Getting Started with Pentaho Business Analytics

This document supports Pentaho Business Analytics Suite 4.8 GA and Pentaho Data Integration 4.4 GA, documentation revision October 31, 2012.

Help and Support Resources

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Welcome

This guide is an introduction to Pentaho Business Analytics, and includes:

- Instructions for the installation of Pentaho Business Analytics on Windows
- Features of a simple report created using Pentaho Interactive Reporting
- Features of a simple report created using Pentaho Analyzer
- Features within a report created within the Pentaho Dashboard Designer
- Instructions for creating a data source
- Instructions for creating a new analyzer report
- Instructions for working with dashboards
- Instructions for accessing other client tools
- The supported and compatible products
- Some instructions for troubleshooting your installation

Important: If you need more information about deploying Pentaho Business Analytics or have custom configuration requirements, contact your Pentaho Sales Representative or send an email to *Support*.

Overview

This section contains information about the Pentaho components included in this release and system requirements for installation.

Components Included in this Release

There are three categories for the components of this release: content creation tools, solution design tools, and service providers (servers). The three categories and their contents are:

Thin Client Tools

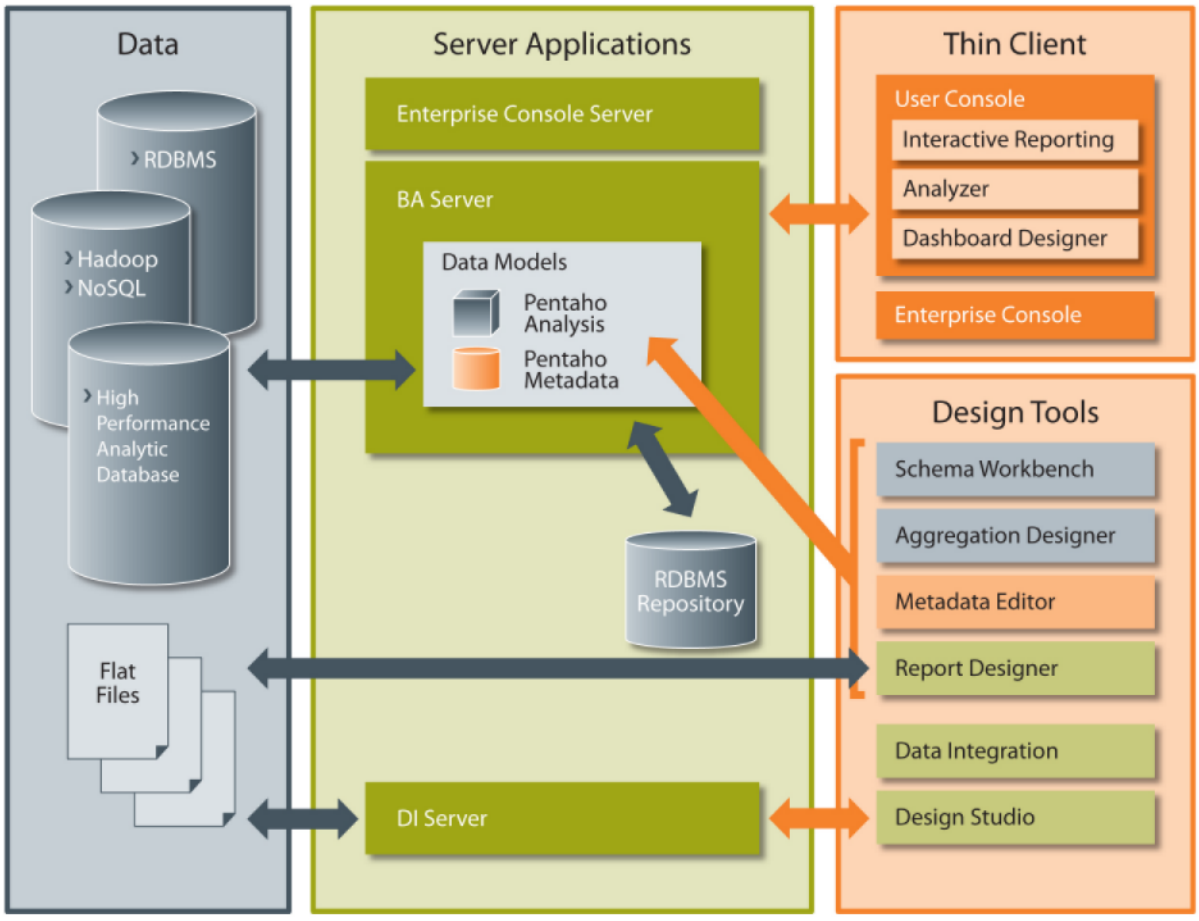
- Interactive Reporting
- Analyzer
- Dashboard Designer

Design Tools

- Schema Workbench
- Aggregation Designer
- Metadata Editor
- Report Designer
- Data Integration
- Design Studio

Server Applications

- Enterprise Console Server
- BA Server
- DI Server



Thin Client Tools

The Pentaho User Console is a web-based user interface that is used to view, create, schedule, and apply permissions to reports and dashboards. The Thin Client Tools all run within the Pentaho User Console in a browser (such as Firefox, Chrome, or Internet Explorer).

Design tool	Description
Pentaho Interactive Reporting	Pentaho Interactive Reporting is a web-based design interface which is used to create both simple and ad hoc operational reports without depending on IT or report developers. Features include the ability to: • Access Pentaho Metadata data sources • Easily interact with reports • Use a drag-and-drop designer to add, move, and delete fields within the report canvas • Use inline formatting, filtering, sorting, grouping, aggregations, and summary calculations • Design and edit reports with WYSIWYG (What You See Is What You Get) software • Create reports based on templates
Pentaho Analyzer	Pentaho Analyzer is an intuitive analytical visualization tool that filters and drills down into business information contained in Pentaho Analysis data sources. Features include: • Accessibility to Pentaho Analysis data sources • Web-based, drag-and-drop report creation • Advanced sorting and filtering • Customized totals and user-defined calculations • Chart visualizations
Pentaho Dashboard Designer	Dashboard Designer allows users to create dashboards with little or no training. The dashboard is several different reports brought together inside one screen. Features include the ability to: • Create dashboards by selecting the layout, theme, and content you want to display. • Include any type of Pentaho reports, external web pages, or dashboard internal elements (charts and data grid) that access Pentaho Metadata data sources. • Add dynamic filter controls • Drive content within a dashboard using other dashboard content

Design Tools

The **design tools** are desktop applications that allow you to create BI solutions for reporting and analysis:

Design tool	Description
Report Designer	Report Designer is a visual design environment that makes it easy for report authors to quickly create sophisticated reports. These reports can encompass a wide range of data sources that address the demands of

Design tool	Description
	operational, financial, and production reporting. They can also be executed as standalone reports within the User Console or used within a Pentaho Dashboard. In addition, Report Designer creates detailed charts, and templates for Pentaho Interactive Reporting and Report Design Wizard. It is best used by experienced users who are familiar with report design concepts and the data sources used.
Pentaho Data Integration	Data Integration is an intuitive, graphical, drag-and-drop design environment that provides powerful Extraction, Transformation and Loading (ETL) features. In addition, Pentaho Data Integration provides you with Agile BI capabilities that collapse the multi-step and lengthy BI project cycles into a single integrated design, modeling, and visualization process. Agile BI drives close collaboration between BI application developers and end-users.
Pentaho Metadata Editor	Metadata Editor builds Pentaho metadata data sources, a data model representation of a relational database where business users can create queries without having to know SQL. Pentaho Dashboards and Pentaho Interactive Reporting are primary tools to access this data source. Additionally, a data model designer can tag useful attributes to secure or format columns in a data model which can be inherited in a report (prpt) and interactive report (prpti).
Pentaho Schema Workbench	Schema Workbench builds Pentaho Analysis data sources, (ROLAP cubes) facilitating data exploration and analysis for business users without having to know MDX.
Pentaho Aggregation Designer	Pentaho Aggregation Designer is a graphical environment used to increase query performance of a Pentaho Analysis (Mondrian OLAP) schema through the creation of aggregate tables.
Pentaho Design Studio	Design Studio is used to create Action Sequences (.xaction). Action Sequences define lightweight, success-oriented process flows within the Pentaho Business Analytics Server. It enables full customization and integration among all components within Pentaho Business Analytics.

Server Applications

The **Business Analytics Server** (BA Server) is a Java-based report management system, application server, and lightweight process-flow engine. The BA Server also provides a Web-based interface for creating, scheduling, and distributing reporting, analysis, and dashboard content.

The **Data Integration Server** (DI Server) is a dedicated enterprise class server for ETL and Data Integration. It is used to execute Data Integration jobs and transformation. It also provides services such as scheduling and content management (including revision history and security integration).

The **Enterprise Console Server** provides security, scheduling, repository management, and configuration services for the BA Server and DI Server.

System Requirements

This section lists system requirements for Pentaho Business Analytics.

Pentaho provides several installation paths to meet a variety of customer needs. This procedure is the simplest, but provides the least customization. This guide explains how to use the graphical installer to perform a default installation of the latest release of the Pentaho Business Analytics Enterprise Edition.

Note: There are 32-bit and 64-bit editions of this installation utility. Check the file name to ensure that you are using the intended version before you proceed.

The Pentaho Business Analytics Installation Utility Will Provide	You Must Supply On Your Own
Application server: Tomcat **Solution database:** PostgreSQL **BA Server:** • Pentaho User Console • Analyzer • Dashboard Designer • Interactive Reporting • Pentaho Enterprise Console **Data preparation tools:** • Schema Workbench • Pentaho Data Integration • Metadata Editor **Design tools:** • Report Designer • Design Studio • Aggregation Designer **Data Integration (DI) Server** **Hadoop support for PDI** **Hive support for Pentaho Metadata** **Sun JRE** on the server, and on each workstation that you will install data preparation or design tools to **Steel Wheels** sample data	**A supported operating system:** See the *Compatibility Matrix: Supported Components* in the *Pentaho Business Analytics Graphical Installer Guide* for detailed OS, database, and application server version information. • Linux • Windows • OS X **You may also provide your own data source if you wish. It must be in one of the following formats:** • Any JDBC-compliant database • A spreadsheet • A flat file containing comma-separated values

Note: The graphical installation procedure is most popular for pre-sales evaluation; the manual deployment process is most popular for development and production installations.

Installing Pentaho Business Analytics

These instructions assume that you have used graphical installer and incorporated the default settings, which installs to a *local* device (localhost).

If you are upgrading, ensure that all previous versions of Pentaho software have been removed from your machine. If you do not delete previous versions, there is an increased possibility for errors.

Follow the instructions below as you go through each step in the installation wizard. See *Troubleshooting Your Installation* in the unlikely event you run into port conflict issues.

Note: You must disable any anti-spyware software before installing Pentaho Business Analytics. Some types of software firewalls and anti-virus scanners may also block the BA Server or prevent it from operating normally.

1. Click **Next** in the **Welcome** page.
2. Read and accept the **License Agreement**.
3. Click **Default** to accept the default installation.
4. Specify the location to install Pentaho Business Analytics.

   Note: You must have the ability to write to the installation directory from your user account. If you attempt to install to a write-protected directory, you will encounter various problems with your installation.
5. Type and retype **password** to set the master password for required users, the repository "root" user, the BA server publish password, and the admin user for the Pentaho Enterprise console.

   Obviously this is not very secure. However, this installation and the instructions in this document are intended for evaluation purposes only. Production installations require more careful consideration and have a separate set of guides intended for system administrators. The examples in this document assume that you will use **password** as your global Pentaho password. If you choose a different password, adjust the instructions later in this guide accordingly.
6. Click **Next** to start installing the Pentaho components.
7. Once the installation is complete, you can choose to view the installation summary and launch the Pentaho User Console. Accept the default choices.
   This document and Pentaho User Console home page will appear. Some systems may prevent the browser from opening. In these instances, you must open a browser and navigate to the console manually. See instructions for starting the Pentaho User and Pentaho Enterprise consoles under *Verifying Your Installation* on page 34. Keep your console open and available as you step through the exercises in this document.

Logging into the Pentaho User Console

Below are instructions for logging into the Pentaho User Console.

Note: The Pentaho User Console opens automatically after installation. If you do not currently have it open, follow the first step below to open it.

1. Go to **Start** -> **All Programs** -> **Pentaho Enterprise Edition** -> **User Console Login**, or open a browser and go to `http://localhost:8080/` or or the hostname, IP address, or domain name of the machine you installed the BA Server to.

   Note: The BA Server must be on or you will receive an error screen once you log in.

2. Enter the User Name **joe** and the password **password** (all lowercase letters), to open the Pentaho User Console launch page. Joe is a sample user with administrative privileges to the Pentaho User Console.

The Pentaho User Console launch page will appear.

Starting and Stopping the Servers

To start or stop any of the servers in Pentaho Business Analytics, go to **Start** -> **All Programs** -> **Pentaho Enterprise Edition** -> **Server Management**. Select the server you want to start or stop.

Examining Sample Reports

The Pentaho Business Analytics download includes sample data called Steel Wheels. Steel Wheels is included so that you can quickly use the software and discover Pentaho Business Analytics' capabilities.

This section will give you step-by-step instructions for analyzing three different reports. Each report was created with a different thin client tool. These reports are named:

- Inventory List Report, created with Pentaho Interactive Reporting
- Top Five Product Lines by Territory, created with Pentaho Analyzer
- Regional Sales Performance Dashboard, created with Pentaho Dashboard Designer

If you would like another functionality or different type of report included please let us know so we can try to include it in future releases.

Inventory List Report

This section explains how to find, open, and generate an **Inventory List report**, which highlights many **Report Designer** capabilities.

How To Find This Report In The Pentaho User Console

This report was created using Report Designer and published to the BA Server; you can find it in the Pentaho User Console solution repository by following these steps:

1. Click on the **Open File** icon.
2. The **Open** box will appear.
3. Within this box, open **Steel Wheels**.
4. Open the **Reporting** folder icon.
5. Open the **Inventory List** icon.

How to Open the Source Report in Report Designer

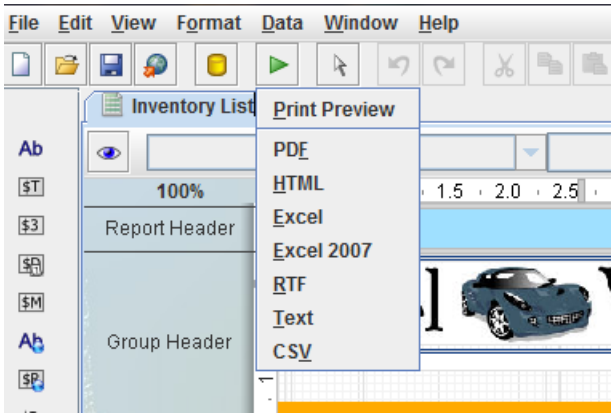
When published to the BA Server, you can only run, schedule, and share a report. To edit the style or structure of a report, you must edit it in Report Designer.

1. Go to the **Start** menu.
2. Select **All Programs**.
3. Open **Pentaho Enterprise Edition**.
4. Open **Design Tools**.
5. Open **Report Designer**. The **Welcome** page will open.
6. Within the **Welcome** page, inside of the right side inner **Samples** window, open **Inventory List**.

How to Generate a Report in Report Designer

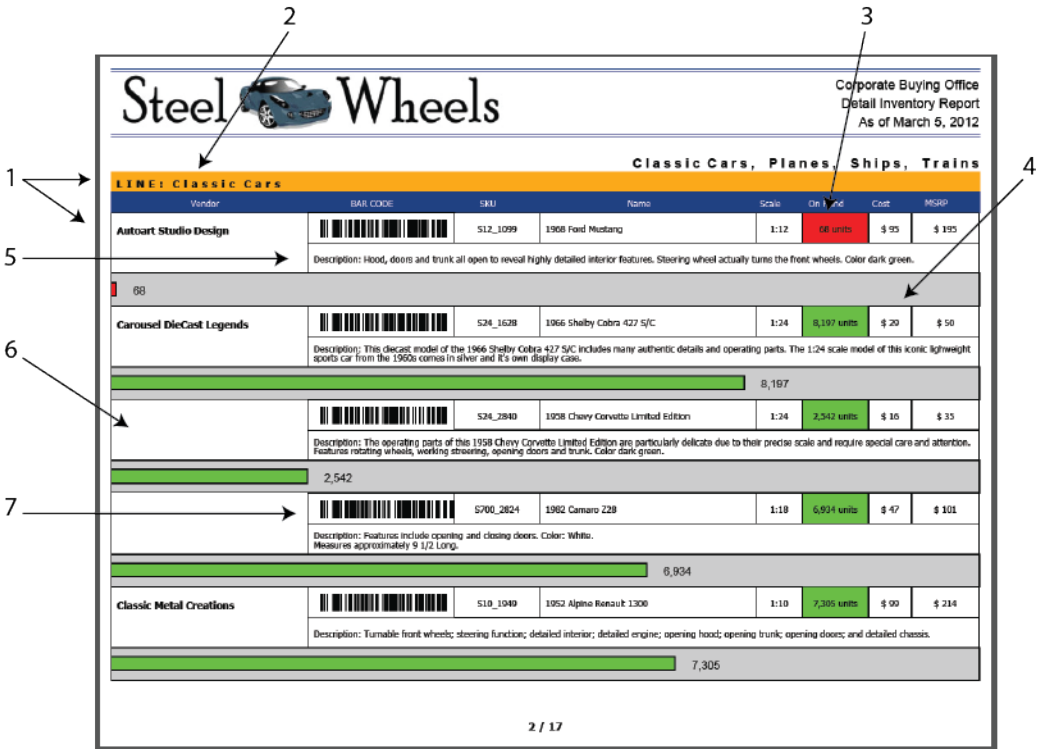
You can generate reports manually from Report Designer. This is useful for testing, and for creating reports locally that don't need to be shared with Pentaho User Console users.

1. Click on the **Run** button (green right-facing arrow) within the top tool bar. A drop-down menu will appear with possible formats.
2. Select the format for your report.



Featured Report Designer Capabilities

The below graphic shows how Inventory List implements some Report Designer features.



1. Mixing of columnar and form style layouts
2. Produce data-driven hyperlinks to access external content or launch other Pentaho reports
3. Conditionally color elements by setting the background color based on a formula expression
4. Control when elements (name, cost, etc.) display on a report, based on report parameters
5. Elements can have dynamically set width and position
6. Ability to hide repeating rows
7. Generate sophisticated bar codes for all major symbologies (for example: EAN, UPC, ISBN, EAN13, Code39, Code128, UPCE)

Some other features not shown in the above image:

- Pick from an assortment of selection controls (buttons, drop-down list boxes, list boxes, checkboxes, options) to pass values to report parameters and drive report data.
- Fine-tune the presentation of report sections (Table of Contents) or elements based on the output type.

Top Five Product Lines by Territory

You can find and open a Product Line Report from the `Steel Wheels` sample data. This section highlights some popular Pentaho Analyzer capabilities that are available within this product line report, `Top 5 Product Lines by Territory`.

How To Find and Open the Top 5 Product Lines by Territory Sample Report

This report was created using Penataho Analyzer; you can find it in the `Steel Wheels` solution repository.

1. Click on the **Open File** icon.
2. The **Open** box will appear.
3. Within this box, open `Steel Wheels`.
4. Open the **Analysis** folder icon.
5. Open **Top 5 Product Lines by Territory**.

Pentaho Analyzer Panels

You can view `Top 5 Product Lines by Territory` from Pentaho Analyzer, which is accessed through the Pentaho User Console. Each of these elements allow the report to implement Pentaho Analyzer features.

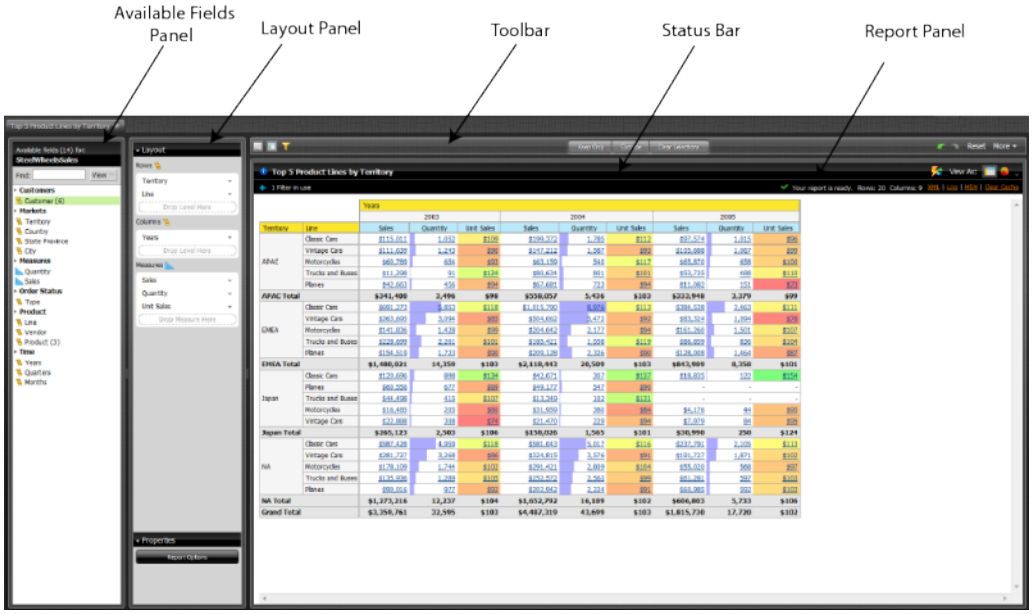
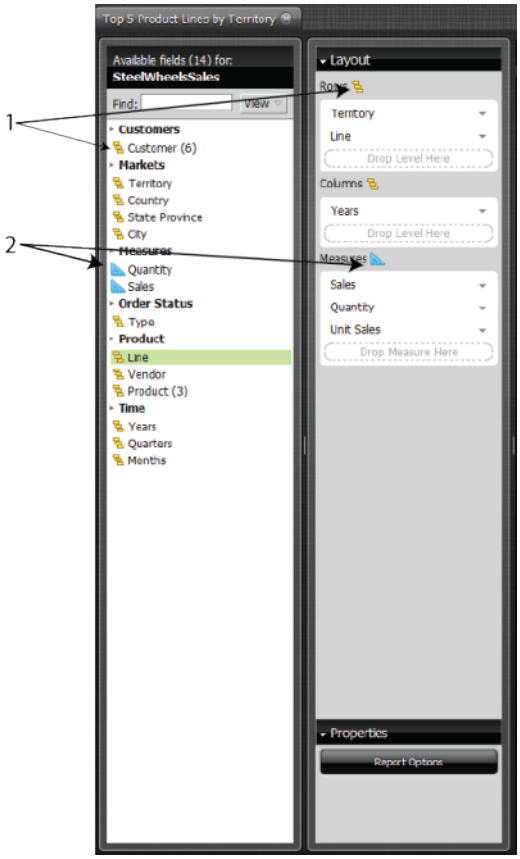


Table Formatting Using the Available Fields Panel and the Layout Panel

You can use the Layout Panel to drag levels and measures into the correct areas of a report.



1. Yellow steps represent levels (text fields) within the hierarchy.
2. Blue carpenter squares represent measurements (number fields) within the hierarchy.

Dynamically Changing the Layout

You have the ability to dynamically change the layout of a chart.

- Drag measures into the **Measures** field in the **Layout** column to add them to your chart.
- Drag levels into the **Rows** and **Columns** field in the **Layout** column to add them to your chart.
- Delete a field by dragging it to the bottom right corner of the page. A trash can will appear and you can "throw away" the field you don't want. It will remain in the **Available Fields** panel but it will be deleted from the **Layout Panel**.

Layout Panel Field Customization

With the Layout Panel shows which fields are available for report creation. The fields change depending on the report type.

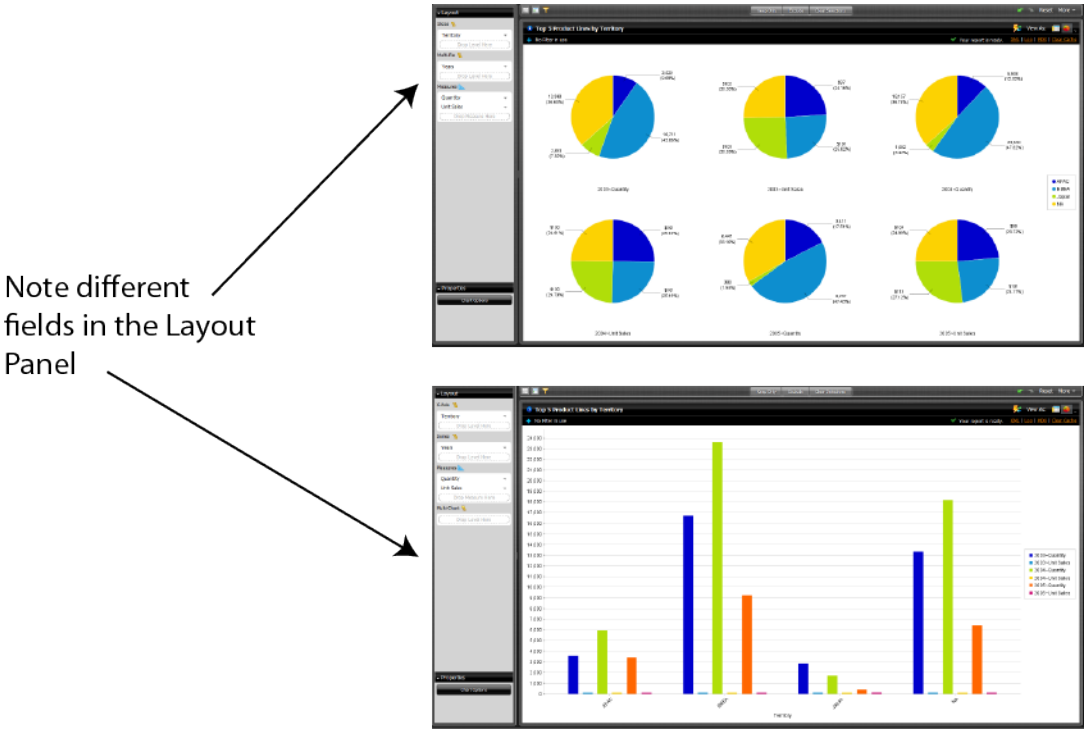


Chart Types

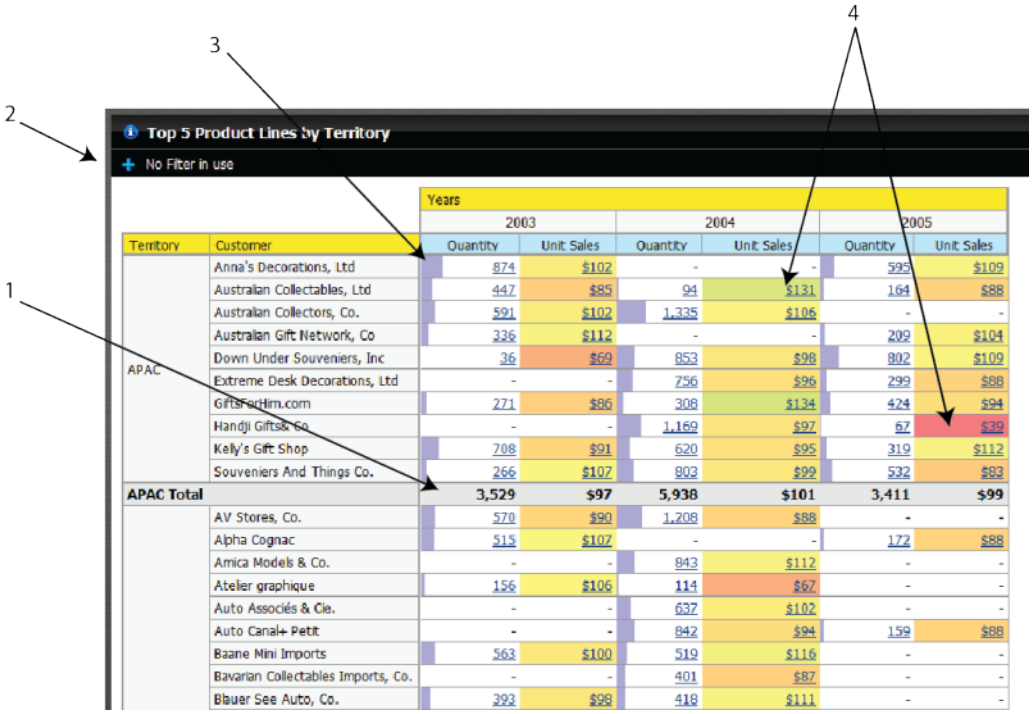
There are many types of charts in addition to the **Table Format**.

- Column
- Stacked Column
- 100% Stacked Column
- Column-Line Combo
- Bar
- Stacked Bar
- 100% Stacked Bar
- Line
- Area
- Pie
- Scatter
- Heat Grid
- Geo Map

A check mark appears to the left of the currently selected chart type.

Featured Pentaho Analyzer Capabilities

Your data is easy to analyze when you view it in Pentaho Analyzer.



Territory	Customer	Years 2003 Quantity	2003 Unit Sales	2004 Quantity	2004 Unit Sales	2005 Quantity	2005 Unit Sales
APAC	Anna's Decorations, Ltd	874	$102	-	-	595	$109
	Australian Collectables, Ltd	447	$85	94	$131	164	$88
	Australian Collectors, Co.	591	$102	1,335	$106	-	-
	Australian Gift Network, Co	336	$112	-	-	209	$104
	Down Under Souveniers, Inc	36	$69	853	$98	802	$109
	Extreme Desk Decorations, Ltd	-	-	756	$96	299	$88
	GiftsForHim.com	271	$86	308	$134	424	$94
	Handji Gifts& Co	-	-	1,169	$97	67	$39
	Kelly's Gift Shop	708	$91	620	$95	319	$112
	Souveniers And Things Co.	266	$107	803	$99	532	$93
APAC Total		**3,529**	**$97**	**5,938**	**$101**	**3,411**	**$99**
	AV Stores, Co.	570	$90	1,208	$88	-	-
	Alpha Cognac	515	$107	-	-	172	$88
	Amica Models & Co.	-	-	843	$112	-	-
	Atelier graphique	156	$106	114	$67	-	-
	Auto Associés & Cie.	-	-	637	$102	-	-
	Auto Canal+ Petit	-	-	842	$94	159	$88
	Baane Mini Imports	563	$100	519	$116	-	-
	Bavarian Collectables Imports, Co.	-	-	401	$87	-	-
	Blauer See Auto, Co.	393	$98	418	$111	-	-

Top 5 Product Lines by Territory features the ability to:

1. Subtotal items for a dimension
2. Add filters (alternative to the new Layout Panel)
3. Quickly visualize and compare values using the Data Bar
4. Add a colored range bar to easily determine outliers and median values

Other Abilities Not Shown Above

- Drill on a data cell to view supporting data.
- Leverage Pentaho Analysis for fast Top/Bottom queries.

Regional Sales Performance Dashboard

This section explains how to use a customized dashboard. The dashboard pulls in previously created reports into one place for presentation purposes. You will use the sample file **Regional Sales Performance**, which shows a dashboard that contains three filters, two charts, (created using Chart Designer — Sales Mix and Recent Sales), and an Analyzer report (Product Performance). **Pentaho Dashboard Designer** features an interactive drag-and-drop interface that allows you to quickly assemble content, as well as link to content both within and outside of the dashboard.

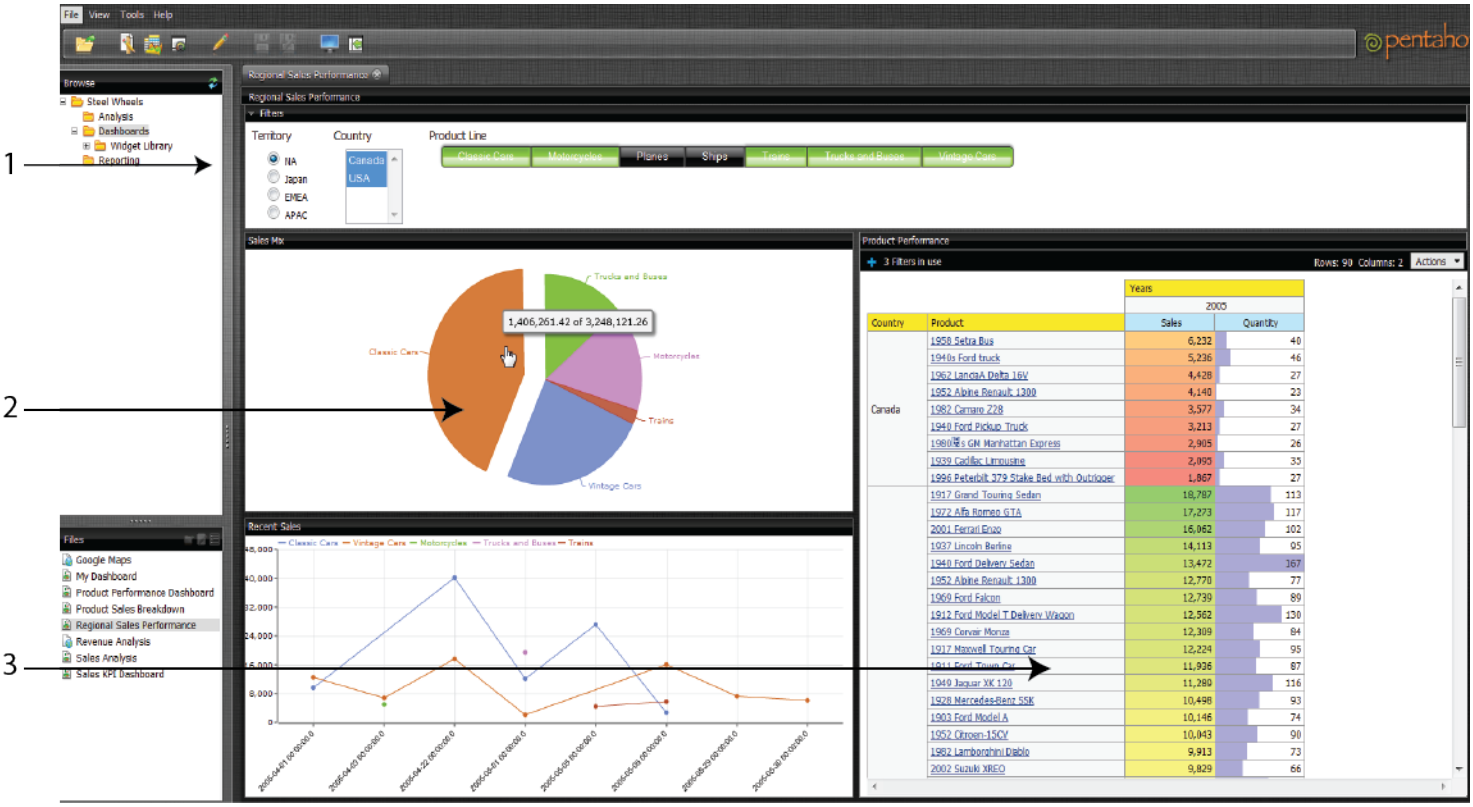
How To Find and Open This Report

This report was created using **Pentaho Dashboard Designer**. You can find it in the Pentaho User Console solution repository by following these steps:

1. Click on the **Open File** icon.
2. The **Open** box will appear.
3. Within this box, open **Steel Wheels**.
4. Open the **Dashboards** folder icon.
5. Open the **Regional Sales Performance** file.

Featured Report Designer Capabilities

The below graphic shows how the **Regional Sales Performance** implements popular **Dashboard Designer** features.



Regional Sales Performance dashboard features:

1. Pick from an assortment of selection controls (buttons, drop down list boxes, list boxes, checkboxes, options) to pass parameters to any dashboard panel.
2. Build flash-based charts (bar, line, pie, area, dial) that are interactive with the dashboard.
3. Display any Pentaho-generated content.

Creating a Data Source

The Data Sources feature allows you to connect to your data so that the data can be used to create reports, (such as Interactive Reports, Analyzer Reports, and Dashboards), in the Pentaho User Console.

Using the Data Source Wizard, you can quickly add, edit, and delete **CSV File**, **SQL Query**, and **Database Table(s)** data sources in the Pentaho User Console.

Below is a quick description of each data source type:

Data Source Type	Description
CSV File	Data originating in a CSV file is extracted and staged in a database table on the Pentaho BA Server. A default Pentaho Metadata (Reporting) Model and a Mondrian (OLAP) Schema are generated for use in Interactive Report, Dashboard, and Analyzer.
SQL Query	A SQL query written against a relational database is used to establish the context of the data source. Data available for report creation is confined to the scope of the data source's query. A default Pentaho Metadata (Reporting) Model and a Mondrian (OLAP) Schema are generated for use in Interactive Report, Dashboard, and Analyzer.
Database Table(s) Reporting Only	Data originates in a one or more relational database tables that is often operational or transactional in nature. Using the Data Source Wizard, database tables can be selected and joined. A default Pentaho Metadata (Reporting) Model is generated for use in Interactive Report and Dashboards only.
Database Table(s) Reporting and Analysis	Data originates in one or more relational database tables arranged in a star schema with a single fact table. Using the Data Source Wizard, multiple dimension tables can be selected and joined to the single fact table. A single table containing both fact and dimensional information can also be used for this data source type. A default Pentaho Metadata (Reporting) Model and a Mondrian (OLAP) Schema are generated for use in Interactive Report, Dashboard, and Analyzer.

The exercises in this section will walk you through creating a **Database Table(s) Reporting and Analysis** data source.

Adding a JDBC Driver

Before you can connect to a data source in any Pentaho server or client tool, you must first install the appropriate database driver. Your database administrator, Chief Intelligence Officer, or IT manager should be able to provide you with the proper driver JAR. If not, you can download a JDBC driver JAR file from your database vendor or driver developer's Web site. Once you have the JAR, follow the instructions below to copy it to the driver directories for all of the Business Analytics components that need to connect to this data source. See the *Compatibility Matrix: Supported Components* in any of the Installation guide for current version numbers.

Note: Microsoft SQL Server users frequently use an alternative, non-vendor-supported driver called JTDS. If you are adding an MSSQL data source, ensure that you are installing the correct driver.

Backing up old drivers

You must also ensure that there are no other versions of the same vendor's JDBC driver installed in these directories. If there are, you may have to back them up and remove them to avoid confusion and potential class loading problems. This is of particular concern when you are installing a driver JAR for a data source that is the same database type

as your Pentaho solution repository. If you have any doubts as to how to proceed, contact your Pentaho support representative for guidance.

Installing JDBC drivers

Copy the driver JAR file to the following directories, depending on which servers and client tools you are using (Dashboard Designer, ad hoc reporting, and Analyzer are all part of the BA Server):

Note: For the DI Server: before copying a new JDBC driver, ensure that there is not a different version of the same JAR in the destination directory. If there is, you must remove the old JAR to avoid version conflicts.

- **BA Server:** `/pentaho/server/biserver-ee/tomcat/lib/`
- **Enterprise Console:** `/pentaho/server/enterprise-console/jdbc/`
- **Data Integration Server:** `/pentaho/server/data-integration-server/tomcat/webapps/pentaho-di/WEB-INF/lib/`
- **Data Integration client:** `/pentaho/design-tools/data-integration/libext/JDBC/`
- **Report Designer:** `/pentaho/design-tools/report-designer/lib/jdbc/`
- **Schema Workbench:** `/pentaho/design-tools/schema-workbench/drivers/`
- **Aggregation Designer:** `/pentaho/design-tools/agg-designer/drivers/`
- **Metadata Editor:** `/pentaho/design-tools/metadata-editor/libext/JDBC/`

Note: To establish a data source in the Pentaho Enterprise Console, you must install the driver in both the Enterprise Console and the BA Server or Data Integration Server. If you are just adding a data source through the Pentaho User Console, you do not need to install the driver to Enterprise Console.

Restarting

Once the driver JAR is in place, you must restart the server or client tool that you added it to.

Connecting to a Microsoft SQL Server using Integrated or Windows Authentication

The JDBC driver supports Type 2 integrated authentication on Windows operating systems through the **integratedSecurity** connection string property. To use integrated authentication, copy the **sqljdbc_auth.dll** file to all the directories to which you copied the JDBC files.

The **sqljdbc_auth.dll** files are installed in the following location:

```
<installation directory>\sqljdbc_<version>\<language>\auth\
```

Note: Use the **sqljdbc_auth.dll** file, in the x86 folder, if you are running a 32-bit Java Virtual Machine (JVM) even if the operating system is version x64. Use the **sqljdbc_auth.dll** file in the x64 folder, if you are running a 64-bit JVM on a x64 processor. Use the **sqljdbc_auth.dll** file in the IA64 folder, you are running a 64-bit JVM on an Itanium processor.

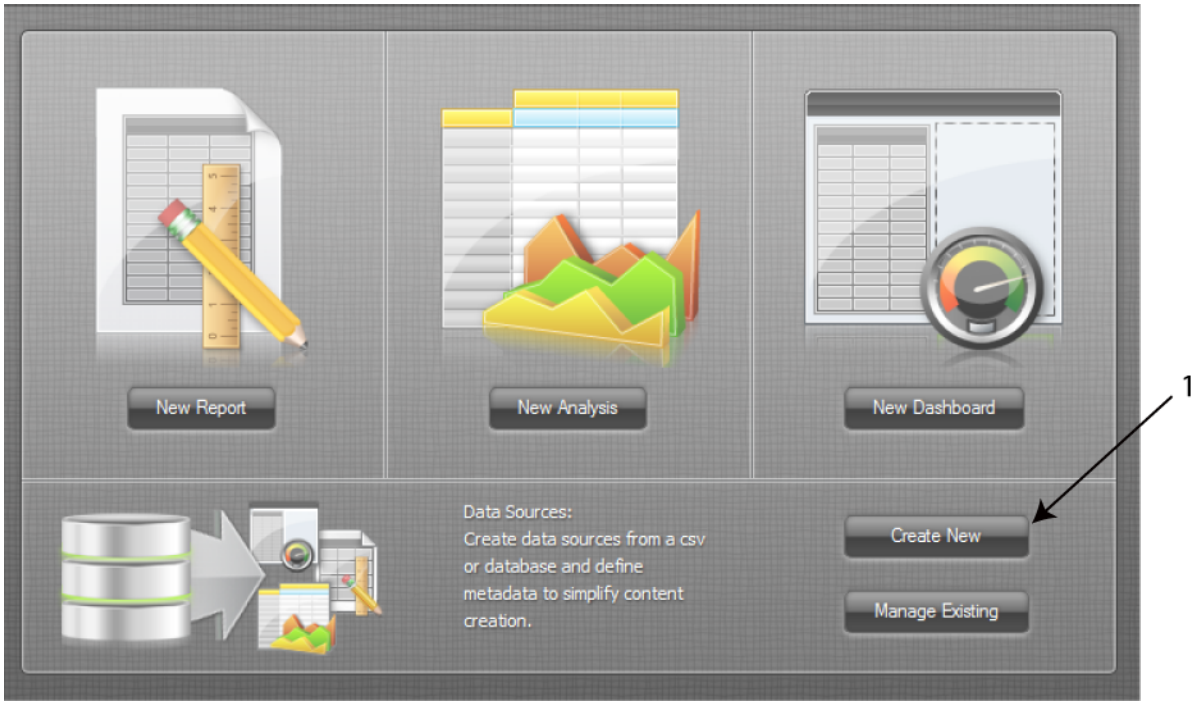
Connecting to Your Database

To create a Database Tables data source, you must first connect to the database that contains data you want to access, (if a database connection does not already exist). Existing database connections appear in a list under **Connection** in the Data Source Wizard.

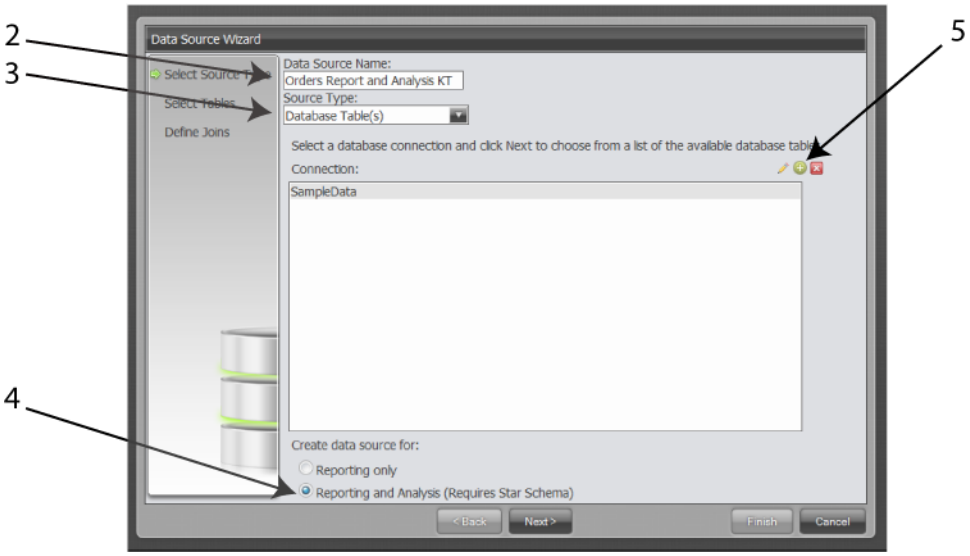
Note: A default connection is provided for evaluation purposes, but these steps for connecting to the sample data have been included for evaluating the data

Follow the instructions below to connect to a database:

1. In the Pentaho User Console quick launch page click **Create New** as shown in the below image.



2. Under **Data Source Name**, type **Orders Report and Analysis KT**.
3. Under **Source Type**, select **Database Table(s)** as your data source type.
4. In the lower portion of the wizard page, under **Create data source for** select the radial button for **Reporting and Analysis (Requires Star Schema)**.
5. In the center of the page, to the right of **Connection:**, click the **Add** icon (the green circle with a white plus sign inside of it) to define a connection to the database. The **Database Connection** dialog box appears.

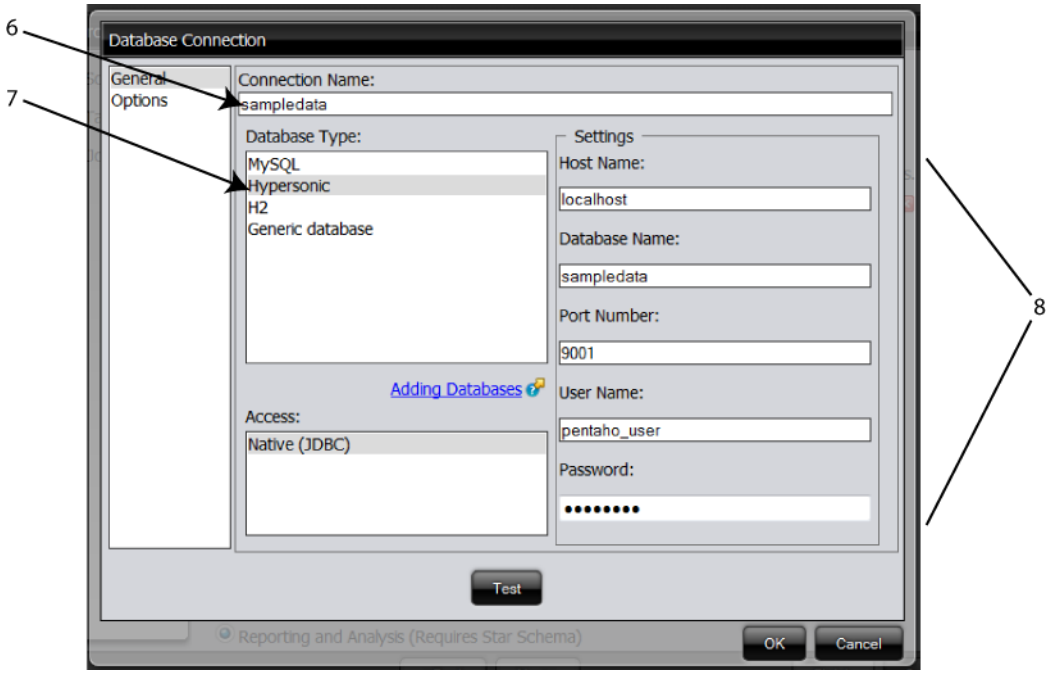


6. In the **Connection Name** text box, type **SampleData**. A Connection Name must be easy to remember and must identify the data you are accessing. The name can have spaces but it cannot have special characters (#, $, %, etc.).
7. Under **Database Type**, select **Hypersonic**.

   Text fields for required settings associated with your connection type appear under **Settings** on the right.
8. Enter the appropriate connection information for your database type:

Option	Description
Host Name	localhost
Database Name	sampledata
Port Number	9001 (automatically available, by default)

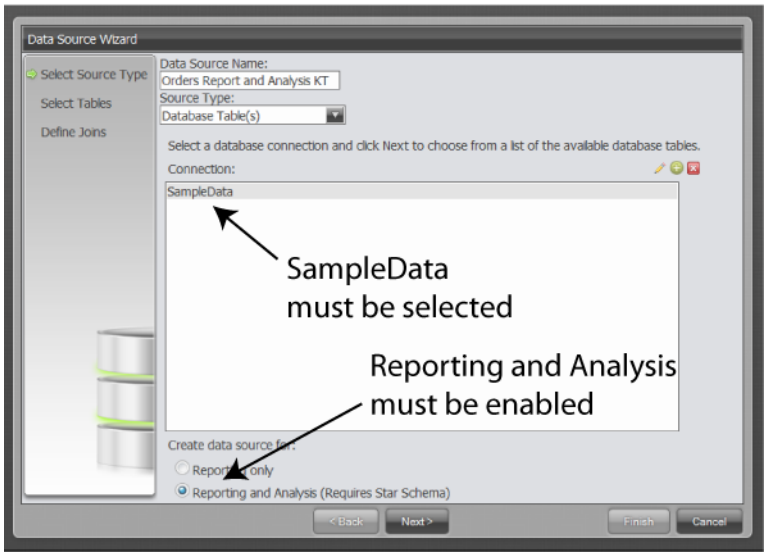
Option	Description
User Name	pentaho_user
Password	password



9. In the **Database Connection** dialog box, click **Test** to test your connection and click **OK**.
   A success message appears. The connection name appears in the list under **Connections** in the Data Source Wizard.

Creating a Database Table(s) Data Source (Reporting and Analysis)

Before proceeding make sure that you have selected the **SampleData** connection and that **Reporting and Analysis (Requires Star Schema)** option is enabled.

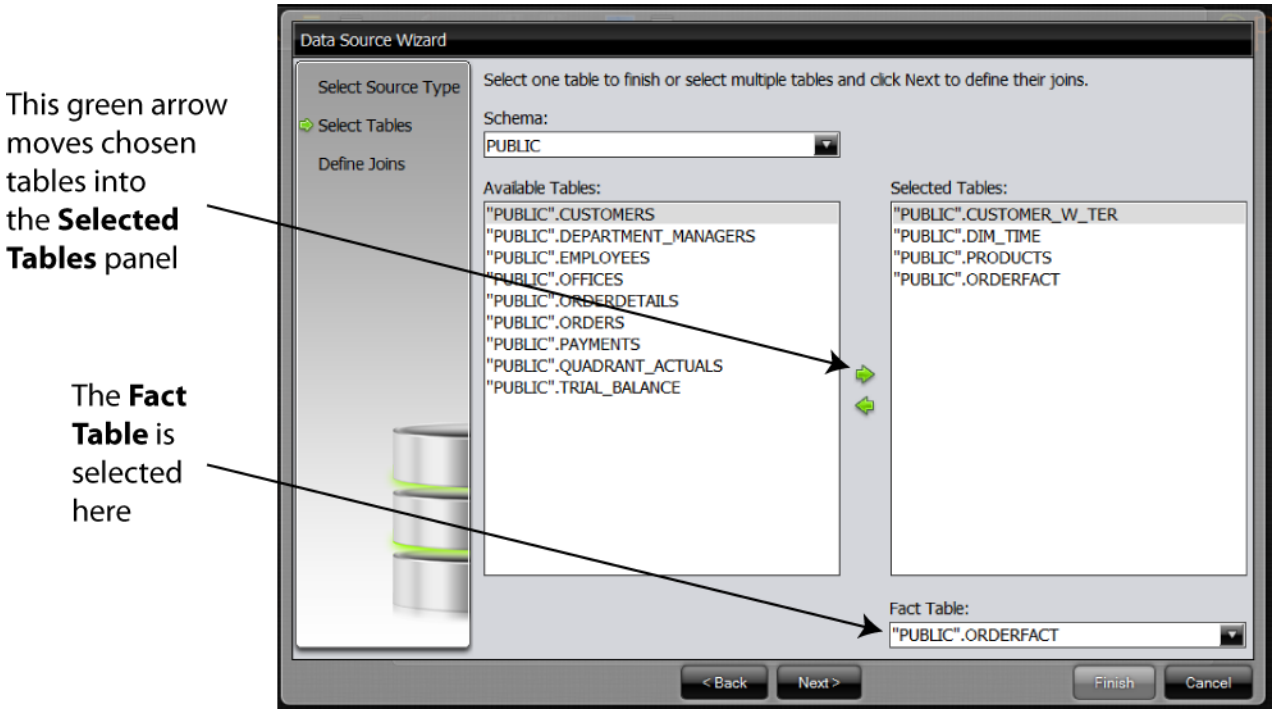


These steps will show you how to set up the connection between Pentaho Data Source software and your database. This connection is called a **datasource**. The Pentaho Data Source not only creates the path between the software and the database, it also adds Metadata (names within the software) to create a user-friendly definition for the content. We will be using sample data to connect the fact table ORDERFACT with the dimension tables CUSTOMER_W_TER, DIM_TIME, and PRODUCTS within the database.

1. In the **Data Source Wizard**, click **Next**.

A list of available database tables appears.

2. Press <**CTRL+CLICK**> to select the **ORDERFACT**, **CUSTOMER_W_TER**, **DIM_TIME**, and **PRODUCTS** tables, then click the right-facing green arrow between the fields to move the selections to the **Selected Tables** field.
3. Under **Fact Table**, at the bottom of the window, select **ORDERFACT** and click **Next**.



Note: The Fact Table must be selected before you can proceed. In a production environment, a database administrator knows how to identify Fact tables.

4. You must define how the tables you selected join to each other. Your fact table (in the left drop-down field) must link to all of your dimension tables (the tables in the right drop-down field). Ensure that **"PUBLIC".ORDERFACT** is selected in the **Left Table:** drop-down menu. **"PUBLIC".ORDERFACT** will be the selection for all of the preceding steps.
   a) Select **"PUBLIC".CUSTOMER_W_TER** in the **Right Table:** drop-down menu. Select the **CUSTOMERNUMBER** table from **both** the left and right lists. Click the **Create Join** button in the middle right side of the window.
   The join relationship between **"PUBLIC".CUSTOMER_W_TER** (Dimension Table) and **"PUBLIC".ORDERFACT** (Fact Table) is created. Both tables share the key field, **CUSTOMERNUMBER**. The **Join(s):** screen at the bottom of the page will populate with:

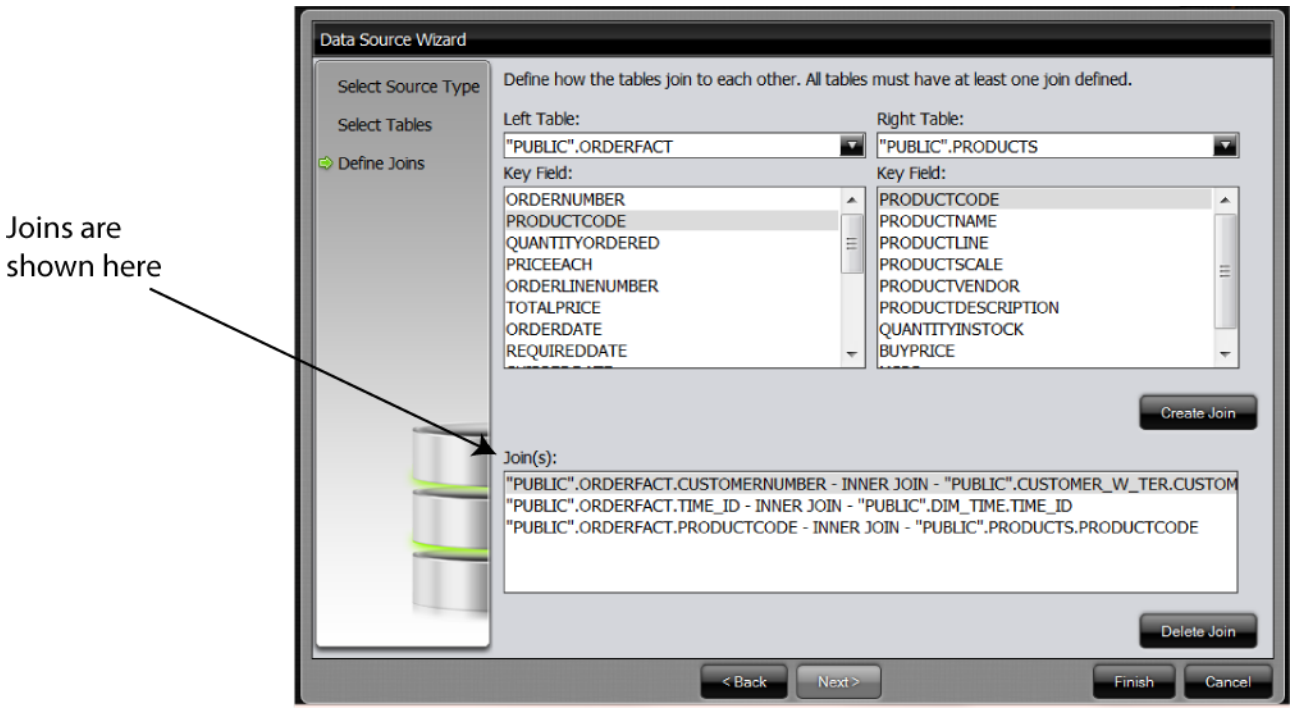
   "PUBLIC".ORDERFACT.CUSTOMERNUMBER - INNER JOIN - "PUBLIC".CUSTOMER_W_TER.CUSTOMERNUMBER

   b) Select **"PUBLIC".DIM_TIME** in the **Right Table:** drop-down menu. Select the **TIME_ID** field from **both** the left and right lists. Click the **Create Join** button in the middle right side of the window.
   The join relationship between **"PUBLIC".DIM_TIME** (Dimension Table) and **"PUBLIC".ORDERFACT** (Fact Table) is created. Both tables share the key field, **TIME_ID**. The **Join(s):** screen at the bottom of the page will populate with:

   "PUBLIC".ORDERFACT.TIME_ID - INNER JOIN - "PUBLIC".DIM_TIME.TIME_ID

   c) Select **"PUBLIC".PRODUCTS** from the list under **Right Table:** drop-down menu. Select the **PRODUCTCODE** field from **both** the left and right lists. Click the **Create Join** button in the middle right side of the window.
   The join relationship between the **"PUBLIC".PRODUCTS** table and **"PUBLIC".ORDERFACT** table is created. Both tables share the key field, **PRODUCTCODE**. The **Join(s):** screen at the bottom of the page will populate with:

   "PUBLIC".ORDERFACT.PRODUCTCODE - INNERJOIN - "PUBLIC".PRODUCTS.PRODUCTCODE



5. Click **Finish** to create your data source.
6. In the **Data Source Created** dialog box, select the bottom **Customize model now** radial button. Click the **OK** button.
7. When the next window appears, click the **OK** button to close it.

At this time, the new data source is added to the list of available data sources that users select when creating a new Interactive Report, a dashboard, or Analyzer report.

Customizing the Data Source

During the data source creation process, a *default* Pentaho Metadata (Reporting) model and a Mondrian (OLAP) Schema (model) are generated. You may want to make changes to the default model so that the data is more useful to report consumers but the default model can be used as is.

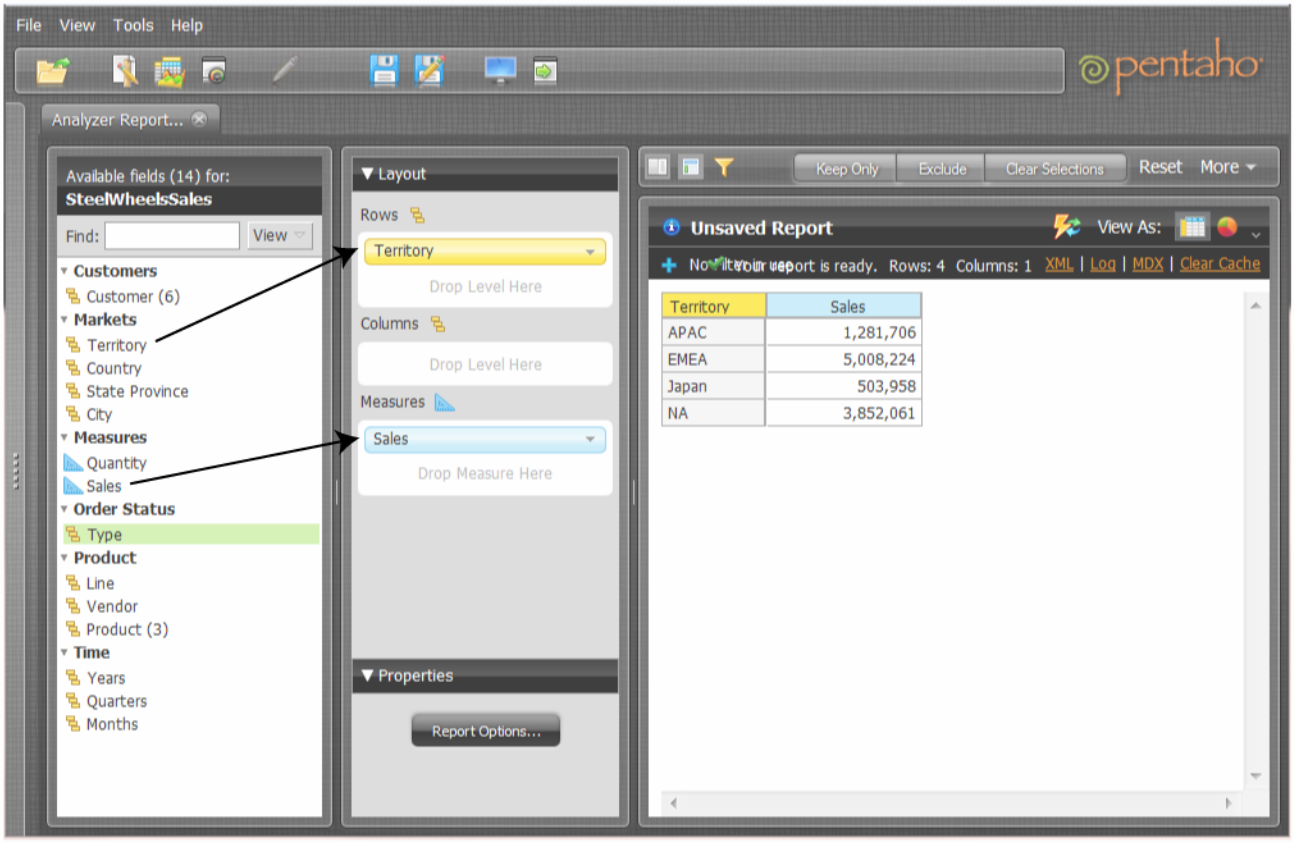
You can edit your data source by clicking the **Manage Existing** button within the Pentaho User Console launch page, selecting the appropriate data source, then clicking the **Close** button. You may now create a **New Report**, a **New Analysis**, or a **New Dashboard** based upon the database tables you have just linked. For more information about customizing your data source, see *Customizing a Reporting Data Source* and *Customizing an Analysis Data Source* in the Pentaho User Console Guide.

Creating a New Analyzer Report

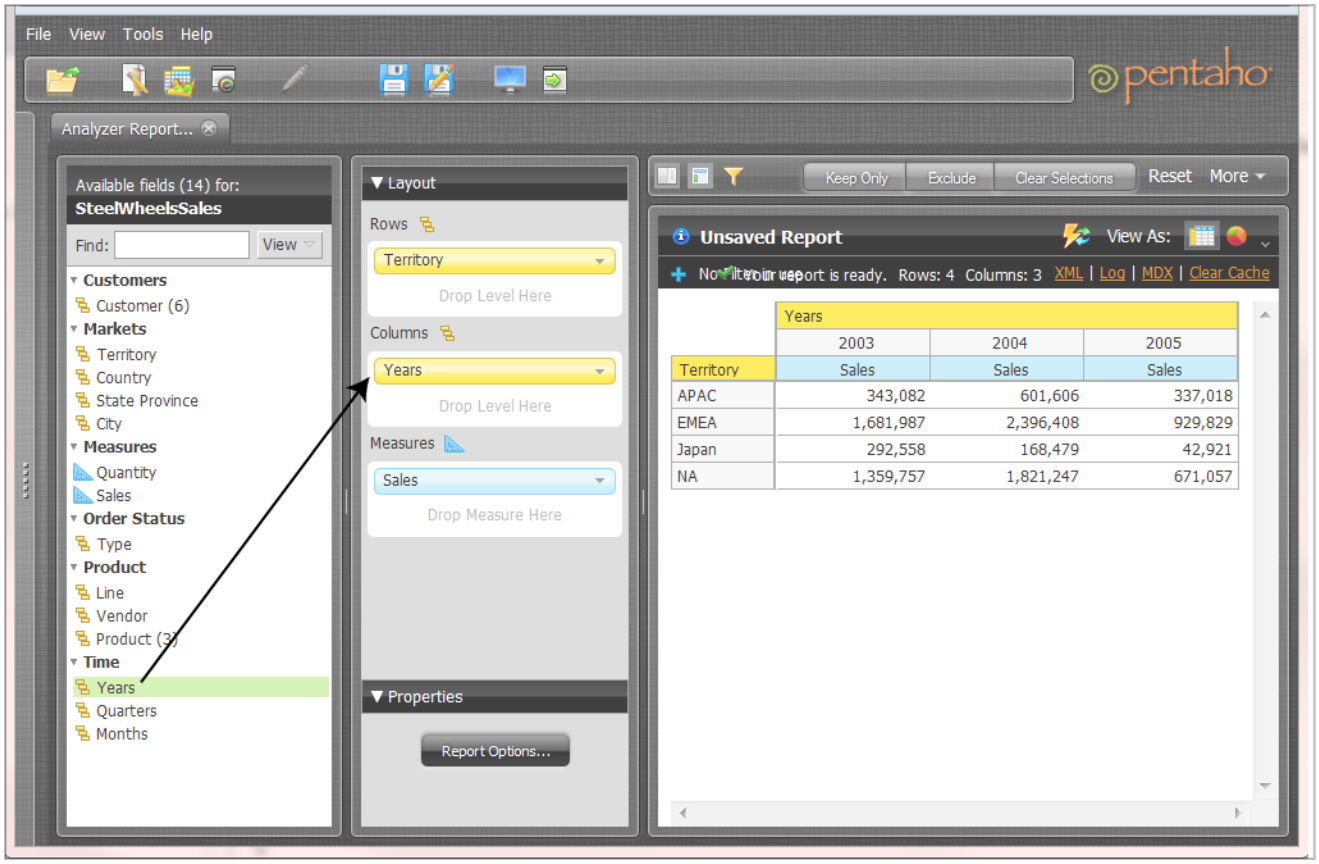
Follow the instructions below to create an Analyzer report with the Steel Wheels sample data.

Note: Notice that the yellow steps denote levels in a hierarchy and the blue carpenters squares represent measures. Level elements must be placed in the Level panels and Measure elements must be placed in the Measure panels.

1. In the Pentaho User Console menu bar, go to **File** > **New** and select **Analyzer Report**.
   The Pentaho Analyzer design tool will start.
2. Select the **Steel Wheels: SteelWheelsSales** option from the list, then click **OK**.
   A blank Analyzer report appears.
3. Click and drag the **Territory** element, dropping it into the **Rows Panel**. Click and drag the **Sales** element into the **Measures Panel**.

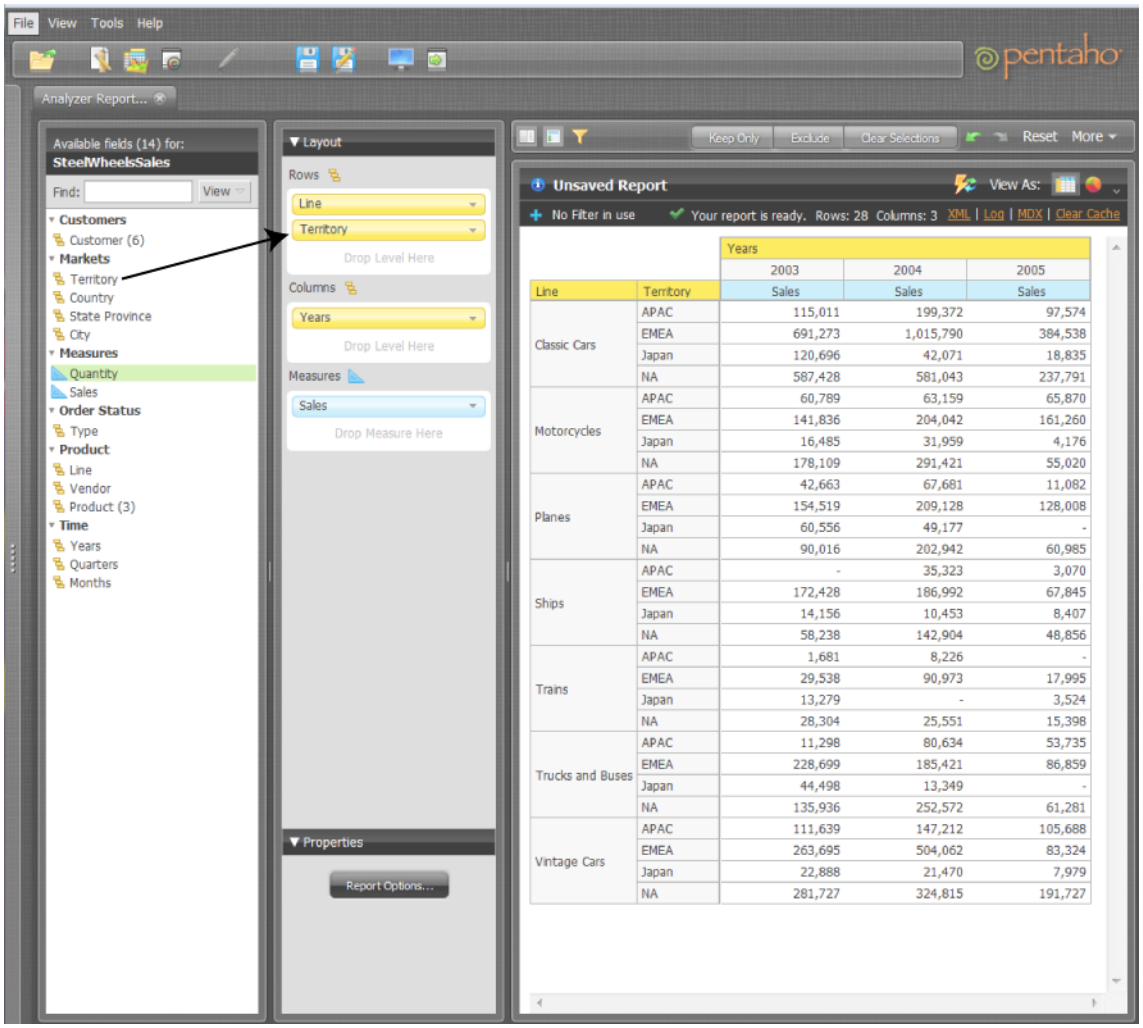


   A table with the Territory and Sales appears and auto-populates with the information from the server.
4. Click and drag the **Years** field, dropping it into the Columns Panel.



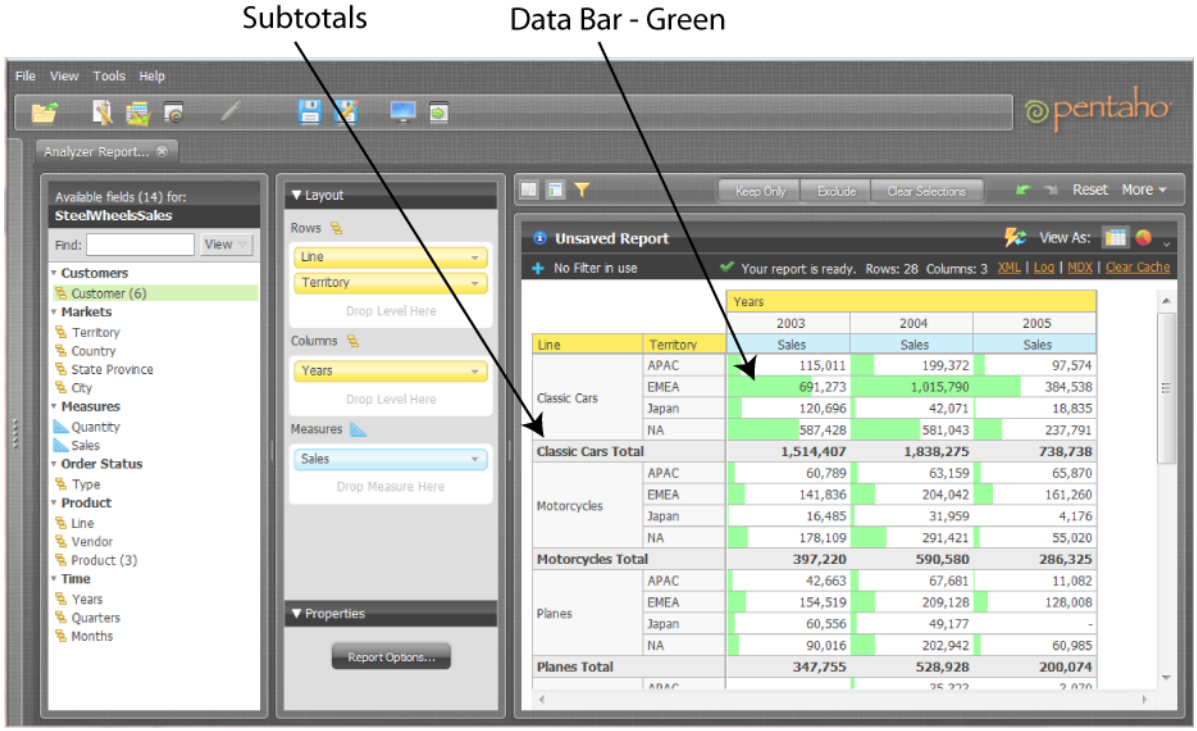
The Years columns are added to the existing table. They also auto-populate with the information from the server.

5. Click and drag the **Line** field and drop it next to **Territory**.



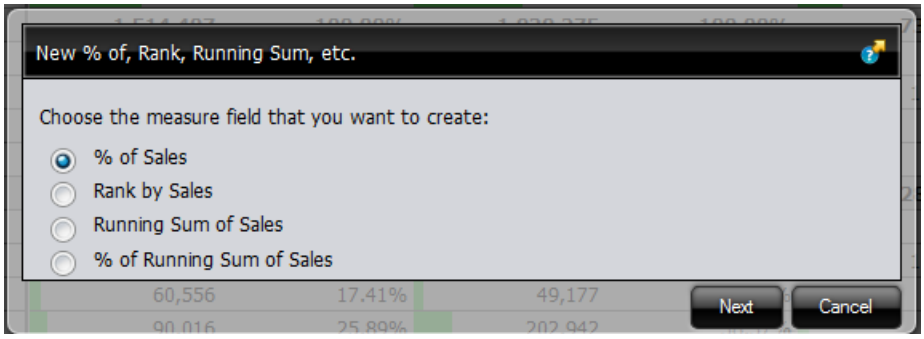
Line	Territory	Years 2003 Sales	2004 Sales	2005 Sales
Classic Cars	APAC	115,011	199,372	97,574
	EMEA	691,273	1,015,790	384,538
	Japan	120,696	42,071	18,835
	NA	587,428	581,043	237,791
Motorcycles	APAC	60,789	63,159	65,870
	EMEA	141,836	204,042	161,260
	Japan	16,485	31,959	4,176
	NA	178,109	291,421	55,020
Planes	APAC	42,663	67,681	11,082
	EMEA	154,519	209,128	128,008
	Japan	60,556	49,177	-
	NA	90,016	202,942	60,985
Ships	APAC	-	35,323	3,070
	EMEA	172,428	186,992	67,845
	Japan	14,156	10,453	8,407
	NA	58,238	142,904	48,856
Trains	APAC	1,681	8,226	-
	EMEA	29,538	90,973	17,995
	Japan	13,279	-	3,524
	NA	28,304	25,551	15,398
Trucks and Buses	APAC	11,298	80,634	53,735
	EMEA	228,699	185,421	86,859
	Japan	44,498	13,349	-
	NA	135,936	252,572	61,281
Vintage Cars	APAC	111,639	147,212	105,688
	EMEA	263,695	504,062	83,324
	Japan	22,888	21,470	7,979
	NA	281,727	324,815	191,727

6. Right-click the **Line** column and select **Show Subtotals**.
7. Right-click the first **Sales** column and select **Conditional Formatting** -> **Data Bar - Green**.

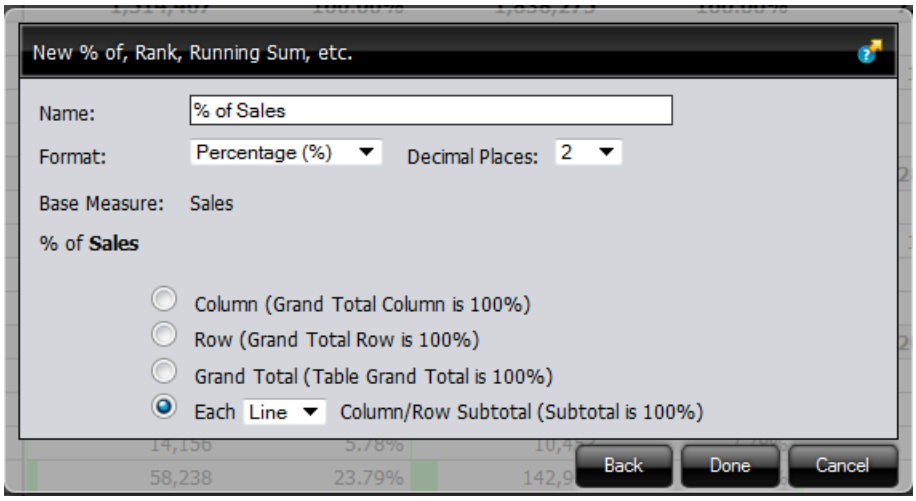


Line	Territory	Years 2003 Sales	2004 Sales	2005 Sales
Classic Cars	APAC	115,011	199,372	97,574
	EMEA	691,273	1,015,790	384,538
	Japan	120,696	42,071	18,835
	NA	587,428	581,043	237,791
Classic Cars Total		**1,514,407**	**1,838,275**	**738,738**
Motorcycles	APAC	60,789	63,159	65,870
	EMEA	141,836	204,042	161,260
	Japan	16,485	31,959	4,176
	NA	178,109	291,421	55,020
Motorcycles Total		**397,220**	**590,580**	**286,325**
Planes	APAC	42,663	67,681	11,082
	EMEA	154,519	209,128	128,008
	Japan	60,556	49,177	-
	NA	90,016	202,942	60,985
Planes Total		**347,755**	**528,928**	**200,074**

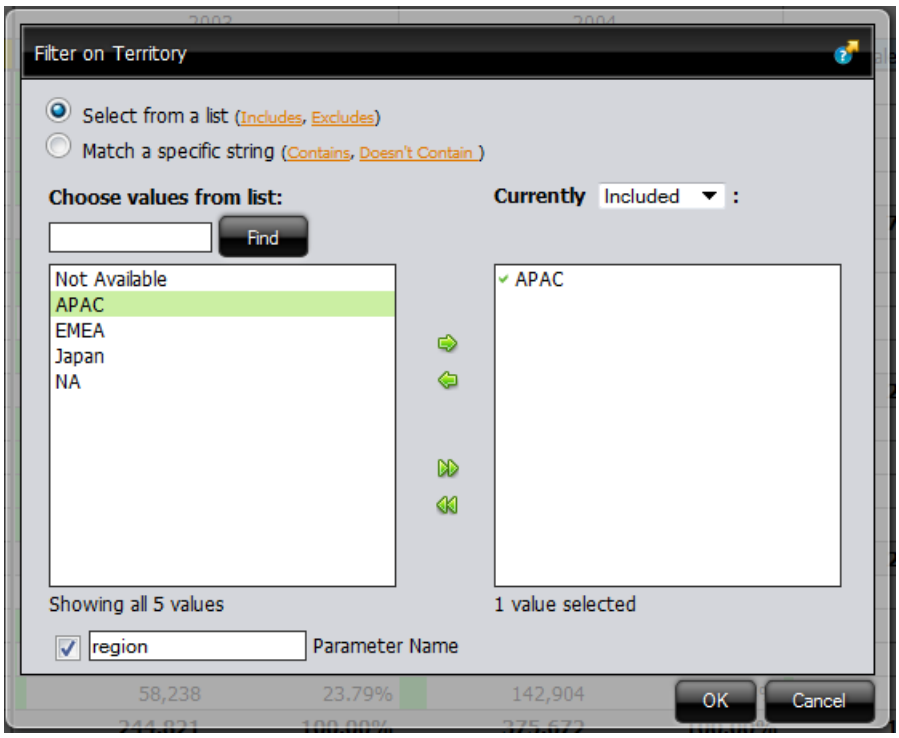
8. Right-click the same (first) **Sales** column and select **User Defined Measure** -> % of **Rank, Running Sum..**, then in the dialog box select **% of Sales**. Click **Next**.



9. Select the radial button for **Each Line Column/Row Subtotal (Subtotal is 100%)**. Click **Done**.

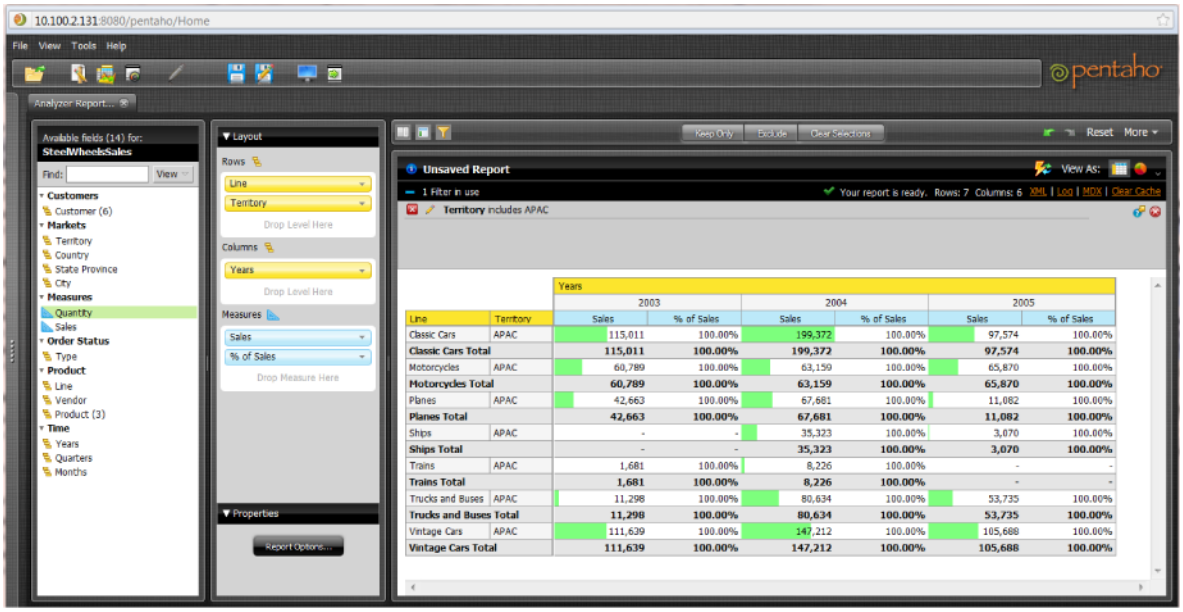


10. Click and drag the **Territory** field (under **Available Fields** on the left) into the filter area at the top of the report.
11. In the **Filter on Territory** dialog box, select APAC from the list and click the top, right-pointing green arrow to move it to the box on the right.
12. Enable **Parameter Name** by clicking on the check box in the bottom left of the dialog box. Type **region** (lowercase) as your parameter name in the text box. Click **OK**.



The report updates and displays sales data for APAC exclusively.

Click the line that separates each column to adjust it for better viewing. Move the line right or left as needed.



13. At this point you have a functioning report which can be viewed in a chart format. Click the **Switch to Chart Format** button (or select CNTRL + ALT + C) to examine your report data in a chart format. The default display is a bar chart but if you click the down arrow to the right of the **Switch to Chart Format** button, you can select a different format.
14. Save your report before continuing the exercise. In the Pentaho User Console, click the **Save As** button. When the **Save As** dialog box appears, save your report as **Territory Line - Sales** under `/Steel Wheels/Analysis` and click **Save**.

You've successfully created an Analyzer report from scratch.

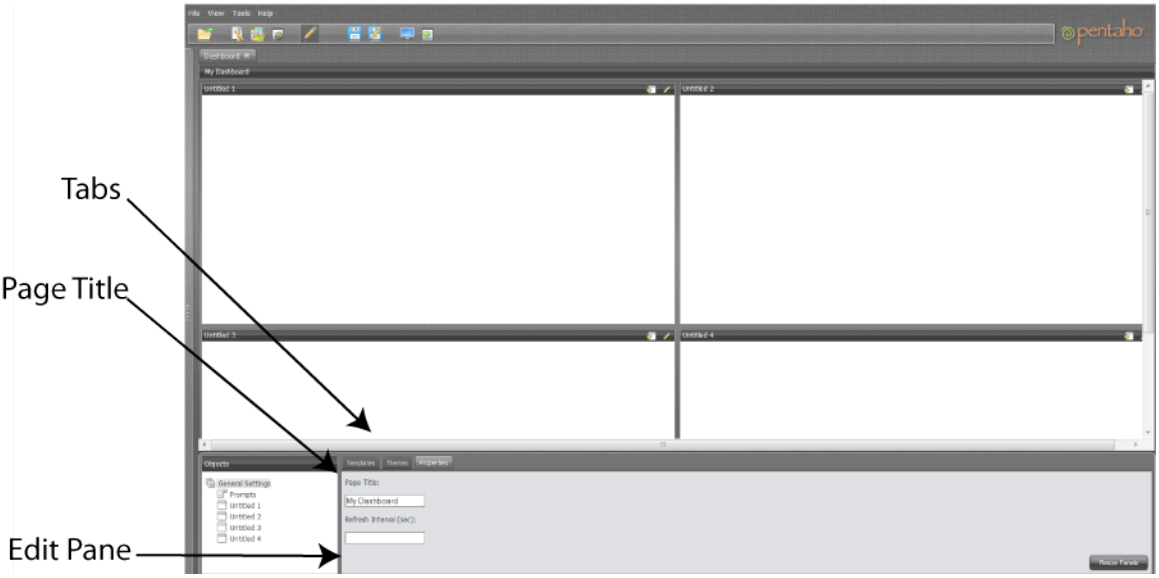
Working with Dashboards

Dashboards provide at-a-glance access to key performance indicators for your business. Pentaho Dashboard Designer makes it easy to create dashboards based on existing BI content. Dashboard Designer also makes it easy to generate simple charts and data tables within the tool.

Defining Your Dashboard Look-and-Feel

Ensure that you are logged on to the Pentaho User Console. Follow the instructions below to create a new dashboard.

1. In the Pentaho User Console Launch page, click **New Dashboard**. Alternatively, go to **File** > **New** > **Dashboard** in the Pentaho User Console Launch page or click **New Dashboard** in the toolbar.
2. In the edit pane (lower portion of the page), click **Properties**, and type **My Dashboard** in the **Page Title** text box. This is the title for your dashboard page.



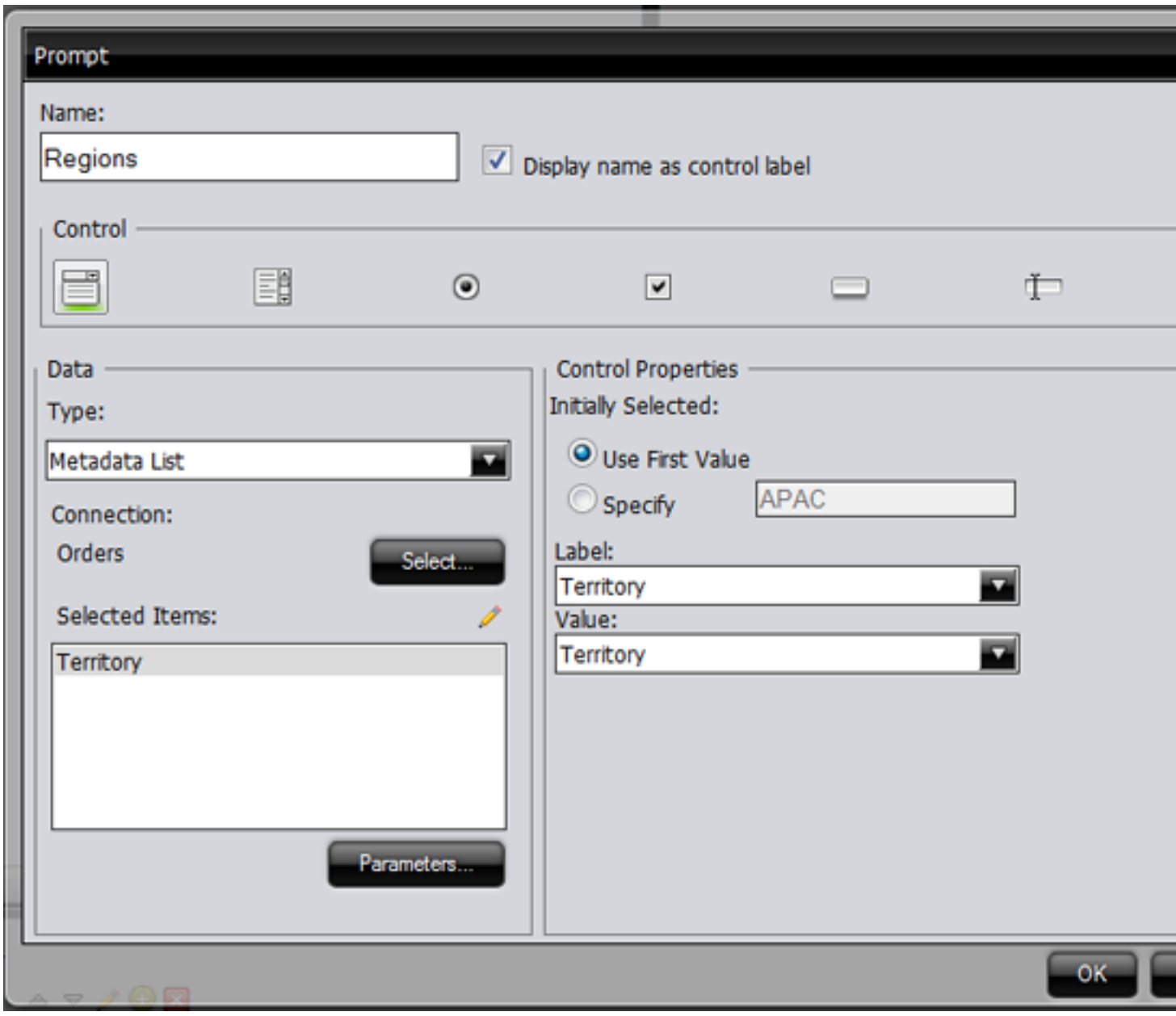
   The name you entered appears on the top left corner of the dashboard.
3. Click **Templates** and select the **2 Column** layout to use for this exercise.
4. Click **Theme**, and select the theme of your choice.
   The new theme will be applied to your dashboard immediately.

Adding Data to Your Dashboard

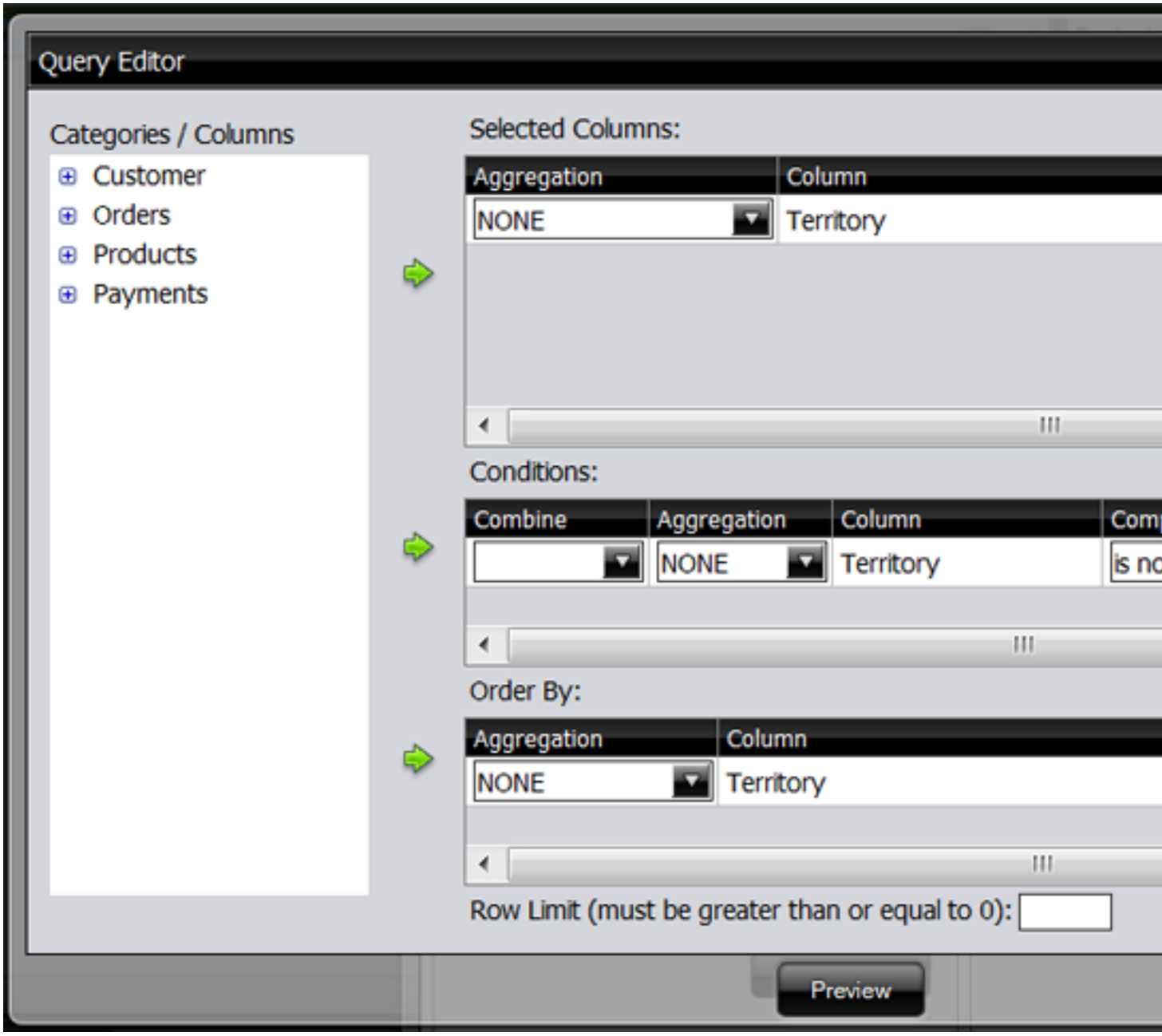
Follow the instructions below to add data to your dashboard.

1. Open a new **Dashboard** report.
2. Open the samples repository (**Steel Wheels**) and open the **Reporting** folder to display the list of available reports.
3. Click-and-drag the **Vendor Sales Report** file into the upper right dashboard panel.
4. Within the Edit Pane, type **Product Vendor** in the **Title** text box and click **Apply**.
5. Click **Analysis** folder in your samples repository (**Steel Wheels**) to display the list of available reports.
6. Click-and-drag the **Top Five Lines by Territory** Analyzer report into the upper left dashboard panel.
7. Within the Edit Pane, type **Top Five Lines by Territory** into the **Title** textbook and click **Apply**.
   The title for this section will change to **Top Five Lines by Territory**.
8. Click on the **Edit** (pencil) icon to close the Edit View.

9. Open Edit Mode and ensure the **Top Five Lines by Territory** pane is selected. Click on the **Content Linking** tab and click the **Enabled** boxes so **Years**, **Territory**, and **Line** are all enabled. Click Apply. Save the dashboard.
10. Select the **Product Vendor** tab and click the **{p}** next to the **Title** box which currently holds **Product Vendor**.
    The Product Vendor shows the two parameters that are applied to it.
11. Delete "& output-target parameter." You don't need that output presented in the title.
12. Choose the source of the **Region** parameter by selecting the source within the drop-down **Source** box. You have now selected a content link.
    The parameter appears next to the title. Exit **Edit Mode** by pressing the pencil icon if you want to see the user-friendly name.
13. Select the **Prompts** option from the bottom panel. Ensure the **Show Prompt Toolbar** box is checked, so this will appear at the top of the dashboard.
14. Add a new **Prompt** by clicking the **Add** icon.
    The Prompt Dialog Box will appear.
15. Type **Regions** into the Name field. Ensure the **Display name as control label** box is checked.
16. Select the Control Type that you want to use. For the sample, the first option (**Drop Down**) is selected.
17. For the **Type:** drop-down menu, select **Metadata List**.



18. Click the **Select** button
    The **Select Data Source** dialogue box will appear.
19. Click on **Orders** and click **OK**.
    The **Query Editor** dialogue box will appear.
20. Select **Customer** -> **Territory** and press the top right-facing arrow.
    This will move **Territory** into the **Selected Columns:** panel. This means that Territory is now what is returned by the query.
21. Click the middle green-facing arrow to add a condition on **Territory**.
22. Click on the drop-down **Comparison** option and select **is not null**.
    This will move the **Territory** field to the **Conditions:** panel. This filters or restricts the data as you define it.
23. Click the bottom green-facing arrow to aggregate (organize) the **Territory** field. From the drop-down field you can choose to order in ascending or descending order.
    This will move the **Territory** into the **Order By:** panel.
24. Click the **OK** twice to exit to the Dashboard.



25. Select the **Product Vendor** panel.

26. Under the **Parameters** tab, select **Regions** from the **Source** drop-down menu. Click **Apply**.
You have now linked this content to the prompt.

27. Click the edit (pencil) icon to exit **Edit** mode. You can save this dashboard by clicking the **Save** icon.
You can now dynamically apply the parameters to the **Product Vendor** panel. This will change the data and add the parameter to the title.

Saving Your Dashboard

Follow the instructions below to save your dashboard:

1. In the toolbar, click the **Save** icon to open the dialog box.
2. In the **File Name** text box, type **My Dashboard**.
3. Save your file in the `.../steel-wheels/dashboards` directory. You can do this by double clicking the **Steel Wheels** folder and the **Dashboards** folder.
4. Click **Save**.

Note: To learn more about Dashboard features, see the *Pentaho User Console Guide*. Click **Help** -> **Documentation** in the Pentaho User Console.

Editing Your Dashboard

In this exercise, you will edit a dashboard by adding a chart. Before you can add a chart you must select a data source that contains the data you want to use. You must then define the data that will be displayed in the chart.

1. Double-click the **Open File** icon -> **Steel-wheels** -> **Dashboards** ->**Regional Sales Performance** file.
   The dashboard opens.
2. Click the **Edit** icon in the Pentaho User Console toolbar.
3. In the Dashboard, choose a dashboard panel, click the **Insert Content** icon, and select **Chart** from the drop-down menu.
   A Warning Box Appears asking "Discard current content?" Click **OK**. The **Select a Data Source** dialog box appears.
4. Select **Orders** from the list of available choices. Click **OK**. The **Orders** data source contains the content you want to display in your chart.
   The **Query Editor** opens. The Query Editor allows you to retrieve dynamic data from a database for display in a chart. Defining your query is the first step in ensuring that the correct data is selected.
5. Expand the **Products** category and select **Product Line**. Click the right-facing green arrow next to the **Selected Columns** sub-window to place this option within the **Selected Columns** sub-window.
6. Expand the **Orders** category and select **Total**. Click the right-facing green arrow next to the **Selected Columns** sub-window to place this option within the **Selected Columns** window.
7. Expand the **Customer** category and select **Territory**. Click the right-facing green arrow next to the **Conditions** sub-window to place this option within the **Conditions** sub-window.

   These are the constraints that filter what you are selecting.
8. In the **Conditions** sub-window, click on the drop-down menu within the **Comparison** column and select **in**.
9. In that same section, in the **Value** text box, type **{Region}**.

   When you enclose a comparison name with curly braces, you are creating a parameter on that query.
10. In the **Default** text box, type **APAC**. Click on the **Preview** button.

    When the chart renders (as seen in the preview), it displays data associated with APAC. APAC is the default value of the parameter. That means users can change the query dynamically by replacing the default, "APAC," with a different territory, (for example, EMEA), when the query runs. You can click **Preview** in the Query Editor to ensure that the query you created is correct.
11. Click **OK** to exit the Query Editor.
    The **Chart Designer** opens.
12. In the Chart Designer, under **Type**, select **Pie Chart**.
13. In the **Data** section, from the **Series Column** drop-down box, select **Product Line**.
14. Still in the **Data** section, from the **Values Column** drop-down box,, select **Total**.
    The pie chart appears.
15. Click **OK** to exit the Chart Designer.
    The pie chart appears in the dashboard panel.
16. Within the dashboard, in the gray sub-window at the bottom of the screen, ensure your current panel within the dashboard is selected. Click the **{p}** button and **{Region}** will populate after the title.
17. Under the **Parameters** tab, You see the name **Region** with a drop-down box next to it. Select **Territory** from that drop-down and click **Apply**.
    When you exit Edit Mode, this will cause the applied parameter to appear after the title of the panel.

As you select a different territory, the individual reports and/or chart dynamically update. Because the **Parameter** value was applied to the **Product Performance** cart, the applied parameter will appear after the name.

Appendix: Troubleshooting Your Installation

The following tips may help you troubleshoot installation and other related issues.

Verifying Your Installation

After you have successfully installed Pentaho Business Analytics, verify your installation.

As you start and stop the consoles and other Pentaho components, you may see black command prompt windows open or close. These windows display the scripts that run the Pentaho Business Analytics components. You can minimize the command prompt windows so they do not clutter your desktop

Making sure the BA Server and PostgreSQL Repository have started

If you selected to launch the User Console or Enterprise Console, the installer automatically starts the BA Server, Solution Repository, and Enterprise Console. You can check to see if the Pentaho BA Server and the PostgreSQL database that contains the Pentaho Solution Repository have started by launching **Services**.

If you are using Windows, access **Services** from the **Start Menu**. Type **Services** into the search bar. When it appears, click to open. Scroll down to **Pentaho BA Server**. Right-click on the BA Server or Solution Repository in the Services window to start or stop them. Alternatively, you can start the BA Server by navigating to **Start** > **Programs** > **Pentaho Enterprise Edition Server Management Start BA Server**. The PostgreSQL database starts automatically when you log on.

Referencing Your Installation Summary

The installation summary automatically appears when you have completed an installation. It looks similar to the example below. The installation summary provides you with information about what is installed on your computer. In this example, all Pentaho Business Analytics components have been installed. The information in the summary helps the support team know what has been installed.

Follow the instructions below before you call support to resolve an issue. The support staff must know what components have been installed.

1. Navigate to the folder that contains Pentaho installation; for example, `C:\Program Files\pentaho`.
2. Locate and open the following file: `installation-summary.txt`.
3. Copy the contents of the file and send it, via email, to the support technician as instructed.

Resolving an Unable to Connect Error

If you followed the default installation instructions, the BA Server starts automatically at startup and remains available until you shut your computer down, or, you manually stop the server. If the BA Server is not started, an **Unable to**

Connect error will occur when you try to log onto the Pentaho User Console. This error may also occur if the URL to the Pentaho User Console has been changed. The default URL is, `http://localhost:8080/`.

To correct the issue start the server. Go to **Start** -> **Programs** -> **Pentaho Enterprise Edition** -> **Server Management** -> **Start BA Server**. If the problem persists, check the URL to make sure it has not changed.

Stopping the BA Server

To close the BA Server down after you log out of the Pentaho User Console, go to **Start** -> **Programs** -> **Pentaho Enterprise Edition** -> **Server Management** -> **Stop BA Server**

Resolving a License Not Found Error

Your Pentaho installation provides you with licenses to access all Pentaho Business Analytics components for 30 days. If, however, you attempt to use the software after 30 days or you uninstall and try to reinstall Pentaho Business Analytics, a "License Not Found" error will occur. This is true even if the previous software was a trial version.

Contact your Pentaho Sales Representative or send an email to *Support* to reinstate licensing.

Default Port Configuration

You must be able to assign ports during installation. We recommend that you contact your system or database administrator for help when you encounter port-related conflicts.

Below is the default port information:

Enterprise Console	Startup Port: 8088
MySQL Server	Startup Port: 3306
PostgreSQL	Startup Port: 5432
Tomcat BA Server	Startup Port: 8080
Tomcat Data Integration Server	Startup Port: 9080