Evaluating Pentaho Reporting 2.0

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Evaluating Pentaho Reporting

Your organization is ready to implement an open source business intelligence reporting solution, but where do you begin your evaluation? This guide will walk you through the evaluation process, using the Pentaho BI Suite Community Edition 2.0. Proprietary BI companies typically charge prospective clients for a "proof-of-concept" build of their software, integrated with the client's data. The Pentaho BI Suite Community Edition is entirely open source software, so it is free to download, use, and modify. However, a free download means that there's no consultant standing over your shoulder to personally walk you through using and evaluating these rather sophisticated products. This guide is essentially a free replacement for that consultant, meant to satisfy prospective Pentaho customers who want to save money by performing an initial evaluation on their own. There are still Pentaho consultants, salespeople, and pre-sales support specialists to help you with more advanced concepts, and if you still want that proof-of-concept after you've performed your initial evaluation, a Pentaho consultant can make that happen.

Audience

This guide's intended audience is relatively broad. You might be anyone from a chief information officer, IT manager, or database administrator, to someone who reports to one of those positions. No matter what your title or responsibility is, if your goal is to evaluate and make a recommendation on a business intelligence reporting tool, you will be able to follow this guide without any difficulty.

Prerequisites

At this point, you should have already outlined your business problems and commenced a project to solve them through business intelligence software. You should expect to budget an hour to perform the initial evaluation, which includes installing the Pentaho Reporting evaluation package, creating a data-driven report in Report Designer using the included sample data, and working with ad hoc reporting in the Pentaho User Console.

If at any time you run into a technical problem that is not covered in the troubleshooting section of this guide, contact your Pentaho sales representative for pre-sales support.

The Pentaho Reporting evaluation package includes an application server, sample data in an HSQLDB database, and a pre-configured MySQL database instance that will hold sample reports, schedules, and program settings. This package is not functionally much different from the Enterprise Edition version that you would likely deploy to a production environment, except that the Pentaho Enterprise Console, which simplifies user and server management, is not included. Pentaho Enterprise Edition customers also have access to a manual deployment package that enables sysadmins to build their own Pentaho BI Server Enterprise Edition Web application for an existing production application server and database. So if your company is purely an Oracle or PostgreSQL shop, you won't be forced to use MySQL.

For evaluation purposes, you will be installing the application server, database, and client tools on the same machine. In a production installation, you would ordinarily install the client tools on workstation machines, and the BI Server on a dedicated server. The unified system requirements are explained below.

Hardware Requirements

Pentaho Enterprise Edition software does not have strict limits on computer or network hardware. As long as you meet the minimum software requirements (note that your operating system will have its own minimum hardware requirements), Pentaho is hardware agnostic. There is, however, a recommended set of system specifications:

RAM	At least 1GB
Hard drive space	At least 1GB
Processor	Dual-core AMD64 or EM64T

It's possible to use a less capable system, but in most realistic scenarios, the too-limited system resources will result in an undesirable level of performance.

Your environment does not have to be 64-bit, even if your processor architecture supports it.

Software Requirements

In terms of operating systems, Windows XP with Service Pack 2, modern Linux distributions (SUSE Linux Enterprise Desktop and Server 10 and Red Hat Enterprise Linux 5 are officially supported, but most others should work), Solaris 10, and Mac OS X 10.4 are all officially supported.

No matter which operating system you use, you must have the Sun Java Runtime Environment (JRE) version 1.5 (sometimes referenced as version 5.0) installed. 1.4.2 will not work, and 1.6 (6.0) is not fully supported at this time.

Workstations will need to have reasonably modern Web browsers to access Pentaho's Web interface. Internet Explorer 7 or higher; Firefox 2.0 or higher (or the Mozilla or Netscape equivalent); and Safari 2.0.3 or higher will all work.

Your environment can be either 32-bit or 64-bit as long as it meets the above requirements.

The aforementioned configurations are officially supported by Pentaho. Other operating systems such as Windows Vista, FreeBSD, and OpenBSD; other Java virtual machines like Blackdown; and other Web browsers like Opera may work without any problems. However, the Pentaho support team may not be able to help you if you have trouble installing or using the BI Suite under these conditions.

DANGER: If you intend to install onto a headless Linux, Solaris, or BSD server, you will need to execute two extra steps. First of all, the installation utility requires a graphical environment, so you'll have to install onto a workstation and then copy over the `/bi-suite-2.0.0/` directory to your server. You will also have to install the **Xvfb** package on your server to simulate a working X11R6 environment; the Pentaho Reporting engine requires an X server or Xvfb instance to generate charts in Report Designer or the ad hoc reporting interface in the BI Server.

Evaluation Overview

This guide walks you through installing the reporting elements of the Pentaho BI Suite Community Edition version 2.0, which includes Report Designer, Metadata Editor, Design Studio, and the BI Server. Only the Pentaho Reporting components are covered in this evaluation. If you would like to

evaluate Pentaho Analysis or Pentaho Data Integration, there are separate guides available to walk you through them.

The bulk of this evaluation should take less than an hour, during which time you will accomplish the following goals:

1. Download and install the Pentaho BI Suite Community Edition evaluation package: **15 minutes**.
2. Read and follow a walkthrough for creating a basic, data-driven report with the included sample data: **10 minutes**.
3. Refine the report to include conditional text formatting, user-controllable parameters, and a chart: **10 minutes**.
4. Publish your report to the Pentaho BI Server and share it with others: **10 minutes**.
5. Create an ad hoc report with the wizard built into the Pentaho User Console: **5 minutes**.

Once you've seen the power of Pentaho Reporting, if you are technically inclined and have more time to spend on your evaluation, you can move onto more advanced concepts and tasks:

1. Connect to your own data source: **20 minutes**.
2. Create reports with your data: **Variable**.
3. Learn about the underlying technologies that drive Pentaho Reporting Enterprise edition: **10 minutes**
4. View some sample dashboards, which present report data in unique, interactive ways: **5 minutes**.

Obtaining An Evaluation Package

It's easy to obtain the Pentaho BI Suite Community Edition evaluation package. Follow the instructions below.

1. Open a Web browser and navigate to the Pentaho evaluation download page .

   If you are unable to click the link above, navigate to **www.pentaho.com**, then click **BI Suite** under the **Try** category on the right side of the Pentaho home page.
2. Fill out the Web form appropriately, then click **Get Free Downloads Now**.
3. Select the option for the **BI Suite**.
4. Follow the remaining on-screen directions to complete the download.

Installation Walkthrough

In order to proceed, you must have downloaded the Pentaho Reporting Community Edition 2.0 .exe (Windows) or .bin (Linux) installation utility.

Follow the below instructions to install the Pentaho Reporting Community Edition components on your system.

1. Double-click the installation utility you just downloaded.

   On Linux systems, you will have to set execute permissions on the installer before trying to run it; you may also have to run it from a terminal window.
2. When the installation utility starts, you'll see a Pentaho splash screen. Click **Forward**.
3. Accept the license agreement to continue.

4. When prompted for which Pentaho applications you want to install, all of the options that you will need are preselected; simply lcick **Forward**.
5. When asked whether or not you'd like to install the sample data, click **Forward** to accept the default, which is **Yes**.
6. Accept the default location to install the BI Suite to, then click **Forward**.
7. Next, enter a username and password to use for a BI Server administrator account, then click **Forward**.
8. Type in a publish password in the next screen, then click **Forward**.

   The publish password enables Report Designer to publish reports to the BI Server.
9. Click **Forward** through the next two summary screens.
10. After the installation process is finished, you'll be asked if you'd like to start the Pentaho User Console. Click **Finish** to select this option and exit the installer.

Once the installation wizard is complete, the BI Server should be up and running with default parameters, and the Pentaho Reporting client tools should be installed. Your system default Web browser will open and display the Pentaho User Console login screen.

Create, Publish, and Share Reports

Walkthroughs for creating, refining, publishing, and sharing data-driven reports.

Now that you've got Pentaho Reporting Community Edition installed, you're ready to start creating a basic report with the sample data. Once created, you'll publish the report to the output format of your choice, and to the Pentaho BI Server, where you will be able to share the report more directly. You'll start with Pentaho's most sophisticated reporting tool, Report Designer, and then move on to creating an ad-hoc report through the BI Server.

Pentaho Report Designer is a pixel-perfect report creation tool that allows you to have total control over how your data is selected, refined, formatted, and displayed in a variety of useful output formats. The Pentaho BI Server combines elements of Pentaho Reporting and Pentaho Analysis into an easy-to-use Web interface that enables report scheduling and sharing.

Starting Report Designer

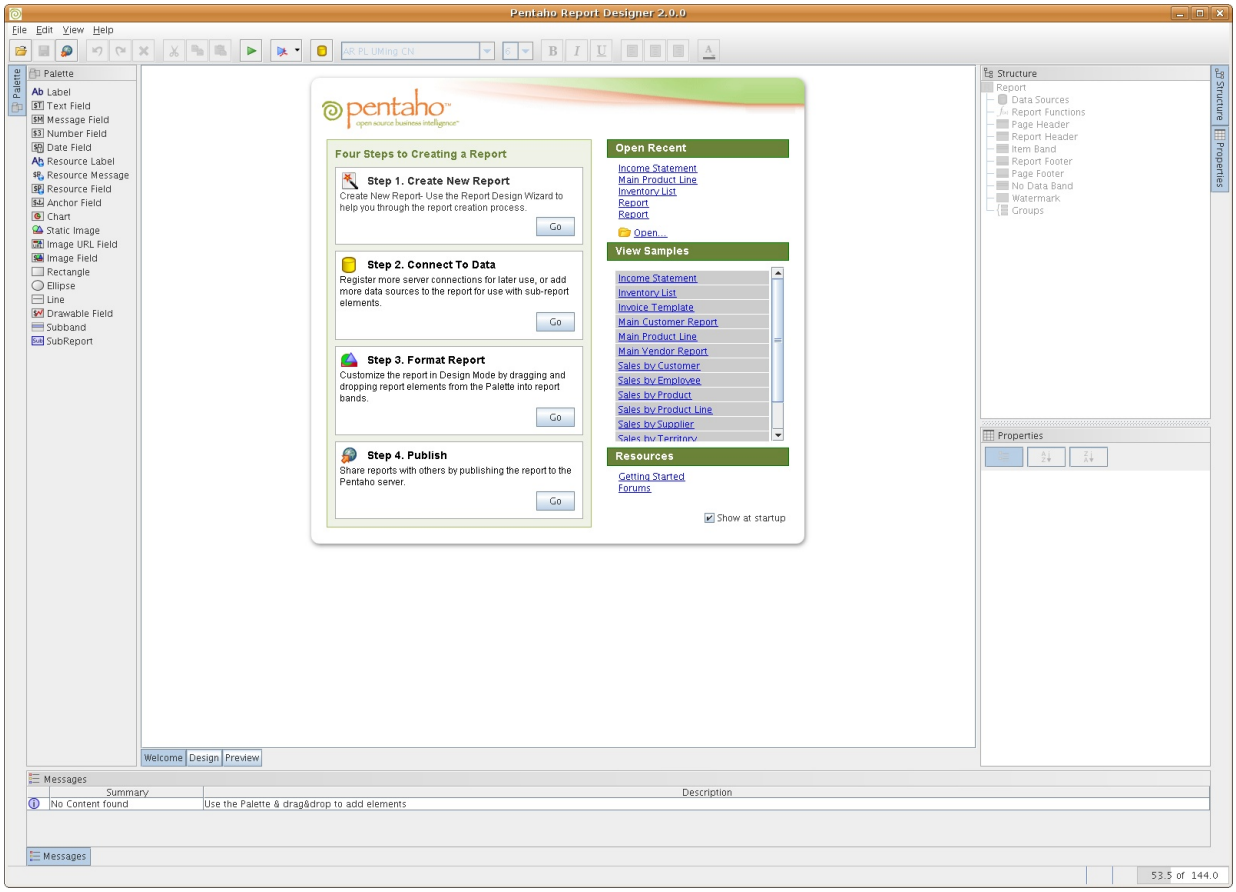
Follow the below process to start Report Designer.

1. Click the **Report Designer** entry in the **Pentaho** folder in the **Programs** section of your Start menu, or navigate to the **/bi-suite-open-2.0.0/client/report-designer/** directory and run **ReportDesigner.exe** on Windows, or **startdesigner_linux.sh** on Linux.
2. Before the program starts, it will run a version checking utility. You can click either option in the version checker screen to start Report Designer – if you just downloaded this file, it is assuredly the most current version, so you may not need to enable this feature right now.

After the version check is complete (or skipped), Report Designer will start. Report Designer displays a Welcome screen and a default workspace at startup. The Welcome screen provides you with a brief introduction to the program, some instructions for getting started, and access to sample content and recently opened reports. For this walkthrough, you won't be following the instructions on the Welcome screen, though if you would like to experiment with Report Designer a little before continuing, feel free.

Exploring the Report Designer Interface

Report Designer's interface is similar to that of other graphic design and layout tools. A typical menu and button bar are at the top of the screen; a tool palette for adding design elements is on the left; and on the right are two panes that contain data and structure elements, and show the properties of a selected report element.



Creating a Basic Report

As an introduction to Report Designer, follow this procedure to create a simple report that shows which products are associated with cancelled orders, sorted by product line and territory.

1. From the Welcome screen, click the **Design** tab in the lower left corner of the workspace.

   The Design view enables you to create and adjust your report's layout by hand.
2. Go to the **File** menu, then click **Open**. In the ensuing file dialog, navigate to `/bi-suite-open-2.0.0/client/report-designer/samples/`, select the **evaluation_blank.report** file, then click **Open**.

   The sample report file you just opened was designed specifically for this evaluation guide. It comes with a predefined data source linked to the sample data included in the evaluation package. The only element in this report is a header at the top that says "Pentaho Report Designer Sample Report." You can remove this header if you like.
3. Drag and drop a **Label** element from the Palette onto the **Page Header** band.

   The page header appears at the absolute top of every page in the report.
4. Double-click the label to edit it, then type in **Cancelled orders for all regions**.
5. Click the **12** drop-down box in the top toolbar, and select **24** in the list.

   This will increase the text size to 24 point, which is more appropriate for a page title than 12 point.

6. Click and drag the horizontal resize handles on the Label element you just created until the field is as large as the page; drag the vertical resize handles until the text fits appropriately in the space.

   Expanding the field out to the size of the page will allow you to center the text more easily.
7. With the label selected, click the **AlignCenter** icon on the left side of the top toolbar.

   The text is now perfectly centered in the page header.
8. In the Structure pane, click **Data Source default JNDI:SampleData** to select it.
9. In the Properties pane, click **TERRITORY** to select it, then click and drag it into the left side of the **Item Band** section of the grid.

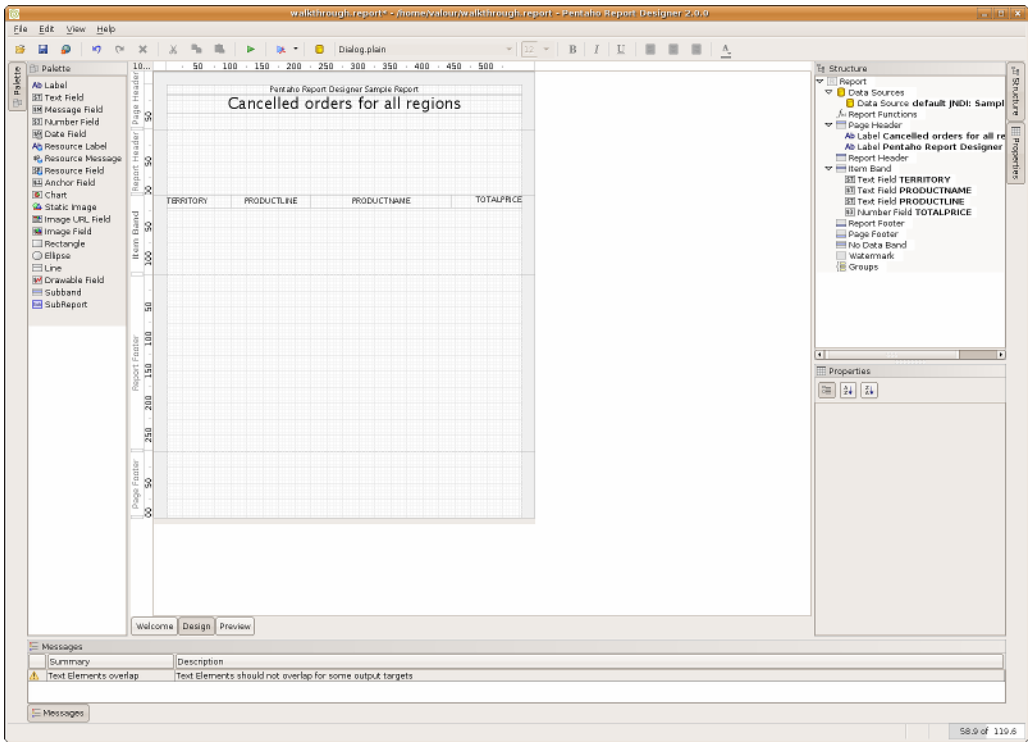
   The Item Band will repeat itself for as many iterations of the query elements as there are. So if TERRITORY contains 5 rows, there will be 5 item elements in the report, spread across as many pages as is necessary.
10. Repeat the previous step for the **PRODUCTLINE** column, but drop it into the center of the Item Band instead.
11. Repeat the previous step for the **PRODUCTNAME** column, but drop it into the right side of the Item Band instead.
12. Drag the TERRITORY field to the absolute top left of the Item Band.
13. Drag the PRODUCTLINE to the absolute top center of the Item Band, then click the **AlignCenter** icon in the top toolbar.
14. Drag the PRODUCTNAME to the absolute top right of the Item Band, then click the **AlignCenter** icon in the top toolbar.
15. Drag the TOTALPRICE to the absolute top right of the Item Band, then click the **AlignRight** icon in the top toolbar.
16. Drag the resize handles on the **TERRITORY**, **PRODUCTLINE**, **PRODUCTNAME**, and **TOTALPRICE** fields so that they fill all of the horizontal space in the grid. Don't change their vertical size -- just adjust their horizontal borders and orientations so that they are at the top of the Item Band with their borders abutting to one another and the sides of the report.

    The three fields should appear to be one solid line when you're done resizing and repositioning them.
17. Click **Preview** near the bottom left of the grid.

    The Preview tab is a good way to verify the effects of any changes you make to a report.
18. Go to the **View** menu, then select **Preview as PDF**.

    A PDF version of the report will appear in your default PDF reader.

You now have a basic report that shows information that would be quite useful to the fictional company it belongs to. If you'd like to see some of Report Designer's more advanced functionality, continue on to the next section. Otherwise, skip ahead to the next portion of this guide that appeals to you.



Refining Your Report

To complete this process, you must have created a report according to the directions in the previous section. You should have the modified **evaluation_blank.report** file open in Report Designer at this time.

Being able to view properly refined and constrained data is useful, but Report Designer is capable of much more than just collecting and printing data; it also has many formatting options to increase the readability and visual appeal of your reports. Follow the below process to enhance your report with conditional formatting, borders, a company logo, a dynamic report date in the footer, and a pie chart. Feel free to go to the Preview tab at any time to see your progress.

1. Click in the grid and drag a selection box around all four fields in the Item Band.
2. In the Properties pane, click the right half of the **Border** property, then click the **...** button.
3. In the border dialog, click the checkbox next to **Same border for all sides**.

   This applies the settings from one border element to all eight.
4. Click any of the border sides, then select black for the color, 1 for the width, and SOLID in the **Dotted** drop-down box, then click **OK**.

   This will add a solid black line around each field.
5. Click the **Top** drop-down box in the **Vertical Alignment** property, and select **Middle**.

   This will center the text in the middle of the field, vertically.
6. Change the **Padding** property to **0;0;5;5**.

   This will put a little more space between the borders and the field text.
7. Click the **PRODUCTLINE** field to select it.
8. In the Properties pane, click the right half of the **Style Expressions** property, then click the **...** button.
9. Click **Add Expression**, then select **background-color** from the list, then click **OK**.

10. Click **background-color** to select it, then click **Edit Formula**.
11. Select **Logical** from the **Date/Time** drop-down box.
12. Double-click the **IF** statement in the list on the left.
13. Erase the default value from the **A Condition** field, then click the field selection button to the right.
14. Select the **PRODUCTLINE** field, then click **OK**.
15. Add **="Classic Cars"** to the A Condition line.

    Your condition should look like this: **[PRODUCTLINE]="ClassicCars"**
16. Type in **"red"** and **"white"** into the true and false fields, respectively.
17. Click **OK** to leave the Formula Editor, then click **OK** to leave the Style Expressions dialog.

    All cancelled orders in the Classic Cars product line will now be highlighted in red.
18. Drag and drop a **Static Image** element from the Palette to the **Report Header** band.
19. In the Properties pane, click the right half of the **URL** property, click the **...** button, then navigate to `/pentaho/report-designer/samples/logo.png`, then click **Open**.

    This graphic is a Steel Wheels Inc. logo developed by Pentaho for demonstration purposes.
20. Reposition and resize the logo until it is the width of the report.

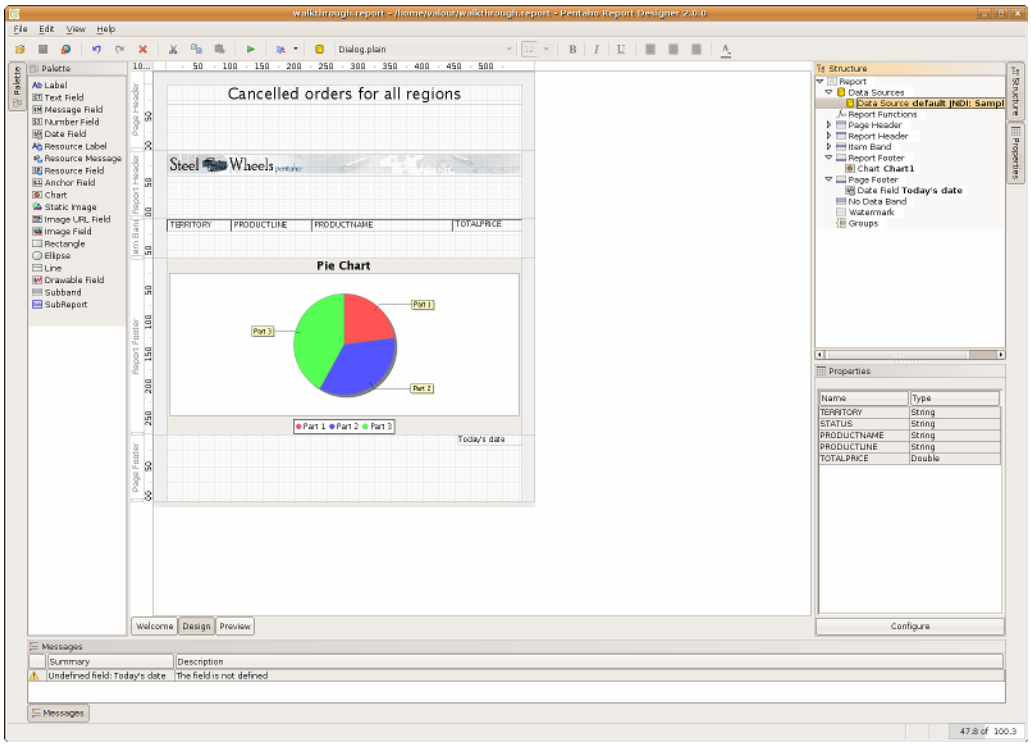
    Report Designer will downsize images proportionately according to the size of the element.
21. Drag and drop a **Date field** element to the right corner of the Page Footer.
22. Double-click the new date field, and type in **Today's date** for a field name.
23. In the Properties pane, click the right half of the **Formula** field, then click the **...** button.

    The Formula Editor will appear.
24. Double-click **NOW** in the list on the left, then click **OK**.
25. Drag and drop a **Chart** element from the Palette to the Item band, below the text fields you created earlier.
26. In the Properties pane, click **Edit Chart**.
27. Click **Pie** in the list on the left.
28. Double-click the right half of the **Title** field, then type in **Highest Cancelled Order Costs**.
29. Click the right half of the **Value Column** field, then click **...**. In the ensuing popup dialog, select **TOTALPRICE**.

    This column determines the numerical data that the pie chart will represent.
30. Click the right half of the **Series Column** field, then click **...**. In the ensuing popup dialog, select **PRODUCTLINE**.

    This determines how the TOTALPRICE data will be constrained in the pie chart.
31. Un-check the **Summary Only** box.
32. Click **Apply** to save the chart settings.

Your report is now branded for the fictional Steel Wheels company, easier to read, and specifically highlights cancelled orders relating to the Vintage Cars product line. This is still only the beginning, but you should now have a good impression of the power and flexibility of Pentaho Report Designer.



Sharing Your Report

In addition to printing out or archiving a report directly from Report Designer, you can also publish it to the Pentaho BI Server where it can be shared electronically through a Web interface, or distributed via email. If you've created a parameterized report (a report that requires user input through the BI Server Web interface in order to run), you must publish to the BI Server in order to take advantage of its interactive elements.

Follow the process below to add parameterization to your report, publish it to the BI Server, and run it from the solution repository.

1. Edit the **default** data source by double-clicking its entry in the Structure pane.
2. In the **WHERE** portion of the SQL statement shown in the Query Details field, add the following line: `PRODUCTLINE = '${ENTER_PRODUCTLINE}' AND`

   This is the value that BI Server users will be asked to supply when they run this report.

   Your WHERE statement should now look like this:

   ```
   WHERE
       `PRODUCTLINE` = '${ENTER_PRODUCTLINE}' AND
       `ORDERFACT`.`STATUS` = 'Cancelled'
   ```
3. Click **OK** to save the query.

   DANGER: Once you add parameterization, you will be unable to preview your report in Report Designer. This is because the report has become dependent on user input via the BI Server's Web interface. To regain preview functionality, simply remove the query line you added above.
4. From the **File** menu, select **Publish to Server...**

   The Repository Login dialog will appear, pre-populated with credentials valid for the evaluation sample data and users.

5. Type your publish password (you set this during installation) into the appropriate field, then click **OK**.

   A Publish Report dialog will appear.
6. Type in a report name and description into the appropriate fields.
7. Select **html** from the Report Output Type drop-down box.
8. Click the checkbox next to **User Server Data Source (JNDI)**, then click **Publish**.

   You should see a message that says the publish operation was successful.
9. Click **Yes** when prompted if you would like to go directly to the Pentaho User Console to view the report you just published to the BI Server.

   If you want to access the report later, just log into the BI Server by going to **http://localhost:8080** in your Web browser, then navigate to the **Reporting Examples** directory in the Solution Browser. You should see your published report in the list.
10. Log in as **Joe**. Joe's password is **password**.
11. In the **ENTER_PRODUCTLINE** field, type in any of the product lines from the sample data: Classic Cars, Motorcycles, Vintage Cars, Ships, Trains, or Planes, then click **Ok**.

    You can use your browser's back button to revisit this screen and enter a different product line if you wish.

You now have a dynamic report that BI Server users can run at any time, with updated data, that concentrates on specific product lines. The conditional formatting is still set to give Classic Cars a red background, and the pie chart is configured to compare cancelled order costs among all product lines, so there is still some adjustment to do to put this report into production. However, at this point in your evaluation, you've seen most of Report Designer's key features; if you'd like to go back into Report Designer and make more changes to the cancelled orders report, feel free. This guide, however, will proceed to a walkthrough of the BI Server's ad-hoc reporting capabilities.

Ad-hoc Reporting Tutorial

This walkthrough shows you how to create a simple, template-based report that shows which territory generates the most sales.

1. Click the **Create New Report** button in the middle of the screen.

   The ad hoc query wizard will start.
2. In the first step of the wizard, select a **Business Model**, which is another name for a data set.

   The **Business Model Details** table will populate with available tables and columns. (Business Models are defined by your solution metadata, which can be modified through the Pentaho Metadata Editor.)
3. Select **Orders** in the **Business Model Details** pane.
4. In the **Apply a Template** field, select a predefined report template that appeals to you.

   A thumbnail preview of the template will appear in the **Template Details** field. A template specifies a variety of properties in the report that affect its appearance, like font size and background colors for various report elements.
5. Click **Next**.
6. In the **Available Items** list, click the **Territory** business column and drag it to the upper right into the **Level 1 box**.

   This will determine how the data is grouped.

7. Drag and drop the **Amount** and **Buy Price** into the **Details** box on the right.

   This determines which fields to display for the given groups.
8. Click **Go** to preview how these new items have affected the report, then close the preview tab when you're done.
9. Click **Next**.
10. Click the **Territory** item in the **Groups** list.

    A list of general options will appear on the right.
11. Click **Center**.

    This will center the territory name above each table, making it easier to read.
12. Click **Go** to test the new change, or **Next** to continue to the next part of the wizard.
13. To set the header, footer, description, paper type, and page orientation, change the on-screen values for these elements accordingly.

    PDF is the only output type that has a concept of a page, so the **Page** portion of the **Header** and **Footer** sections only applies to PDFs.
14. Click **Save as** to save your report. In the ensuing file dialog, navigate to the location you want to save the report to, type in a filename for the report, and click the checkboxes next to the file formats you want to save in.

    You can continue to modify your report after it's been saved; just click **Save** to update the report file after you've made changes.

You now have a report that shows how much revenue is coming from each sales territory, and the itemized price of each purchased item. As you can see, ad hoc reporting is quicker and simpler than Report Designer, but doesn't offer nearly the same level of design detail, nor does it have advanced reporting features like conditional formatting or parameterization.

Advanced Concepts and Tasks

Up till this point, you've been reading specific, easy-to-follow procedures for working with reports. From an end-user's perspective Pentaho's client tools and the Pentaho User Console are all easy to use, but the technologies that Report Designer and the BI Server depend on are more technically sophisticated. This section contains advanced instructions, information, and tips for more technically savvy evaluators.

Creating and Constraining a Data Source

In Report Designer, data sources are defined through SQL or MQL queries, or through a Mondrian MDX file. If you aren't an SQL guru, you can still form a good query through Report Designer's built-in SQL Query Builder. The reporting examples in this guide have thus far involved using a mostly blank report file that contains a predefined query. This was done to enable Pentaho Reporting evaluators to dive into Report Designer quickly without having to worry about forming a query. Follow the below process to establish a connection to the sample HSQLDB database and create the same query that came with the example report. This query will constrain the data so that it only reveals data pertaining to cancelled orders, sorted by sales territory, product line, total price, and product name.

1. Click the **Design** in the bottom left area of the window.

   The Welcome screen will be replaced by the Design view.
2. Right-click on **Data Sources** in the **Structure** panel, then click **Add Data Source...** in the context menu.

   A configuration window will appear.
3. Click on **SampleData** in the **Connection** field to select it.
4. You must now enter an SQL query to pull in information to use in the report, but since you aren't familiar with the sample data structure, you'll need some assistance. Click **Query Designer** to bring up the easy-to-use SQL Query Builder tool.

   The SQL Query Builder window will appear.
5. Double-click the **CUSTOMER_W_TER** table in the lower left pane.

   All of the columns in that table will appear in a list below the SELECT command in the upper left pane, and in a sub-window in the blue workspace to the right.
6. Double-click the **ORDERFACT** table.
7. Double-click the **PRODUCT** table.
8. Right-click each table's sub-window, then click **deselect all** from the context menu.

   By default, all columns in a table are selected. If you just want to select a few of them, it's easier to deselect all and then select only the relevant columns than it is to deselect unwanted columns by clicking checkboxes.
9. Create an SQL JOIN by clicking on the **CUSTOMERNUMBER** column in the **CUSTOMER_W_TER** field, then clicking and dragging to the **CUSTOMERNUMBER** column in the **ORDERFACT** sub-window.

   A grey line with a red square in the middle will appear between the two sub-windows. If there is not already a JOIN between the ORDERFACT and product tables, create one now.
10. In the **CUSTOMER_W_TER** table, click the checkbox next to the **TERRITORY** column.

11. In the **PRODUCT** table, click the checkboxes next to the **PRODUCTLINE** and **PRODUCTNAME** columns.
12. In the **ORDERFACT** table, click the checkboxes next to the **STATUS** and **TOTALPRICE** columns.
13. Right-click on the **STATUS** column in the **ORDERFACT** table, then select **add where condition...** in the context menu.

    A conditional statement window will appear.
14. Type **'Cancelled'** into the lower text field, then click **ok**.

    This will constrain the data in the STATUS column so that only the cancelled orders are displayed.
15. In the upper left pane, right-cllick on **TERRITORY**, then select **add to order-by** in the context menu.

    This will sort the results by territory.
16. Repeat the previous step for **PRODUCTLINE**, then **PRODUCTNAME**.

    This will sort the results by territory first (because it is first in the order-by list), and then by the product line, and then by product name within each product line.
17. Click Preview to make sure that the lists are sorted and grouped correctly.
18. When you're done looking at the basic query results, close the preview window, then click **Ok** to save your query and exit the SQL Query Builder.
19. Click **OK** to exit the Configure window.

You should now be back in the Design tab of Report Designer. You are now ready to create a report with the data you just specified in the query.

Your query should look like this:

```
SELECT
            `CUSTOMER_W_TER`.`TERRITORY`,
            `ORDERFACT`.`STATUS`,
            `PRODUCTS`.`PRODUCTNAME`,
            `PRODUCTS`.`PRODUCTLINE`,
            `ORDERFACT`.`TOTALPRICE`
FROM
            `ORDERFACT` INNER JOIN `CUSTOMER_W_TER` ON
 `ORDERFACT`.`CUSTOMERNUMBER` = `CUSTOMER_W_TER`.`CUSTOMERNUMBER`
INNER JOIN `PRODUCTS` ON `ORDERFACT`.`PRODUCTCODE` = `PRODUCTS`.`PRODUCTCODE`
WHERE
            `ORDERFACT`.`STATUS` = 'Cancelled'
ORDER BY
            `CUSTOMER_W_TER`.`TERRITORY` ASC,
            `PRODUCTS`.`PRODUCTLINE` ASC,
            `PRODUCTS`.`PRODUCTNAME` ASC
```

Note: The MQL Query Builder tool works almost identically to SQL Query Builder.

Pentaho Software Technology

The Pentaho Reporting engine

Report Designer is one possible implementation of the Pentaho Reporting engine, formerly known as JFreeReport. The engine can be integrated into existing Java applications, or you can build your own Report Designer-like user interface for it, or you can use it as sort of a reporting appliance that you send jobs to from other services.

If you're looking for an embeddable reporting solution, the Pentaho Reporting engine is an excellent option because of its source code availability, its history of successful embedding projects, and

Pentaho Reporting Enterprise Edition's developer assistance options. As an Enterprise Edition customer, your application developers can get assistance from the Pentaho engineers who created and maintain the Reporting engine code, and get a fast track for bug fixes.

Preparing data for Report Designer

In order for Report Designer to interface properly with your database, you must prepare the data so that it is easier to work with. The Pentaho Metadata Editor is designed specifically to prepare data for Report Designer and ad hoc reporting in the BI Server. If you extend your evaluation to include connecting to your own database, you will have to start with Metadata Editor, which is included in the Pentaho Reporting Enterprise Edition evaluation package.

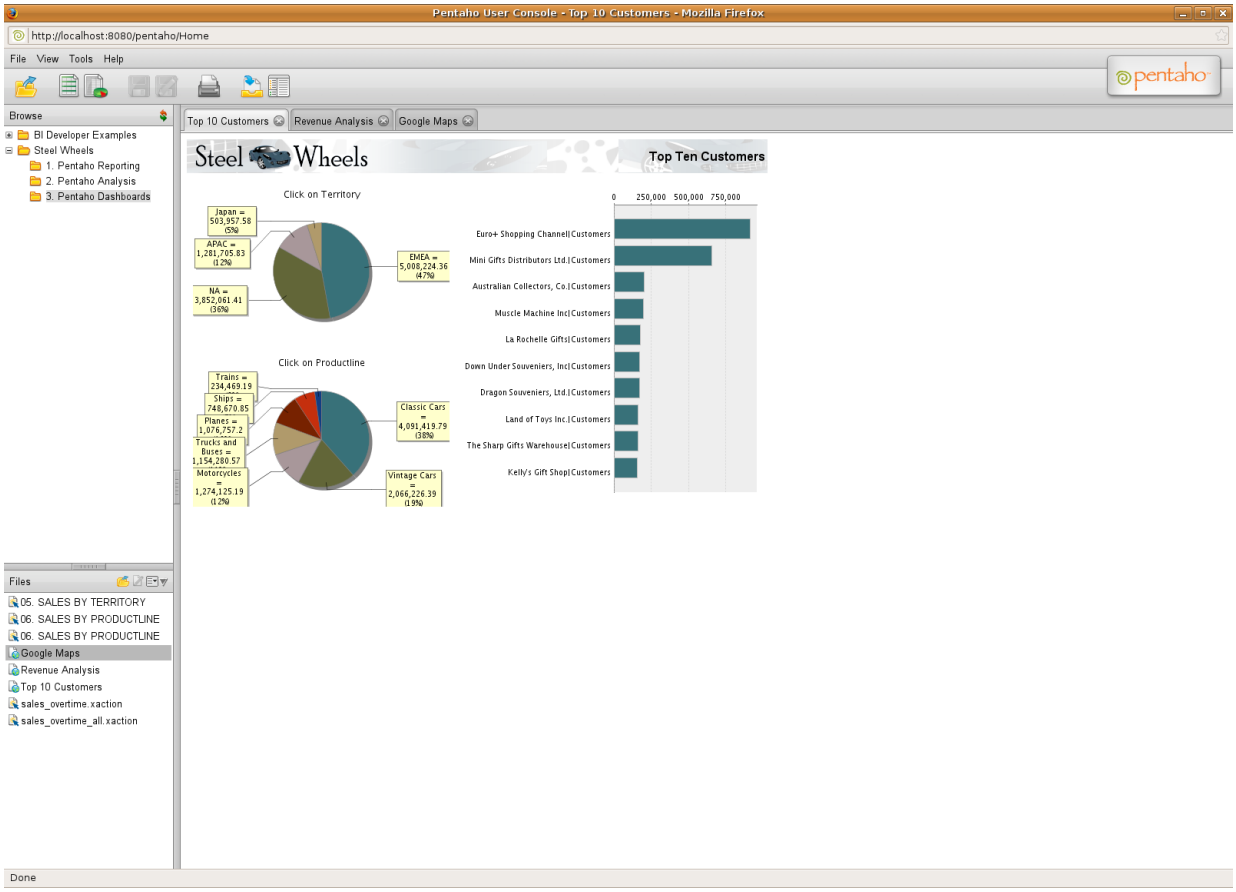
Reporting Dashboards

Reporting may only be the first step for you in terms of information delivery. When you have data that need to be updated frequently or in real-time and delivered to a large number of people, reports become cumbersome and bandwidth-intensive. In these situations, you may be better served by a Web portal that shows rich and interactive charts, graphs, and stoplight reporting dashboard elements. Pentaho has excellent dashboard and portal functionality that allows you to embed reports into Web pages with a variety of interesting features, including:

- Stoplight alerting and conditional formatting
- Google Maps integration
- Adobe Flash widget support

To see some dashboards in action, log into the Pentaho User Console by opening a Web browser and navigating to `http://localhost:18080`. Log in as **joe** with **password** as the password. When you get to the quick launch screen, go to the **View** menu, then select **Browser**. A new navigation pane will appear on the left. In it, click on **3. Pentaho Dashboards** in the **Steel Wheels** category. A list of example files will appear in the lower left pane; in it, double-click on the **Google Maps**, **Revenue Analysis**, and **Top 10 Customers** items to see different interactive dashboard examples.

Pentaho offers a Dashboard Enterprise Edition support module that makes dashboard development expertise available to your JSP developers. If you're interested, ask your Pentaho sales representative for more information and a live demonstration.


Pentaho User Console - Top 10 Customers - Mozilla Firefox
http://localhost:8080/pentaho/Home
File View Tools Help
pentaho
Browse
BI Developer Examples
Steel Wheels
1. Pentaho Reporting
2. Pentaho Analysis
3. Pentaho Dashboards
Top 10 Customers
Revenue Analysis
Google Maps
Steel Wheels
Top Ten Customers
Click on Territory
Japan = 503,957.58 (5%)
APAC = 1,281,705.83 (12%)
NA = 3,852,061.41 (36%)
EMEA = 5,008,224.36 (47%)
Click on Productline
Trains = 234,469.19
Ships = 748,670.85
Planes = 1,076,757.2
Trucks and Buses = 1,154,280.57
Motorcycles = 1,274,125.19 (12%)
Classic Cars = 4,091,419.79 (38%)
Vintage Cars = 2,066,226.39 (19%)
0 250,000 500,000 750,000
Euro+ Shopping Channel|Customers
Mini Gifts Distributors Ltd.|Customers
Australian Collectors, Co.|Customers
Muscle Machine Inc|Customers
La Rochelle Gifts|Customers
Down Under Souveniers, Inc|Customers
Dragon Souveniers, Ltd.|Customers
Land of Toys Inc.|Customers
The Sharp Gifts Warehouse|Customers
Kelly's Gift Shop|Customers
Files
05. SALES BY TERRITORY
06. SALES BY PRODUCTLINE
06. SALES BY PRODUCTLINE
Google Maps
Revenue Analysis
Top 10 Customers
sales_overtime.xaction
sales_overtime_all.xaction
Done

Case Study: Steel Wheels, Inc.

The following theoretical case study was written to show you what a typical Pentaho Enterprise Edition evaluation scenario is like. It's based on the sample data included with the Pentaho BI Suite Enterprise Edition, and is closely related to the Report Designer and ad-hoc reporting walkthroughs earlier in this guide, so if you'd like, you can follow along with the story.

The February that never ended

Every year, sales at Steel Wheels, Inc. (a leading distributor of collectible scale-model classic vehicle replicas) reached a crescendo in December, stayed relatively strong through January, then dropped off to dismal levels in February. Sales picked up again gradually after that, through the spring, summer, and fall. This trend was generally predictable, though the overall numbers did increase year-over-year.

This past March, however, profits never picked up beyond the anemic February levels. The mood was grim as the CEO called a management meeting to figure out what the problem was and how it could be solved. Naturally, the CEO turned to the man who usually had all of the answers – Sam the Steel Wheels CIO. Unfortunately, Sam was not prepared for this meeting.

Sam the CIO and his (not-so) trusty Excel solution

When the company was founded three years ago, Sam started a Microsoft Excel spreadsheet to record sales numbers, and this was the only method of tracking and analyzing business data that he had (or thought he'd ever need). Sales, operations, and services data would come in via email from each department's director, and Sam would enter it into Excel every Friday afternoon. Late last year, however, the company doubled its sales force and expanded to overseas markets, making maintaining the spreadsheet almost a full-time job in itself. It could no longer be updated in a single afternoon, and Sam wasn't willing to work weekends to get it in order. At the same time, Steel Wheels was rolling out an improved CRM application and a new webmail system, so Sam the CIO didn't even have Friday afternoons for spreadsheet updates anymore. As a result, the Excel data began to get stale, but it wasn't really a problem because the company was making lots of money and no one was asking any questions about sales numbers. Besides, it wasn't all that important – the primary function for Sam's spreadsheet was providing cool-looking graphs for quarterly reports, not for finding business problems.

All of this flashed before Sam's eyes at the emergency management meeting. According to the director of sales, the raw sales numbers looked great, but somehow they weren't translating into profits. Sam opened up his gigantic Excel spreadsheet and took a look at the pile of email that contained months worth of unentered data, and determined that it would take him more than a solid week to update the spreadsheet, not to mention the extra time beyond that trying to tweak the graphs to find Steel Wheels' pain points. Sam asked his boss for more time to compile the numbers and come up with some solutions; the CEO agreed, and told Sam that this project would be his top priority until the problem was solved.

When the meeting was adjourned, Sam briefly considered hiring someone to maintain the Excel data, but decided to hit Google first to see if there was some kind of miraculous software program that would do this all automatically.

Discovering business intelligence software

Through Google and Wikipedia, Sam the CIO discovered the business intelligence software industry and was immediately enamored of it... until he found out how much it cost to implement. The two biggest BI solution providers quoted Sam $190,000 and $150,000, respectively, and that was for a single-CPU server with five client access licenses, and it only covered reporting, not analysis. Those prices also did not cover training or support – combined, the costs for these services nearly doubled

the initial licensing fees – and Sam was sure he was going to need plenty of training and support to get his project going quickly with as few hurdles as possible.

Then there were the hidden costs. One of the proprietary companies wanted to tack on a mysterious 20%-per-year maintenance fee, so that was another $34,000 or so on top of the base cost. One solution required a proprietary database server, but no one in the Steel Wheels IT department had worked with it before, so not only would Steel Wheels have to pay an extra license fee for the database, but the IT manager would also have to hire a new database administrator or pay huge training costs for the existing DBA if Sam went with that BI package. All things considered, both the upfront prices and hidden costs were so high that Sam was pretty sure the CEO would either laugh at or fire him if he included them in a proposal. If he wanted to use one of these proprietary BI solutions, Sam would have to de-scope his project to the point that it wouldn't make sense to spend much money on it.

The BI marketing materials alone were enough to satisfy Sam's initial interest, but the price put him off an evaluation. There was no sense in evaluating a product that his company had no hope of affording. Theoretically speaking, though, if Steel Wheels wanted a proper evaluation from these proprietary BI companies, it would have to pay for a consultant to come out to the Steel Wheels corporate office and put together a proof-of-concept. A full-time Excel jockey was starting to look like an attractive alternative to impressively featured but intolerably expensive BI solutions.

The Pentaho evaluation

Sam the CIO was ready to give up on business intelligence solutions, and would have gone ahead with the Excel option if he hadn't casually mentioned his plight to the Steel Wheels IT manager in the break room that afternoon. The IT manager asked if Sam had looked for any open source alternatives to proprietary BI suites; indeed, Sam had not. When he got back to his desk, a quick search through Google and SourceForge turned up an interesting open source solution – Pentaho. As an open source project, it was free to download, use, and even to see and modify the source code. It could be expanded and scaled to match any BI project, and the price was not for per-seat licensing, but for support and maintenance. For less than a tenth of the upfront licensing costs of the proprietary BI solutions, Sam could deploy the Pentaho BI Suite, get a support contract, and still have enough left over to send several people to training.

After downloading and installing the Pentaho BI Suite Enterprise Edition evaluation package, Sam the CIO was satisfied that he could discover the exact business problems that were currently plaguing the company and still have his really cool graphs for the quarterly meeting. Since the Pentaho BI Suite would be pulling sales and product data directly from the CRM database, there was no data entry required and nothing to manually enter or update.

Identifying pain points

Sam worked with his DBA and IT manager to connect the Steel Wheels CRM database to the Pentaho BI Server and generate metadata to use with Pentaho Analysis. From there was able to determine that an unusual number of returns in the EMEA region had led to a dramatic reduction in profits. Due to a typographical error, the EMEA operations manager had made a mistake in ordering stock for the Carousel DieCast Legends series, and this was compounded by a badly translated piece in a marketing campaign that misled customers; these two factors combined to create a perfect storm of lost profits due to order cancellations and disputes. After discovering these pain points with an analysis view, Sam created a few quick ad-hoc reports and emailed them to the directors of sales and operations, who proceeded to correct the problems immediately.

In an effort to stop the next emergency before it happened, Sam dove back into an analysis view and saw several inefficiencies that, when corrected, would result in higher overall profits. Addressing those issues wasn't within the scope of his project – in fact, it wasn't even appropriate for his department to handle all of them. This made Sam realize that business intelligence was more of a process than an event. Monitoring the health of the overall business environment was not something done on a Friday afternoon by one person; it was best done in terms of constant evaluation and adjustment by all departmental managers.

Building a business case

Though the important problem was already solved, it was time for Sam to talk to his boss about implementing a Pentaho-based BI project. He wrote up a business case that compared the different solutions, including their capabilities, support and training options, and bottom-line pricing, then estimated how much money the company would save by catching supply chain and fulfillment problems before they could manifest into lost profits. The CEO read Sam's proposal, and asked some questions:

1. "Pentaho may be cheaper than the other vendors, but are we really getting good value from Enterprise Edition? Can't we just use the free version without paying?"
2. "How will this affect our operations and productivity? Are you going to spend weeks implementing this solution?"
3. "Since this is open source, won't we be subject to potential IP-related lawsuits? I read something about SCO and Linux a while ago, and it was pretty alarming."

Sam had done his research, and was able to respond in detail to the CEO's questions. He started by explaining the general benefits of business intelligence for the retail industry: Proper inventory management, shipping and fulfillment streamlining, excellent cash flow analysis, and detailed sales reporting. He'd also had some experience in setting up and using the Pentaho BI Suite, so he had a basic familiarity with its key features, so Sam knew that after a good salvo of training courses, the sales, marketing, and operations managers would not waste any production time on messing with unfamiliar software. Also, the BI Platform ran on a standard J2EE application server, which Steel Wheels already had for its CRM solution. Lastly, Sam outlined the Pentaho Enterprise Edition benefits that resonated with his CEO – top-tier support and IP indemnification, which shields Pentaho Enterprise Edition customers from outside lawsuits. And besides, SCO lost that Linux case, which has discouraged copycat lawsuits against open source companies.

Winter's over

With the recent expansion into new global markets came new complexities that Steel Wheels management was not prepared to handle with its current business practices. The company had reached the point where it could no longer operate on a small business philosophy, and a good BI solution was the perfect way for Sam the CIO to upgrade its processes to scale with its sales volume, which enabled Steel Wheels to achieve new goals. The Pentaho Business Intelligence Suite didn't just solve an important problem for Steel Wheels and get the company back on track; it also solved future problems before they turned into emergencies, and it accomplished this without wreaking havoc on the company's IT budget.

March turned into April, and while sales were up marginally over last year (as expected), profits went up by 20% because Sam's Pentaho solution helped people in operations, sales, and marketing streamline all of their processes. Sam still uses Excel, but only for tracking the IT department's internal costs, and even that gets imported into Pentaho Analysis for fine-grained evaluation.

So the storm was over, and Sam was a hero to his people. As far as Sam was concerned, though, he was just doing his job – nothing more than an everyday CIO with above-average Google skills, a love of cutting-edge technology, and an eye for value would do.