

IBM WEBSPHERE BUSINESS MONITOR 6.0 – LAB EXERCISE

Creating Business Measures Using the Business Measures Editor in WebSphere Business Modeler V6

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What this exercise is about

The objective of this lab is to provide you with instructions on how to define business measures against a process model. This is so you can subsequently monitor the process execution using WebSphere Business Monitor V6. You will use the Business Measures Editor (BME) within the WebSphere Business Modeler V6 product.

Lab Requirements

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

- Windows® 2000 with service pack 4 or later or Windows XP with service pack 2 or later
- IBM WebSphere Business Modeler Version 6.0

What you should be able to do

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

- Create a Business Measures Model
 - Add business measures to the model
 - Metrics
 - Counters
 - Stopwatches
 - Triggers
 - Situation Events
 - Export your model for deployment into WebSphere Process Server and monitoring using WebSphere Business Monitor.
-

Introduction

This lab will show you how to start with an existing process model and define business measures. This will be done using the BME, a feature of the WebSphere Business Modeler V6 product. Modeler has many advanced capabilities for creating process models, but this lab assumes that you have already completed this and provides you with a ready to use process model.

The focus of this lab is to show how to define business measures so that the Monitor runtime can later capture this data and display it. You will create a default business measures model and then you will add a number of specific measures that will show you how to define each of the different types of measures.

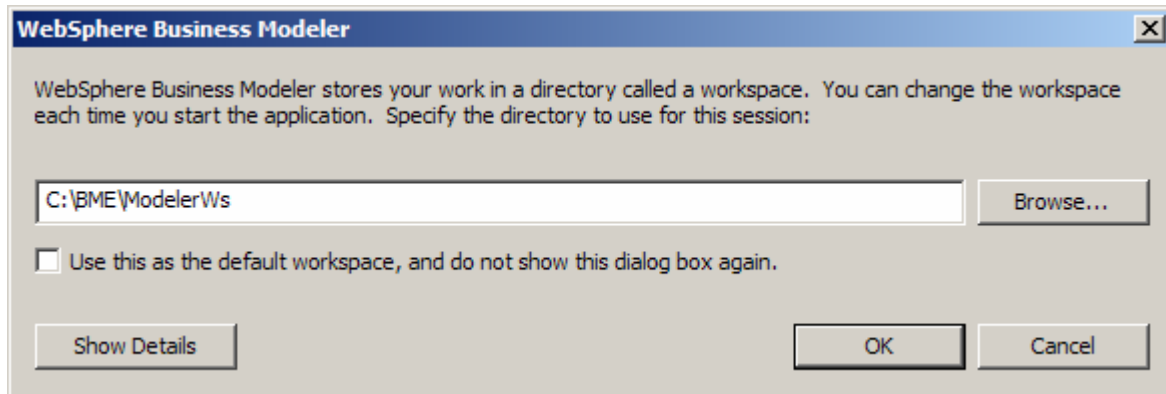
Part 1: Importing the existing process model

In this part of the lab you will start Modeler and import the process model ready for adding business measures. You will also familiarize yourself with the model.

___ 1. Start Modeler.

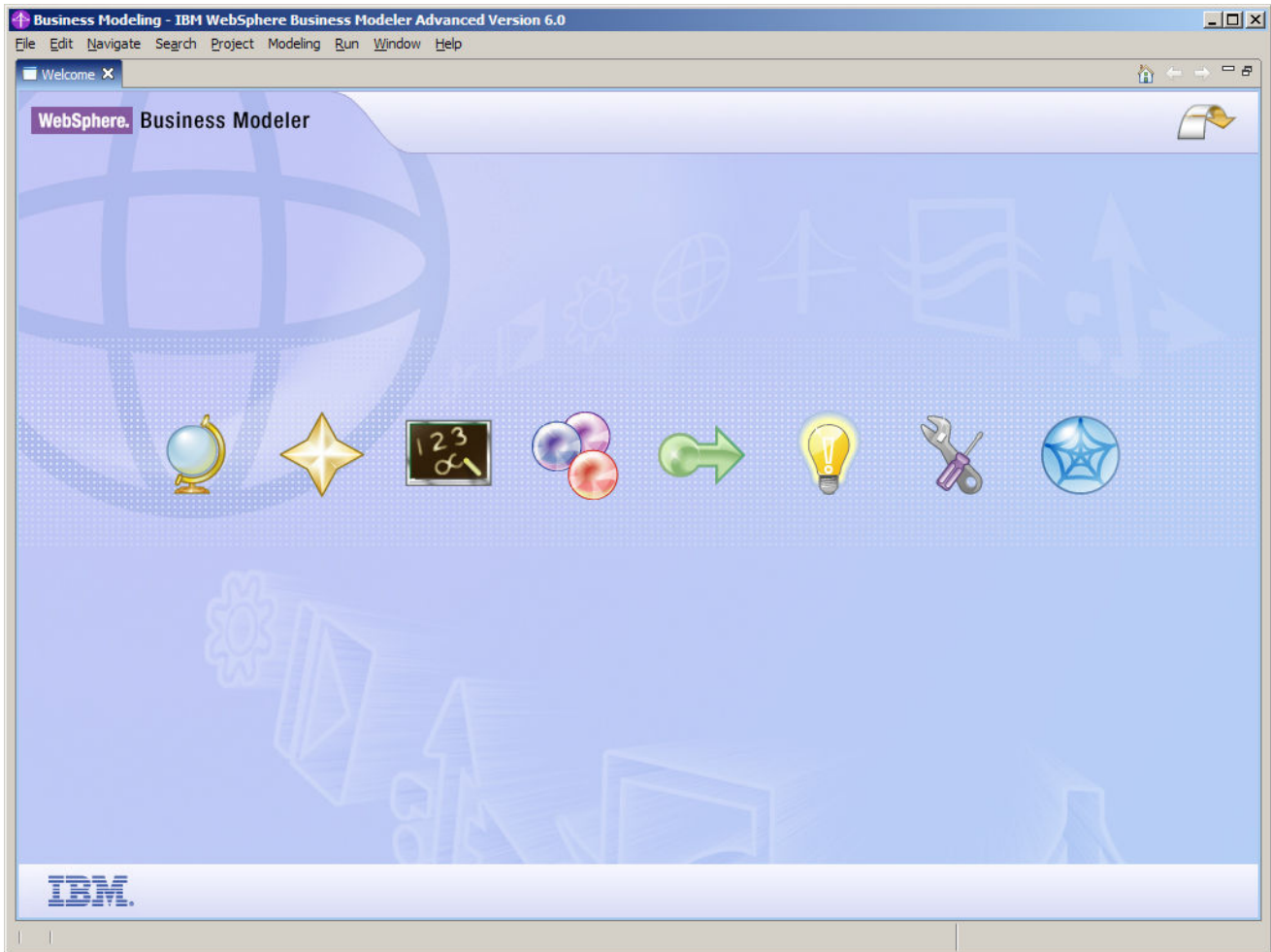
___ a. **Start > All Programs > WebSphere Business Modeler > IBM WebSphere Business Modeler**

___ b. When prompted, enter a new workspace directory, C:\BME\ModelerWs and click **OK**.




___ c. The following window will appear:

Note: If the Quickstart wizard opens, deselect the '**Always show this wizard on startup**' option and click **Cancel**.



___ d. Close the welcome window by clicking the arrow in the top right corner of the welcome window.

___ e. Also, apply the 4-pane layout by clicking on the icon near the top: 

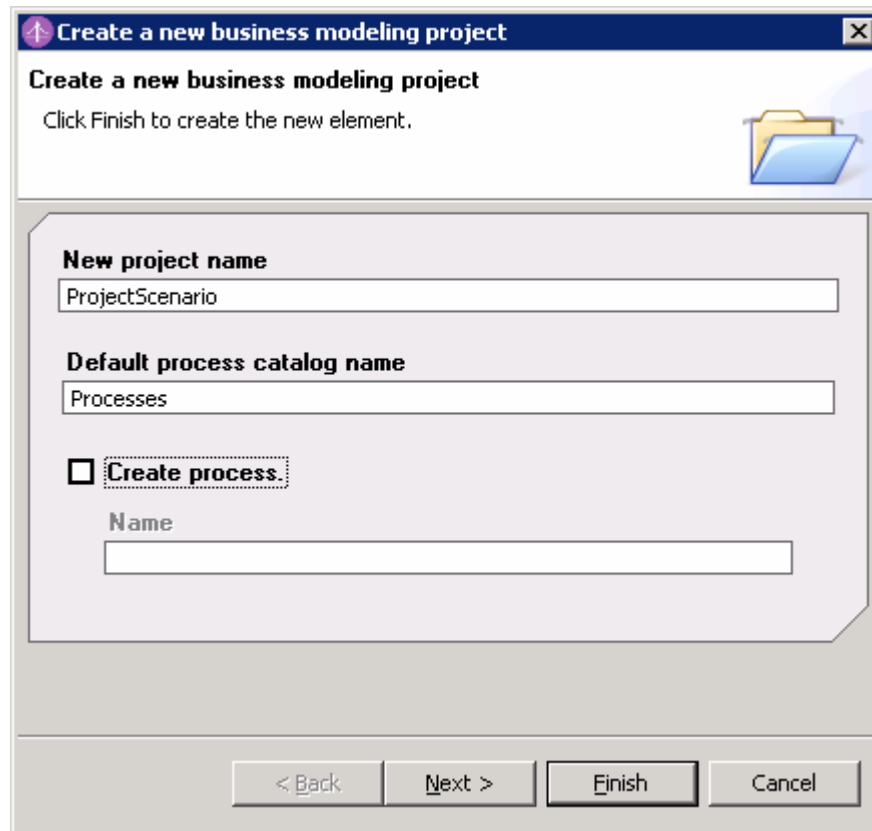
___ f. Change the modeling mode from the main menu by selecting **Modeling > Mode > WebSphere Process Server**.

Note: The 4-pane layout gives you more views within your window. You can change between 1, 2 or 4-pane views to suit your own preference.

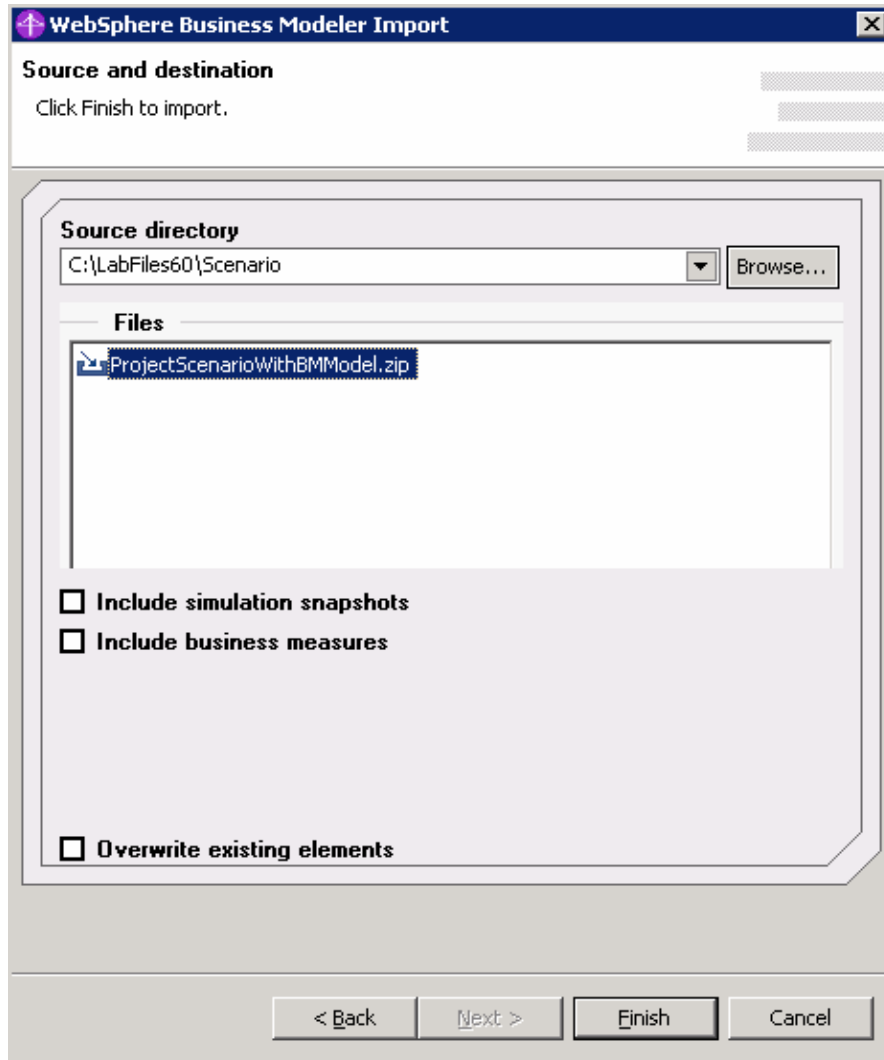
The modeling mode determines how many options are available to you. When working at a higher level you can remove some of the more technically oriented options by choosing a basic or intermediate mode.

___ 2. Create a new project and import the pre-created ProjectScenario model.

___ a. Right click in the Project Tree view, and then select **New > Business Modeling Project**. Enter the project name 'ProjectScenario' and uncheck **Create process** (we will import a process instead of creating one).

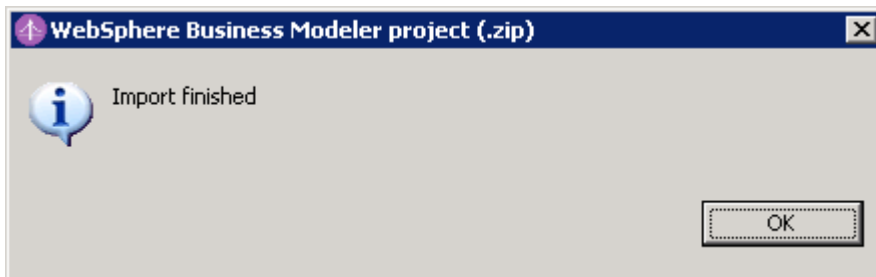


- ___ b. Click **Finish**.
- ___ c. Right click in the Project Tree view, then **Import**. Pick **WebSphere Business Modeler project (.zip)**, then click **Next**.
- ___ d. On the following window, navigate to '<LAB_FILES>\Scenario\' for the Source directory and choose '**ProjectScenarioWithBMMModel.zip**'.
- ___ e. Be careful that you **deselect** the 'Include simulation snapshots' and 'Include business measures' options.



Note: You can see that the Import allows you to not include business measures in the import. The ProjectScenario.zip already has the business measures pre-created so that you were able to complete the End-to-End Scenario Lab without creating all of the business measures. However, in this lab we specifically want to perform those steps so we do not import the business measures this time.

- __ f. Then click **Finish**.
- __ g. You should see a confirmation window as follows.

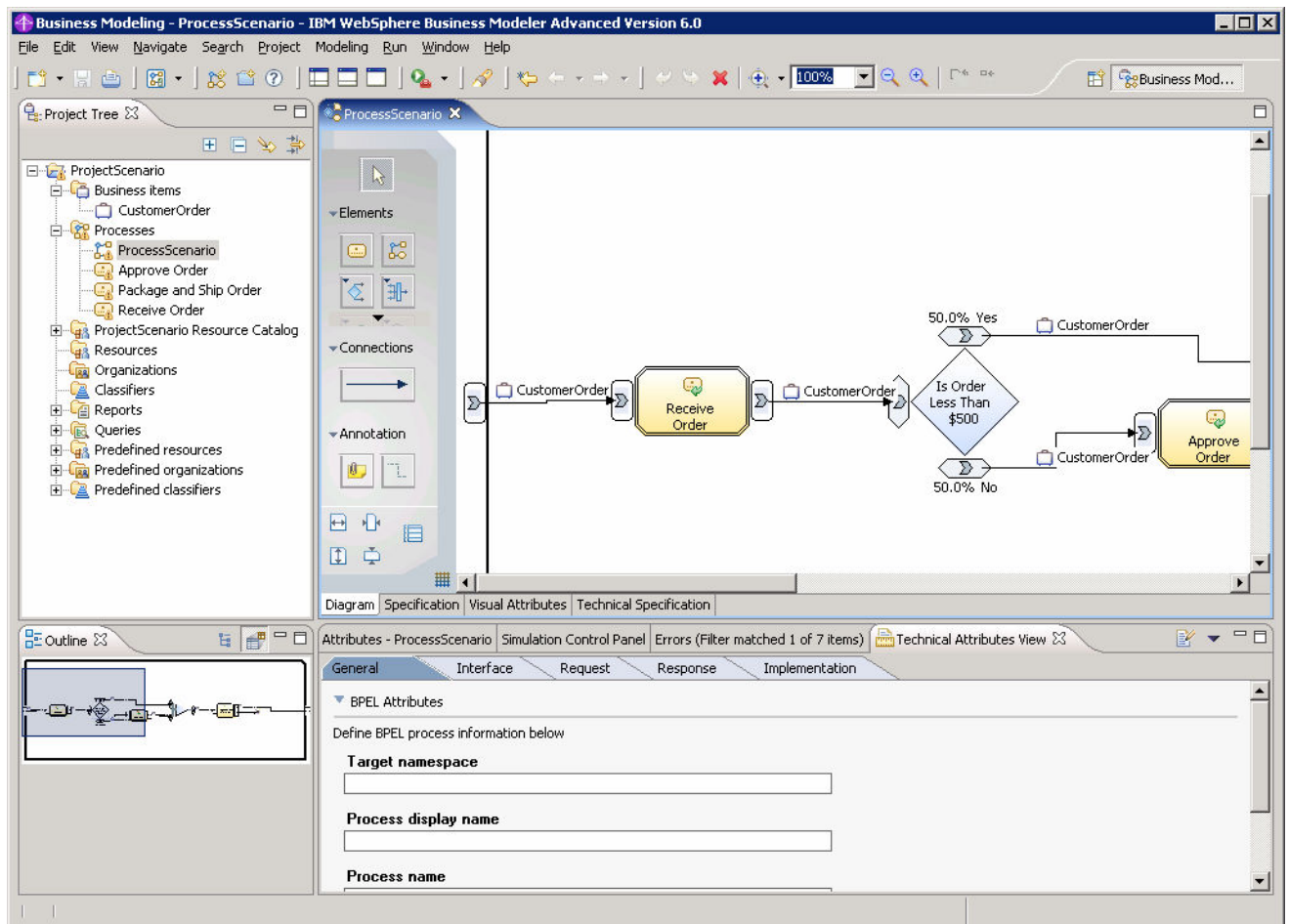


___ h. Click **OK**.

___ 3. Review the model and business object.

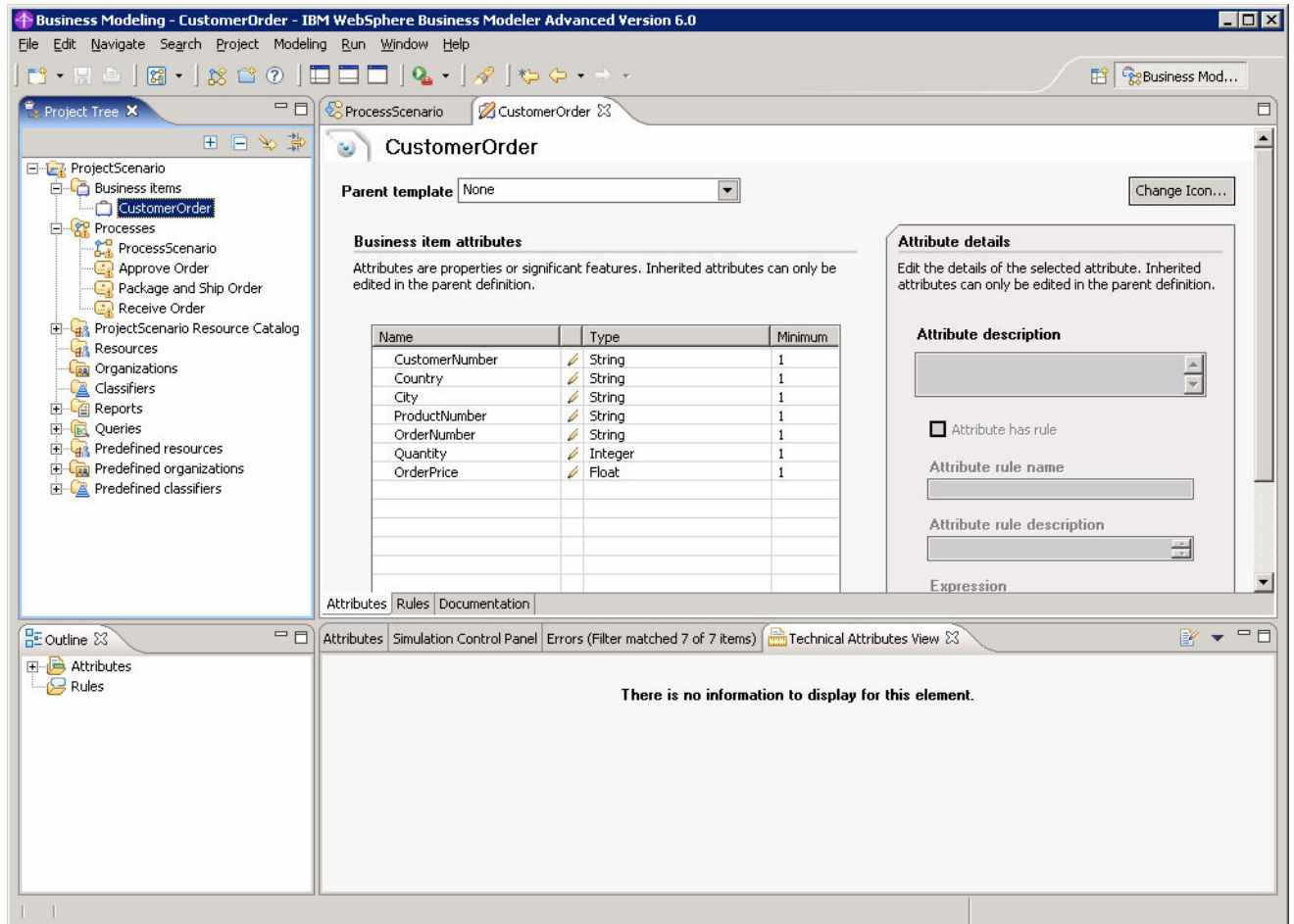
Note: The model is the same one that you saw in the end to end scenario lab. You may skip this step if you are already familiar with it.

___ a. In the Project Tree, expand **ProjectScenario**, then **Processes**. Double click on **ProcessScenario** to bring up the Process editor.



___ b. In this process, there are three tasks 'Receive Order', 'Approve Order' and 'Package and Ship Order'. Also there is a Decision that is based on the OrderPrice of the CustomerOrder that determines whether the order must be approved. If the order price is greater than or equal to \$500 then the order must be approved. Orders with a price less than \$500 require no approval.

___ c. Expand **Business Items** in the Project Tree, and double click on **CustomerOrder** to view the attributes of this business item.

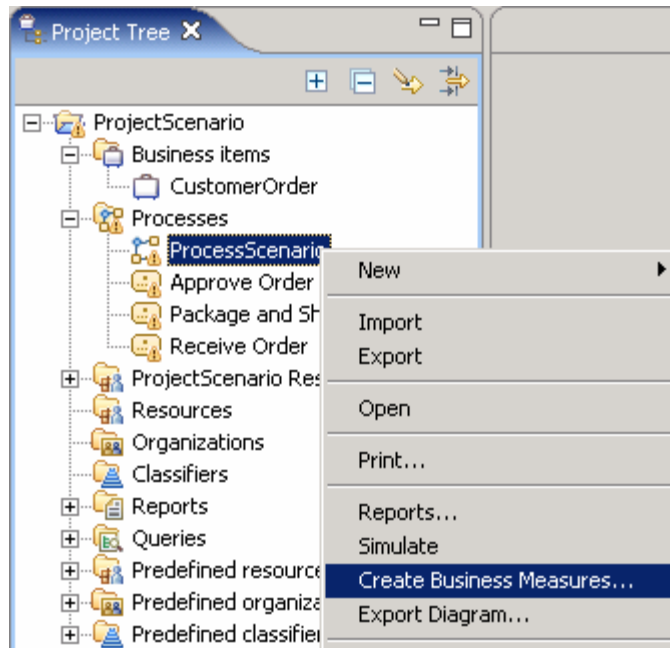


___ d. Close the ProcessScenario view and the CustomerOrder view.

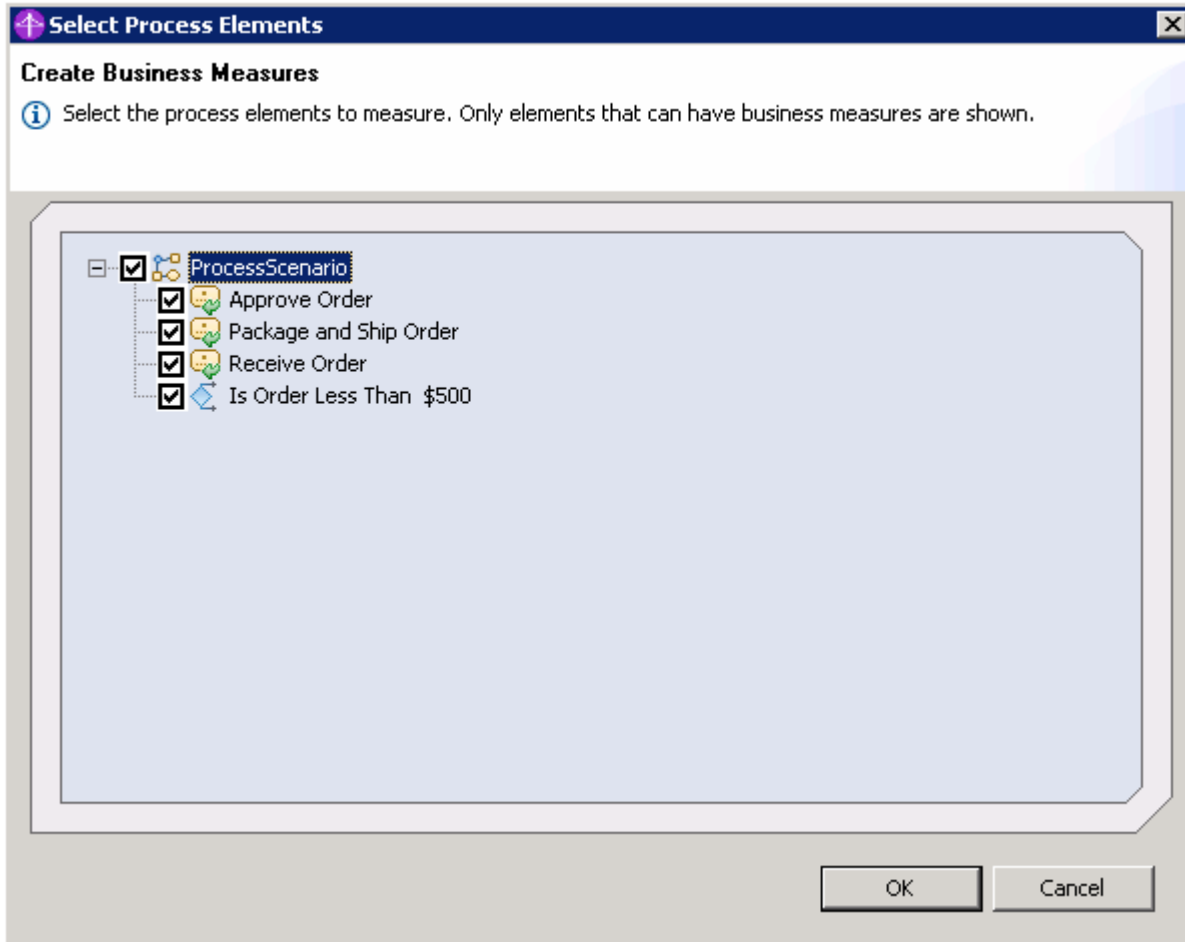
Part 2: Create the default business measures

In this part you will take the process model and simply create the default business measures model. Once this model is created you will then add measures to it in later parts.

- ___ 1. Create the business measures model for the ProcessScenario process.
 - ___ a. In the Project Tree view, expand **ProjectScenario > processes** and right click on **ProcessScenario**.
 - ___ b. Select **Create Business Measures...** from the context menu.



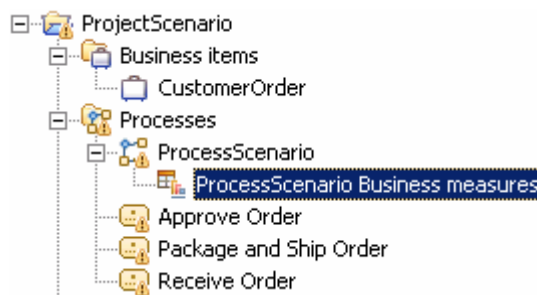
- ___ c. Accept the default of creating business measures against all elements and click **OK**.



Note: You can choose to omit some of the elements if you do not need to measure anything that is related to them. Be aware that doing this might affect some of the pre-defined measures causing them to be calculated incorrectly – for example the process working duration will be affected as the deselected tasks will not be included in the value.

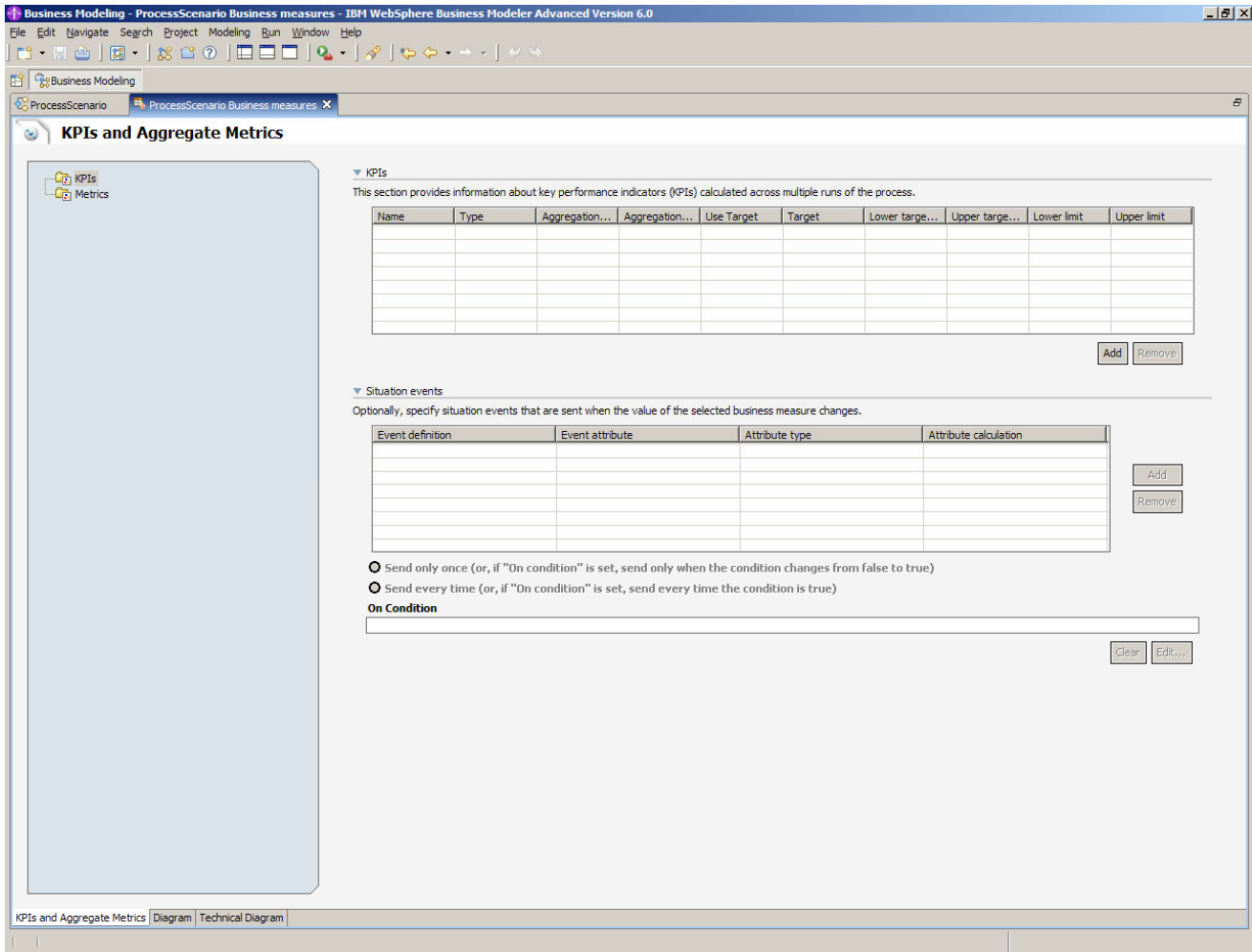
2. Explore the Business Measures Editor.

a. Look in the Project Tree view – you should see that the new item has appeared beneath your process model:



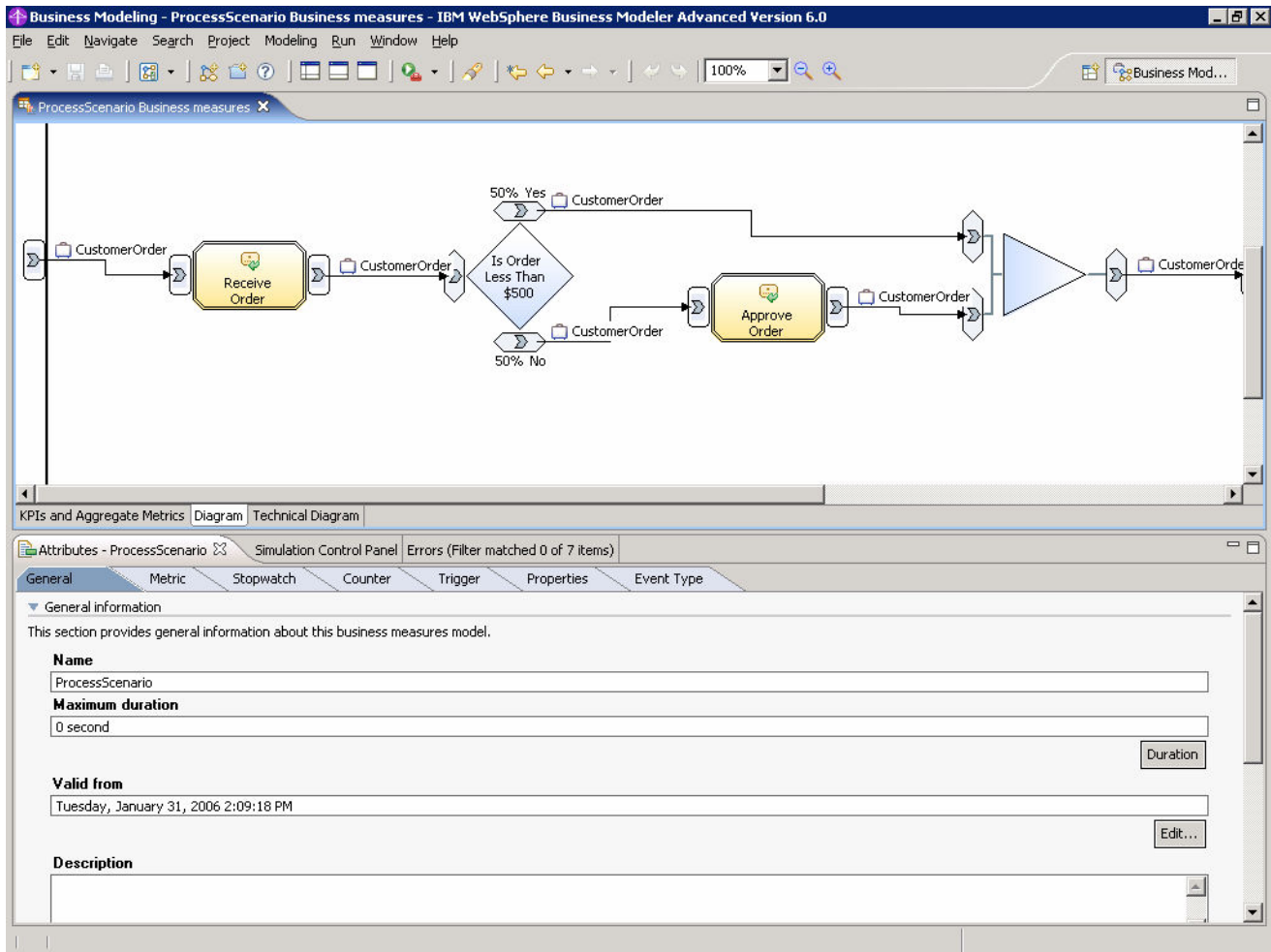
b. In the right hand pane, the BME has opened to the default **KPIs and Aggregate Metrics** tab. On this tab you define measures that are calculated by looking at all of the process instances and performing aggregate functions, for example averaging. You can also see that **Situation events**

can be configured here as well. These are business events that cause some action to take place. You will see that there is nothing defined yet but we will define some of these soon.



Note: You can make a view fill the entire window by double clicking on the blue tab at the top, as shown in the screen above. To restore it, double click again.

- ___ c. Click on the **Diagram** tab and you will see a read-only picture of your process model. This is useful for keeping track of what process you are defining metrics for.
- ___ d. Once you are in the Diagram view, click on the **Attributes – ProcessScenario** tab below the process editor. It is in the ‘attributes’ section that many of the measures are defined.



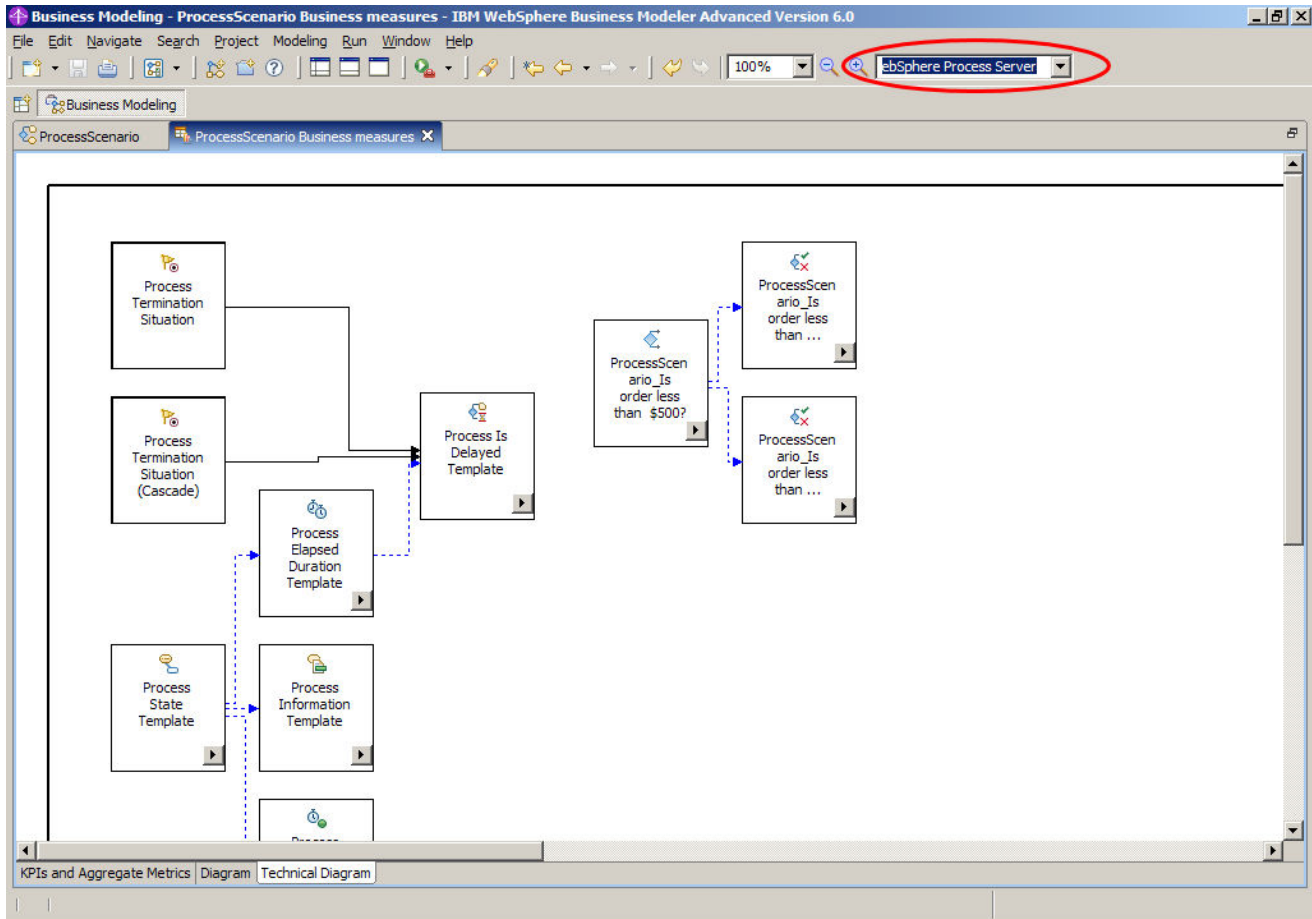
Note: The above screen shows the 2-pane layout.

- ___ e. Inside the Attributes panel you should see another row of sub-tabs – **General, Metric, Stopwatch, Counter, Trigger, Properties** and **Event Type**. These are measures that you define against the process. They differ from the aggregate measures that you just saw because these measures are all calculated per-process, rather than being calculated by aggregating across all the processes.

Note: The number of tabs that are shown depends on the modeling mode you are in – to see them all you should be in the 'WebSphere Process Server' modeling mode.

- ___ f. Click each of the tabs and review some of the settings and options. In this lab you will define these measures.
- ___ g. Now click the **Technical Diagram**, the third tab in the top panel of the editor, next to the 'Diagram' tab you previously clicked.
- ___ h. The Technical Diagram provides a visual representation of the underlying model. This model is exported to XML files that are imported into WebSphere Business Monitor. You will not need to use this view but we show you it here for completeness. By default you see a runtime independent view in the Technical Diagram, but you can select 'WebSphere Process Server'

instead of 'non-specified' in the drop down box at the top. This will show you the specific model representation for WebSphere Process Server.



Part 3: Configuring general properties in the Business Measures model

In this part you will configure the general properties for the Business Measures Model.

- ___ 1. Change the process **valid from** field to a date in the past.
 - ___ a. Open the ProcessScenario business measures and click on the **Diagram tab**.

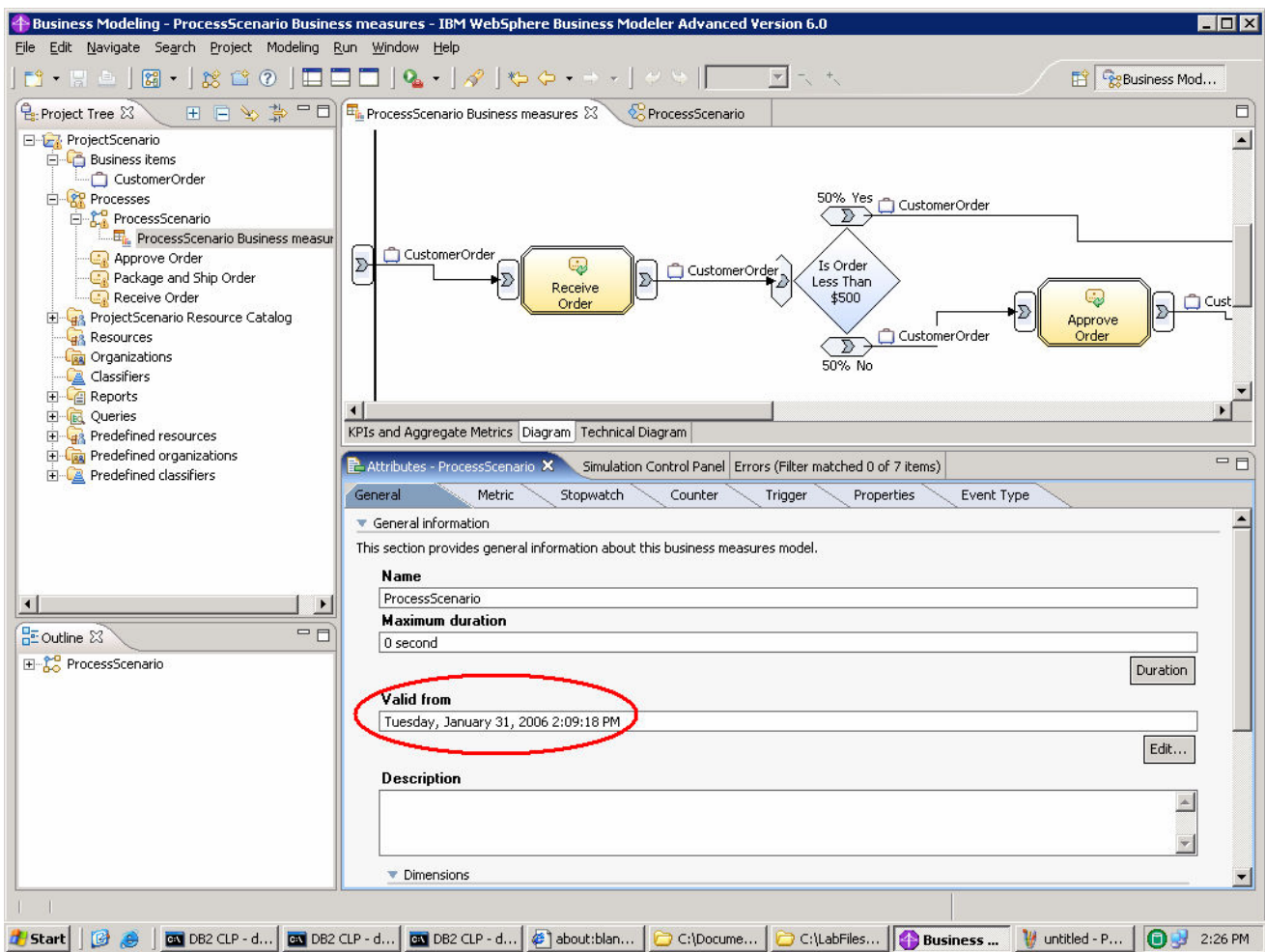
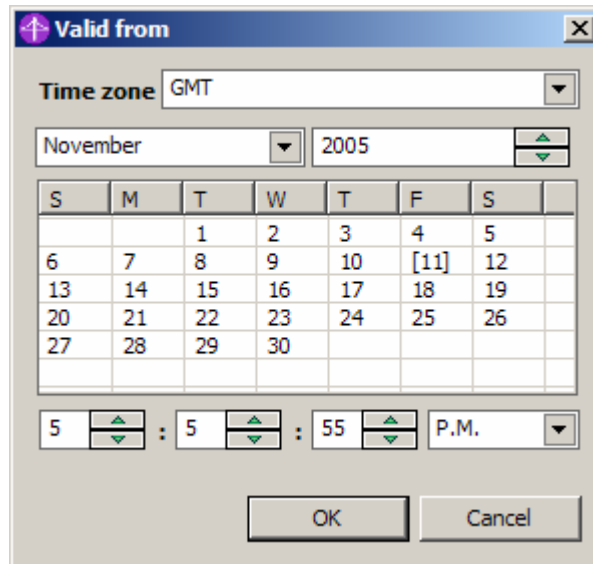
Note: The size of the diagram canvas is determined by the size of the upper panel at the time you open the Diagram tab. If you find that the diagram canvas is too large, try closing the BME, then re-opening it. Re-size the upper panel while looking at the KPI/Aggregates and then click on the **Diagram** tab. The diagram should be automatically sized to a close fit to the new upper panel size.

- ___ b. Select the overall process (not an individual task) by clicking in the white space on the diagram canvas.
- ___ c. Click on the **Attributes – ProcessScenario** tab in the lower pane if it is not already selected.
- ___ d. Click on the **General** tab within the Attributes panel.

The screenshot shows the IBM WebSphere Business Modeler Advanced Version 6.0 interface. The main window displays a process diagram with tasks 'Receive Order' and 'Approve Order', and a decision diamond 'Is Order Less Than \$500'. The 'Attributes - ProcessScenario' panel is open, showing the 'General' tab with fields for Name, Maximum duration, Valid from, and Description. The 'Valid from' field is currently set to 'Tuesday, January 31, 2006 2:09:18 PM' and has an 'Edit...' button next to it.

- ___ 2. Alter the **Valid from** field to a date in the past by clicking the **Edit...** button and changing the date to a date before the current date. The time does not matter as long as the date is in the past (this

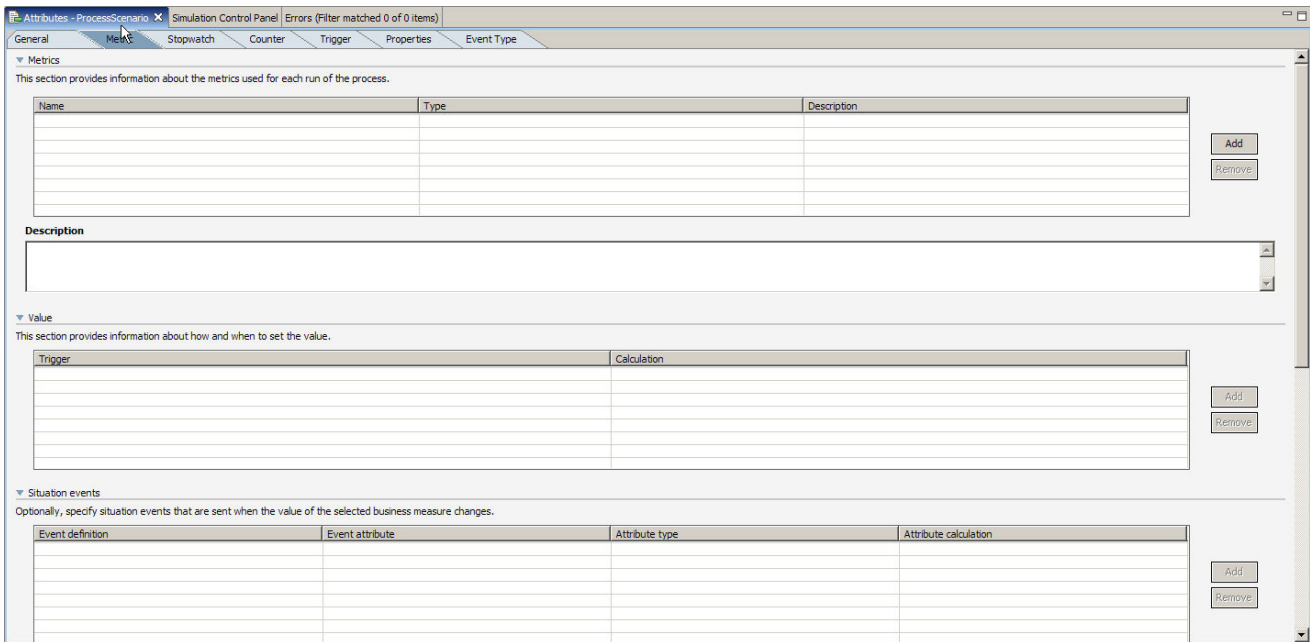
ensures that the process runtime will begin using the process immediately should you choose to later deploy this model).



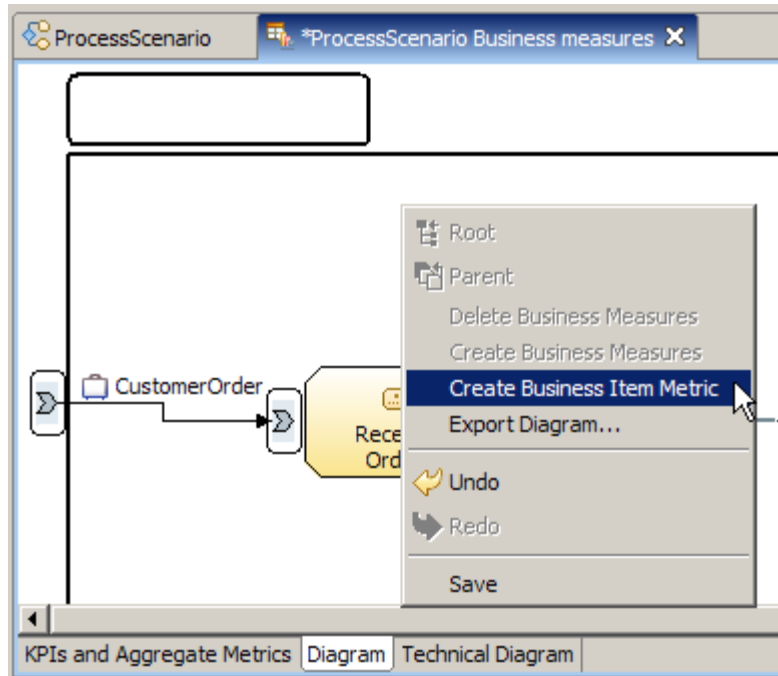
Part 4: Adding Metrics and defining a dimension

In this part you will now add the first business measures to the model using the BME. You will be adding Metrics.

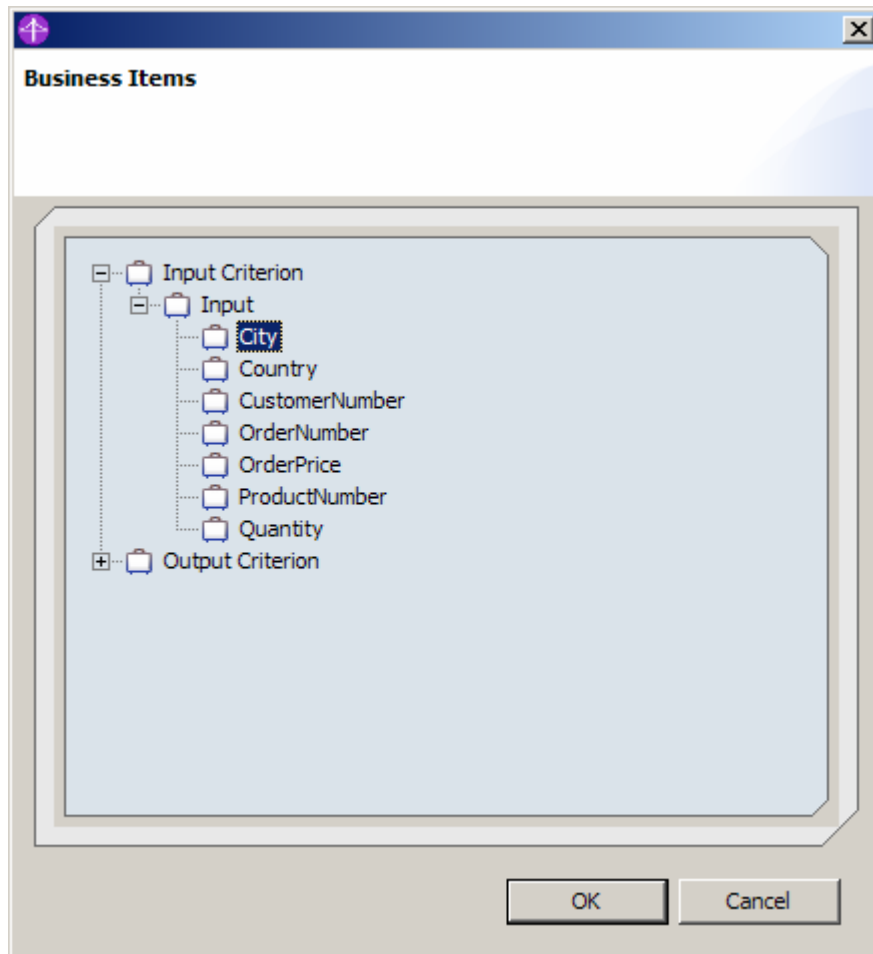
- ___ 1. Add Metrics for Country, City and OrderPrice.
 - ___ a. Select the **Metric** tab in the Attributes panel. You will see that no metrics are defined.



- ___ b. There is an Add button that allows you to define metrics, but we will use a quicker method that is very useful for adding business item metrics. Business items are data held within the business objects that are used within the process. We want to add metrics for three fields from the input data.
- ___ c. Right click in the white space canvas of the Diagram view in the BME and select **Create Business Item Metric**.



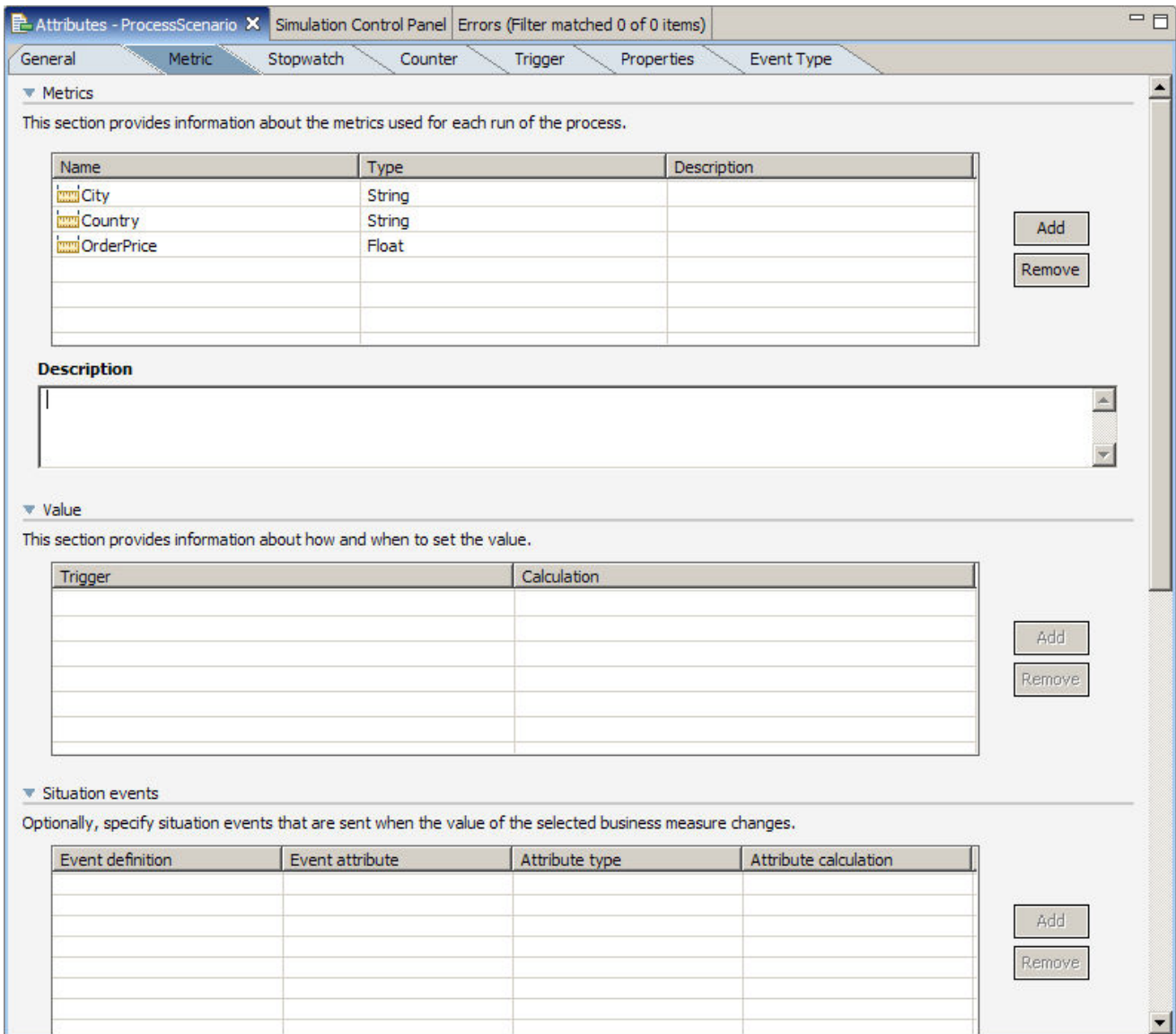
___ d. Select **Input Criterion > Input > City** and click **OK**.



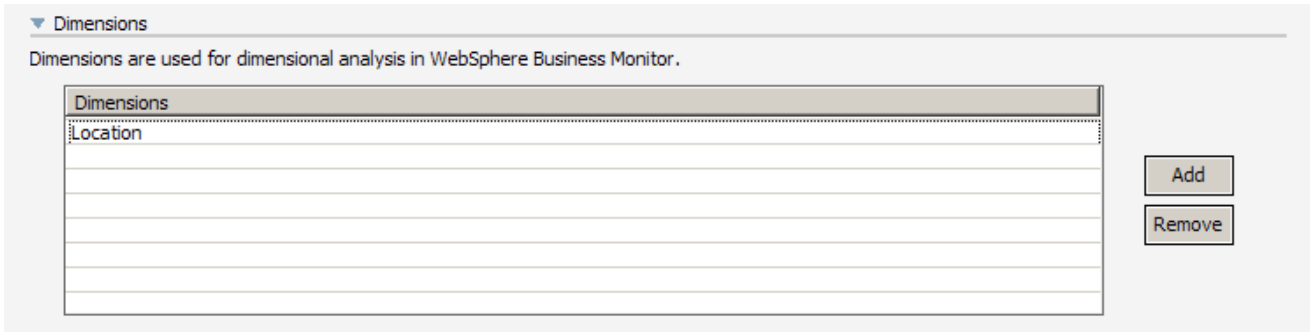
- ___ e. Notice that the metric is created and is named 'City1'. The trigger for this metric is also automatically created.

Note: The trigger that is created is a 'local trigger'. Local triggers are not re-usable and therefore will not appear on the Trigger tab. If you wish, you can create a global trigger on the Trigger tab and then use this instead if you need to. In the situation in this lab, a local trigger is perfect.

- ___ f. Rename the metric from 'City1' to 'City' by selecting the Name field and editing.
- ___ g. Right click on the canvas and choose **Create Business Item Metric** again.
- ___ h. Select **Input Criterion > Input > Country** and click **OK**.
- ___ i. Rename the metric from 'Country1' to 'Country'.
- ___ j. Right click on the canvas a final time and choose **Create Business Item Metric** again.
- ___ k. Select **Input Criterion > Input > OrderPrice** and click **OK**.
- ___ l. Rename the metric from 'OrderPrice1' to 'OrderPrice'.
- ___ m. Save the business measures model by pressing **CTRL+S** or clicking on the **Save** icon



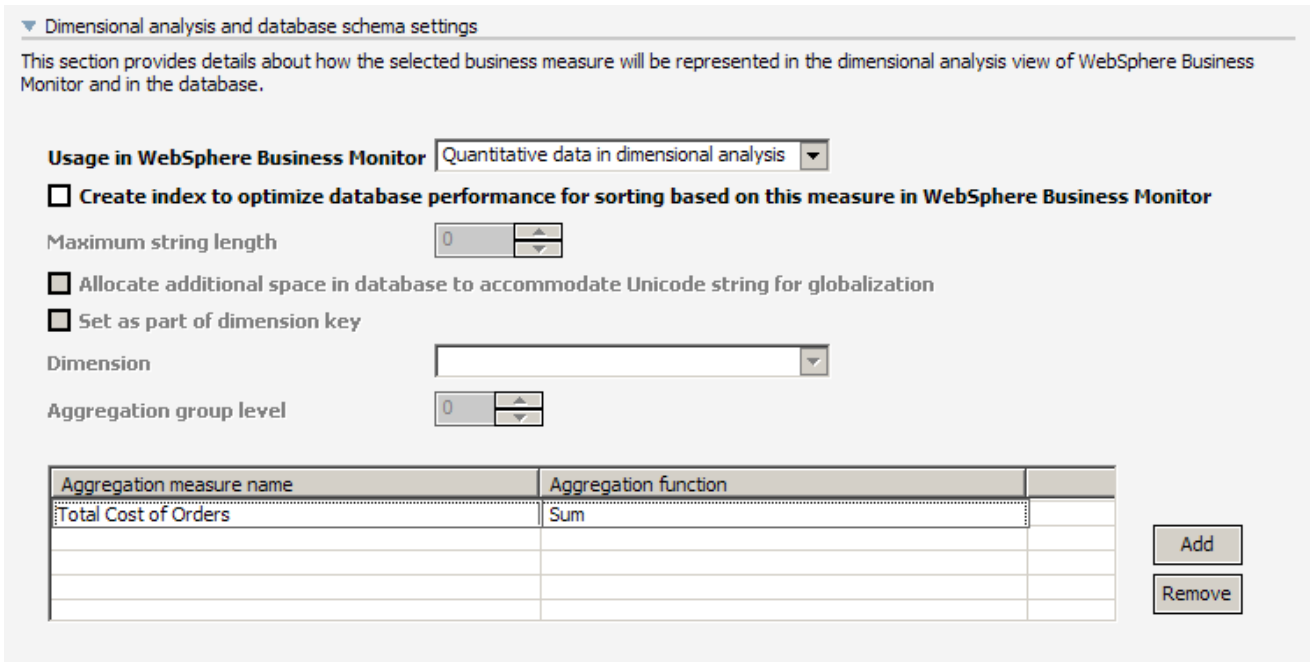
- ___ 2. Define a 'Location' dimension.
 - ___ a. Click back to the **General** tab.
 - ___ b. Click **Add** in the Dimensions section.
 - ___ c. Rename the dimension from 'Dimension group 1' to 'Location'.



- ___ 3. Specify Country at the first level and City at the second level of the Location dimension, and define OrderPrice as the measure that you want to analyze against this dimension. This will enable you to perform drill up/down analysis of the OrderPrice by location when using the Monitor.
 - ___ a. Click on the **Metric** tab and select the **OrderPrice** metric.

Note: You can easily select the metric by right-clicking on the metric. Left-clicking activates editing the name of the metric but right-clicking simply selects the metric.

- ___ b. Scroll down to the last section of the Metric view, which is the **Dimensional analysis and database schema settings**. In the drop down list **Usage in WebSphere Business Monitor**, change the selection to **Quantitative data in dimensional analysis**
- ___ c. At the bottom of the panel, click **Add** to the right of the 'Aggregation measure name' table.
- ___ d. Change the name from 'Measure1' to '**Total Cost of Orders**'.
- ___ e. Change the Aggregation function to '**Sum**'.



- ___ f. Select the **Country** metric and scroll down to **Dimensional analysis and database schema settings** section.

- ___ g. In the dropdown list **Usage in WebSphere Business Monitor**, select **Aggregation group in dimensional analysis**.
- ___ h. Set the maximum string length to 50.
- ___ i. Select the '**Set as part of dimension key**'.
- ___ j. Select the '**Location**' option for the Dimension field.
- ___ k. Ensure that the **Aggregation group level** is 0.

Note: Country is the first level in the location dimension and the first level is always 0. Next you will set City as level 1.

▼ Dimensional analysis and database schema settings

This section provides details about how the selected business measure will be represented in the dimensional analysis view of WebSphere Business Monitor and in the database.

Usage in WebSphere Business Monitor Aggregation group in dimensional analysis ▼

Create index to optimize database performance for sorting based on this measure in WebSphere Business Monitor

Maximum string length 50 ▲ ▼

Allocate additional space in database to accommodate Unicode string for globalization

Set as part of dimension key

Dimension Location ▼

Aggregation group level 0 ▲ ▼

Aggregation measure name	Aggregation function

Add
Remove

- ___ l. Select the City metric and scroll down to **Dimensional analysis and database schema settings**
- ___ m. In the dropdown list **Usage in WebSphere Business Monitor** select **Aggregation group in dimensional analysis**.
- ___ n. Set the maximum string length to 50.
- ___ o. Select the '**Set as part of dimension key**'.
- ___ p. Select the '**Location**' option for the Dimension field.
- ___ q. Ensure that the Aggregation group level is 1.
- ___ r. Save the business measures model.

▼ Dimensional analysis and database schema settings

This section provides details about how the selected business measure will be represented in the dimensional analysis view of WebSphere Business Monitor and in the database.

Usage in WebSphere Business Monitor

Create index to optimize database performance for sorting based on this measure in WebSphere Business Monitor

Maximum string length

Allocate additional space in database to accommodate Unicode string for globalization

Set as part of dimension key

Dimension



Aggregation group level

Aggregation measure name	Aggregation function	

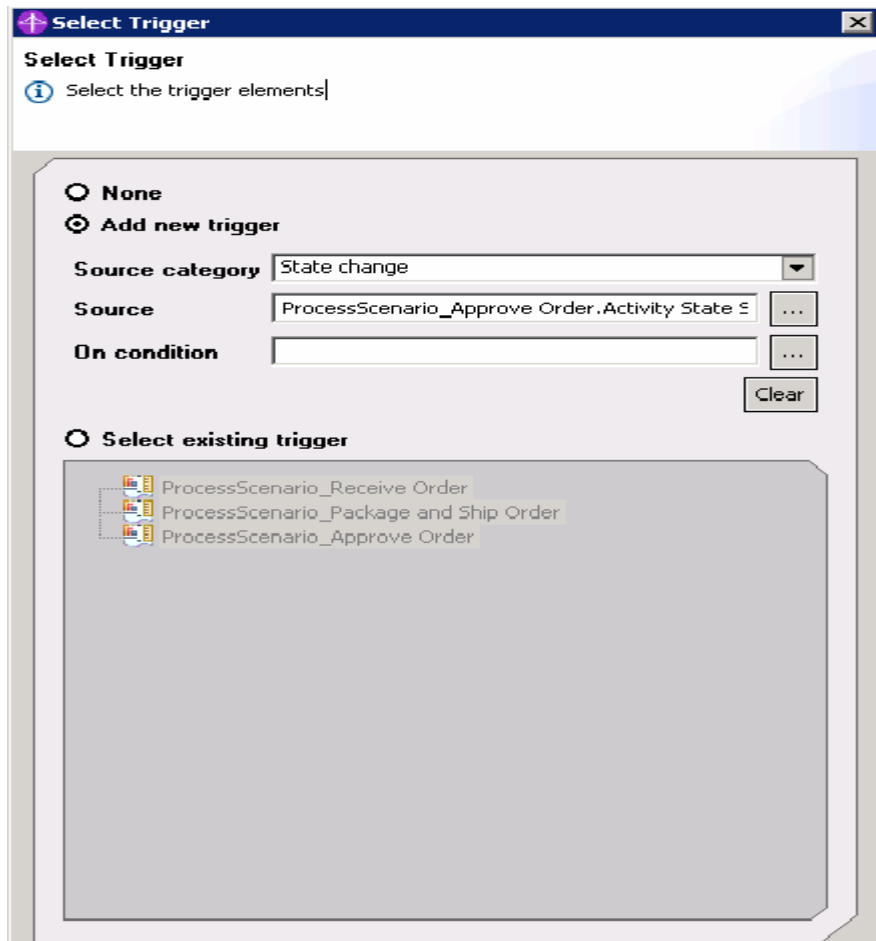
Part 5: Adding a Stopwatch

Now you will add a stopwatch for the amount of time taken to make an approval of the order.

- ___ 1. Define an 'Approval Time' stopwatch measure that will record how long an order takes to be approved.
 - ___ a. Click on the **Stopwatch** tab.
 - ___ b. Click **Add** next to the 'Stopwatch Name' section.
 - ___ c. Rename the Stopwatch from 'Stopwatch1' to 'Approval Time' by clicking on the name and editing it.
 - ___ d. Click **Add** to the right of the 'Triggered actions' section. This adds a 'Start' action.
 - ___ e. Click in the blank space in the **Trigger** column of the table and then click the '...' button.

Trigger	Resulting action
	 Start

- ___ f. Select the '**Add new trigger**' option.
- ___ g. Set the Source category to '**State change**'.
- ___ h. Click the '...' browse button to set the Source.
- ___ i. Expand **ProcessScenario_Approve Order**, select **Activity State Started** and click **OK**.
- ___ j. Leave the **On condition** field blank and click **OK**.

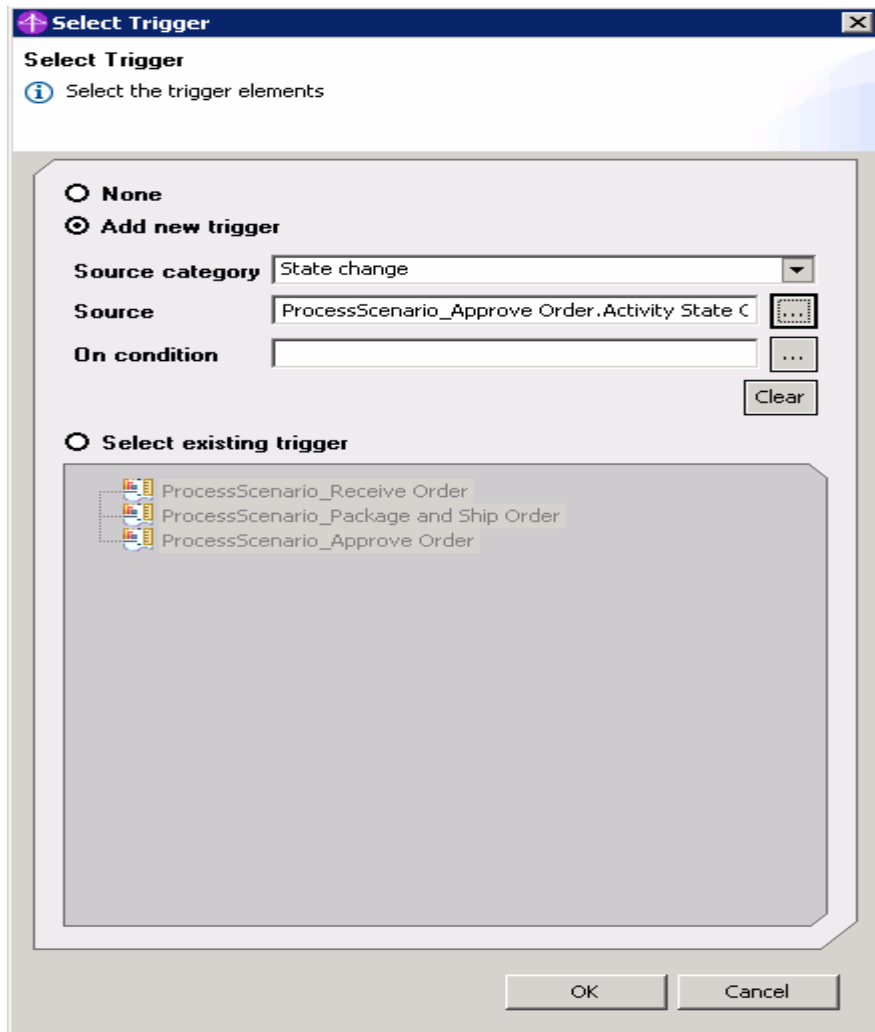


- __ k. Click **OK**.
- __ l. Click **Add** to add another triggered action.
- __ m. Change the Resulting action from 'start' to '**Stop**'.

Trigger	Resulting action
ProcessScenario_Approve Order.Activity State Started	Start
	Stop
	Start
	Stop
	Reset

- __ n. Click the blank space in the Trigger column and then click the browse '...' button.
- __ o. Select the '**Add new trigger**' option.
- __ p. Set the Source category to '**State change**'.
- __ q. Click the '...' browse button to set the Source.
- __ r. Expand **ProcessScenario_Approve Order**, select **Activity State Completed** and click **OK**.

___ s. Leave the **On condition** field blank, and click **OK**.



___ t. Click **OK**.

___ u. Check that your completed stopwatch looks like the one shown below:

General Metric **Stopwatch** Counter Trigger Properties Event Type

▼ Stopwatches

This section provides information about stopwatches, which keep track of elapsed time.

Stopwatch Name
Approval Time

Add
Remove

▼ Triggered actions

This section provides information about triggers that affect the selected stopwatch.

Trigger	Resulting action
ProcessScenario_Approve Order.Activity State Started	Start
ProcessScenario_Approve Order.Activity State Completed	Stop

Add
Remove

__ v. Save the business measures model.

Part 6: Adding Counters

Now you will add counters to measure the number of times that a decision was made during the execution of a process instance, and how many times an approval was made during the execution of a process instance. These counters will not be particularly useful in isolation, but you will later be aggregating them across all process instances to demonstrate a KPI built from these.

- ___ 1. Add Counter measures for the number of decisions made and the number of approvals made.
 - ___ a. Click on the **Counter** tab.
 - ___ b. Click **Add** to the right of the Counter Name section.
 - ___ c. Rename the new counter from 'Counter1' to '**Decisions Made**' by clicking on the name and editing it.
 - ___ d. Click **Add** to the right of the Triggered actions section.
 - ___ e. Notice that you can choose what actions to perform on your counter – add one, subtract one or set to zero. Leave the resulting action as **Add one**.
 - ___ f. Click the empty space in the trigger column and then click the browse '...' button.
 - ___ g. Select the '**Add new trigger**' option.
 - ___ h. Set the Source category to '**State change**'.
 - ___ i. Click the '...' browse button to set the Source.
 - ___ j. Expand the **ProcessScenario_Receive Order**, select **Activity State Completed** and click **OK**.
 - ___ k. Leave the **On condition** field blank. Click **OK**.

General	Metric	Stopwatch	Counter	Trigger	Properties	Event Type														
<p>▼ Counters</p> <p>This section provides information about counters, which count the number of occurrences.</p> <table border="1"> <thead> <tr> <th>Counter Name</th> </tr> </thead> <tbody> <tr> <td>08 Decisions Made</td> </tr> <tr> <td> </td> </tr> <tr> <td> </td> </tr> <tr> <td> </td> </tr> <tr> <td> </td> </tr> <tr> <td> </td> </tr> </tbody> </table>							Counter Name	08 Decisions Made												
Counter Name																				
08 Decisions Made																				
<p>▼ Triggered actions</p> <p>This section provides information about triggers that affect the selected counter.</p> <table border="1"> <thead> <tr> <th>Trigger</th> <th>Resulting action</th> </tr> </thead> <tbody> <tr> <td>ProcessScenario_Receive Order .Activity State Completed</td> <td>Add one</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>							Trigger	Resulting action	ProcessScenario_Receive Order .Activity State Completed	Add one										
Trigger	Resulting action																			
ProcessScenario_Receive Order .Activity State Completed	Add one																			

Note: This counter is designed to count the number of decisions that are made when the process executes. It is not possible to put a trigger on the decision step because it is not a real activity, so instead we trigger when the activity immediately before the decision completes.

- __ l. Click **Add** to the right of the Counter Name section to add a second counter.
- __ m. Rename the new counter from 'Counter1' to '**Approvals Made**' by clicking on the name and editing it.
- __ n. Be sure that the 'Approvals Made' counter is selected and click **Add** to the right of the Triggered actions section below.
- __ o. Leave the resulting action as **Add one** .
- __ p. Click the empty space in the trigger column and then click the browse '...' button.
- __ q. Select the '**Add new trigger**' option.
- __ r. Set the Source category to '**State change**'.
- __ s. Click the '...' browse button to set the Source.
- __ t. Expand **ProcessScenario_ Approve Order**, select **Activity State Started** and click **OK**.
- __ u. Leave the **On condition** field blank. Click **OK**.
- __ v. Save the business measures model.

General Metric Stopwatch Counter Trigger Properties Event Type

▼ Counters

This section provides information about counters, which count the number of occurrences.

Counter Name
08 Decisions Made
08 Approvals Made

▼ Triggered actions

This section provides information about triggers that affect the selected counter.

Trigger	Resulting action
ProcessScenario_Approve Order.Activity State Started	Add one

Note: All of the measures defined so far are *per-process*, including these counters (we will define aggregates later in this lab). Looking at the process model, you can see that the number of Decisions Made *per-process* will always count to one, and the number of Approvals Made will either be zero or one depending on whether the order needs approving. Our counters are therefore not particularly useful, but we will also aggregate their values which will provide more important information.

Counters would be more useful in other scenarios – perhaps to count the number of times a loop is executed for example.

Part 7: Create a Trigger and associate a Situation Event

In this section you will create a trigger for the start of a new order and then you will add a situation event to this trigger. The situation event will allow you to sent alerts when this trigger happens, using the Action Manager capability in Monitor.

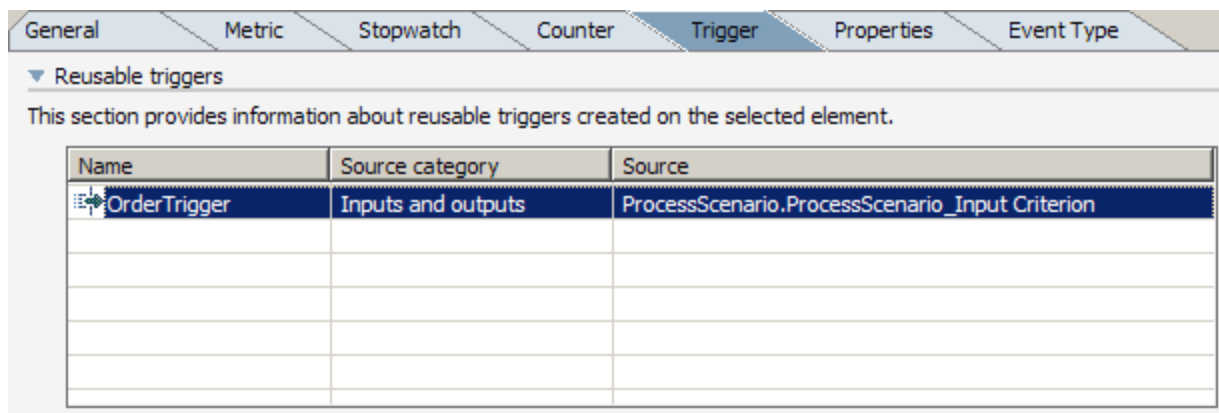
This lab shows how to create a situation event in a model.

You can complete the following labs if you wish to see an example of how a situation event can notify users through the dashboard.

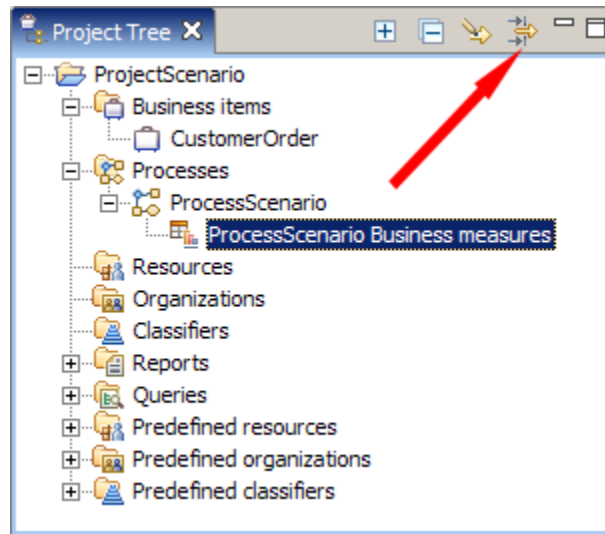
- End-to-End Scenario Lab (to deploy the process).
- Action Manager Lab (to create Alerts when the event occurs).
- Dashboard Lab (to view alerts in the dashboard).

The following steps will show you how to create a trigger and then how to produce a situation event when that trigger occurs.

1. Define a trigger for the beginning of a process instance and create a situation event for when this trigger occurs. This will allow you to pass the event information to a user in the form of an 'Action' when using the Monitor. The Action Manager in the Monitor can notify users based on these actions.
 - a. Click on the **Trigger** tab.
 - b. Click **Add** to the right of the Reusable triggers section.
 - c. Rename the trigger from 'Trigger1' to '**OrderTrigger**' by clicking on the name and editing it.
 - d. Change the source category to **Inputs and outputs**.
 - e. Click in the empty space in the source column and then click the browse '...' button.
 - f. Select **ProcessScenario_InputCriterion** and click **OK**.

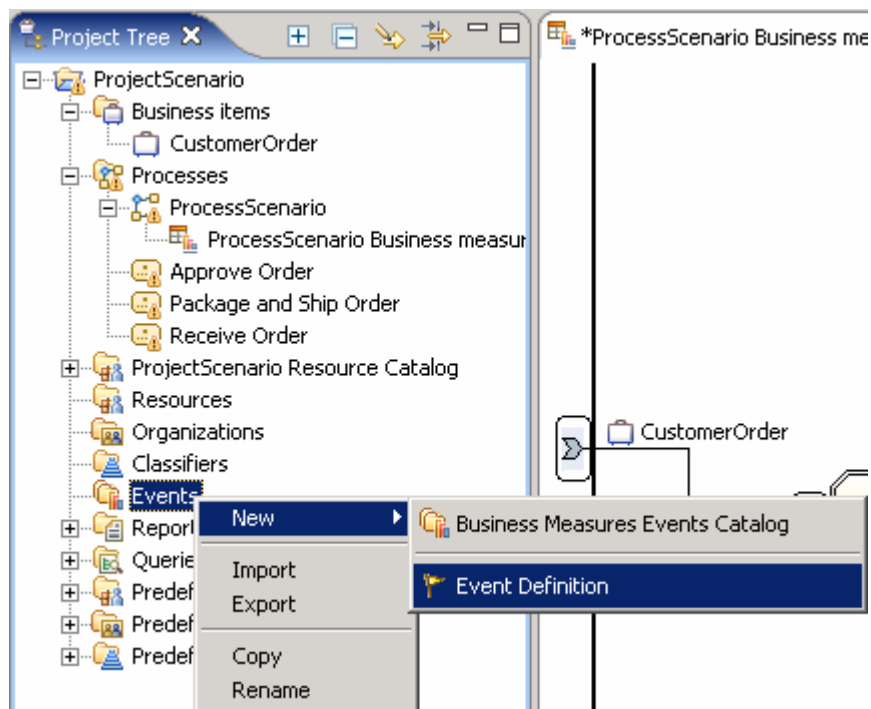


- g. In the Project Tree view (on the left if you are in the 4-panel layout) click the Filters icon at the top of the view as shown by the arrow below.

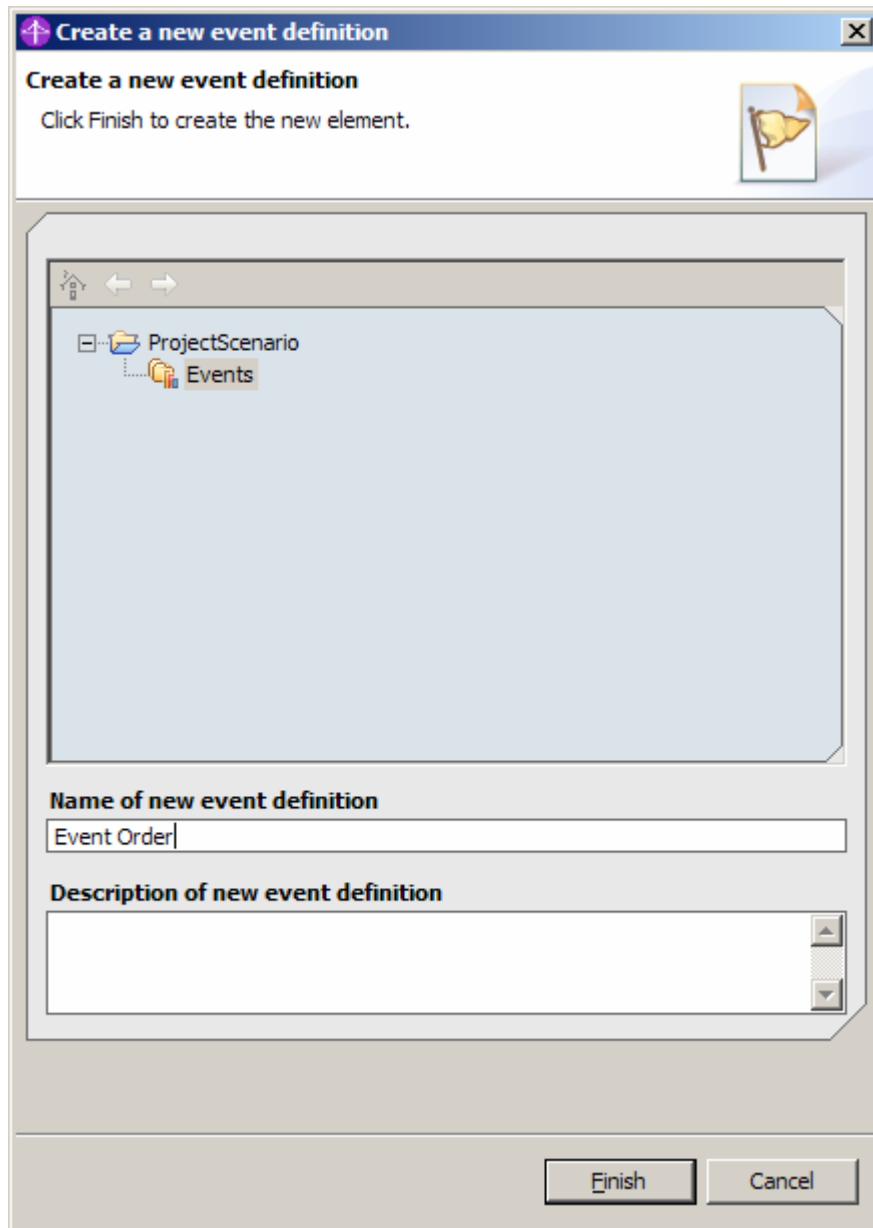


___ h. Deselect '**Business measures events**' and click **OK**.

___ i. Right click on **Events** in the Project Tree and select **New > Event Definition**.

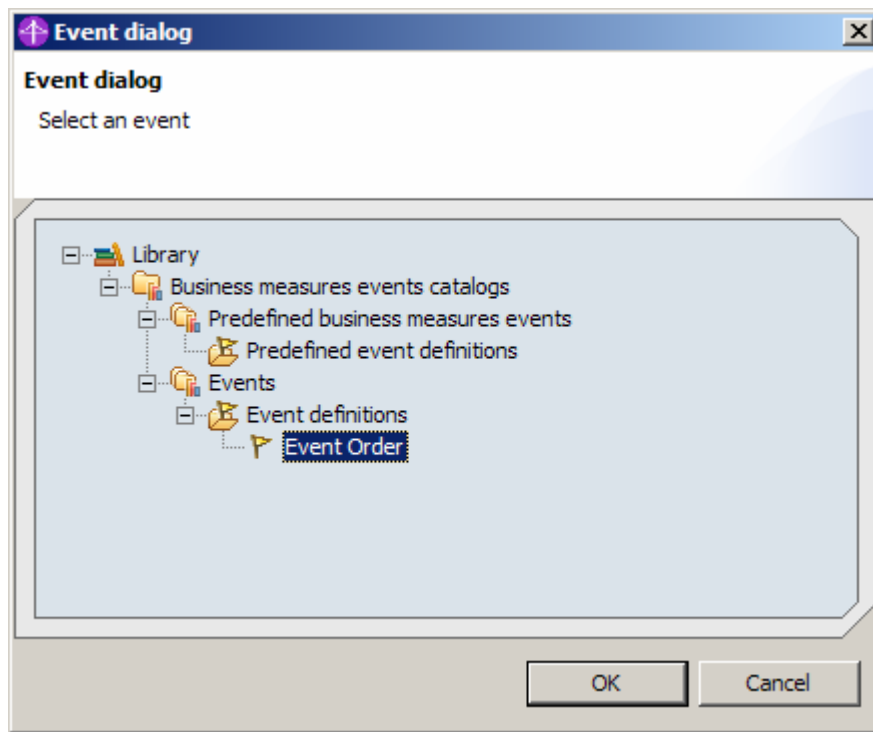


___ j. Change the name from 'Event definition 1' to '**Event Order**' and click **Finish**.



- ___ k. Notice that the Parent template of the new event is '\Business Situation' – this format is automatically recognized by the Action Manager in Monitor. We can then add our own attributes to the event and still use the parent template.
- ___ l. Click **Add** at the bottom of the Event type list.
- ___ m. Change the new attribute's name from 'Attribute' to '**OrderNumber**' by double clicking on its name and editing it.
- ___ n. Save and close the EventOrder editor.
- ___ o. Return to the Trigger tab of the business measures model and select the **Order Trigger** by right clicking on it.
- ___ p. Scroll down to the **Situation events** section and click **Add** to the right of this section.

- ___ q. Select the **Library > Business measures events catalogs > Events > Event definitions > Event Order** and click **OK**.



- ___ r. Expand the **Event Order** situation event and double click in the 'Attribute Calculation' section of the **BusinessSituationName** Event attribute, then click the '...' button.

▼ Situation events

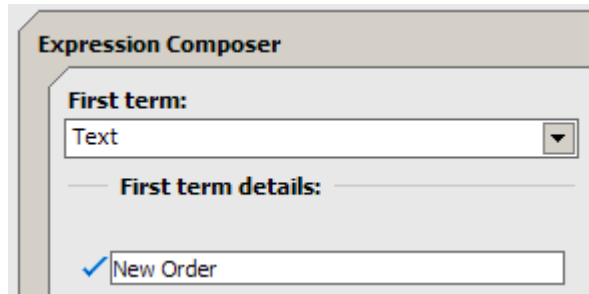
Optionally, specify situation events that are sent when the value of the selected business measure changes.

Event definition	Event attribute	Attribute type	Attribute calculation
Event Order	BusinessSituationName	String	<input type="text" value=""/>
	ContextID	Long	
	ContextDef	String	
	CreationTime	DateTime	
	OrderNumber	String	

- ___ s. In the Expression Builder window, set the value of the first term to be **Text** and then enter '**New Order**' into the text field and click **Apply**. Then click **OK** afterwards.

Note: The string 'New Order' is important when you set up the Action Manager in WebSphere Business Monitor. You must specify this situation name when configuring what action to take on this event. Refer to the Action Manager lab for further details of this configuration.

Note: You must click Apply before OK because the Apply button is used to build the expression. This is because more complicated expressions can consist of multiple terms and you need to build the expression one term at a time. The Apply button confirms each individual term. In this case there is only one simple term for the calculation so the temptation is to click OK and forget to click Apply. This will not work so ensure that you click Apply first.



- ___ t. Double click the 'attribute calculation' column for the OrderNumber Event attribute and click the '...' button to open the Expression Builder.
- ___ u. Select **Modeling artifact** for the First term, then select **ProcessScenario > Input Criterion > Input > OrderNumber** by expanding the Modeling artifact tree.
- ___ v. Click **Apply** and then click **OK**.

General Metric Stopwatch Counter **Trigger** Properties Event Type

▼ Reusable triggers
This section provides information about reusable triggers created on the selected element.

Name	Source category	Source
OrderTrigger	Inputs and outputs	ProcessScenario.ProcessScenario_Input Criterion

Add
Remove

Condition

Clear Edit...

▼ Situation events
Optionally, specify situation events that are sent when the value of the selected business measure changes.

Event definition	Event attribute	Attribute type	Attribute calculation
[-] Event Order	BusinessSituationName	String	"New Order"
	ContextID	Long	
	ContextDef	String	
	CreationTime	DateTime	
	OrderNumber	String	"Input Criterion.Input.OrderNumber"

Add
Remove

- ___ w. Save the business measures model.

Part 8: Define KPIs and Aggregate Metrics

In this part you will define aggregate metrics – these are measures that are calculated by looking at all of the process instances that have executed. For example averages, maximums, minimums and custom calculations.

- ___ 1. Define Aggregate metrics for the total number of decisions made and the total number of approvals made (across all processes).
 - ___ a. Click the **KPIs and Aggregate Metrics** tab at the bottom of the business measures editor view.
 - ___ b. Select **Metrics** on the left panel and then click **Add** under the Metrics table.
 - ___ c. Rename the new metric from 'Aggregate metric 1' to '**Total Decisions**'.
 - ___ d. Click the empty space in the Aggregation source column by the red cross and then click the '...' button.
 - ___ e. Select **Counters > Decisions Made** and click **OK**.
 - ___ f. Change the type from Integer to **Float**.

Note: When you selected the Counter as the aggregation source, the type of the aggregation metric was automatically set to Integer (to match the type of the Counter). You need to change this type to Float because we will be using this aggregate metric to calculate a KPI and we need to use Floats in the calculation, not integers. This is because our KPI will use the following type of calculation:

$$\text{Approval Percentage} = (\text{Total Approvals} / \text{Total Decisions}) * 100$$

If both are defined as Integers then the calculation result will suffer from Integer rounding. For example if Total Approvals = 5 and Total Decisions = 10.

Using Integers:

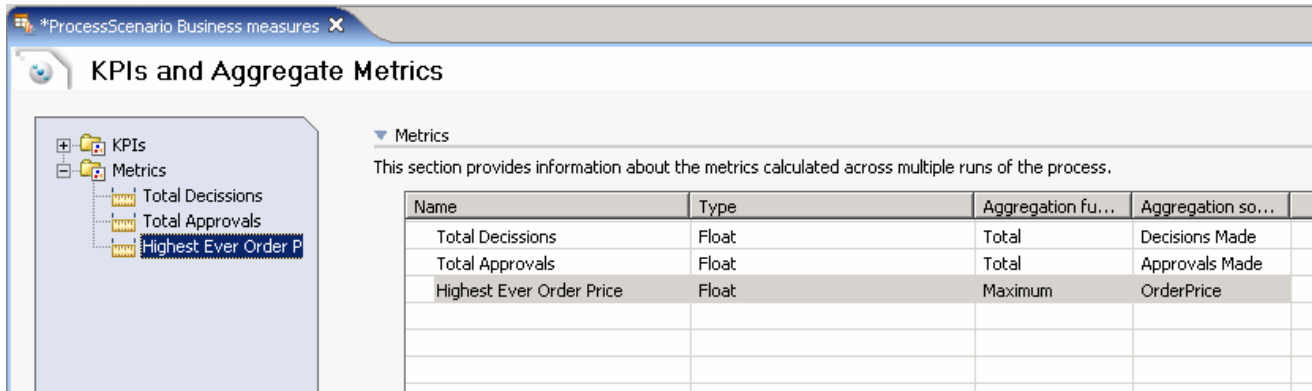
$$\text{Approval Percentage} = (5 / 10) * 100 = 0 * 100 = \mathbf{0 \text{ (due to rounding)}}$$

Using Floats:

$$\text{Approval Percentage} = (5 / 10) * 100 = 0.5 * 100 = \mathbf{50 \%}$$

- ___ g. Click **Add** under the Metrics table again.
- ___ h. Rename the new metric from 'Aggregate metric 1' to '**Total Approvals**'.
- ___ i. Click the empty space in the Aggregation source column by the red cross and then click the '...' button.
- ___ j. Select **Counters > Approvals Made** and click **OK**.
- ___ k. Change the type from Integer to **Float**.
- ___ l. Click **Add** under the Metrics table again
- ___ m. Rename the new metric from 'Aggregate metric 1' to '**Highest Ever Order Price**'.
- ___ n. Change the **Aggregation Function** from **Total** to **Maximum**

- ___ o. Click the empty space in the Aggregation source column by the Red Cross and then click the ‘...’ button.
- ___ p. Select **Metrics > Order Price** and click **OK**
- ___ q. Save the metrics by pressing **Ctrl+S**.



- ___ 2. Add a Key Performance Indicators (KPIs) for the average order price.
 - ___ a. In the KPIs and Aggregate Metrics panel, click **KPIs** at the top left.
 - ___ b. Click **Add** below the KPIs table.
 - ___ c. Rename the KPI from ‘KPI1’ to **‘Average Order Price’** by clicking the name and editing it.

Note: You do not have to select the correct Type because it will change based on the type of the aggregation source that you select.

- ___ d. Change the Aggregation function to **Average**.
- ___ e. Click the **Aggregation source** column and then the ‘...’ button.
- ___ f. Select **Metrics > OrderPrice** and click **OK**.
- ___ g. Click in **Target** column and then click the ‘...’ button.
- ___ h. Select **Literal value**.
- ___ i. Enter **1000** and click **OK**.
- ___ j. Click in **Lower target margin (%)** column and then click the ‘...’ button.
- ___ k. Select **Literal value**, enter **25** and click **OK**.
- ___ l. Click in **Upper target margin (%)** column and then click the ‘...’ button.
- ___ m. Select **Literal value**, enter **50** and click **OK**.

Note: These margin percentages are ‘percentages of the target figure’ so, for example, we are saying that the upper target margin is 50% of the target. Note that the lower target is 25%. The *absolute* size of the

upper margin is therefore $50\% * 25\% = 12.5\%$. This is equivalent to an upper limit of: $\text{target} + \text{margin} = 25\% + 12.5\% = 37.5\%$.

▼ KPIs

This section provides information about key performance indicators (KPIs) calculated across multiple runs of the process.

Name	Type	Aggregation ...	Aggregation ...	Use Target	Target	Lower target margin (%)	Upper target margin (%)	Lower limit	Upper limit
Average Order Price	Float	Average	OrderPrice	<input checked="" type="checkbox"/>	1000.0	25.0	50.0		

Add Remove

3. Add a Key Performance Indicator for average approval time.
 - a. In the KPIs and Aggregate Metrics panel, click **KPIs** at the top left.
 - b. Click **Add** below the KPIs table.
 - c. Rename the KPI from 'KPI1' to '**Average Approval Time**' by clicking the name and editing it.
 - d. Change the Aggregation function to **Average**.
 - e. Click the **Aggregation source** column and then the '...' button.
 - f. Select **Stopwatches > Approval Time** and click **OK**.
 - g. Deselect the **Use Target** option.
 - h. Click in the **Lower limit** column and then click the '...' button.
 - i. Select **Literal value** and then click the '...' button.
 - j. Click the '...' button on the right side, and select **30 minutes** from the **Select duration** popup window, then click **OK**.
 - k. Click **OK** again.
 - l. Click in **the Upper limit** column and then click the '...' button.
 - m. Select **Literal value**, and then click the '...' button.
 - n. Click the '...' button on the right side, and select **1 hour and 30 minutes** from the **Select duration** popup window, then click **OK**.
 - o. Click **OK** again.

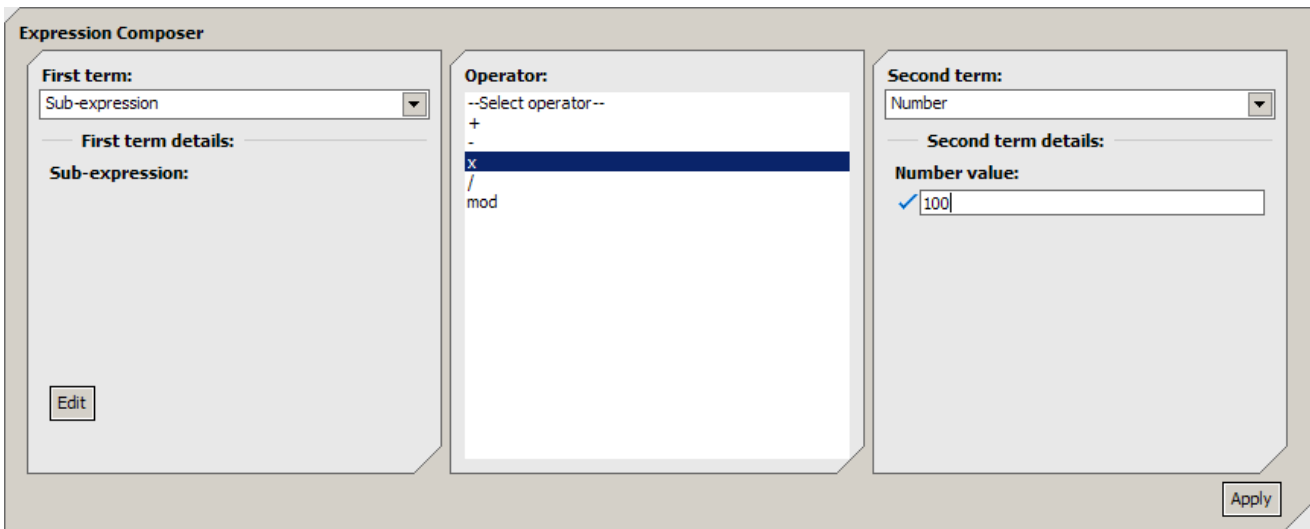
▼ KPIs

This section provides information about key performance indicators (KPIs) calculated across multiple runs of the process.

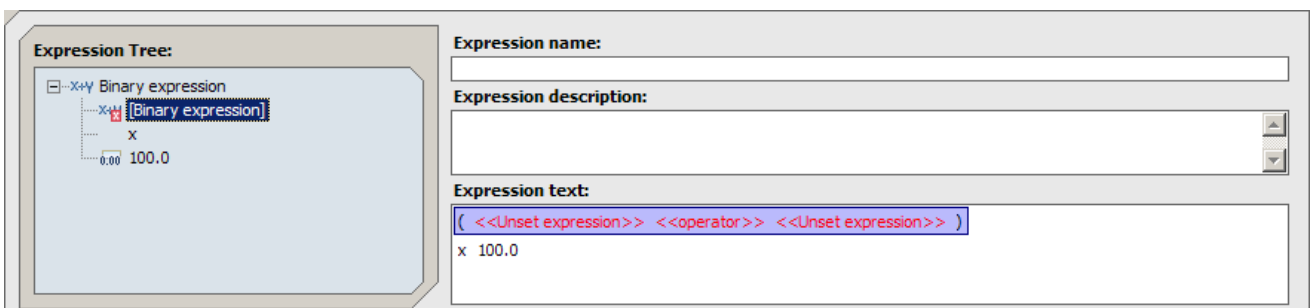
Name	Type	Aggregation f...	Aggregation s...	Use Target	Target	Lower target ...	Upper target ...	Lower limit	Upper limit
Average Order Price	Float	Average	OrderPrice	<input checked="" type="checkbox"/>	1000.0	25.0	50.0		
Average Approval Time	Duration	Average	Approval Time	<input type="checkbox"/>				30 minutes	1 hour 30 minutes

4. Add a KPI for the percentage of decisions that require approval.

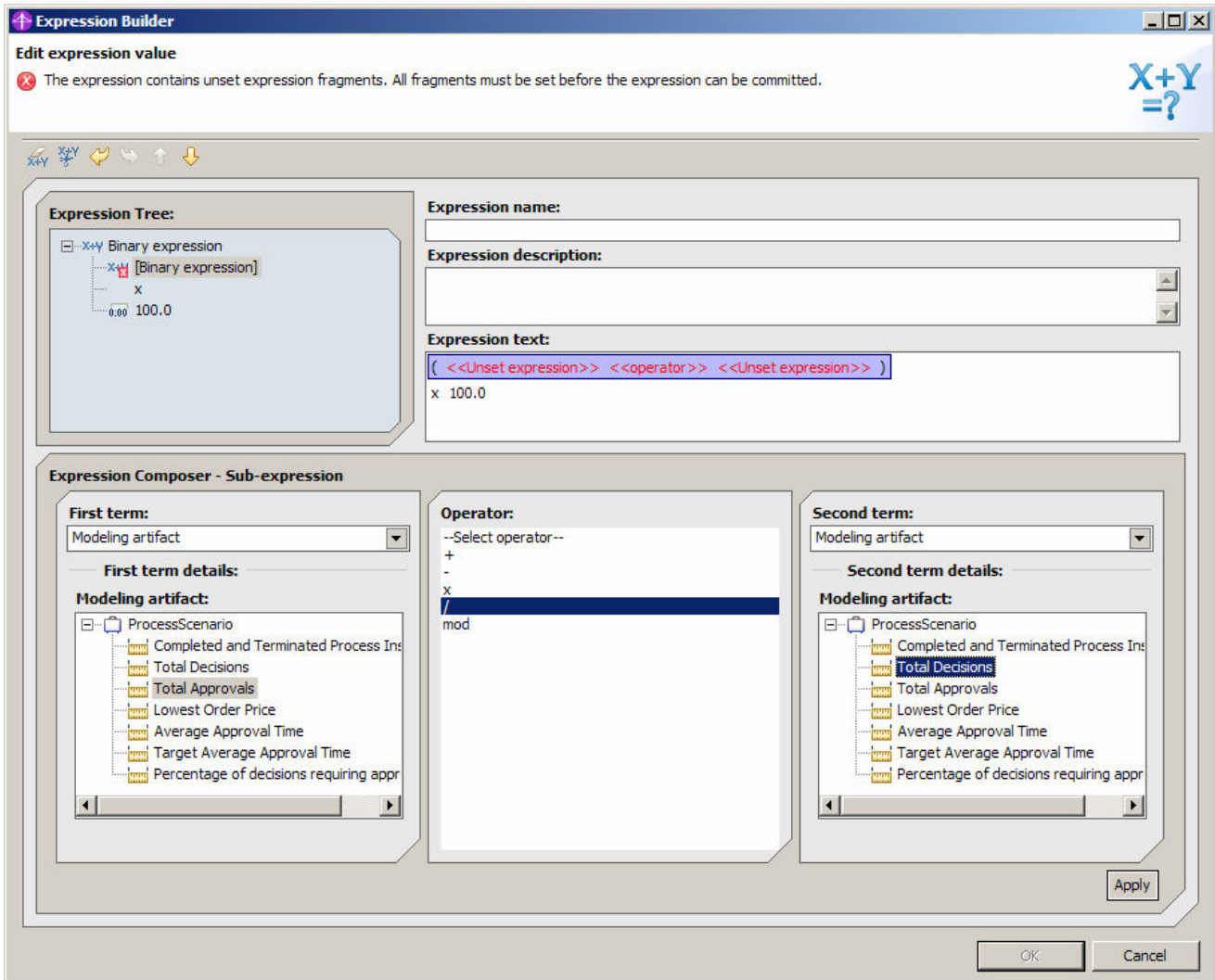
- ___ a. In the KPIs and Aggregate Metrics panel, click **KPIs** at the top left.
- ___ b. Click **Add** below the KPIs table.
- ___ c. Rename the KPI from 'KPI1' to '**Percentage of decisions requiring approval**' by clicking the name and editing it.
- ___ d. Change the Aggregation function to User Defined.
- ___ e. Click the **Aggregation source** column and then the '...' button to open the Expression Builder.
- ___ f. Set the first term to **Sub-expression**, select the multiplier operator '**x**'.
- ___ g. Set the second term to **Number** and enter the number value 100.



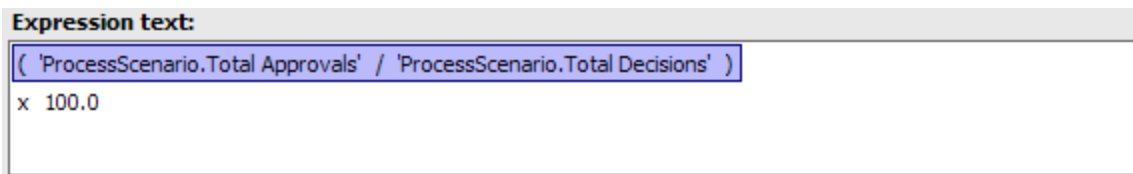
- ___ h. Click **Apply**.
- ___ i. Select **[Binary Expression]** in the expression tree.



- ___ j. Select **Modeling artifact** for the first term and then choose **ProcessScenario > Total Approvals** in the modeling artifact section.
- ___ k. Select the divide '/' operator.
- ___ l. Select **Modeling artifact** for the second term and then choose **ProcessScenario > Total Decisions** in the modeling artifact section.



__ m. Click **Apply** and check that the expression text is as shown below.



__ n. Click **OK**.

__ o. Click in **Target** column and then click the '...' button.

__ p. Select **Literal value** and enter 25.

Note: The calculation is evaluating a percentage so we are specifying here that the target percentage is 25%.

__ q. Click **OK**.

__ r. Click in **Lower target margin (%)** column and then click the '...' button.

- ___ s. Select **Literal value** and enter **20** (for 20%) and then click **OK**.
- ___ t. Click in **Upper target margin (%)** column and then click the ‘...’ button.
- ___ u. Select **Literal value** and enter **20** (for 20%) and then click **OK**.

▼ KPIs

This section provides information about key performance indicators (KPIs) calculated across multiple runs of the process.

Name	Type	Aggregation ...	Aggregation source	Use Target	Target	Lower target...	Upper target...	Lower limit	Upper limit
Average Order Price	Float	Average	OrderPrice	<input checked="" type="checkbox"/>	1000.0	25.0	50.0		
Average Approval Time	Duration	Average	Approval Time	<input type="checkbox"/>				30 minutes	1 hour
Percentages of decisions...	Double	User Defined	(('Total Approvals' / T...	<input checked="" type="checkbox"/>	25.0	20.0	20.0		

- ___ 5. Add a Key Performance Indicators (KPIs) for the average process duration.
 - ___ a. In the KPIs and Aggregate Metrics panel, click **KPIs** at the top left.
 - ___ b. Click **Add** below the KPIs table.
 - ___ c. Rename the KPI from ‘KPI1’ to **‘Average Process Duration’** by clicking the name and editing it.
 - ___ d. Change the Aggregation function to **Average**.
 - ___ e. Click the **Aggregation source** column and then the ‘...’ button.
 - ___ f. Select **Stopwatches > Process Elapsed Duration** and click **OK**.
 - ___ g. Click in **Target** column and then click the ‘...’ button.
 - ___ h. Select **Literal value** and then click the ‘...’ button.
 - ___ i. Click the ‘...’ button on the right side, and select **30 minutes** from the **Select duration** popup windows, then click **OK**.
 - ___ j. Click **OK** again.
 - ___ k. Click in **Lower target margin (%)** column and then click the ‘...’ button.
 - ___ l. Select **Literal value**, enter **50** and click **OK**.
 - ___ m. Click in **Upper target margin (%)** column and then click the ‘...’ button.
 - ___ n. Select **Literal value**, enter **10** and click **OK**.

▼ KPIs

This section provides information about key performance indicators (KPIs) calculated across multiple runs of the process.

Name	Type	Aggregation ...	Aggregation source	Use Target	Target	Lower target...	Upper target...	Lower limit	Upper limit
Average Order Price	Float	Average	OrderPrice	<input checked="" type="checkbox"/>	1000.0	25.0	50.0		
Average Approval Time	Duration	Average	Approval Time	<input type="checkbox"/>				30 minutes	1 hour
Percentages of decisions...	Double	User Defined	(('Total Approvals' / T...	<input checked="" type="checkbox"/>	25.0	20.0	20.0		
Average Process Duration	Duration	Average	Process Elapsed Duration	<input checked="" type="checkbox"/>	30 minutes	50.0	10.0		

- ___ o. Save the business measures model and close the business measures editor.

Part 9: [Optional] Export the business measures model

In this part you will see how to export the model. However, you don't need to do this as you already saved and exported the same model in the end to end scenario lab.

- ___ 1. From the menu select **File > Export...**
- ___ 2. Select **WebSphere Business Modeler Export** and click **Next** .
- ___ 3. Select **WebSphere Business Monitor and development tool** and click **Next**.
- ___ 4. Set the Target directory to '**C:\BMEModelerExport**'.
- ___ 5. Select the **ProjectScenario** project.
- ___ 6. Click **Finish** and click **Yes** if you are asked whether you want to create the export directory.
- ___ 7. Click **OK** to acknowledge the successful export.
- ___ 8. Close WebSphere Business Modeler.

What you did in this exercise

In Part 1, you imported the process model.

In Part 2, you created a default business measures model.

In Parts 3-8, you defined numerous business measures using each of the capabilities within the BME.

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