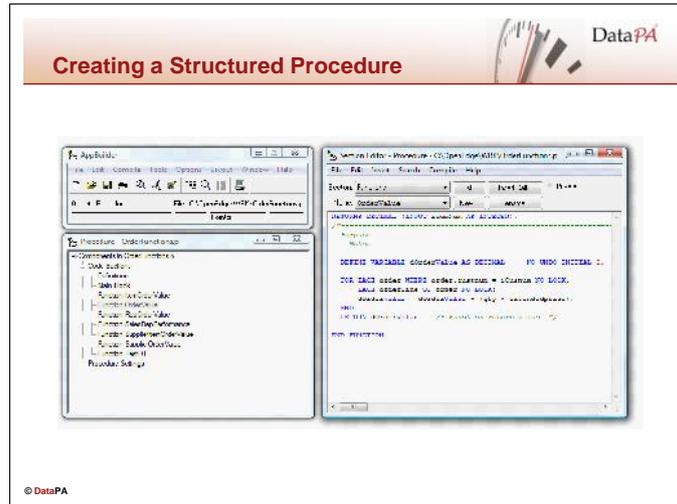
Dynamic functions can be used in DataPA to create complex calculated columns for freeform subjects and, if the function returns a handle to a temp-table, for creating Business Logic subjects.

### Preparing Dynamic Functions for use by DataPA

Before you can use a dynamic function in DataPA you must complete the following steps:

1. Create a Progress structured procedure that containing the functions you wish to use from DataPA
2. Create a Progress procedure to add the structured procedure containing your functions to the super procedure stack and add this as the AppServer startup procedure.
3. Add calculated columns that call the dynamic functions to your subjects.

Each of these steps will be described in detail below.



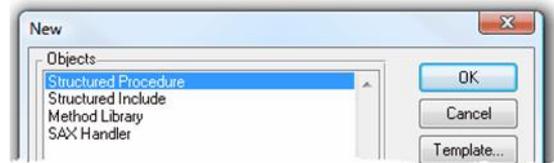
## Introduction

In order to use a dynamic function in DataPA we must first write the functions as Progress ABL functions. The functions can take any number of input parameters, and return a single value.

## Creating a Structured Procedure

Follow these steps to create a structured procedure library that can be used for dynamic function calls from DataPA:

- Open the Progress AppBuilder
- Select *File* → *New*, ensure the *Procedures* tab is selected, select *Structured Procedure* and press *OK*



- From the *Section* combo box of the Section Editor, select functions.
- Press *OK* to confirm you want to create a new function.
- Enter the name of the function you want to create and select the appropriate data type, then press *OK*.
- Enter the code for your function, including any input parameters and setting the return value. (see example below).

1. Save the structured procedure somewhere in the PROPATH of your AppServer.

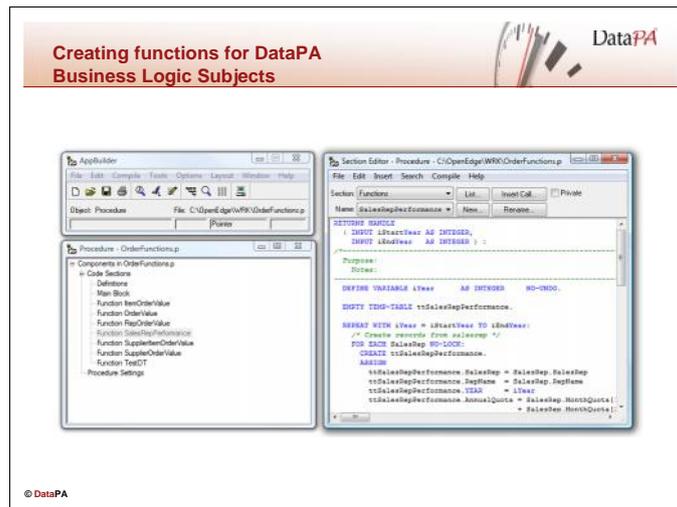
```

RETURNS DECIMAL ( INPUT iCusnum AS INTEGER ) :
/*-----
Purpose:
Notes:
-----*/
DEFINE VARIABLE dOrderValue AS DECIMAL          NO-UNDO INITIAL 0.

FOR EACH Order WHERE Order.custnum = iCusnum NO-LOCK:
    FOR EACH orderline OF order NO-LOCK:
        dOrderValue = dOrderValue + extendedprice.
    END.
END.
    
```

## DataPA OpenAnalytics End User Training

```
RETURN dOrderValue. /* Function return value. */  
END FUNCTION.
```



## Introduction

Dynamic functions can be used in DataPA for creating Business Logic subjects. This section details how to write a Dynamic function that can be used in a DataPA Business Logic Subject.

## Creating Dynamic Functions for Business Logic Subjects

To add a Dynamic Function that can be used from a DataPA Business Logic Subject, follow these steps:

1. In the definitions section of your Structured Procedure, add a definition for the Temp-Table you wish to return. Make sure you add the RCODE-INFORMATION option to your temp-table definition so the format and labels are passed to DataPA.

```

DEFINE TEMP-TABLE ttSalesRepPerformance NO-UNDO RCODE-INFORMATION
  FIELD SalesRep      LIKE SalesRep.SalesRep
  FIELD RepName      LIKE SalesRep.RepName
  FIELD YEAR         AS INTEGER FORMAT "9999" LABEL "Financial Year"
  FIELD AnnualQuota  AS DECIMAL FORMAT ">>>, >>>, >>9.99" LABEL "Annual Quota"
  FIELD TotalSales   AS DECIMAL FORMAT ">>>, >>>, >>9.99" LABEL "Total Sales"
  FIELD Percentage   AS DECIMAL FORMAT ">, >>>, >>9.99" LABEL "Percent Achieved"
  INDEX idx1 IS PRIMARY IS UNIQUE SalesRep YEAR.
    
```

2. Create a new function, with a return type of handle.
3. Define any input parameters for your temp table.
4. Enter code to empty the temp-table.
5. Enter code to populate the temp-table.
6. Return the handle for the temp-table.

```

RETURNS HANDLE
( INPUT iStartYear AS INTEGER,
  INPUT iEndYear   AS INTEGER ) :
/*-----
Purpose:
Notes:
-----*/
DEFINE VARIABLE iYear      AS INTEGER      NO-UNDO.

EMPTY TEMP-TABLE ttSalesRepPerformance.

REPEAT WITH iYear = iStartYear TO iEndYear:
  /* Create records from salesrep */
  FOR EACH SalesRep NO-LOCK:
    CREATE ttSalesRepPerformance.
    
```

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```
ASSIGN
  ttSalesRepPerformance.SalesRep = SalesRep.SalesRep
  ttSalesRepPerformance.RepName  = SalesRep.RepName
  ttSalesRepPerformance.YEAR     = iYear
  ttSalesRepPerformance.AnnualQuota = SalesRep.MonthQuota[1]
                                       + SalesRep.MonthQuota[2]
                                       + SalesRep.MonthQuota[3]
                                       + SalesRep.MonthQuota[4]
                                       + SalesRep.MonthQuota[5]
                                       + SalesRep.MonthQuota[6]
                                       + SalesRep.MonthQuota[7]
                                       + SalesRep.MonthQuota[8]
                                       + SalesRep.MonthQuota[9]
                                       + SalesRep.MonthQuota[10]
                                       + SalesRep.MonthQuota[11]
                                       + SalesRep.MonthQuota[12].

END.

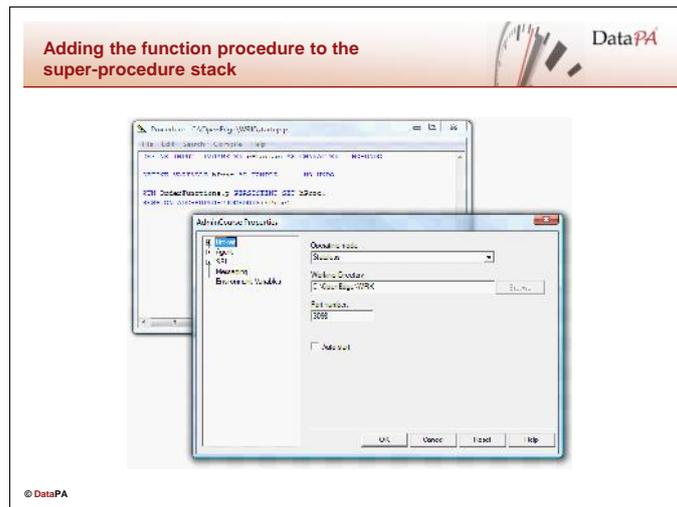
/* Add up order value */
FOR EACH Order WHERE Order.OrderDate >= DATE(1,1,iYear)
                    AND Order.OrderDate <= DATE(12,31,iYear)
                    NO-LOCK:
  FIND ttSalesRepPerformance
    WHERE ttSalesRepPerformance.SalesRep = Order.SalesRep
          AND ttSalesRepPerformance.YEAR = iYear NO-ERROR.
  IF AVAILABLE ttSalesRepPerformance THEN DO:
    FOR EACH OrderLine OF Order NO-LOCK:
      ttSalesRepPerformance.TotalSales = ttSalesRepPerformance.TotalSales +
      OrderLine.ExtendedPrice.
    END.
  END.
END.

/* Work out percentage */
FOR EACH ttSalesRepPerformance:
  IF ttSalesRepPerformance.TotalSales = 0
    THEN ttSalesRepPerformance.Percentage = 0.
  ELSE ttSalesRepPerformance.Percentage = (ttSalesRepPerformance.TotalSales
/ ttSalesRepPerformance.AnnualQuota).
  END.
END.

FOR EACH ttSalesRepPerformance:
  DISP ttSalesRepPerformance WITH 1 COLUMN.
END.

RETURN TEMP-TABLE ttSalesRepPerformance:HANDLE. /* Function return value. */

END FUNCTION.
```



## Introduction

In order to use the functions defined in structured procedure from DataPA, they need to be placed into memory on the server and made available to the AppServer. To do this, we use an AppServer startup procedure, which is called each time an agent starts, to run the structured procedure persistently and place it on the super-procedure stack of the AppServer agent session.

## Adding the function procedure to the super procedure stack

Follow these steps to add the structured procedure that contains the function definitions to the super procedure stack:

1. Open the Progress AppBuilder
2. Select *Tools* → *New Procedure Window*
3. When an AppServer agent runs a startup procedure, it passes in a character variable. Therefore your procedure must start with an input character variable definition as below:

```
DEFINE INPUT PARAMETER startup-data AS CHARACTER NO-UNDO.
```

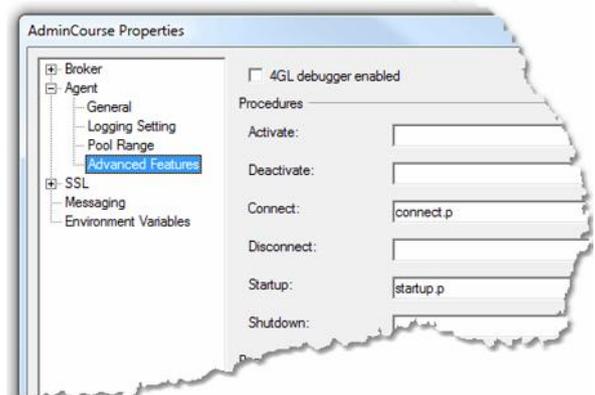
4. Define a progress handle variable we can use to store the procedure handle:

```
DEFINE VARIABLE hProc AS HANDLE NO-UNDO.
```

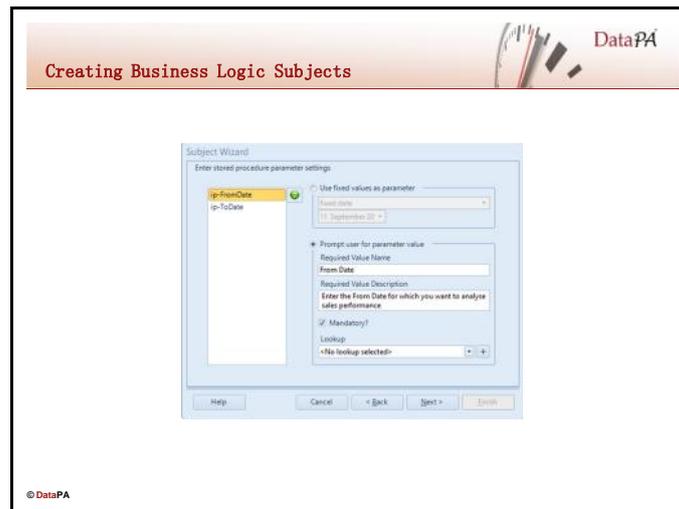
6. Run the structured procedure persistently, storing the handle in the defined variable, and add it to the session super procedure stack.

```
RUN OrderFunctions.p PERSISTENT SET hProc.  
SESSION:ADD-SUPER-PROCEDURE (hProc).
```

7. Save the procedure as startup.p somewhere in the PROPATH of the AppServer.
8. Open Progress Explorer
9. Open the properties screen for your AppServer
10. Select *Agent* → *Advanced Features*
11. Enter startup.p in the *Startup* text box.
12. Press *OK*
13. Restart the AppServer.







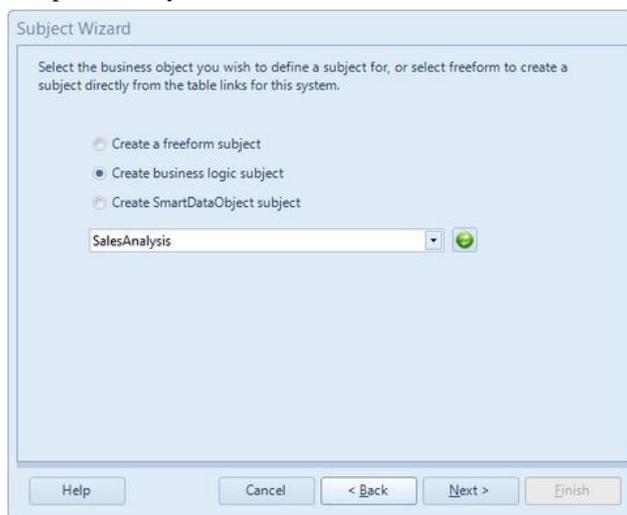
## Introduction

In addition to creating freeform subjects, DataPA also allows the creation of subjects from Business Logic functions running persistently on the AppServer.

## Creating Business Logic Subjects

Follow these steps to create an SDO subject:

1. Open the DataPA Analytics Engine screen and ensure your System is selected.
2. Select *File* → *New Subject* or click on the *New Subject* button on the Ribbon.
3. Press *Next*, then enter a name and description for the subject.
4. Select the System and press *Next*
5. Select *Create Business Logic Subject* and select the persistently running business logic procedure you wish to use.

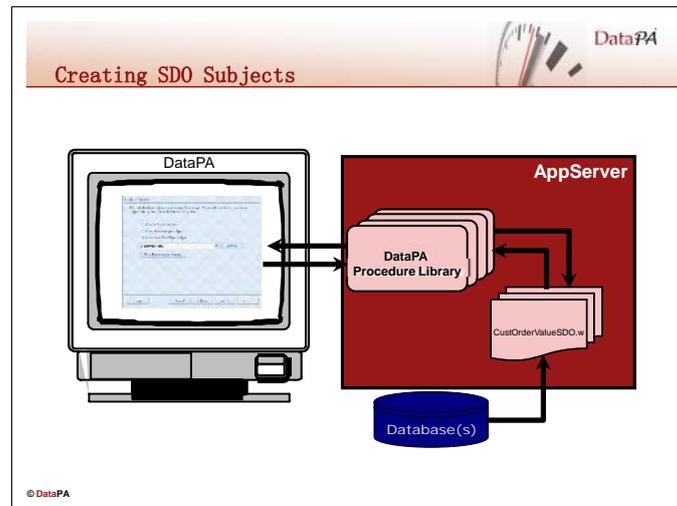


6. Press *Next*.

7. For each input parameter of the business logic function, specify whether or not you want the subject to use the stored value or prompt the user for an input parameter. If you are going to prompt the user, you need to enter a name and description for the parameter and specify whether or not the parameter is mandatory. If the parameter is not mandatory, and the user chooses to skip the parameter when they run a query, a null value will be passed to the business logic procedure.

8. In the *Test Execution Parameter Wizard Step*, enter a value for each input parameter for your function, then press *Finish*.

9. Press *Next*, and enter any further conditions you wish to set against the subject.
10. Press *Next* and select which columns you wish to be available with the subject.
11. Press *Next*, then for each column, specify a user friendly name, whether or not it can be used as a condition and whether or not it can be used for sorting.



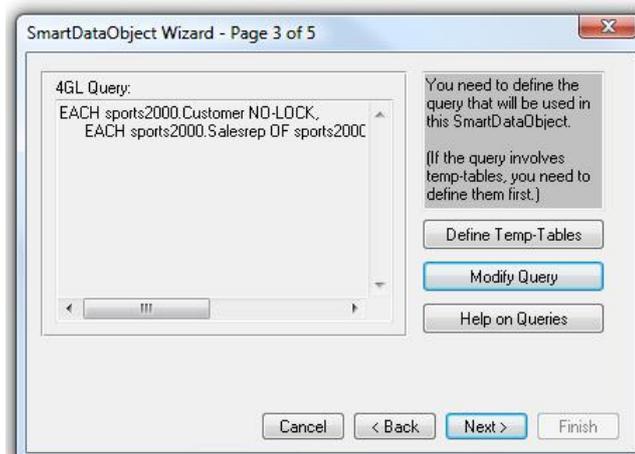
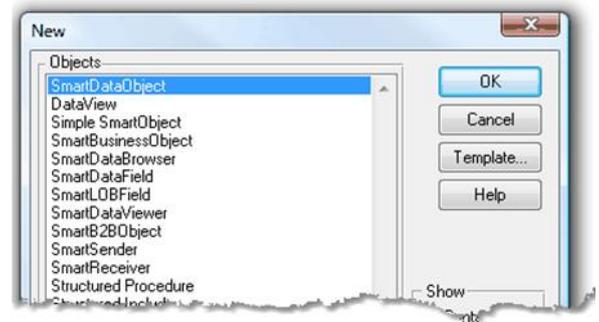
## Introduction

In addition to creating freeform subjects, DataPA also allows the creation of subjects from ADM2 and Dynamics Smart Data Objects (SDO's). SDO's form the basis of the Progress ADM2 and Dynamics frameworks and are designed to provide read and write access to a database in a distributed environment. For DataPA, SDO's provide a consistent method of accessing any server-side business logic to read data, allowing DataPA to support almost any complex reporting requirement. SDO's are Progress procedures and can be created quickly and simply using the Progress wizard.

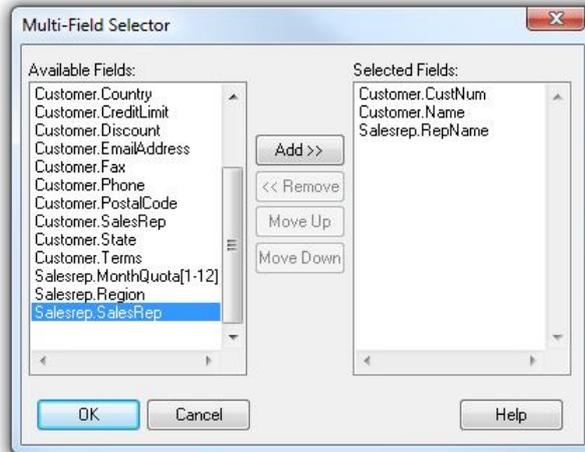
## Creating SDO Subjects

Follow these steps to create an SDO subject:

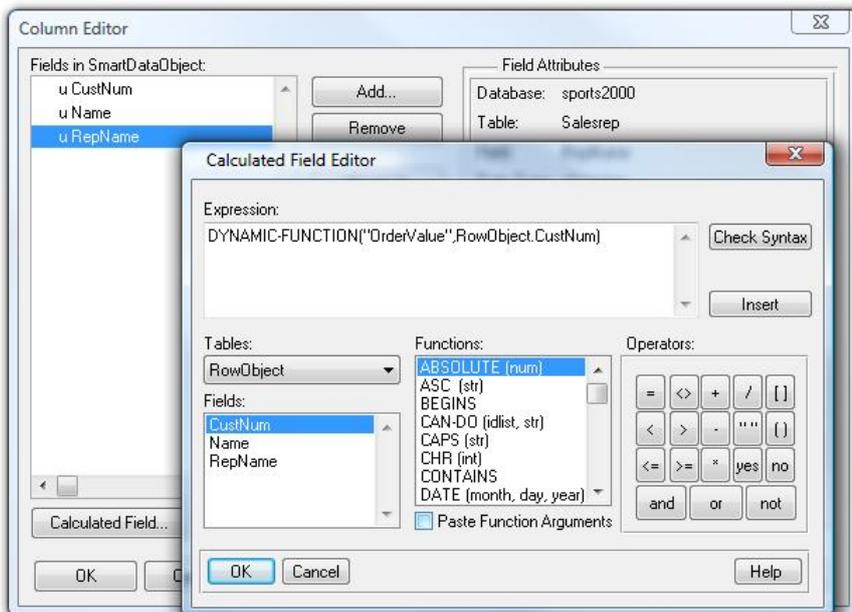
1. Open the Progress AppBuilder and connect to any databases required.
2. Select *File* → *New*
3. Make sure *SmartObjects* is checked, select *SmartDataObject* and press *OK*
4. Press *Next*
5. Press *Next* to get to the *ABL Query* screen
6. Press *Define Query*
7. Use the *Query Builder* to build your query.



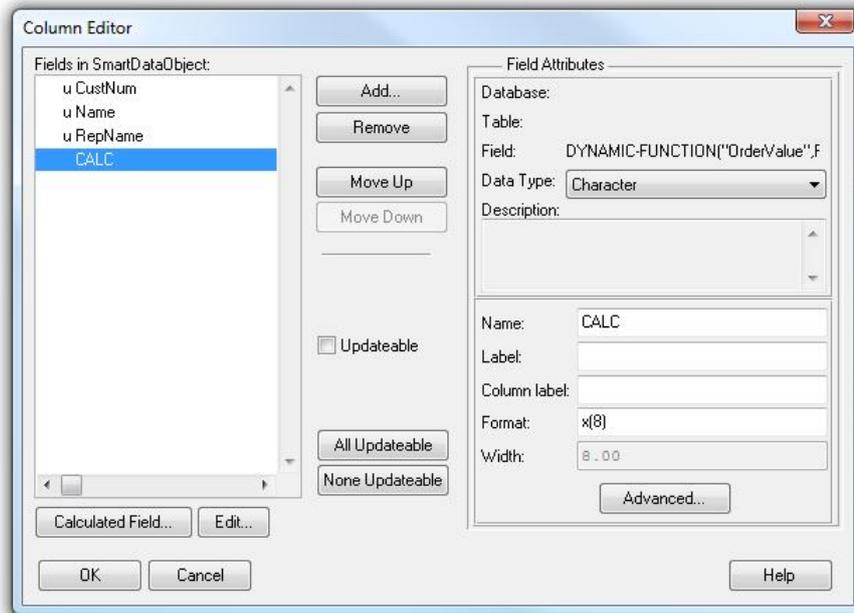
8. Press *Next*
9. Press *Add Fields*
10. Select the fields you wish to be available in the query and press *OK*.



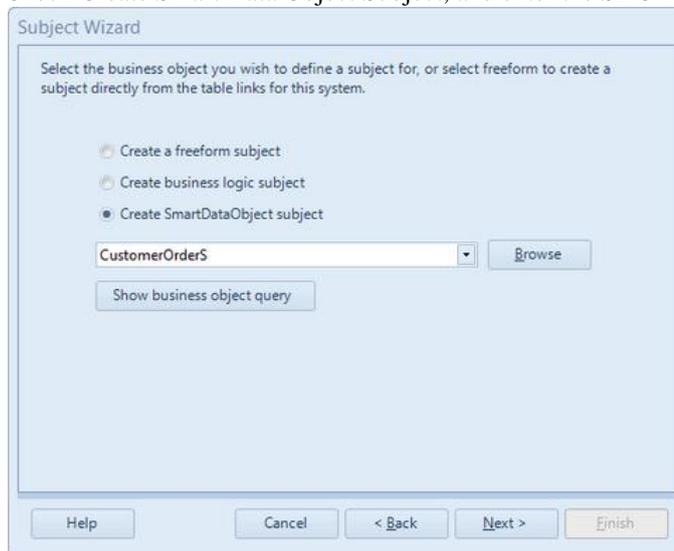
11. Press *Calculated Field* to enter a calculated field.
12. Use the *Calculated Field Editor* to build a calculated field expression and press *OK*.



13. Select the data type and enter a name, label, column label and format for each calculated field. Press OK.



14. Press *Next* and *Finish*.
15. Save the SDO in the PROPATH of the AppServer.
16. Open the DataPA Analytics Engine screen and ensure your System is selected.
17. Select File → *New System* or click on the *New System* button on the Ribbon.
18. Press Next, then enter a name and description for the subject.
19. Select the System and press Next
20. Check Create Smart Data Object Subject, and enter the SDO name. Press Next



21. Press Next, then enter a name and description for the subject.
22. For each field, enter a column label, and select whether or not it can be used for sorting and conditions.
23. Press Next, press Finish.