

## IBM WEBSHERE BUSINESS MONITOR 6.2 – LAB EXERCISE

## WebSphere Business Monitor V6.2 KPI history and prediction lab

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### What this exercise is about

The objective of this lab is to show you how to use the KPI history and prediction widget. Since the KPI history service runs once per hour, it could take some time to build up enough history records for testing the widget. In this lab, you will preload the database with history records, then use the widget to view those records. You will create a KPI prediction model using the KPI Manager widget, then view the prediction data. Also, you will configure a business user alert using the Alert Manager widget, and the alert will be based on data that exceeds a threshold which is defined on the prediction model.

### Lab requirements

List of system and software required for the student to complete the lab:

- Rational Application Developer V7.5 or WebSphere Integration Developer V6.2.
- WebSphere Business Monitor V6.2 – Toolkit Installation including the Monitor Model editor and Monitor Server

### What you should be able to do

At the end of this lab you should be able to:

- Use the KPI history and prediction widget to view KPI historical information and KPI prediction information.
- 

## Introduction

In this lab you will load the KPI history table with approximately 52,000 records, approximately 3 years of data for each of two KPI's. You will load the records into the Derby database for use with the Monitor toolkit.

After loading the database with the history records, you will deploy the monitor model. Then you will create a dashboard and use the KPI history and prediction widget.

You will also create a prediction model and view the prediction values in the dashboard.

Finally, you will create a business user alert when the KPI prediction values exceed a predefined threshold.

### URL Cheatsheet

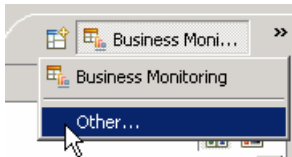
The following URLs may be helpful to you as you exercise this lab. Note that the port numbers in the URL of your installation may be different depending on your configuration.

- Server administrative console  
<https://localhost:9044/ibm/console>
- Business space dashboard  
<https://localhost:9444/BusinessSpace>

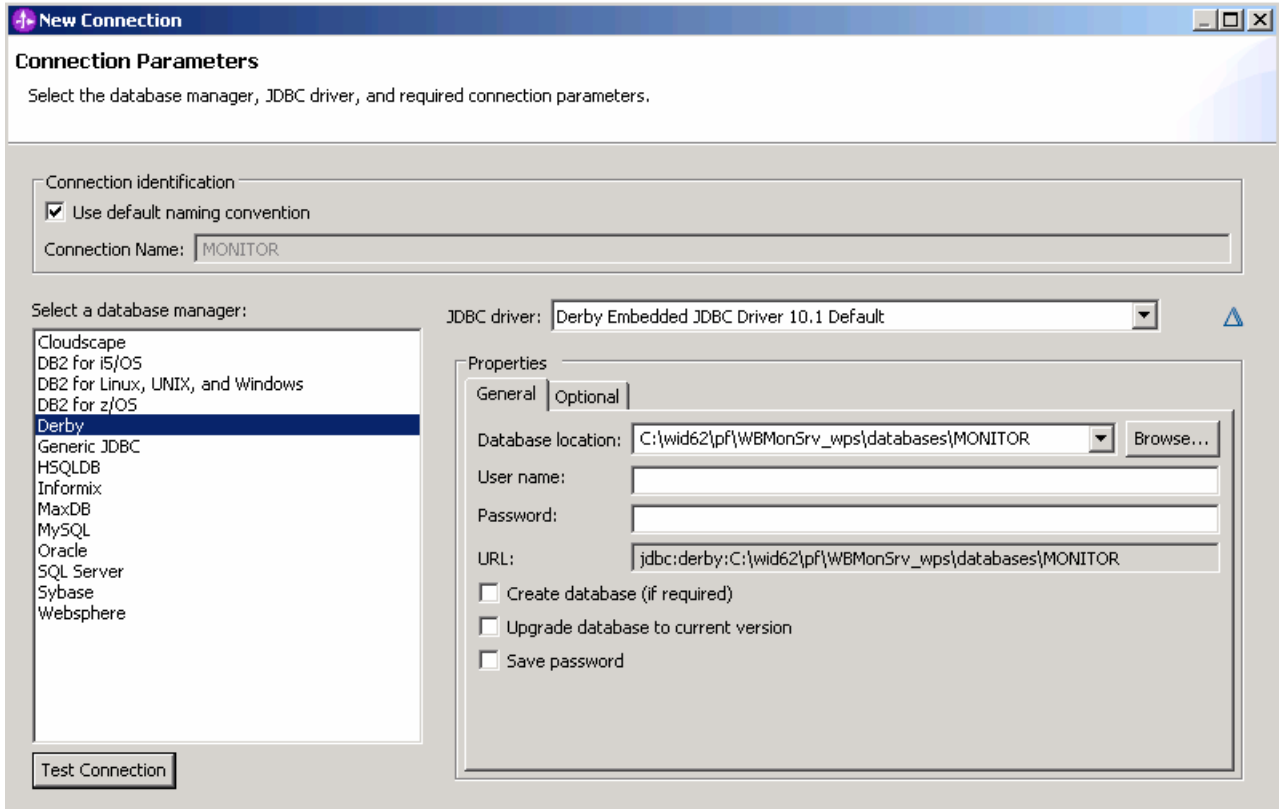
## Part 1: Load the KPI history table with data

To load the history data into Derby, use the following procedure.

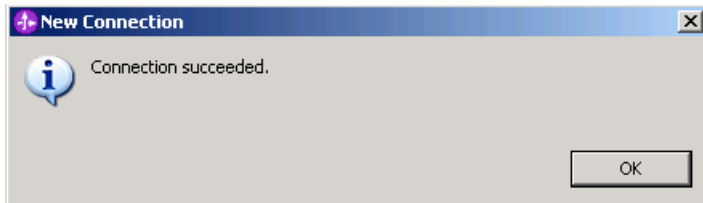
- \_\_\_ 1. Open the Monitor toolkit.
- \_\_\_ 2. Stop the Monitor server in the servers view
- \_\_\_ 3. Open the Data perspective using the icon in the upper right corner of the window



- \_\_\_ 4. Create a new connection to the MONITOR database
  - \_\_\_ a. In the Data Source Explorer view, right click **Databases**, then click **New**
  - \_\_\_ b. Select **Derby** as the database manager
  - \_\_\_ c. For JDBC driver, select '**Derby Embedded JDBC driver 10.1 Default**'
  - \_\_\_ d. For database location, browse to **C:\<WID-path>\pf\WBMonSrv\_wps\databases\MONITOR**
  - \_\_\_ e. For user name, enter '**user**'
  - \_\_\_ f. Leave the password field empty
  - \_\_\_ g. De-select 'Create database'



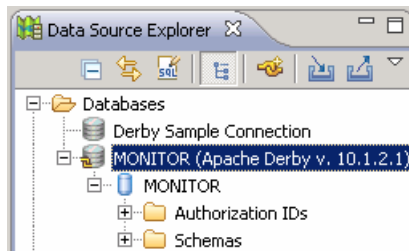
\_\_ h. Click 'Test Connection' button to verify the connection



\_\_ i. Click OK

\_\_ j. Click Finish

\_\_ k. You should see the Monitor database in the data source explorer



\_\_\_ 5. Load the supplied data into the Monitor KPI History table

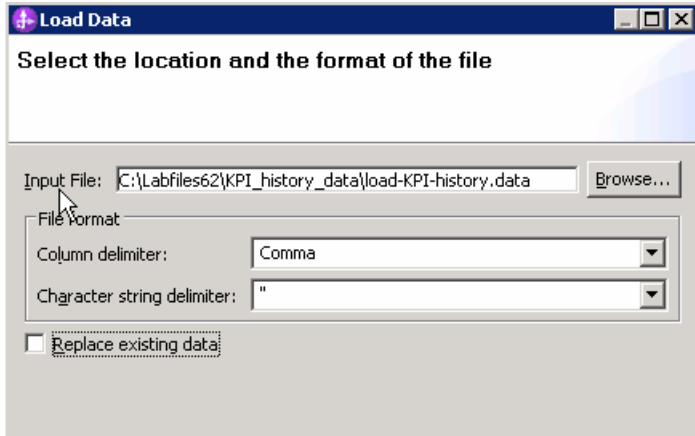
\_\_ a. In the data source explorer, navigate to **Databases > MONITOR > MONITOR > Schemas > MONITOR > Tables > KPI\_HISTORY\_T**

\_\_\_ b. Right click **KPI\_HISTORY\_T** and select **Data > Load...**

\_\_\_ c. For import file, browse to the supplied file load-KPI-history.data

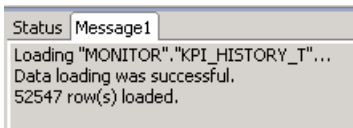
1) For example, browse to c:\Labfiles62\KPI\_history\_data\load-KPI-history.data

\_\_\_ d. Use column delimiter Comma and character string delimiter ". De-select 'Replace existing data', which will preserve history data for any other models, such as the showcase model.



\_\_\_ e. Click **Finish**

\_\_\_ f. After a few minutes, in the SQL Results view you should see that the rows were loaded



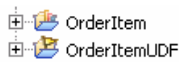
\_\_\_ 6. Disconnect the connection to the MONITOR database

\_\_\_ a. In the data source explorer view, right click the MONITOR connection and select Disconnect

## Part 2: Import the monitor model

Import the supplied monitor model to the monitor toolkit.

- \_\_\_ 1. Open the monitor toolkit.
- \_\_\_ 2. Open the Business Monitoring perspective using the icon in the upper right corner of the window.
- \_\_\_ 3. If it is not started, start the monitor server in the servers view.
- \_\_\_ 4. Import the supplied project interchange file OrderItem-PI.zip
  - \_\_\_ a. In the Project Explorer view, right click then select **Import...**
  - \_\_\_ b. Navigate to **Other > Project Interchange** then click **Next**.
  - \_\_\_ c. For the .zip file, browse to the supplied file, for example, c:\Labfiles62\KPI\_history\_data\OrderItem-PI.zip
  - \_\_\_ d. You should see two projects listed, so click **Select All**.
  - \_\_\_ e. Click **Finish**.
  - \_\_\_ f. You should see two projects listed in the project explorer.



- \_\_\_ g. Check for any errors in the Problems view. You should resolve any errors before continuing. Warnings and informational messages may be present but these will not be a problem.
- \_\_\_ 5. Review the two KPI's in the model.
  - \_\_\_ a. In the Project Explorer, navigate to OrderItem > Monitor Models. Double click OrderItem.mm to open the monitor model editor.
  - \_\_\_ b. Click the KPI Model tab.
  - \_\_\_ c. In the editor, navigate to Order Item > FunctionKPIs, then click Avg Order Price.
  - \_\_\_ d. You see that the check box is selected for keeping track of KPI history.
    - Keep track of historical values for this KPI
  - \_\_\_ e. It has a target and ranges, and colors have been selected for the ranges. These colors will show up on the KPI history widget in the dashboard.

Target:

Ranges:

| Range name | Start value | End value | Color  |
|------------|-------------|-----------|--------|
| Low        | 0           | < 10000   | CC0000 |
| Medium     | 10000       | < 20000   | FFFF00 |
| High       | 20000       | < 40000   | 339900 |

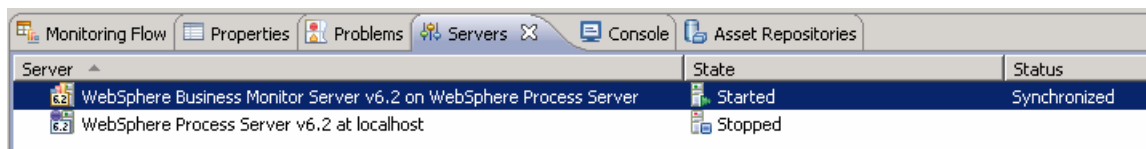
- \_\_\_ f. Notice also that the metric is Item Price and the function is Average, and no time period is selected. In the editor, navigate to Order Item > FunctionKPIs, then click Avg Order Price.

- \_\_\_ g. In the editor, navigate to Order Item > TimePeriodKPIs, then click Sum Price Today.
- \_\_\_ h. You see that the check box is selected for keeping track of KPI history. It has a target and ranges, and colors have been selected for the ranges. These colors will show up on the KPI history widget in the dashboard. Notice also that the metric is Item Price and the function is Sum. The time period metric is set to Date Ordered, and the time period is set to a repeating daily period.

## Part 3: Publish the model to the server

In this section you will use the toolkit to publish the monitor model to the monitor server.

- \_\_\_ 1. In Project Explorer, expand **OrderItem** → **Monitor models** → **OrderItem.mm**. Right click over **OrderItem.mm** and then select **Generate Monitor J2EE Projects** from the context menu
- \_\_\_ 2. Select **Finish**.
- \_\_\_ 3. A progress dialog shows the status of the operation and it closes when the operation is complete. Check for errors in the Problems view. There may be warnings, but there should not be any errors. If you see errors, then try to perform a clean to see if the errors can be removed: Project > Clean... > select 'Clean all projects', then click OK.
- \_\_\_ 4. If your server is not started, in the Servers tab, right click and select the **Start** option to start the server. This may take a few minutes to complete.



- \_\_\_ 5. Right click in the servers view, then select **Add and Remove Projects....**
- \_\_\_ 6. Click **Add** to move the OrderItemApplication from the list of available projects to the list of configured projects.
- \_\_\_ 7. Click **Finish**.
- \_\_\_ 8. A progress message is displayed in the lower right corner of the window.
- \_\_\_ 9. Check the messages in the console view. You should see the following message when the application has been started:
 

Application started: OrderItemApplication
- \_\_\_ 10. In the servers view, right click, then select **Administration > Run administrative console**. You should see it open in a separate tab.
- \_\_\_ 11. It will prompt you for user ID and password. Enter 'admin' without the quotes for user ID, then enter 'admin' without the quotes for password. Click **Log in**
- \_\_\_ 12. Click **Applications > Monitor Models**. The application should show green status if it started successfully.
- \_\_\_ 13. If the model shows red (stopped), then wait a moment, then refresh by clicking on the icon to the right of Status in the last column of the table. You should see green (started) for the model. If it does not show green, be patient and keep refreshing until it does show green.
- \_\_\_ 14. Check the server log to ensure there are no problems. You can check this in the console view.
- \_\_\_ 15. If you are using the integrated server within WebSphere Integration Developer or Rational Application Developer, then you do not need to setup Monitor data security, since the administrative user is automatically authorized to all models. If you are using a different server, then you should



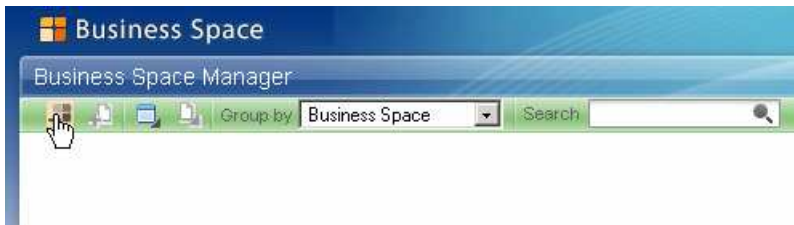
open the administrative console, navigate to **Security > Monitor Data Security**, then add the model, role and user information to a resource group.

## Part 4: Create a dashboard in business space

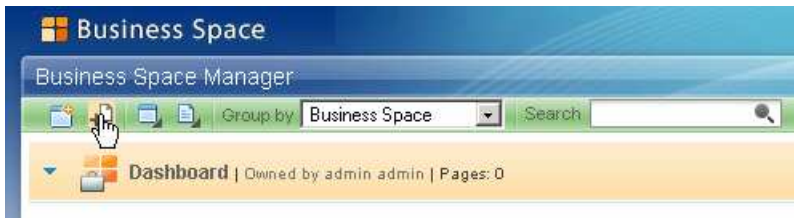
In this section you will build a dashboard in business space. You will add views to the dashboard and configure them.

\_\_\_ 1. Create the dashboard.

- \_\_\_ a. The default browser is 'Internal Web Browser', but you should not use this one since some standard functions are not provided that you may need. Select Window > Preferences > General > Web browser > select 'Use external Web browser'. Select an external browser. Click OK.
- \_\_\_ b. In WebSphere Integration Developer, in the servers view, right click and select **Business Space**
- \_\_\_ c. When prompted, enter **admin** for the user ID and enter **admin** for the password.
- \_\_\_ d. Click the icon to create a new space.





- \_\_\_ e. Enter a name such as Dashboard, select Empty, then click **OK**.
- \_\_\_ f. Click the icon to create a new page in the Dashboard space.

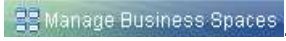


- \_\_\_ g. Enter a name such as Page1, select Empty, then click **OK**.
- \_\_\_ h. Click Page1 to open it.



- \_\_\_ i. You can drag widgets to the page by opening the widget palette in the upper right corner . If you want to rename the page, change the layout or remove the page from display, use the icons to the right of the page name on the tab . To

return to the business space list, click 'Manage Business Spaces' in the upper right corner



## Part 5: View KPI history information

In this section you will add the KPI history and prediction widget to the dashboard, and you will use the widget to view KPI historical information.

\_\_\_ 1. Add the KPI history and prediction widget.



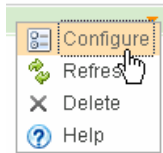
\_\_\_ a. Click **Add Widgets**, page forward using the pager arrow select **KPI history and prediction**, and drag it to the page.

\_\_\_ 2. Configure and view KPI history for KPI Avg Order Price.

\_\_\_ a. Click **Configure** on the widget menu.



1) To Access the menu, hover the mouse over the right corner of the widget and then click the down arrow. On this menu you can configure the widget, refresh the widget and delete the widget.



\_\_\_ b. On the KPI tab, select 'Latest version', 'KPI ranges', 'KPI target'

**KPI History and Prediction**

**KPI** History and Prediction

Select the models for which you want to retrieve the KPIs.

Latest version  All versions

Display options

KPI ranges  KPI target

\_\_\_ c. For the monitor model, navigate to OrderItem <timestamp> > Avg Order Price, then select it.

Select the KPI to display. You can choose only one at a time.

OrderItem 2006-08-03 00:00:00

Avg Order Price

Sum Price Today

\_\_\_ d. Click **OK**.

\_\_\_ e. At this point, you may be prompted to install a plug-in into your browser.

1) Internet Explorer

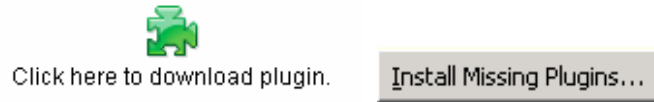
a) You will see a dialog for the plug-in.



b) Click **Install**.

2) Firefox

a) There is an icon in the widget or a button at the top of the browser.

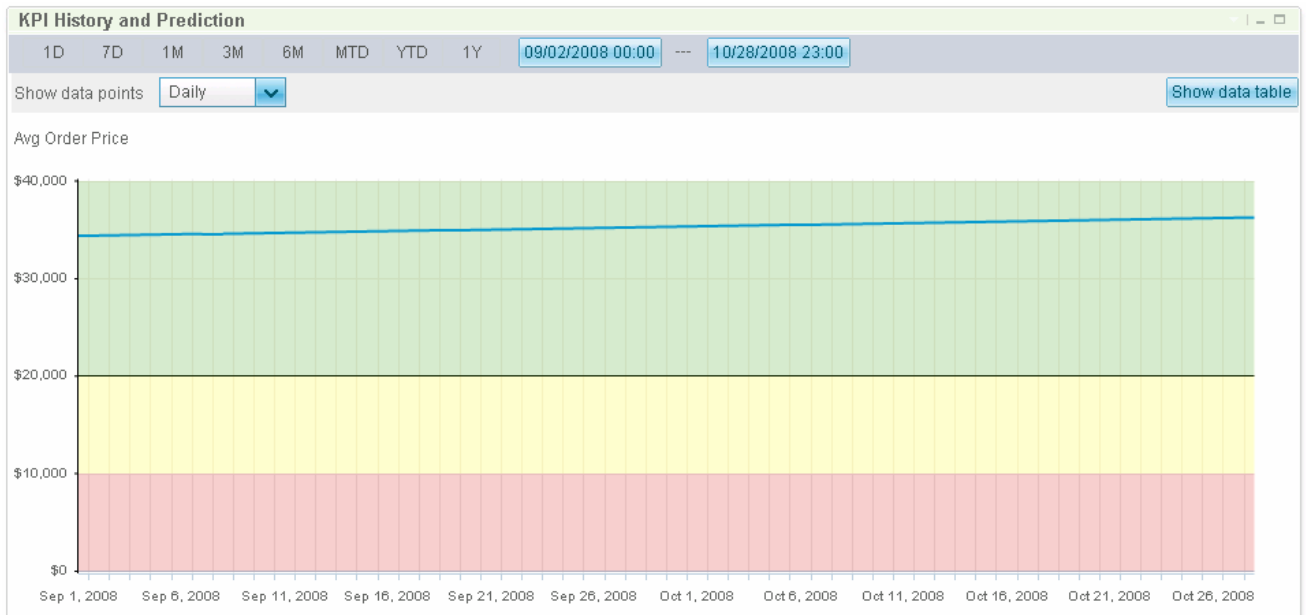


b) Click on either to install the plug-in.

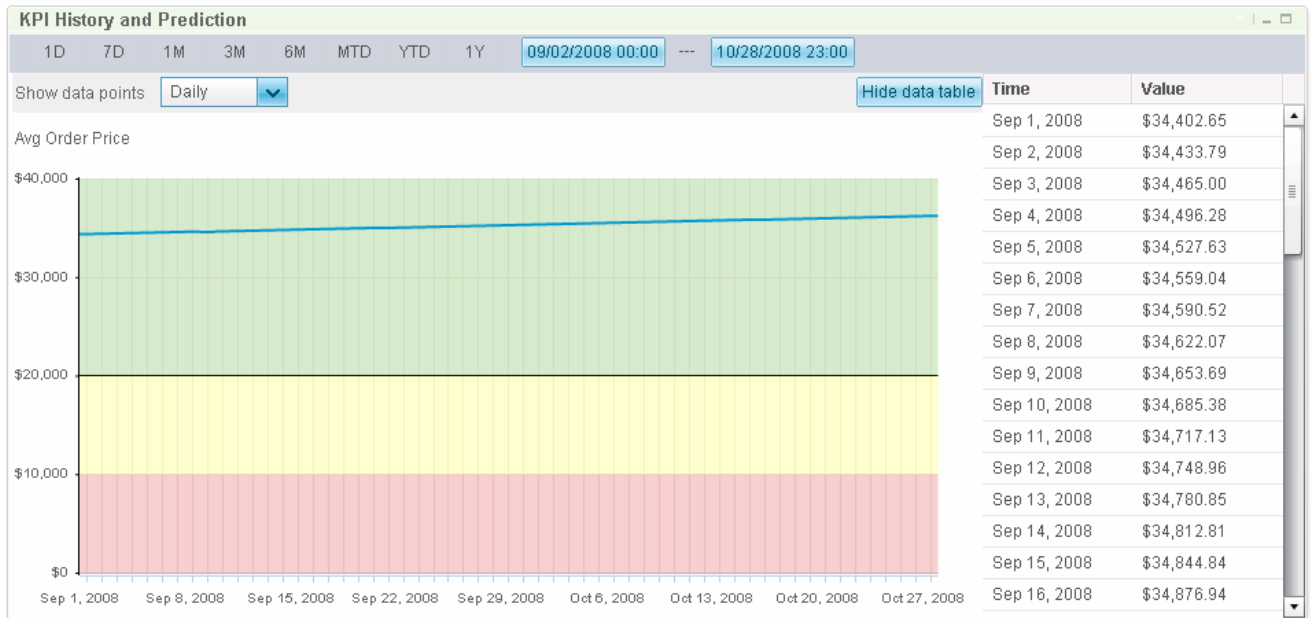
\_\_\_ f. Click **OK**.

\_\_\_ g. You can adjust the granularity and the date window on the widget. The default display is two months with daily data points. Initially the data display may be empty because historical data has been loaded for this KPI only from years 2008 through 2010. You should adjust the dates to display historical data within this date window. To change the date period, you can use the pre-set date windows such as 1D or YTD, or you can click the blue From and To dates to open a calendar picker to select specific dates.

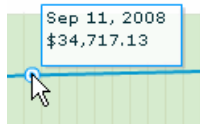
\_\_\_ h. The graph shows a line for the KPI value in blue. The black line is the target value. The three bands of color represent the three ranges defined in the KPI.



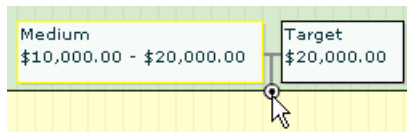
\_\_\_ i. To see the values in tabular format, click 'Show data table'.



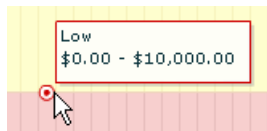
\_\_\_ j. To see specific values in the graph, hover your mouse pointer over the blue KPI value line.



\_\_\_ k. To see specific targets in the graph, hover your mouse pointer over the black target line. Since the target coincides with the top of a range, you also see the range values.



\_\_\_ l. To see ranges in the graph, hover your mouse pointer over the top of the range.



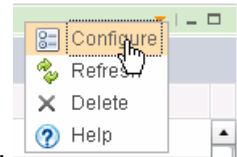
\_\_\_ m. There are hourly records loaded in KPI history and so you can experiment with various granularities and date windows. To change the date window, you can use the pre-set date windows such as 1D or YTD, or you can click the blue From and To dates to open a calendar picker to select specific dates.



## Part 6: Create a prediction model and view KPI prediction data

In this section you will create a prediction model, then view the prediction data in the KPI history and prediction widget.

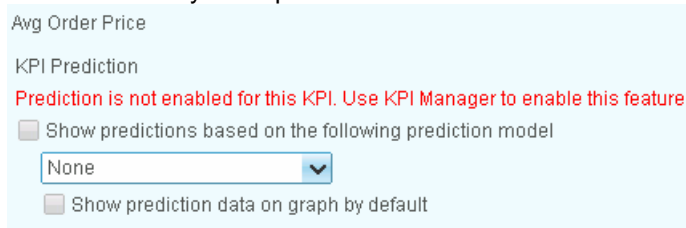
\_\_\_ 1. Configure and view KPI prediction for KPI Avg Order Price.



\_\_\_ a. On the KPI history and prediction widget, click the Configure menu option.

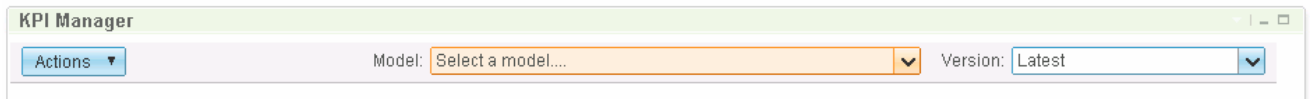
\_\_\_ b. Click the tab History and Prediction.

\_\_\_ c. Notice that it says that prediction is not enabled.



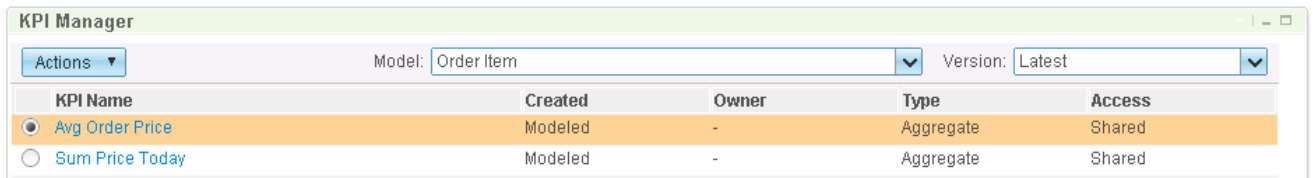
\_\_\_ d. Click the Cancel button to exit the configuration.

\_\_\_ e. Use the Add Widgets menu to drag the KPI Manager widget to the dashboard.



\_\_\_ f. For model, select Order Item.

\_\_\_ g. Select Avg Order Price.



\_\_\_ h. Click Actions, and select History and Prediction.

\_\_\_ i. Click New Model to create a new prediction model.



- \_\_\_ j. Enter a prediction model name such as Daily. Select 'Once a day' for prediction data points. Enter '30' for the prediction period.

**Prediction Model Definition**

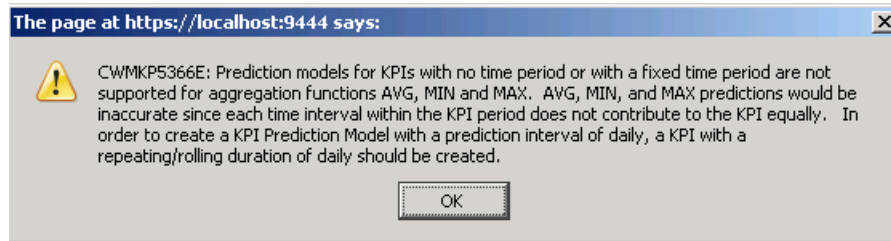
Model name

Prediction data points

Prediction period  
 30 Days  
 To the end of the KPI time period  
 Include a repeating business pattern  
 Days

- \_\_\_ k. Click OK.

- \_\_\_ l. You will receive a message indicating that you need a time period to be set on this KPI.




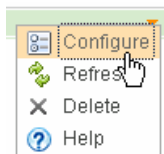
- \_\_\_ m. You could update the model with a daily time period, but this would also delete the KPI history when you re-deployed the changed model. To show you the prediction capability for a KPI with a daily time period, another KPI 'Sum Price Today' is available which is already setup in the model. Proceed to the next section to see how to setup prediction for this KPI.

- \_\_\_ n. Click OK. Click Cancel. Click Cancel.

\_\_\_ 2. Configure and view KPI history for KPI Sum Price Today.

- \_\_\_ a. On the KPI history and prediction widget, click **Configure** on the widget menu.

- 1) To Access the menu, hover the mouse over the right corner of the widget  and then click the down arrow. On this menu you can configure the widget, refresh the widget and delete the widget.



- \_\_\_ b. On the KPI tab, select 'Latest version', 'KPI ranges', 'KPI target'



**KPI History and Prediction**

**KPI** History and Prediction

Select the models for which you want to retrieve the KPIs.

Latest version  All versions

Display options

KPI ranges  KPI target

\_\_\_ c. For the monitor model, navigate to OrderItem <timestamp> > Sum Price Today, then select it.

Select the KPI to display. You can choose only one at a time.

OrderItem 2006-08-03 00:00:00

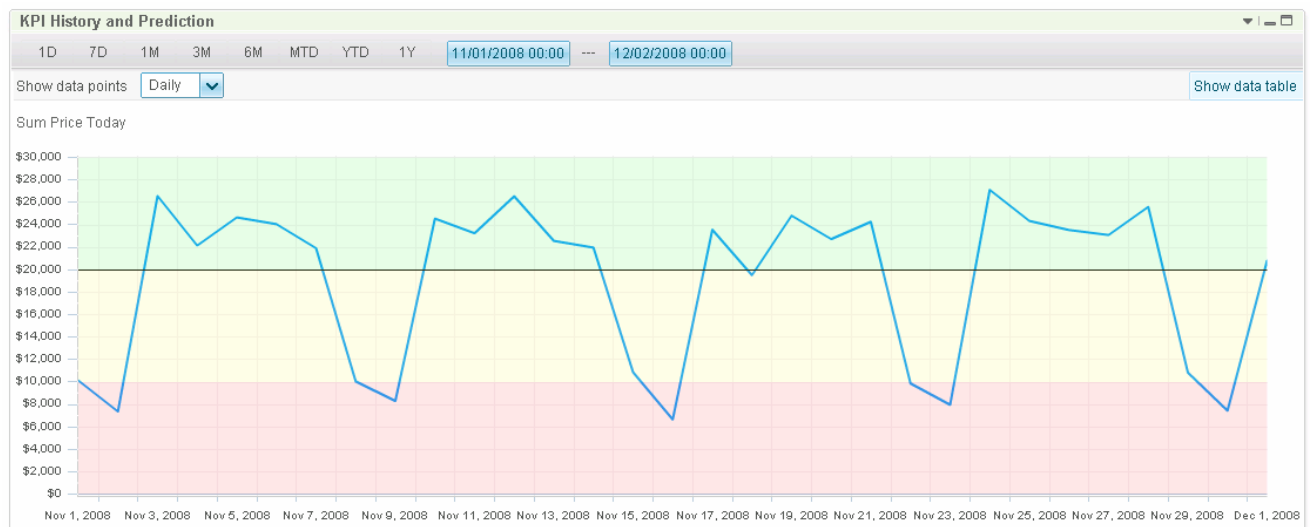
Avg Order Price

Sum Price Today

\_\_\_ d. Click **OK**.

\_\_\_ e. You can adjust the granularity and the date window on the widget. The default display is 2 months with daily data points. Initially the data display may be empty because historical data has been loaded for this KPI only from years 2008 through 2010. You should adjust the dates to display historical data within this date window. To change the date window, you can use the pre-set date windows such as 1D or YTD, or you can click the blue From and To dates to open a calendar picker to select specific dates.

\_\_\_ f. Notice that there is a repeating business pattern or business cycle such that there is a significant drop in values on the weekends, so there is a 7 day business cycle. You will use this information when you create the prediction model.

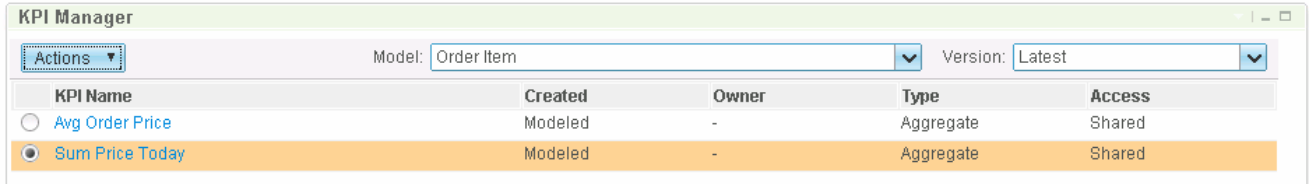


\_\_\_ 3. Create a prediction model for KPI Sum Price Today.

\_\_\_ a. If you have not done this already, Use the Add Widgets menu to drag the KPI Manager widget to the dashboard.

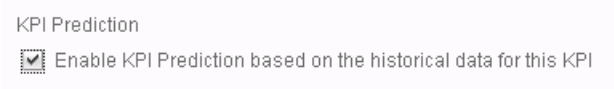
\_\_\_ b. For the model, select Order Item.

\_\_\_ c. Select Sum Price Today.



\_\_ d. Click Actions, and select History and Prediction.

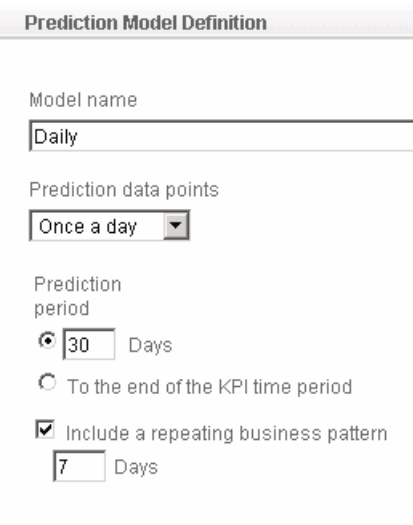
\_\_ e. Select 'Enable KPI Prediction based on the historical data for this KPI'.



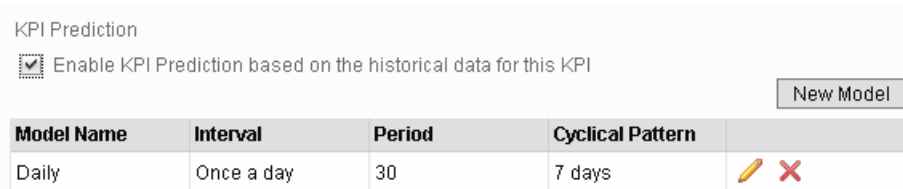
\_\_ f. Click **Apply**. If you forget this step, then the predictions will not be displayed and you may have to wait up to an hour for the KPI prediction service to run.

\_\_ g. Click **New Model** to create a new prediction model.

\_\_ h. Enter a prediction model name such as Daily. Select 'Once a day' for prediction data points. Enter '30' for the prediction period. As you saw in the KPI history graph, there is a 7 day business cycle. To provide a more accurate prediction, select 'Include a repeating business pattern', and enter 7 Days for the pattern. If you did not know there was a repeating 7 day pattern or if you forgot to enter it here, the prediction will still be created, however it will not be as accurate.

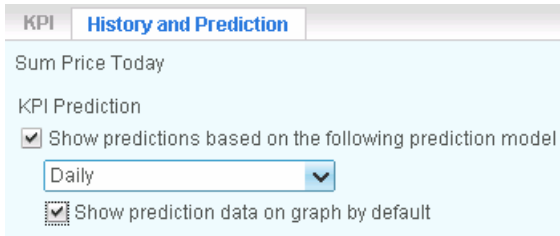


\_\_ i. Click OK. The KPI prediction service runs immediately, so this dialog may take a few moments to close while the service is invoked. Do not click the OK button twice, since this will create a duplicate model. You should see the prediction model listed as follows:

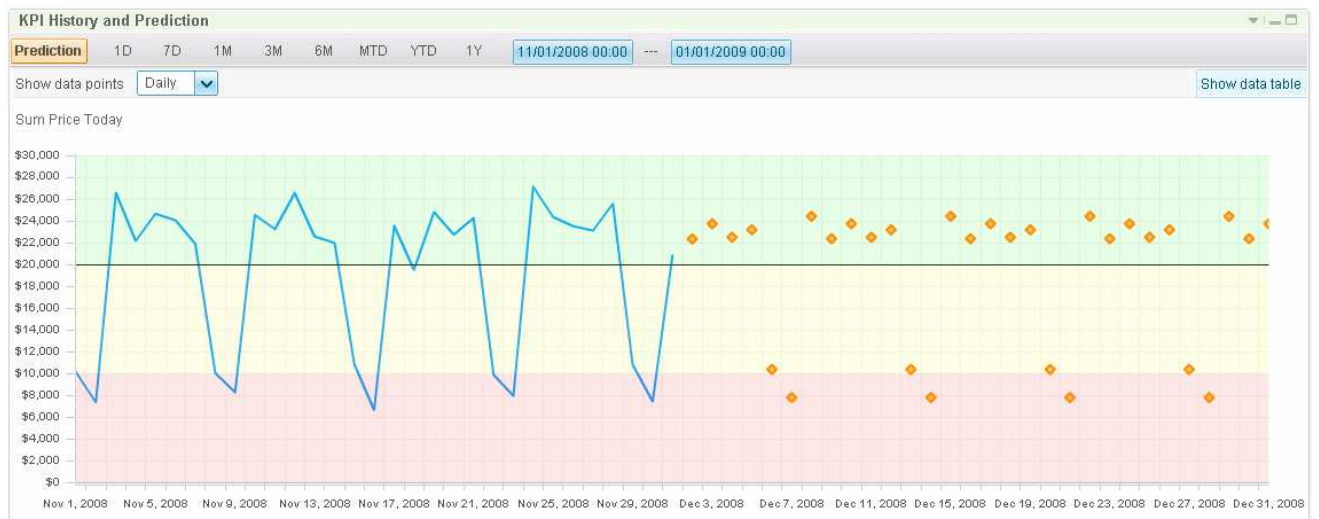


\_\_ j. Click OK.

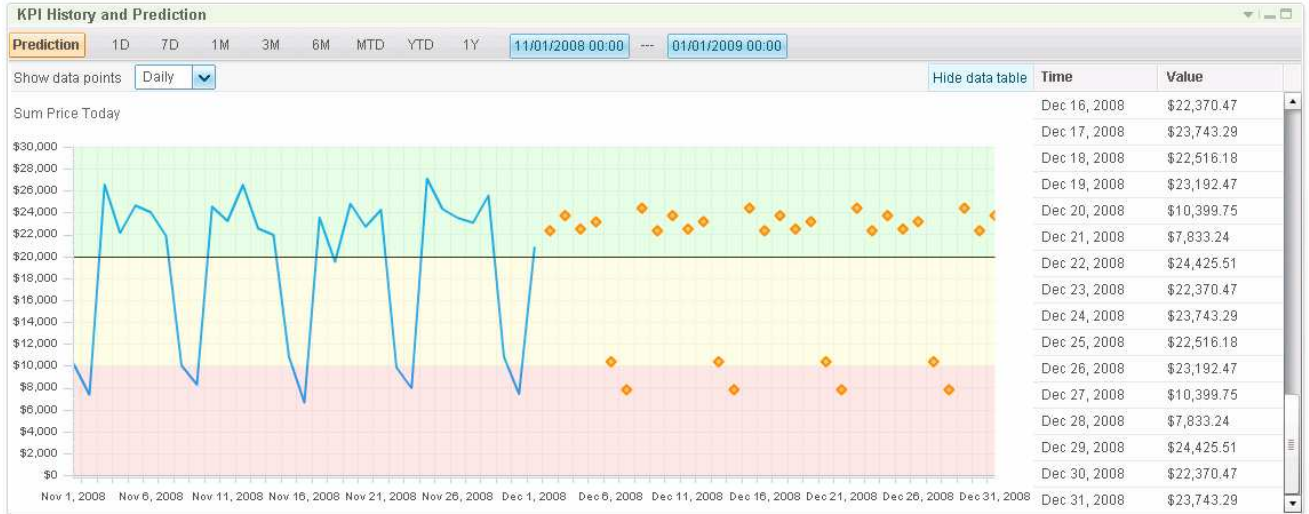
- \_\_\_ 4. Configure and view prediction data for KPI Sum Price Today.
  - \_\_\_ a. In the KPI History and Prediction widget, click Configure.
  - \_\_\_ b. On the KPI tab, insure that you have selected KPI 'Sum Price Today'.
  - \_\_\_ c. On the History and Prediction tab, select 'Show predictions based on the following prediction model. Select Daily. Select 'Show prediction data on graph by default'. Take the defaults for the remaining fields.



- \_\_\_ d. Click OK.
- \_\_\_ e. Notice the orange diamonds that represent the prediction points in the graph. If you do not see the orange diamonds, then the KPI prediction service has not completed, so wait a few moments then refresh the widget display by clicking the down arrow in the upper right corner of the widget, and selecting the refresh option.



- \_\_\_ f. Click 'Show data table', and you can see the specific prediction values at the end of the table.



## Part 7: Create a business user alert based on the KPI prediction model

In this section you will configure a business user alert that will fire when the KPI prediction data exceeds a predefined threshold.

- \_\_\_ 1. Create a business user alert when the KPI prediction values exceed a predefined threshold.
  - \_\_\_ a. In Business Space, use the Add Widgets menu to drag the Alert Manager widget to the dashboard.
  - \_\_\_ b. Click the New Alert button.
  - \_\_\_ c. Enter an alert name and optionally a description. Also, for the model, select 'Order Item 2006-08-03 00:00:00' from the drop down.

**Alert**

Conditions | Alert Content | Notification

Alert name:

Description:

Model:

Owner:

- \_\_\_ d. In the Conditions section, click Add, which will add a row to the conditions table.

**Conditions**

Notify when all of the following conditions apply Add

| KPI Name            | Prediction Model       | Condition                 | Value                 |
|---------------------|------------------------|---------------------------|-----------------------|
| Click to choose KPI | None (Use actual data) | Click to choose condition | Click to choose value |

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- \_\_\_ e. For KPI Name, click to choose Sum Price Today.
- \_\_\_ f. For Prediction Model, click to choose Daily (Anytime). You could also choose Daily (End) which would only compare to end of day values.
- \_\_\_ g. For Condition, click to choose 'Below range'.
- \_\_\_ h. For Value, click to choose range Medium.

| KPI Name        | Prediction Model | Condition   | Value  |
|-----------------|------------------|-------------|--------|
| Sum Price Today | Daily(Anytime)   | Below range | Medium |

- \_\_\_ i. In the timing section, set the timing to 5 minutes, and set the notification frequency to 'Only once during the KPI time period when the condition applies'. So this means that the condition will be checked every 5 minutes, but the alert will be created at most once per day since the KPI period is daily.

**Timing**

How often to check conditions: Minutes

When to start notifications: December 10, 2008 00:00:00 GMT-05:00 America/New\_York

Notification frequency: Only once during the KPI time period when the condition applies Sum Price Today

\_\_\_ j. Click the Alert Content tab, and view the default message that is created. You could customize the alert message if the generated content did not meet your needs.

Conditions **Alert Content** Notification

Generated content  Define your own content

Subject: Prediction low

Body: %/SumPriceToday/name% %/SumPriceToday/prediction/Daily/name% Below range %/SumPriceToday/range/My\_Range/name%

\_\_\_ k. Click the Notification tab, and you see that the administrative user is notified using a dashboard alert.

Conditions Alert Content **Notification**

| Recipients | <input checked="" type="checkbox"/> Dashboard Alert | <input type="checkbox"/> Cell Phone | <input type="checkbox"/> E-mail | <input type="checkbox"/> Pager |
|------------|---|-------------------------------------|---------------------------------|--------------------------------|
| admin      | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>        | <input type="checkbox"/>       |

\_\_\_ l. Click OK.

\_\_\_ m. Click OK. You should see the new alert in the list.

| Alert Manager                  |             |       |   |                                     |                                 |                                |  |
|--------------------------------|-------------|-------|---|-------------------------------------|---------------------------------|--------------------------------|--|
| Alerts to Display: All alerts  |             |       |   |                                     |                                 |                                |  |
| Alert Name                     | Description | Owner | <input checked="" type="checkbox"/> Dashboard Alert | <input type="checkbox"/> Cell Phone | <input type="checkbox"/> E-mail | <input type="checkbox"/> Pager |  |
| Prediction low                 |             | admin | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>        | <input type="checkbox"/>       |  |
| Print 72 hours exceeded Alert  |             |       | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>        | <input type="checkbox"/>       |  |
| NTB Failure Alert              |             |       | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/>        | <input type="checkbox"/>       |  |
| Invalid Loan Application Alert |             |       | <input type="checkbox"/>                            | <input type="checkbox"/>            | <input type="checkbox"/>        | <input type="checkbox"/>       |  |
| Fee Compliance Alert           |             |       | <input checked="" type="checkbox"/>                 | <input type="checkbox"/>            | <input type="checkbox"/>        | <input type="checkbox"/>       |  |

\_\_\_ 2. In Business Space, use the Add Widgets menu to drag the Alerts widget to the dashboard. You should see the new alert listed. If you remember, the prediction values that you saw earlier included values that were in the low range, so the alert should have been created since the condition on the alert was based on the predicted value being below the medium range. If you do not see the alert, then wait a few moments then refresh the widget display by clicking the down arrow in the upper right corner of the widget, and selecting the refresh option.

**Alerts**

Mark Read   Mark Unread   Forward Alert   Remove

**Subject**

- Prediction low
- Fee compliance: Loan 091220

\_\_\_ a. To see the details of the alert, click the alert.

| Subject        | Date and |
|----------------|----------|
| Prediction low | Decembe  |
| • Fee complian | 091220   |
| • Fee complian | Decembe  |

**December 10, 2008 12:00:48 PM**

**Subject**  
Prediction low

**Business situation name**  
Prediction low

**Comments**  
Sum Price Today Daily Below range Medium

Close

## What you did in this exercise

In the lab, you loaded the KPI history table with data, deployed a monitor model, and used the KPI history and prediction widget to view the KPI historical information. You created a prediction model and viewed KPI prediction information. You defined a business user alert based on the prediction model exceeding a certain threshold.