

WebSphere<sub>®</sub> Monitor

Version 6.0.2



Generating a Monitor Model using the BMV and BPEL model

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#### Part 1. Overview

This document describes the two ways of building the Clips and Tacks sample using the monitor model produced from the Business Measures View (BMV) and the monitor model produced from the Business Process Execution Language (BPEL). The dual-model approach uses one model to capture and store the data from the BPEL model. This model sends outbound events to a separate model, the KPI model, which contains all of the key performance indicators (KPIs) that are of interest. The BMV model exported for this sample is created as a KPI model, and so contains essentially only the KPI information. The BPEL model are exported from the BPEL process and essentially contains the generated events and contexts for the model. In the merged model approach, the KPIs from the BMV model are copied into the BPEL model to produce a single model.

This document describes the steps to generate a monitor model based on the Clips and Tacks sample. It does not describe the steps to generate the Clips and Tacks application. However, this application is included in the project interchange file for the sample.

### Sample project interchange file and enterprise archive files

To help you generate a monitor model, this sample includes a project interchange (PI) file and enterprise archive (EAR) files.

- **Project interchange file**: ClipsAndTacksSample1.zip contains a complete solution to this sample. It includes these zip files:
  - ClipsAndTackDualModel.zip, which includes the BPEL model and the KPI model
  - ClipsAndTacksMergedModel.zip, which includes a single BPEL model with merged KPI contents.

The project interchange file is ready to be imported into WebSphere Integration Developer.

- **EAR files**: The sample uses these EAR files which are provided with the sample download:
  - o ClipsAndTacksApp.ear: the BPEL application
  - ClipsAndTacksHumanCustomEAR.ear and ClipsAndTacksServiceEAR.ear: EAR files for human tasks
  - ClipsAndTacksMergedSampleEAR.ear: a monitor EAR file with a merged KPI model
  - ClipsAndTacksSampleEAR.ear: an application that monitors the BPEL application and sends events to the monitored-KPI application
  - ClipsAndTacksSampleKPIEAR.ear: an application that receives outbound events and sets KPI values

These generated EAR files are ready to be deployed on the Monitor Server.

#### Software requirements

To run this sample, you need to have installed this software:

- WebSphere Integration Developer v6.0.2 and the WebSphere Business Monitor development toolkit.
- WebSphere Business Monitor v6.0.2 Basic Installation including the Dashboard Server and Monitor Server
- WebSphere Business Modeler v6.0.2 (optional), to use the KPI model contained in the artifact file

### KPIs required for the Clip and Tacks application

From either of the files in the project interchange file (ClipsAndTackDualModel.zip or ClipsAndTacksMergedModel.zip), you can import the Clips and Tacks application into WebSphere Business Modeler. The KPIs are already defined in the imported model.

This section does not describe the exact steps to take using the Business Measures View (BMV). Refer to the Modeler InfoCenter for details on how to use the BMV.

The steps listed here describe at a high level how to create KPIs in the BMV. The model created in the BMV can be exported as an .mm file and imported into WebSphere Integration Developer later. You then update the .mm file using the Monitor tooling in WebSphere Integration Developer. These steps are optional – you can get the .mm file exported from Modeler from the ClipsAndTacksSample1.zip file. The file name is **Order Handling** (Future 1) Business Measures.mm.

The Clips and Tacks application requires these settings for the indicated KPIs:

- Average Order Fulfillment Time KPI:
  - Target type and value set to Duration with target of 3 days
  - Range details use actual value with ranges:
    - One Day, start value of 0 seconds and end value of 1 day
    - Two Days, start value of 1 day and end value of 2 days
    - Three Days, start value of 2 days and end value of 3 days
    - Four Days, start value of 3 days and end value of 4 days
  - The KPI uses a dimension based on the Order Status value. (Using the Monitor Model Editor, update the KPI model to check the Order Status field for a value of Shipped.)

- Percent of Orders Approved This Month KPI:
  - Target type and value set to Number with a target of 90
  - Time period is repeating with a monthly period type based on the period in progress
  - Range details use actual value with ranges:
    - High Range, start value of 90 and end value of 100
    - Low Range, start value of 9 and end value of 90
  - The KPI uses a dimension based on the **is Approval Step Completed** value. (Using the Monitor Model Editor, update the KPI model to check for the **is Approval Step Completed** field for a value of **Completed**.)
  - Average Order Price (US Dollars) KPI:
    - Target type and value set to Number and a target value of 300
    - Range details use actual value with ranges:
      - High Range, start value of 300 and end value of 1000
      - Low Range, start value of 0 and end value of 300
  - Declined Orders This Month KPI:
    - o Target type and value set to Number and a target value of 3
    - Time period is repeating with a monthly period type based on the period in progress
    - Range details use actual value with the ranges:
      - High Range, start value of 3 and end value of 10
      - Low Range, start value of 0 and end value of 3
  - Order Count Review KPI:
    - The KPI uses a dimension based on the order status. (Using the Monitor Model Editor, update the KPI model to check the **Order Status** field for a value of **Review Order**.)
- Order Count Cancel KPI:
  - The KPI uses a dimension based on the order status. (Using the Monitor Model Editor, update the KPI model to check the **Order Status** field for a value of **Cancel**.)
- Order Count Cancelled KPI:
  - The KPI uses a dimension based on the Order Status. (Using the Monitor Model Editor, add a check for an **Order Status** field value of **Cancelled**.)
- Order Count Check Account KPI:
  - The KPI uses a dimension based on the Order Status. (Using the Monitor Model Editor, add a check for an **Order Status** field value of **Check Account**.)
- Order Count Ship KPI:
  - The KPI uses a dimension based on the Order Status. (Using the Monitor Model Editor, check for an **Order Status** field value of **Ship Order**.)
- Order Count Shipped KPI:
  - The KPI uses a dimension based on the Order Status. (Using the Monitor Model Editor, add a check for an **Order Status** field value of **Shipped**.)

- Order Count Check Handling Policy KPI:
  - The KPI uses a dimension based on the **Order Status**. (Using the Monitor Model Editor, add a check for an Order Status field value of **Check Order Handing Policy**.)
- Number of Sales This Month KPI:
  - **Target value** and **type** set to Number and target value set to 100
  - **Time period** is repeating with a monthly period type based on the period in progress
  - Range details use actual value with the values:
    - Excellent, start value of 60 and end value of 125
    - Fair, start value of 30 and end value of 60
    - Poor, start value of 0 and end value of 30
  - Total Sales Amount This Year KPI:
  - **Target value** and **type** set to Number and target value set to 300000
  - **Time period** is repeating with a yearly period type based on the period in progress
  - Range details use actual value with the values:
    - Poor, start value of 0 and end value of 100000
    - Fair, start value of 100000 and end value of 200000
    - Good, start value of 20000 and end value of 300000
    - Excellent, start value of 300000 and end value of 400000
- Total Sales Amount This Year Canada KPI:
  - **Target value** and **type** set to Number and target value of 150000
  - **Time period** is repeating with a yearly period type based on the period in progress
  - Range details use actual value with the values:
    - Poor, start value of 0 and end value of 50000
    - Fair, start value of 50000 and end value of 100000
    - Good, start value of 100000 and end value of 150000
    - Excellent, start value of 150000 and end value of 200000
  - The KPI uses a dimension based on the Country. (Using the Monitor Model Editor, add a check for a **Country field** value of **Canada**.)
- Total Sales Amount This Year US KPI:
  - **Target value** and **type** set to Number and target value of 150000
  - **Timer period** is repeating with a yearly period type based on the period in progress

- Range details use actual value with the values:
  - Poor, start value of 0 and end value of 50000
  - Fair, start value of 50000 and end value of 100000
  - Good, start value of 10000 and end value of
  - 150000Excellent, start value of 150000 and end value of 200000
- The KPI uses a dimension based on the Country (Using the Monitor Model Editor, add a check for a **Country field** value of **US**.)

The following figures show the KPIs for the **Average Order Fulfillment Time** metric:

Figure 1. KPIs for the Average Order Fulfillment Time metric – figure 1

🖩 Business	Measure Detail	s		X
Business Measure [	)etails			
Specify addition	onal details to describe l	how the business measure is c	alculated.	
Name	Average Order Fulfillm	nent Time		
Туре	⊙ KPI ○ Instance metric	O Aggregate metric O Unspecified		
Description			^	
			~	
				Ξ
Dashbo	ard views			
Specify a	target value and type	at the KDI should ashieve		
i ne tar	get is an exact value tha	at the KPI should achieve.	Hours Minutes Seconds	
Type:	Duration	Target value: 3 ♀		
Specify a	time period over which the b	usiness measure will be monitored		
O Re	peating	<b>O</b> Rolling	© Fixed	
Peri	od type:	Size of period:	Start date:	
	Yearly 🔽	Number of previous days:	November 02, 2(	
Base	e period on:	90 🔶	End date:	
(	• Last full period	Base last day on:	December 31, 20	
•	Period in progress	• Previous day • Day in progress		
		- Day		•
			OK Cancel	

Figure 2. KPIs for the Average Order Fulfillment Time metric – figure 2

Business Measure Details			×
Business Measure Details			
Specify additional details to describe how the	business measure is	calculated.	
			~
✓ Specify range details:			
Ranges can be defined as percentage	s of the target value o	or as fixed, actual value	S.
O Percentage of target value (target v	/alue = 100%)		
<ul> <li>Actual value</li> </ul>	100707		
Specify ranges			
A range is a set of values, such as all	owable margins or lo	wer and upper limits, a	gainst which
Range name	Start value	End value	Add
One Day	0 seconds	< 1 days	Add
Two Days	1 days	< 2 days	Remove
Three Days	2 days	< 3 days	Sort
Four Days	3 days	< 4 days	5010
Specify when to send an alert and the action to	take as a result		
For example, when this measure exce	eds a certain value, a	an email may need to b	£ 11
Alert description			Add
Average Order Fulfillment is over 3 o	lays		Bomovo
✓ Specify the dimensions to use to calculate the K	PI value		
For example: location sales represen	tativo or dato		
Dimension	tative, of date.	A	ı
			Add
		*	Bomovo
<		>	Remove V
		OK	Cancel

The following figure is an example of the process for the Clips and Tacks sample, as shown in the BMV tool. The KPIs have been added to the model.





### Part 2. Generating monitor models from BMV and the BPEL process

Regardless of whether you use the dual-model approach or the merged-model approach, you first need to generate the monitor models for future use as input.

Instead of following the instructions in this chapter, you can get the artifacts directly from the artifacts files provided with the samples. The instructions show you how to do some aspects of the model generation.

- You can get the .mm file exported from the BMV directly from the ClipsAndTacksSample1.zip file. Its name is Order Handling (Future 1) Business Measures.mm. Or, if you performed the steps in Part 1, you can export the model from Modeler as an .mm file.
- Import the Clips and Tacks Application project and the related projects into the WebSphere Integration Developer workspace from the ClipsAndTacksSample1.zip file.

#### Exporting the monitor model from BMV

To export the model from Modeler:

- 1. Select the process under **Processes** in the project tree and select **Export** from the context menu.
- 2. In the Export window, select the WebSphere Business Monitor Development Toolkit (.mm) option.

WebSphere Business Modeler Export	×
Select type. Select a format and click Next.	
Types         L <sup>4</sup> WebSphere Business Modeler project (.mar)         L <sup>4</sup> WebSphere MQ Workflow (.fdl)         L <sup>4</sup> WebSphere Business Integration Server Foundation         L <sup>4</sup> Delimited text (.csv, .txt)         L <sup>4</sup> WebSphere Business Modeler XML (.xml)         L <sup>4</sup> WebSphere Business Monitor and development tool         L <sup>4</sup> WebSphere Business Server         L <sup>4</sup> CEI Event Catalog         L <sup>4</sup> WebSphere Business Monitor (from BPEL process)	
< Back Next > Einish Ca	ncel

Figure 4. Select WebSphere Business Monitor Development Toolkit (.mm) 3. Click **Next**. In the **WebSphere Business Modeler Export** window, as shown in this example, enter the target directory, select **Export specific elements**, and select the process to export.

Figure 5. Select Export specific elements and the process to export

WebSphere Business Mo	deler Ex	port		×
Destination and Source Choose a target directory.				
Target directory         Project         Clips n Tacks         O Export entire project         O Export specific elements				Browse
☆				
Overwrite files				
	< <u>B</u> ack	Next >	Einish	Cancel

4. Click **Finish** to generate the .mm file.

# Generating the monitor model from the BPEL process

- 1. Import BPEL Application project into WebSphere Integration Developer. Unzip ClipsAndTacksSample1.zip to a directory, for example, c:\ClipsAndTacksSample1. There are two .zip files unzipped to the directory:
  - ClipsAndTackDualModel.zip
  - ClipsAndTacksMergedModel.zip
  - 2. Start WebSphere Integration Developer and click File ► Import ► Project Interchange, as illustrated below:

🔂 Import	×
Select Import a project and its dependent projects from a Zip file.	Ľ
Select an import source: FIP FTP Heap dump HTTP HTTP Recording 22E Utility Jar JSP Tag Library JUnit test into component test project Log File Performance Call Graph Probe Probe Profiling file Profiling file Security Certificate Security Certificate Security Certificate Security Certificate Security Certificate Security Certificate MAR file Team Project Set MAD File	
< <u>B</u> ack <u>N</u> ext > Einish	Cancel

Figure 6. Click File ► Import ► Project Interchange

3. Click Next and select ClipsAndTackDualModel.zip file to import, Select projects with the exception of ClipsAndTacksSample project, as shown in the following figure:

🚹 Import Project Iı	nterchange Contents	×
Import Projects Import Projects from	a zip file.	Ţ
From zip file: Project location root:	D:\ttt\WBI_Monitor\SamplesDoc_verify\ClipsAndTacl	Browse Browse
<ul> <li>ClipsAndTacks</li> </ul>	FrontWeb FrontWeb HumanCustomEAR HumanTusko HumanTasks Sample Service ServiceEAR	
	Q、	
Select All Deselect	tt All Select Referenced	
	< Back Next > Finish	Cancel

\_\_\_\_\_4. Click **Finish** to finish the project importing.

Figure 7. Select projects with the exception of "ClipsAndTacksSample"

5. To generate the monitor model from the BPEL process, select the **OrderHandlingFuture1process** in the **Business Integration** view, as shown in the following example:

Figure 8. Select the OrderHandlingFuture1 process





\_\_\_\_\_7. In the next window, either create a new monitor project or select an existing one, and enter the name for the model, as shown in the following example:

Figure 9. Create a new monitor project or select an existing one

Generate Monitor	Model		×
Generate monitor model Specify the target location ar Any required event definition	nd model name for the new monitor model. ns will also be generated.		
Target monitor project Target monitor model name	ClipsAndTacksSample ClipsAndTacksSample	•	New project
	,		
	< <u>B</u> ack <u>N</u> ext > Einish	Ì	Cancel

In the next window, select the events that you are interested in.

• Main process: Entry and Exit events

- Activities: Entry and Exit events for the activities
  - The activities are listed under the **Flow** item.
  - Only the Exit event is available for the **Reply** activity, so select that.
- BPELVariable process elements: Changed event

The following examples illustrate the selections for the process, one of the activities, and one of the BPELVariable entries:

# Figure 10. Process selection Entry and Exit events

The following example illustrates Entry and Exit events for the activities:

Figure 11. Entry and Exit events for the activities

Generate Monitor Model	
Select BPEL process Select the BPEL activities and events that you w Available process elements 	ant to monitor. Events emitted by selected activity Event nature Event definition name
<ul> <li>BPELVariable [OrderVariable]</li> <li>BPELVariable [ProductShipmentVa</li> <li>BPELVariable [NotificationVariable]</li> <li>BPELVariable [NotificationVariable]</li> <li>Flow</li> <li>Receive [OrderHandlingFuture]</li> <li>Noke [CheckOrderHandlingPool</li> <li>Noke [CheckCustomerAccour]</li> <li>Invoke [ShipOrdertoCustomer]</li> <li>Invoke [ReviewOrder_InputCri]</li> <li>Invoke [CancelOrderandSendN</li> <li>Reply [OrderHandlingFuture1]</li> </ul>	Image: Skipped       BPC.BFM.ACTIVITY.ST         Image: Skipped       BPC.BFM.ACTIVITY.ME         Image: Skipped       BPC.BFM.ACTIVITY.ME         Image: Skipped       BPC.BFM.ACTIVITY.ST         Image: Skipped       BPC.BFM.ACTIVITY.ST
Select All Select None	Select All Select None
< <u>B</u> ack	Next > Einish Cancel

The following example illustrates BPELVariable entries:

Figure 12. BPELVariable entries

Generate Monitor Model		×
Select BPEL process Select the BPEL activities and events that you w	ant to monitor.	
Available process elements  Available process elements  BPELVariable [OrderVariable]  BPELVariable [ProductShipmentVa  BPELVariable [NotificationVariable]  BPELVariable [NotificationVariable]  Flow  KReceive [OrderHandlingFuture]  KReceive [CheckOrderHandlingP]  KInvoke [CheckCustomerAccour]  KInvoke [ShipOrdertoCustomer]  KInvoke [ReviewOrder_InputCri]  KInvoke [CancelOrderandSendN]	Events emitted by se Event nature ⊡∛ CHANGED	elected activity Event definition name BPC.BFM.VARIABLE.ST
Select All Select None	Select All Select N	Ione
< <u>B</u> ack	Next >	<u>F</u> inish Cancel

8. Click **Finish** to create the events and the monitor model.

#### Part 3. Using the dual-model approach

For the dual-model approach, the monitor model generated from BMV and the model generated from the BPEL are placed in the same Business Monitoring project. Assuming the Monitor project is created from the BPEL Export, use File ► System Import to import the BMV files into the same project that contains the BPEL Monitor model and change the name of the BMV model to ClipsAndTackKPIMM.

The following figure illustrates the KPI model (ClipsAndTackKPIMM) that is generated from BMV:

#### Figure 13. KPI model (ClipsAndTackKPIMM) generated from BMV

Business Monitoring - ClipsAnd	ackKPIMM - IBM WebSphere Inte	egration Developer	_ 🗆 🔀
Elle Edit Navigate Search Project Run V	Vindow Help		
☆・≦≙↓₽₽₽₽₽₽ ₽↓₽ ₽ ₽.+.	A	🗊 @Web CResource 🖫 Business 🍄 Debug CaJ2EE 🐻 Business	
Project Explorer × 🔒 🖼 🗂 🗖	ClipsAndTacksBPELMM @Admin Console	ClipsAndTacksBPELMM	
ClipsAndTacks     GinsAndTacksBPELMM	Monitor Details Model		田田
	Monitor Details Model  Concernation (Future 1) Business  Concernation (Future 1) MC  C	Honitor Details         Edit the details of the model. The timestamp is required to identify the version of the model.         ID:       Order_Handlingx0028_Future_1_x0029_Business_Measures         Name:       Order Handling (Future 1) Business Measures         Description:	Edit
			60

Here is the	<b>BPEL</b> -generated	model (Clip	psAndTacksSam	ple):
	DI DD generatea			-p-e/-

Figure 14. BPEL-generated model (ClipsAndTacksSample)

🚯 Business Monitoring - ClipsAn	dTacksSample - IBM WebSphere Integration Developer	
<u>Eile Edit Navigate Search Project</u>	<u>Run Window Help</u>	
📬 • 🔚 🏝   🗞 🎐 😵 🗳 🕯	👂 🛛 🗊 🖉 🗣 🗸 🔻 🖓 🖓 🏷 🗸 🔹 🗸 👘 🔛 📰 🖏 Java 🖺 Business Moni 🐯 Business Inte	
Project Explorer 🛿 🦳 🗖	👫 ClipsAndTacksSample 🗙	
Project Explorer 23	Capandi adosSample  Monitor Details Model  CardendandingFuture1  CardendandingFuture1  CardendandingFuture1  CardendandingFuture1  CardendandingFuture1  CardendandingFuture1  Process Instance ID  OrdenHandlingFuture1  CardendandingFuture1  Process Instance ID  OrdenHandlingFuture1  Process Instance ID  Process Instance ID  ProductShipmentVariable  Monitor Details Model Data Mart Model KPI Model Visual Model Event Model ClipsAndTacksSample.mm  Monitor Details Model Data Mart Model KPI Model Visual Model Event Model ClipsAndTacksSample.mm  Monitor Details Model Data Mart Model KPI Model Visual Model Event Model ClipsAndTacksSample.mm  Monitor Details Model Data Mart Model KPI Model Visual Model Event Model ClipsAndTacksSample.mm  Monitoring Flow  Properties © Problems Servers  No information is available.	Edt
1 1		

# Defining additional data needed by the KPI model

- 1. First, add all of the metrics, counters, and stopwatches to the BPEL model to capture the data needed for the KPI model. Specifically, add these metrics to the OrderHandlingFuture1 monitor context:
  - **City**: string, maximum length of 256, default value of Durham
  - **Company**: string, maximum length of 256, no default value
  - **Country**: string, maximum length of 256, default value of US
  - Current Status: string, maximum length of 256, no default value
  - **Is Approval Step Completed**: string, maximum length of 256, default value of Not Completed
  - Order Amount: decimal, no default value
  - Order Date: date, no default value
  - Order Number: integer, no default value
  - Ship Percentage: integer, default value of 0

# 2. Next, add the **Declined Order Counter** and the **Order Fulfillment Timer** to the OrderHandlingFuture1 monitor context.

Here is the BPEL model with the metrics, counter, and stopwatch added:

Figure 15. BPEL model with the metrics, counter, and stopwatch

Business Monitoring - ClipsAndTacksSa	mple - IB/	A WebSphere	e Integratio	n Develope	r			_ 🗆 🞽
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\_\_\_\_3. Next, add the triggers that cause the metrics, counters, and stopwatches to get updated. First, add a trigger that is associated with the OrderHandlingFuture1\_InputCriterion EXIT inbound event. This inbound event contains the data entered in the BPEL process. Use this trigger later to set the value in City, Company, Country, Order Amount, and Order Number. So first create the trigger, Input Data Trigger, and add a trigger source for the OrderHandlingFuture1\_InputCriterion EXIT event. The new trigger is added to the OrderHandlingFuture1\_InputCriterion context. Here is an example of the new trigger:

# Figure 16. Example of the new trigger

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4. Next, for the metrics to be updated when this trigger fires, add a map on the associated metric that sets the metric from the value in the inbound event. Here is the map for the City metric displayed with vertical orientation so that the entire map expression can be displayed:

Figure 17. Map for the City metric displayed with vertical orientation

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1											

- \_\_\_\_\_ 5. Add the maps for the Company, Country, Order Amount, and Order Number metrics that get set by this trigger. The Order Amount is set to the Total Price field from the inbound event.
- 6. Next, add the triggers that set the Current Status metric. The Current Status metric is set to one these values (depending upon the location of the order in the order process): Started, Cancelled, Shipped, Cancel Order, Check Account, Checked Account, Review Order, Reviewed, Check Order Handling Policy, Checked Order Handling Policy, and Ship Order.

The triggers listed here, in no particular order, are used to set the status. The termination triggers are generated for you in the BPEL model, but you need to add the other triggers. For triggers that need to be added, this list identifies the monitor context where the trigger is to be added, and the event source for the trigger.

- New Order Trigger
  - Monitor context: OrderHandling Future1
  - **Event source**: OrderHandlingFuture1 ENTRY inbound event
  - o Needs to be added
- CancelOrderandSendNotification\_InputCriterion Termination Trigger
  - Monitor context:
    - CancelOrderandSendNotification\_InputCriterion
  - Should already exist in the model, because termination triggers are automatically created in the default BPEL model
- ShipOrdertoCustomer\_InputCriterion Termination Trigger
  - Monitor context:
    - ShipOrdertoCustomerInputCriterion
  - o Should already exist
- Cancel Order Started Trigger
  - Monitor context:
    - CancelOrderandSendNotification\_InputCriterion MC
  - Event source:
    - CancelOrderandSendNotification\_InputCriterion ENTRY inbound event.
  - This trigger needs to be created. The specified inbound event should be in the generated model.
  - Check Account Status Started Trigger
  - Monitor context:

•

- CheckCustomerAccountStatus\_InputCriterion MC Event source:
- Event source: CheckCustomerAccountStatus\_InputCriterion ENTRY inbound event
- This trigger needs to be created. The specified inbound event should already exist in the specified model.
- CheckCustomerAccountStatus\_InputCriterion Termination Trigger
  - Monitor context:
    - CheckCustomerAccountStatus\_InputCriterion MC.
  - This trigger should already exist.
- Review Order Started Trigger
  - **Monitor context**: ReviewOrder\_InputCritierion MC
  - **Event source**: ReviewOrder\_InputCriterion ENTRY inbound event
  - This trigger needs to be created. The specified inbound event should already exist in the generated model.

- Review Order\_InputCriterion Termination Trigger
  - Monitor context: ReviewOrder\_InputCriterion MC
  - o This trigger should already exist
- Check Order Handling Policy Started Trigger
  - Monitor context: in the CheckOrderHandlingPolicyforAutomaticApproval InputCriterion MC
  - Event source:
  - CheckOrderHandlingPolicyforAutomaticApproval \_InputCriterion ENTRY inbound event.
  - This trigger needs to be created. The specified inbound event should already exist in the generated model.
- CheckOrderHandlingPolicyforAutomaticApproval\_Inp utCriterion Termination Trigger
  - Monitor context:
    - CheckOrderHandlingPolicyforAutomaticApproval \_InputCriterion MC.
  - o This trigger should already exist.
- Ship Order Started Trigger
  - Monitor context:
    - ShipOrdertoCustomer\_InputCriterion MC
    - Event source: ShipOrdertoCustomer\_InputCriterion ENTRY event
  - This trigger needs to be created.
- \_\_\_\_7. After adding the new triggers, add the maps to the Current Status metric to set the correct value for each trigger. For each of the following triggers, specify the indicated value as the setting for the Current Status metric when that trigger fires:
  - New Order Trigger Started
  - CancelOrderandSendNotification\_InputCriterion Termination Trigger – Cancelled
  - ShipOrdertoCustomer\_InputCriterion Termination Trigger – Shipped
  - Cancel Order Started Trigger Cancel Order
  - Check Account Status Started Trigger Check Account
  - CheckCustomerAccountStatus\_InputCriterion Termination Trigger – Checked Account
    - Review Order Started Trigger Review Order
  - ReviewOrder\_InputCriterion Termination Trigger –
     Reviewed
  - Check Order Handling Policy Started Trigger Check Order Handling Policy
  - CheckOrderHandlingPolicyforAutomaticApproval\_Inp utCriterion Termination Trigger – Checked Order Handling Policy
  - Ship Order Started Trigger Ship Order

Here is an example of the **Current Status** metric with the **Metric Value Maps** values displayed for **New Order Trigger**:

Figure 18. Metric Value Maps values displayed for New Order Trigger

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<ul> <li>ICancelOrderandSendNotification_InputCriter</li> <li>ICheckCustomerAccountStatus_InputCriterior</li> </ul>	ID:	Current_Statu	5						Edit
Si CheckOrderHandlingPolicyforAutomaticAppr     Si OrderHandlingEuture1 InputCriterion	Name:	Current Status	;						
Kil ReviewOrder_InputCriterion     Kil ShipOrdertoCustomer_InputCriterion     Process Instance ID	Description:								< >
- H City	Type:	String							•
E Company		Maximum Stri	ng Length: 256						
La Current Status		Allocate add	ditional space in o	latabase to accon	nmodate Unicode :	string for globali	zation		
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Grder Date	This metric	can be used fo	r sorting						
Cancel Order Started Trigger     Check Account Status Started Trigger	- Hetric Value H Specify the ex	aps pressions that s	et the value of the	e metric. If a trig	ger is specified, th	e map is evaluat	ed when the trig	ger fires.	
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OrderHandlingFuture1_OutputCriterion EXIT									
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8. Now define the map for the Order Date metric. Use the date function with the creationTime field in the OrderHandlingFuture1 ENTRY inbound event, as shown in this example. (The creationTime is a dateTime field whose type must be converted to Date before it can be placed in the Order Date metric, whose type is Date.)

#### Figure 19. Define the map for the Order Date metric

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Ship Name: Order Date	- Hetric Value Ha Specify the exp	aps pressions that s	et the value of the	metric. If a trig	ger is specified, th	e map is evaluat	ed when the trigg	ger fires.	
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OrderHandlingFuture1 EXIT									
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ProductShipmentVariable CHANGED									
Declined Order Counter									
Order Fulfillment Timer									

9. The **Is Approval Step Completed** metric is also set by triggers, so you need to add the maps to set this value next. This metric is set to **Completed** when either **Ship Order Started Trigger** or **Cancel Order Started Trigger** is fired. Here is an example of this metric with the added metric maps for the triggers:

#### Figure 20. Metric with the added metric maps for the triggers

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Le Country Le Current Status Le Approval Step Completed		Maximum Stri	ng Length: 256 ditional space in d	atabase to accon	nmodate Unicode :	string for global	zation		
Crder Amount Crder Date Crder Number Stip Percentage Cancel Order Started Trigger Cancel Account Status Started Trigger	Default Value     This metric     Hetric Value M     Snarify the av	: <u>('Not Complete</u> : can be used fo aps	r sorting	metric. If a trio	nor is snarified th	a man is avaluat	ad when the tria	our fires	Edita
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10. The Ship Percentage metric is set to 100 when the Ship Order Started Trigger is fired. Shown here is the Ship Percentage metric with its map:

# Figure 21. Ship Percentage metric with its map

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\_\_\_\_\_ 11.Next, add the trigger for the **Declined Order Counter**. Whenever the **Cancel Order Started Trigger** is fired, the **Declined Order Counter** trigger should be incremented. This is show here:

#### Figure 22. Declined Order Counter trigger counter

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<ul> <li>CheckOrderHandlingPolicyforAutomaticAppr</li> </ul>	Name:	Declined Order	Counter						
<ul> <li>OrderHandlingFuture1_InputCriterion</li> </ul>	Description:	tescription							
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Is Approval Step Completed	Specify what	causes the count	er to change and	what action is ta	ken.				
Grder Amount	Trigger / In	bound Event		Resulting Ad	tion				
Order Number	Cancel Or	der Started Trigg	er .	Add One					
Ship Percentage									
Check Order Handling Policy Started Trigger	-								
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OrderHandlingFuture1 ENTRY									
OrderVariable CHANGED									
ProductShipmentVariable CHANGED									
Declined Order Counter									
Order Fulfillment Timer									
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12. Next, add the triggers that start and stop the Order Fulfillment Timer. This timer is started when the order is received, so the New Order Trigger starts the timer. The timer is stopped when the process is terminated, so the OrderHandlingFuture1 Termination Trigger is used to stop the timer. Here is an example of setting these triggers:

Figure 23.	OrderHandlingFuture1	Termination	Trigger settings
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Ship Percentage	Trigger / Inbound Event			Resulting Act	ion				
Cancel Order Started Trigger     Check Account Status Started Trigger     Check Order Handling Policy Started Trigger     Input Data Trigger     New Order Trigger     OrderHandlingFuture1 Termination Trigger	P OrderHan	dlingFuture1 Ten	mination Trigger	Stop		d	-		
New Order Handling-Yuture 1 Termination Trigger     Review Order Started Trigger     Ship Order Started Trigger     NotificationVariable CHANGED     OrderHandlingFuture 1_OutputCriterion EXIT     OrderHandlingFuture 1 EXIT     OrderHandlingFuture 1 EXIT     OrderHandlingFuture 1 EXIT     OrderHandlingFuture 1 EXIT     Order Order Counter     Order Fulfillment Timer								Add	Remo

#### Defining additional events to be sent to the KPI model

- 1. After you have defined the data that is needed for the KPI model, you need to define the events that are needed to populate the KPI model. These events are used to send data to the KPI model:
  - **NewOrderEvent**: sent when the New Order Trigger is fired. Contains the ProcessID value from the BPEL model that are used as the key for the KPI model.
  - ApprovalStepUpdate: sent whenever the isApprovalStepCompleted metric is updated. Contains the isApprovalStepCompleted and ProcessID values.
  - **CompleteOrder**: sent when the OrderHandlingFuture1 Termination Trigger is fired and indicates the end of processing for this order. Contains only the ProcessID value.

- **DeclinedOrderCtrUpdate**: sent whenever the Declined Order Counter is updated. Contains the ProcessID and Declined Order Counter values.
- **ReceiveOrder**: sent when the Received\_Order\_Variable\_Changed\_Trigger is fired, and provides the order information to the KPI model. Contains the ProcessID, Country, Order Status, Approval Step Completed, Order Amount, Order Date, Ship Percentage, and the Declined Order Counter values.
- ShipPercentageUpdate: sent whenever the Ship Percentage value changes. Contains the ProcessID and the Ship Percentage values.
- **StatusUpdate:** sent whenever the Current Status metric has a value change. This event contains the ProcessID and the Current Status.
- **CountryUpdate:** sent whenever the Country metric has a value change. This event contains the ProcessID and the Country.
- OrderAmountUpdate: sent whenever the Order Amount metric has a value change. This event contains the ProcessID and the OrderAmount.

The following figure shows the definition of each of these events:

Figure 24. Definition of the NewOrderEvent

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# Definition of the ApprovalStepUpdate:

# Figure 25. Definition of the ApprovalStepUpdate

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# Definition of the CompleteOrder:

# Figure 26. Definition of the CompleteOrder

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# Definition of the **DeclinedOrderCtrUpdate**:

Figure 27. Definition of the DeclinedOrderCtrUpdate

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# Definition of the ReceiveOrder:

#### Figure 28. Definition of the ReceiveOrder

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# Definition of ShipPercentageUpdate:

# Figure 29. Definition of ShipPercentageUpdate

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# Definition of StatusUpdate:

#### Figure 30. Definition of StatusUpdate

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- 2. Now you need to add the triggers that cause these outbound events to be sent. Add these triggers:
  - ApprovalStepCompletedUpdate: fires when the value for the Is Approval Step Completed metric changes
  - **DeclinedOrderCtrUpdated**: fires when the value for the Declined Order Counter counter changes
  - ShipPercentageUpdated: fires when the value for the Ship Percentage metric changes
  - StatusUpdate: fires when the value for the Current Status metric changes
  - **CountryUpdate**: fires when the value for the Country metric changes
  - **OrderAmountUpdate**: fires when the values for the Order Amount metric changes

Here are examples of the **StatusUpdate**, **CountryUpdate** and **OrderAmountUpdate** triggers. Note that the Trigger is repeatable check box is selected, causing the trigger to fire every time the status changes. It is a good idea to select this option for all of the triggers mentioned previously. All of these triggers are added to the parent monitor context, OrderHandlingFuture1.

#### Figure 31. The StatusUpdate trigger

Business Monitoring - ClipsAndTacks	Sample - IBM WebSph	nere Integration I	Developer		
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# The CountryUpdate trigger:

# Figure 32. The CountryUpdate\_Trigger

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Order Date	Name:	CountryUpdate Trig	gger	
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ApprovalStepCompletedUpdate				
Cancel Order Started Trigger				
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CountryUpdate Trigger				
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OrderHandlingFuture1 Terminal		
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New Order To KPI		Add Remove
Order Completed To KPI		

#### The OrderAmountUpdate\_Trigger:

#### Figure 33. The OrderAmountUpdate\_Trigger

- 3. Now that the triggers are created, you must create these outbound events:
- New Order To KPI (type: NewOrderEvent). Sent when the New Order Trigger fires.
- Order Completed To KPI (type: CompleteOrder). Sent when the OrderHandlingFuture1 Termination Trigger fires.
- **Receive Order To KPI** (type: ReceiveOrder). Sent when the Input Data Trigger fires.
- Ship Percentage Update To KPI. This is the ShipPercentageUpdate event that is sent when the ShipPercentageUpdate trigger fires.
- Update Approval Step Completion. This is the ApprovalStepUpdate event that is sent when the ApprovalStepCompletedUpdate fires.
- Update Status. This is the StatusUpdate event that is sent when the New Order Trigger or the StatusUpdate fires.
- **Declined Order Ctr Update**. This is the DeclinedOrderCtrUpdate event that is sent when the DeclinedOrderCtrUpdate fires.
- Update Country. This is the CountryUpdate event that is sent when the New Order Trigger or CountryUpdate trigger fires.
- Update OrderAmount. This is the OrderAmountUpdate event that is sent when the OrderAmountUpdate trigger fires.

The following figures show the definition for each of these outbound events:

Figure 34. The New\_Order\_To\_KPI outbound event definition

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# The $Order\_Completed\_To\_KPI$ outbound event definition:

# Figure 35. The Order\_Completed\_To\_KPI outbound event definition

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# The Receive\_Order\_To\_KPI outbound event definition:

#### Figure 36. The Receive\_Order\_To\_KPI outbound event definition

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For the preceding ReceiveOrderToKPI outbound event, notice that the Country and Order Amount attributes are set from the inbound event and not the corresponding metric. Because these metrics are set on the inbound event that is the source trigger for this outbound event, there is no guarantee that these values are set when the outbound event is sent. Therefore, you must use the values from the inbound event. The other values in the outbound event have been set by either default values or other inbound events.

# Figure 37. Ship\_Percentage\_Update\_To\_KPI values set by defaults or inbound events

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**Update\_Approval\_Step\_Completed** event values set by default values or inbound events:

# Figure 38. Update\_Approval\_Step\_Completed values set by defaults or inbound events

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**Update\_Status event values** set by default values or inbound events:

Figure 39. Update\_Status event values set by default values or inbound events

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There are two triggers for the preceding **UpdateStatus** outbound event.

Figure 40. Triggers that cause the Declined\_Order\_Ctr\_Update event

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Cline And Tacks Cample	ShipPercentageUpdated	Ev	entNature	string				
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# Triggers that cause the **Update\_Country** event:

# Figure 41. Triggers that cause the Update\_Country event

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🖗 Check Order Handling Policy Sta	Description:			0
le CountryUpdate Trigger				
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la OrderAmountUpdate Trigger	83			
OrderHandlingFuture1 Terminal	Type: CountryUpdate			Browse
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Ship Order Started Trigger				
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StatusLipdate NotificationVariable CHANGED OrderHandlingFuture1_Output OrderHandlingFuture1 ENTRY OrderHandlingFuture1 EXIT OrderVariable CHANGED ProductShipmentVariable CHAN Declined Order Ctr Update New Order To KPI Order Completed To KPI Concercound to KPI Ship Percentage Update To KPI Undate Anorgou State To Complete	Specify the triggers that cause event attribute when the event Mame OcountryUpdate Trigger CountryUpdate Trigger Extended Data Country EventLabel EventNature PayloadType ProcessID	the event to be sent is sent. Type string string string string string	t. Use the Expression column to speci Expression Country ProcessInstanceID	fy the value for each
StatusUpdate     NotificationVariable CHANGED     OrderHandlingFuture1_Output     OrderHandlingFuture1 ENTRY     OrderVariable CHANGED     ProductShipmentVariable CHAN     Declined Order Ctr Update     New Order To KPI     Order Completed To KPI     Ship Percentage Update To KPI     Update Approval Step Complete	Specify the triggers that cause event attribute when the event Name ⊡ New Order Trigger ⊡ CountryUpdate Trigger ⊕ Property Data ⊡ Extended Data Country EventLabel EventNature PayloadType ProcessID	the event to be sent is sent. Type string string string string string string	t. Use the Expression column to speci Expression Country ProcessInstanceID	fy the value for each
StatusUpdate     NotificationVariable CHANGED     OrderHandlingFuture1_output     OrderHandlingFuture1 ENTRY     OrderHandlingFuture1 EXTT     OrderVariable CHANGED     ProductShipmentVariable CHAN     Declined Order Ctr Update     New Order To KPI     Receive Order To KPI     Ship Percentage Update To KPI     Update Country     Update Country	Specify the triggers that cause event attribute when the event Mame CountryUpdate Trigger Property Data Extended Data Country EventLabel EventNature PayloadType ProcessID	the event to be sent is sent. Type string string string string string	t. Use the Expression column to speci Expression Country ProcessInstanceID	fy the value for each
StatusUpdate     NotificationVariable CHANGED     OrderHandlingFuture1_Outputt     OrderHandlingFuture1_ENTRY     OrderVariable CHANGED     ProductShipmentVariable CHAN     Declined Order Ctr Update     New Order To KPI     Order Completed To KPI     Ship Percentage Update To KPI     Update Approval Step Complete     Update Country     Update Context	Specify the triggers that cause event attribute when the event	the event to be sent is sent. Type string string string string string string	t. Use the Expression column to speci Expression Country ProcessInstanceID	fy the value for each
NotificationVariable CHANGED  NotificationVariable CHANGED  OrderHandlingFuture1_Outputt  OrderHandlingFuture1 ENTRY  OrderVariable CHANGED  ProductShipmentVariable CHAN  ProductShipmentVariable CHAN  New Order To KPI  Receive Order To KPI  Receive Order To KPI  Ship Percentage Update To KPI  Update Approval Step Complete  Update Country  Update OrderAmount  Update Status  Desclined Order Curubate  Country  Desclined Order Curubate  Country  Dupdate Order Amount  Dupdate Order Order	Specify the triggers that cause event attribute when the event	the event to be sent is sent. Type string string string string string	t. Use the Expression column to speci Expression Country ProcessInstanceID	fy the value for each

# Triggers that cause the Update\_OredrAmount event:

Figure 42. Triggers that cause the Update OredrAmount even	Figure 42	2. Triggers	that cause	the Update	OredrAmount event
--	-----------	-------------	------------	------------	-------------------

n Order Amount			
order Date	Edit the details of the outbound eve definition.	nt, which is sen	t by the monitoring context. The type must be an event
ii Ship Percentage ApprovalStepCompletedUpdate Capcel Order Started Trigger	ID: Update_OrderAmount		Edit.
Check Account Status Started	Name: Update OrderAmount	1	
Check Order Handling Policy Sta CountryUpdate Trigger DeclinedOrderCtrUpdate New Order Trigger	Description:		
New Order Trigger  New Order AmountUpdate Trigger  OrderAmountUpdate Trigger  OrderHandlingFuture1 Terminal  Ship Order Started Trigger  Ship Order Started Trigger  Ship PercentageUpdated	Type: OrderAmountUpdate		Browse.
<ul> <li>Ship Order Started Trigger</li> <li>ShipPercentageUpdated</li> </ul>			
Ship Order Started Trigger     ShipPercentageUpdated     StatusUpdate     NotificationVariable CHANGED     OrderHandlingFuture1_Output	<b>Event Attributes Details</b> Specify the triggers that cause the event attribute when the event is se	went to be sent	. Use the Expression column to specify the value for eac
Ship Order Started Trigger     ShipPercentageUpdated     StatusUpdate     NotificationVariable CHANGED     OrderHandlingFuture1_Output     OrderHandlingFuture1 ENTRY     OrderHandlingFuture1 EXT	Event Attributes Details     Specify the triggers that cause the event attribute when the event is se     Name	event to be seni int.	. Use the Expression column to specify the value for eac
Ship Order Started Trigger Ship Order Started Trigger StatusUpdate VotificationVariable CHANGED OrderHandlingFuture1_Outputk OrderHandlingFuture1 ENTRY OrderHandlingFuture1 EXIT OrderVariable CHANGED ProductShipmentVariable CHAN	✓ Event Attributes Details     Specify the triggers that cause the event attribute when the event is se     Name     OrderAmountUpdate Trigger     Property Data     Details	went to be seni nt. Type	:. Use the Expression column to specify the value for eac Expression
Ship Order Started Trigger     ShipPercentageUpdated     StatusUpdate     NotificationVariable CHANGED     OrderHandlingFuture1_Outputk     OrderHandlingFuture1 ENTRY     OrderHandlingFuture1 EXIT     OrderVariable CHANGED     ProductShipmentVariable CHAN     Declined Order Ctr Update	✓ Event Attributes Details     Specify the triggers that cause the event attribute when the event is as     Name     OrderAmountUpdate Trigger     Property Data     Extended Data     Event bel	event to be seni	. Use the Expression column to specify the value for eac Expression
Ship Order Started Trigger Ship Order Started Trigger Ship PercentageUpdated StatusUpdate OrderHandlingFuture1_Outputk OrderHandlingFuture1_ENTRY OrderHandlingFuture1_EXIT OrderVariable CHANGED ProductShipmentVariable CHAN Declined Order Ctr Update New Order To KPI	Event Attributes Details     Specify the triggers that cause the event attribute when the event is se     Name     OrderAmountUpdate Trigger     Property Data     Extended Data     EventLabel     EventLabel	rvent to be seni int. Type string	. Use the Expression column to specify the value for eac Expression
Ship Order Started Trigger Ship Order Started Trigger StatusUpdate NotificationVariable CHANGED OrderHandlingFuture1_Outputt OrderHandlingFuture1 ENTRY OrderVariable CHANGED ProductShipmentVariable CHAN Declined Order Tck IPI New Order To KPI Order Completed To KPI	Event Attributes Details     Specify the triggers that cause the e event attribute when the event is se     Name     OrderAmountUpdate Trigger     Property Data     Extended Data     EventLabel     EventNature     OrderAmountUpdate	svent to be seni int. Type string string double	. Use the Expression column to specify the value for each Expression
Ship Order Started Trigger Ship Order Started Trigger ShipPercentageUpdated StatusUpdate NotificationVariable CHANGED OrderHandlingFuture1_Outputk OrderHandlingFuture1_ENTRY OrderVariable CHANGED ProductShipmentVariable CHAN Declined Order Ctr Update New Order To KPI OrderVariable API Order Variable Ship	Event Attributes Details     Specify the triggers that cause the event attribute when the event is se     Name     OrderAmountUpdate Trigger     Property Data     Extended Data     EventLabel     EventNature     OrderAmount     PavloadType	tvent to be seni int. Type string string double string	Expression column to specify the value for each

That completes the work in the BPEL model.

4. Now, update the KPI model to handle the inbound events. For example, the generated model can provide Model Name and Model ID values with some cryptic characters, so change the ID and Name to make them easier to read:

#### Figure 43. Change the ID and Name to make them easier to read

Monitor Details Model			
<ul> <li>B Order Handling Business Measures KPI</li> <li>B Order Handling (Future 1) MC</li> </ul>	<ul> <li>Monitor Details</li> <li>Edit the details of the ID:</li> </ul>	he model. The timestamp is required to identify the version of the model.	Edit
	Name: Description:	Order Handling Business Measures KPI	~
	Timestamp (UTC):	2006-12-05T13:41:37	Edit

 5. Change the ID and Name of the Order Handling (Future 1) MC context to make it easier to read. Here is the model with the default metrics. First, remove all of the metrics that were under the parent context Order Handling (Future 1) MC.

#### Figure 44. Model with the default metrics that require removal

Monitor Details Model 🔠 🔡
Corder Handling (Future 1) Business Me     Corder Handling (Future 1) MC     Corder Handling (Future 1) Business Measures     Corder Handling (Future 1) Process     Review Order Processing Time     Ship Order to Customer Processi      Mane: Corder Landow (UTC): 2006-12-01T14:06:53     Corder Jack KPI Model KPI Model KPI Model Event Model ClipsAndTackKPIMM mm

6. Before you add the inbound events, add the key metric to the parent context. The key metric is used in the correlation expression of the events to make sure that the event is associated with the correct context. The key metric for the parent context is the Process ID value that is sent in the NewOrderInboundEvent. All inbound events sent by the BPEL model are filtered by the key value. The following example shows the definition of the key metric:

Monitor Details Model			
■ 5. Order Handling (Future 1) Business Me	- Key Details Edit the details	s of the key. Each monitoring context requires at least one key.	
	ID:	ProcessID	Edit
	Name:	ProcessID	
	Description:		^
			~
	Type:	String	-
		Maximum String Length: 256	
		Allocate additional space in database to accommodate Unicode string for globalization	
	Default Value:		Edit
	This key ca	n be used for sorting	
	Key Value Map		
	Specify the ex	pressions that set the value of the key.	
	Expression		
		Add	Remove
< >	LApression	Add	

#### Figure 45. Definition of the key metric

\_\_\_\_7. Now add the following inbound events and the related correlation expressions:

- NewOrderInboundEvent (type: NewOrderEvent). The correlation expression verifies that the ProcessID in the event matches the ProcessID key metric in the context. If no instances are found for the correlation, a new instance should be created. If one or more instances are found, it should be treated as an error.
- Approval Update (type: ApprovalStepUpdate). The correlation expression verifies that the ProcessID in the event matches the ProcessID key metric in the context. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.
- End Order (type: CompleteOrder). The correlation expression verifies that the ProcessID in the event matches the ProcessID key metric. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.
- **Receive Order** (type: ReceiveOrder). The correlation predicate expression verifies that the ProcessID in the event matches the ProcessID key metric in the context. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.

- **Status Update** (type: StatusUpdate). The correlation expression verifies that the ProcessID in the event matches the ProcessID key metric in the context. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.
- Update Declined Order Counter (type: DeclinedOrderCtrUpdate). The correlation expression verifies that the ProcessID in the event matches the ProcessID key metric in the context. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.
- Update Ship Percentage This inbound event is of type ShipPercentageUpdate. The correlation expression must verify that the ProcessID in the event matches the ProcessID key metric in the context. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.
- **Country Update** This inbound event is of type CountryUpdate. The correlation expression must verify that the ProcessID in the event matches the ProcessID key metric in the context. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.
- OrderAmount Update This inbound event is of type OrderAmountUpdate. The correlation expression must verify that the ProcessID in the event matches the ProcessID key metric in the context. If one instance is found, the event should be delivered to the instance. If no instance or multiple instances are found, it should be treated as an error.

Here are the definitions for the **NewOrderInboundEvent** and the Approval Update inbound event showing the correlation expression and the actions for number of instances found:

Figure 46. Correlation expression and actions for no. of NewOrderInboundEvent instances

💑 Order Handling (Future 1) Business Me = 🎒 Order Handling (Future 1) MC	- Inbound Event Details Edit the details of the inboun	d event, which references an event that is generated by the monitored application	2
ProcessID NewOrderInboundEvent	Ine type must be an event de ID: NewOrderInbo	ennition, undEvent	t.,
	Name: NewOrderInbox Description:	undEvent	
	Type: NewOrderEvent	Brows	e.
	+ Filter Condition Define a condition based on t	the event attributes to identify whether to accept an event of this type.	
	Filter Condition Define a condition based on t	the event attributes to identify whether to accept an event of this type,	
	Filter Condition Define a condition based on t	the event attributes to identify whether to accept an event of this type.	
	Filter Condition Define a condition based on I	the event attributes to identify whether to accept an event of this type.	
	Filer Condition Define a condition based on 1     Correlation Expression Define an expression to ident NewOrderInboundEvent/exit If no instances are found	the event attributes to identify whether to accept an event of this type. If the monitoring context instance or instances that receive the event at runtime. If the monitoring context instance If the event at runtime. If the monitoring context instance	
		the event attributes to identify whether to accept an event of this type.  ify the monitoring context instance or instances that receive the event at runtime.  ify the monitoring context instance  [Treat as error	

nitor Details Model Data Mart Model KPI Model Visual Model Event Model ClipsAndTackKPIMM.mm

Approval Update inbound event definition showing the correlation expression and the actions for number of instances found:

#### Figure 47. Correlation expression and the actions for number of instances for Approval Update

Monitor Details Model		
Grder Handling (Future 1) Business Me      Bill Order Handling (Future 1) MC     ProcessID     ProcessID     NewOrderInboundEvent	✓ Inbound Event Details           Edit the details of the inbo           The type must be an event           ID:         Approval_Up           Name:         Approval_Up	und event, which references an event that is generated by the monitored application. definition. date
	Description:	Jake
	Type:     ApprovalSter <ul> <li>Filter Condition</li> <li>Define a condition based of</li> <li>Define a condition based of</li> </ul>	n the event attributes to identify whether to accept an event of this type.
	<ul> <li>Correlation Expression</li> <li>Define an expression to id</li> <li>Approval_Update/extended</li> </ul>	entify the monitoring context instance or instances that receive the event at runtime. edData/ProcessID = ProcessID
	If no instances are found	Treat as error
۲	If one instance is found If multiple instances are fo	Deliver to the instance
Monitor Details Model Data Mart Model KPI Mod	el Visual Model Event Model	ClipsAndTackKPIMM.mm

8. Now that you have created the events, you can create the following triggers for each of the events:

- Approval Update Trigger Source Type for this trigger is the Approval Update inbound event.
- End Order Trigger Source Type for this trigger is the End Order inbound event. This trigger also terminates the monitor context.
- New Order Trigger Source Type for this trigger is the NewOrderInboundEvent.
- **Receive Order Trigger** Source Type for this trigger is the Receive Order inbound event.
- Status Update Trigger Source Type for this trigger is the Status Update inbound event. Because multiple status updates are received as the order is processed, select the Trigger is repeatable check box for this trigger.
- Update Ship Percentage Trigger Source Type for this trigger is the Update Ship Percentage inbound event.
- **Declined Order Counter Trigger** Source Type for this trigger is the Update Declined Order Counter inbound event.
- **Country Update Trigger** Source Type for this trigger is the Country Update inbound event.
- **OrderAmount Update Trigger** Source Type for this trigger is the OrderAmount Update inbound event.

Here are the definitions for the **End Order Trigger** and the **Status Update Trigger**:

# Figure 48. End Order Trigger definitions

Monitor Details Model				
Grder Handling (Future 1) Business Me     Grder Handling (Future 1) MC     Approval Update Trigger     Approval Update     Find Order Trigger     Approval Update     Receive Order     Status Update     Update Declined Order Counter     Update Ship Percentage	<ul> <li>Trigger Detail</li> <li>Edit the deta</li> <li>ID:</li> <li>Name:</li> <li>Description:</li> <li>Trigger is</li> <li>Terminate</li> <li>Trigger Source</li> <li>Source Typ</li> <li>Event</li> </ul>	Is Ils of the trigger, which de End_Order_Trigger End Order Trigger repeatable e monitoring context ses ource of this trigger. e	tects an occurrence and initiates an action in response.	Edit
Monitor Details Model Data Mart Model KPI Mod	Trigger Cond Specify the c	tion ondition that determines v Event Model ClipsAndTar	vhether the trigger will fire. kKPIMM.mm	Add Remove

Definitions for the Status Update Trigger:

# Figure 49. Definitions for Status Update Trigger

mpty Folder) r Details Model	
Image: Drider Handling (Future 1) Business Me         Image: DrocessID         Image: ProcessID         <	
Monitor Details Model Data Mart Model KPI Model Visual Model Event Model ClipsAndTackKPIMM.mm	

# Definition for the **Country Update Trigger**:

# Figure 50. Definition for Country Update trigger

Order Handling Business Measures	Name: Country Upd	date Triger	
Country Current Status Current Status	Description:		< >
Content of der Countent     Star Countent	✓ Trigger is repeatable ☐ Terminate monitoring (	context	
- E Country Update Triger	✤ Trigger Sources		
- 🖙 Declined Order Counter Tri	Specify the source of this	trigger.	
End Order Trigger	Source Type	Source	1
Porder Amount Update Trige     Porder Amount Update Trigger     Status Update Trigger     Update Ship Percentage Tr     Approval Update     Country Update	Event	Country Update	
End Order NewOrderInboundEvent OrderAmount Update Receive Order Status Update Update Declined Order Cou Update Ship Percentage	Trigger Condition Specify the condition that	Add R determines whether the trigger will fire.	emove
			3

# Definition for the OrderAmount Update Trigger:

#### Figure 51. Definition for OrderAmount Update trigger

onitor Details Model	Namai OrdarAmajust	Lindate Tricer	
Order Handling Business Measures     Order Handling (Future 1) MC     Order Randling (Future 1) MC     Order SID     Order SID     Order Country     Order Country     Order Current Status	Description:	opuale inger	~
Context Declined Order Counter	✓ Trigger is repeatable ✓ Terminate monitoring comparison	ntext	
- E Approval Update Trigger - E Country Update Triger - E Declined Order Counter Tri	Trigger Sources Specify the source of this tr	gger.	
End Order Trigger	Source Type	Source	
Order Amount Update Trige     Receive Order Trigger     Status Update Trigger     Update Ship Percentage Tr     Approval Update     Country Update	Event	orderAmount Update	
Find Order     NewOrderInboundEvent     OrderAmount Update     Receive Order     Status Update     Update Declined Order Cou	Trigger Condition Specify the condition that d	etermines whether the trigger will fire.	Add Remove
Update Ship Percentage     Order Fulfillment Timer		nen ( exceptor property ( 201 ( 2017) ( 201 <b>987</b> ) ( exceptor ( 2017) ( 2017)	~

- \_\_\_\_9. Now that you have added the triggers, add these metrics, counters, and stopwatches for the KPIs:
- **Country**: metric, string of length 256, default value of US; value is set from the Country field in the Receive Order event or the Country Update event when the when the Receive Order Trigger or Country Update trigger is fired. (Add the two triggers to Metric Value Maps.)
- **Current Status**: metric, string of length 256, no default value; value is set from the Status field in the Status Update event or the Receive Order event when the Status Update Trigger or Receive Order Trigger is fired. The value is set to Started when the New Order Trigger is fired. (Add the three triggers to Metric Value Maps.)
- Is Approval Step Completed: metric, length of 256, default value of Not Completed; value is set from the ApprovalStepCompleted field in the Approval\_Update event when the Approval Update Trigger is fired, and from the ApprovalStepCompleted field in the Receive\_Order event when the Receive Order Trigger is fired.

- Order Amount: decimal, default value of 0; value is set from the OrderAmount field in the Receive\_Order event or OrderAmount Update event when the Receive Order Trigger or OrderAmount Update trigger is fired. (Add the two triggers to Metric Value Maps.)
- Order Date: date, no default value; value is set from the OrderDate field in the Receive Order event when the Receive Order Trigger is fired. It is also set from the creationTime field in the NewOrderInboundEvent event. (Add the two triggers to Metric Value Maps.) Because the OrderDate field in the event has a type of DateTime, the expression must use the data() function to convert this to a date field.
- Ship Percentage: integer, defaults to 0; value is set from the ShipPercentage field in the Receive\_Order event or the Update\_Ship\_Percentage event when the Receive Order Trigger or Update Ship Percentage Trigger fires.
- **Declined Order Counter**: integer, defaults to 0; value is set from the DeclinedOrderCtr field in the DeclinedOrderCtrUpdate event when the Declined Order Counter Update Trigger is fired.
- **Order Fulfillment Timer:** stopwatch; started when the NewOrderEvent inbound event is received and stopped when the End Order inbound event is received.

Here are the definitions for the **Order Date** and the **Order Fulfillment Timer**:

#### Figure 52. Order Date Timer definition

Monitor Details Model						
Response Manualing (Future 1) Business Me	✓ Metric Details					
Order Handling (Future 1) MC	Edit the details	of the metric, which	n is a holding s	pot for information used in oth	er calculations.	
ProcessID	ID:	Order Date				Edit
- izzi Country	ID.	Order_Date				Edit
Current Status	Name:	Order Date				
is Approval Step Completed?	Description:					~
- im Order Amount						
						~
- Ship Percentage	Type:	Date				-
Approval Update Trigger		0-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1				
Fnd Order Trigger	Default Value	[				Edit
New Order Trigger	Default value.					Luit
Receive Order Trigger	□ This metric	can be used for sorti	ing			
🛶 Status Update Trigger						
Update Ship Percentage Trigger     Approval Update	✓ Metric Value Ma	aps				
- Find Order	Specify the exp	pressions that set the	e value of the m	netric. If a trigger is specified, t	he map is evaluated w	when the trigger
NewOrderInboundEvent	fires.					
Receive Order	Trigger		Express	ion		
>> Status Update	Receive Order	r Trigger	date(Re	ceive_Order/extendedData/Ord	lerDate)	
>>> Update Declined Order Counter	<		Ш	Ľ		>
- Pupdate Ship Percentage					Ad	d Remove
G Order Fulfillment Timer						
<						
Monitor Details Model Data Mart Model KPI Mode	Visual Model E	vent Model ClipsAnd	dTackKPIMM.m	m		
					,	



# Figure 53. Order Fulfillment Timer definition

<ul> <li>Stopwatch Details</li> <li>Edit the details of more start and st</li> </ul>	the stopwatch, which ke op times, the durations a	ps track of elapsed time. If an accumulating stopwatch e added together to produce an accumulated time.	is given two or
ID: Ord	ler_Fulfillment_Timer		Edit
Description:	er Fumiment Timer		~ >
This stopwatch This stopwatch Stopwatch Controls	n is an accumulating stop n can be used for sorting	vatch	
Trigger / Inhour	ad Event	Peculting Action	
New Order Tri	igger	Start	
B End Order Tri	gger	Stop	
			Add Remove
	Stopwatch Details     Edit the details of more start and st ID: Orc Name: Orc Description:     This stopwatch     This stopwatch     Specify what caus     Trigger / Inboun     ** New Order Tri     ** End Order Tri	Stopwatch Details Edit the details of the stopwatch, which kee more start and stop times, the durations an ID: Order_Fulfillment_Timer Name: Order Fulfillment Timer Description:      This stopwatch is an accumulating stopw     This stopwatch can be used for sorting      Stopwatch Controls Specify what causes the stopwatch to change     Trigger / Inbound Event     * New Order Trigger     * End Order Trigger	Stopwatch Details     Edit the details of the stopwatch, which keeps track of elapsed time. If an accumulating stopwatch     more start and stop times, the durations are added together to produce an accumulated time.  ID: Order_Fulfillment_Timer Name: Order Fulfillment Timer Description:      This stopwatch is an accumulating stopwatch     This stopwatch is an accumulating stopwatch     This stopwatch can be used for sorting      Stopwatch Controls Specify what causes the stopwatch to change and what action is taken.  Trigger / Inbound Event     Resulting Action      * New Order Trigger     Stop

10. You still need to set the value of the **ProcessID** key metric field. This field is from the **ProcessID** field in the **NewOrderInboundEvent** event. Update the Key Value Map for this key metric with the expression that sets the value of this key, as shown in the following example:



A Order Handling (Future 1) Business Me	✓ Key Details		
Order Handling (Future 1) MC	Edit the details	s of the key. Each monitoring context requires at least one key.	
	ID:	ProcessID	Edit
Current Status     Declined Order Counter     is Approval Stap Completed?	Name: Description:	ProcessID	
- i Order Amount - i Order Date			
	Type:	String	
Declined Order Counter Update T     End Order Trigger		Maximum String Length: 256	
→ New Order Trigger	Default Value		Edi
Keceive Order Trigger     Status Update Trigger     wydate Ship Percentage Trigger     Proval Update	This key ca	L be used for sorting	
> End Order > NewOrderInboundEvent	<ul> <li>Key Value Maps</li> <li>Specify the ex</li> </ul>	pressions that set the value of the key.	
Receive Order     Status Undate	Expression		
Update Declined Order Counter	NewOrderInt	ooundEvent/extendedData/ProcessID	
Opdate Ship Percentage     Order Fulfillment Timer		Add	Remo
>			

#### Setting up the Data Mart model

Now you can work on the Data Mart model to set up the dimensions, facts, and measures.

First, make sure that the following dimensions are defined on the **Order Handling** cube. The dimensions should already be specified (except for the **Order Date**), but the dimension attributes and dimension sources are missing. Because these dimensions are used in the KPI model, you need to complete the definitions in the Data Mart model. For **Order Date**, add the dimension as well as the attribute and source.

- **Country**: for Dimension Attribute and Source, specify Country; select the Is Key check box.
- **Order Status**: for Dimension Attribute, specify Order Status; for Source, specify Current Status; select the Is Key check box.
- **Order Date**: for Dimension Attribute and Source, specify Order Date; select the Is Key check box.

• Is Approval Step Completed: for Dimension Attribute and Source, specify Is Approval Step Completed; select the Is Key check box.

Here is the Data Mart model page showing the details for the Country and Order Status dimensions:

#### Figure 55. Data Mart model page details for Country and Order Status dimensions

<ul> <li>Dimensions</li> <li>Add dimensions and their hierarchical at</li> </ul>	tributes. Each attribute level enables	s you to aggregate the levels that are under	neath it.	
Cube / Dimension	Dimension Attribute	Source	Is Key	S
Order Handling (Future 1) MC Cube     Country		MC Order Handling (Future 1) MC		
≅ Order Status	Country	😾 Country	M	
	Order Status	🖾 Current Status	2	

Now you need to correct the facts for which a red x is displayed in the **Source** field. That leaves facts for **Process ID**, **Order Amount**, **Ship Percentage**, **Declined Order Counter**, and **Order Fulfillment Timer**. If these facts do not exist, add the facts using the metrics as shown in the figure. For example, for the fact **Order Amount**, the source is **Order Amount** metric. If the **Order Date** is still a fact, delete that as well. Some of these are shown here:

#### Figure 56. Correct facts for which x is displayed in the Source field

* Facts						
A fact is required for each metric, counter, an	d stopwatch that is not a dimension attrib	bute. Facts are the basis for any measures you	u create.			
Cube / Fact Table	Fact Attribute	Source				^
ClipsAndTacksKPIMM MC Cube		ClipsAndTacksKPIMM MC				
ClipsAndTacksKPIMM MC Cube Fact Tab	le					
	ProcessID Fact	ProcessID				
	Order Amount Fact	🔤 Order Amount				
	Ship Percentage? Fact	🔤 Ship Percentage				¥
		mo i to to t				
			Details	Add Cube	Add Attribute	

Now you need to ensure the measures are correct. After you renamed the model, the measures might contain some errors, which need to be fixed. Confirm that the following measures are defined with the indicated values:

- Total Order Amount Source is Order Amount Fact and the Aggregation Function is Sum.
- Average Order Amount Source is Order Amount Fact and the Aggregation Function is Average.
- Average Order Fulfillment Time Source is Order Fulfillment Timer Fact and the Aggregation Function is Average
- Number of Orders Source is ProcessID Fact and the Aggregation Function is Count.
- Ship Percentage Source is Ship Percentage Fact and the Aggregation Function is Average.
- **Declined Order** Source is Declined Order Counter Fact and the Aggregation Function is Sum.

Here is an example of the measures:

#### Figure 57. Example of the corrected measures

* Measures							
Add measures, which are calculations perf	formed on facts to collect and combine them into a sir	ngle value.					
Cube	Measure	Source			Aggregation Function	n	^
Order Handling (Future 1) MC Cube		Order Handling (Future 1) MC					
	Total Order Amount	Order Amount Fact			Sum		
	Average Order Amount	Order Amount Fact			Average		
	Average Order Fulfillment Time	Order Fulfillment Timer Fact			Average		
	Number of Orders	ProcessID Fact			Count		¥
		A 41 - A - A - A - A - A - A - A - A - A -					_
			Details	Add Cube	Add Measure	Remove	

# Setting up the KPI model

\_\_\_\_\_1. Next, go to the KPI model view and complete the KPI model.

For the Average Order Fulfillment Time KPI, specify these values, as shown in the example:

- Measure: Average Order Fulfillment Time
- Dimensions: Order Status; add the Shipped value

In And TacksAPUM C Clips And TacksAPIMM									
1 Model						1			
Order Handling Business Measures KPI <u>81</u> Order Handling (Future 1) KC	- RPE Details Edit the details of	the KPL, which is a	performance measureme	nt used to track I	business objectives.				
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			Order Status	String	Shipped				

For the Average Order Price KPI, specify a measure of Average Order Amount. You need to change the **ID** and **name** to remove any cryptic characters. For example, change the ID to Average\_Order\_Price\_US\_Dollars. You might need to use the XML editor to delete an empty dimension tag that is flagged with an error.

For the Declined Orders This Month KPI, specify the **Declined Order Measure** and the **Order Date Time** dimension. Also make sure to specify the type of Decimal.

Figure 58. Specify Measure and Dimension values 2. Verify that the **High Range** and **Low Range** values are specified; if not, specify the correct target and ranges for the KPI, as in this example:



Business Monitoring - O	rder Han	dling (Fut	ure 1) Busir	ness Measure	es - IBM W	ebSphere	e Integration	n Develope	r		
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Based on the problems flagged in the preceding example, you might need to use the XML editor to delete the **displayName=**"" attribute that is flagged with an error. After deleting the **displayName=**"" attribute, rebuild the monitor project to avoid appearance of the error indicator in the xml editor view.

# \_\_\_\_\_ 3. For the Number of Sales This Month KPI, add the **Number** of Orders Measure and the Order Date Time dimension as shown here:

# Figure 60. Add Number of Orders Measure and Order Date Time dimension

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4. For the Order Count Cancel KPI, add the **Cancel Order** value string (do not place the value in quotation marks) to the **Order Status** dimension and make sure that **Decimal** is specified as the **Type**, as shown here:

#### Figure 61. Assure Decimal is specified as the Type

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Iodel	"#CIIpSAII		ClipsAn	dTacksSample/Ord	er Handlin	o (Future 1) Business Measures.mm	- III)		
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		H	Order Status	Order Status	String	Cancel Order			

- 5. Now, make sure each of the following KPIs has a decimal type, has the Measure set to the Number of Orders, and this value in the Order Status dimension check:
  - Order Count Cancelled Cancelled
  - Order Count Check Account Check Account
  - Order Count Check Handling Policy Check Order Handling Policy
  - Order Count Review Review Order
  - Order Count Ship Ship Order
  - Order Count Shipped Shipped

6. For the Percent of Order Approved This Month KPI, change the ID and Name to be as short as possible. If the Name or ID is too long, it could cause problems during configuration of the KPI portlet. Then add the Ship Percentage as the Measure, add the Order Date as the Time Dimension, and add the Completed string to the is Approval Step Completed dimension. This is shown here:

	Figure 62. Add Com	pleted string	g to is Appr	oval Step Con	npleted dimension
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7. For the Total Sales Amount This Year, specify the Total Order Amount for the **Measure** and add the **Order Date** for the **Time dimension**, as seen here:

# Figure 63. Specify Total Order Amount for the Measure

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8. For the Total Sales Amount This Year – Canada KPI and the Total Sales Amount This Year – US KPI, specify the Total Order Amount for the Measure and add the Order Date for the Time dimension. Also, add the string Canada or US for the Country dimension. To avoid the warning about the '-' character in the ID field, change the ID field. In this example, the ID field is changed to Total\_Sales\_Amount\_This\_Year\_for\_Canada. (You might need to change the ID and Name from Total\_Sales\_Amount\_This\_Year\_-Canada to Total\_Sales\_Amount\_This\_Year\_Ca. If the name is too long, it can cause problems during configuration of the KPI portlet.)

Figure 64. ID field changed to Total\_Sales\_Amount\_This\_Year\_for\_Canada

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#### Setting up the visual model for the KPI Model

- Unzip the artifact file ClipsAndTacksSample1.zip to a directory, for example, c:\ClipsAndTacksSample1. There are two .svg file in the directory:
  - \_Order\_Handling\_\_x0028\_Future\_1\_x0029\_\_Busines s\_Measures\_KM\_Order\_Handling\_\_x0028\_Future\_1\_ x0029\_\_KC.svg and
  - \_Order\_Handling\_\_x0028\_Future\_1\_x0029\_\_Busines
     s\_Measures\_MDM\_Order\_Handling\_\_x0028\_Future\_1\_x0029\_\_MC.svg
- 2. Copy the two .svg file to the root of the monitor project ClipsAndTacksSample.
  - \_\_\_\_\_ 3. Open the file ClipsAndTackKPIMM.mm with Monitor Model Editor and go to the Visual Model view.
- 4. Select Order Handling (Future 1) MC context.
- 5. Click **Browse** and select the file
  - \_Order\_Handling\_\_x0028\_Future\_1\_x0029\_Business Measures\_MDM\_Order\_Handling\_\_x0028\_Future\_1\_x 0029\_\_MC.svg
- 6. Select Order Handling (Future 1) KC context.
- **7.** Click **Browse** and select the file
  - \_Order\_Handling\_\_x0028\_Future\_1\_x0029\_Business\_ Measures\_KM\_Order\_Handling\_\_x0028\_Future\_1\_x00 29\_\_KC.svg

Figure 65. Copy .svg file from the artifacts zip file to your project

# Visual Model Vi

#### Part 4. Using the merged-model approach

In the merged-model approach, you copy the KPI model into the BPEL model and use a single model. This section begins with a BPEL model that has the required metrics, events, triggers, and so on, but does not contain the outbound events to be sent to the KPI model. For the merged model, you still need to create the metrics that are needed for the KPIs, but you do not need the events that were used to send the data to the KPI model, because the KPIs are defined in this model. In this case, you are starting with the monitor model that is generated from the BPEL. Assuming that the monitor project is created from the BPEL Export, use the **File System** ▶ **Import** to import the BMV files into the same project that contains the BPEL Monitor model.

#### Defining additional data needed for the KPI

- 1. First, add the metrics, counters, and stopwatches to the BPEL model to capture the data needed for the KPIs. Specifically, add the following metrics to the OrderHandlingFuture1 monitor context:
  - **City**: type string, maximum length of 256, default value of 'Durham'
  - **Company**: string, maximum length of 256, no default value
  - **Country**: string, maximum length of 256, default value of 'US'
  - **Current Status**: string, maximum length of 256, no default value
  - Is Approval Step Completed?: id field set to isApprovalStepCompleted, string, maximum length of 256, default value of 'Not Completed'
  - **Order Amount**: decimal, default value of 0.
  - Order Date: type Date, no default value
  - **Order Number**: type Integer, no default value
  - Ship Percentage: type Integer, default value of 0
  - 2. Next, add the **Declined Order Counter** and the **Order Fulfillment Timer** to the **OrderHandlingFuture1** monitor context.

The following figure shows the BPEL model with the metrics, counter, and stopwatch added:

# Figure 66. BPEL model with metrics, counter, and stopwatch

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C Monitor Models	OrderHandlingFuture1_InputCrite	Name:	Order Fulfillment Timer				
ClipsAndTacksMergedSan	ReviewOrder_InputCriterion	Decerintian					
ClipsAndTacksSample     B ITMM     MewDectorrOffice	ShipOrdertoCustomer_InputCrite     Process Instance ID     Giv	Description					
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🗉 🇀 PatientDataMM	🔤 Order Number	Trigger / I	nbound Event	Resulting Action			
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3. Next, add the triggers that cause the metrics, counters, and stopwatches to get updated. First, add a trigger that is associated with the OrderHandlingFuture1\_InputCriterion EXIT inbound event. This inbound event contains the data entered in the BPEL process. This trigger is used to set the value in City, Company, Country, Order Amount, and Order Number. First create the trigger, Input Data Trigger, in the OrderHandlingFuture1\_InputCriterion context and add a trigger source for the OrderHandlingFuture1\_InputCriterion EXIT event.

The new trigger is shown here:

Figure 67. Add triggers that update metric, counter, and stopwatch

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ClipsAndTacks8PELMM	= 1 OrderHandlingEuture1	Edit the details of the trigger, which detects an occurrence and initiates an action in response.					
GipsAndTacksDualModelOrigin	Ell CancelOrderandSendNotification     Ell CheckCustomerAccountStatus     Ell CheckOrderHandlingPolicyfor#	Chronic and a start	Total Relation				
- 18 ClipsAndTacksMergedSample		ID:	Input_Data_Trigger				
di Event Definitions		Name:	Input Data Trigger				
😑 🙀 Monitor Models	OrderHandlingFuture1_InputC	Description					
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* A NewPatientFromBPEL	OrderHandlingFuture1 Inp	Ingger is repeatable					
NewPatientVisit	OrderHandlingFuture1_Inp		te monitoring context				
B NewPatientVisitBPEL     A	ReviewOrder_InputCriterion						
🖲 🍻 NewPatientVisitCombinedModel	ShipOrdertoCustomer_InputCl	- Trigger Sou	Trigger Sources				
NewPatientVisitMM	<ul> <li>Process Instance ID</li> <li>City</li> </ul>	Specify the	source of this trigger.				
BoliestOstoMM	- Company	Source Ty	pe	Source			
Patient Visit	i= Country	Event		OrderHandlin	gFuture1_InputCriterion	EXIT	
	-j=i Current Status						
🔹 🗁 PatientVisitMM	- Is Approval Step Completed						
	- 🖂 Order Amount						
	- ge Order Date					Add Remove	
	Ship Percentage						
	NotificationVariable CHANGEE     OrderHandlingFuture1_Output	<ul> <li>Trigger Condition</li> <li>Condition</li> </ul>					
		Specify the condition that determines whether the trigger will hre.					
	OrderHandlingFuture1 ENTRY					P	
	OrderVariable CHANGED						
	ProductShipmentVariable CHA *					<u> </u>	
< >>	¢ 3						
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	[12/13/06 10:02:09:078 EST] 0000005b System0:	it 0 Com	pleted order: 9883				
	[12/13/06 10:02:13:297 EST] 00000058 Systemo: [12/13/06 10:02:13:297 EST] 0000005e Serviet	rappe A Si	nd 0 Revieworder RVE0242I: [ClipsAndIs	acksHumanCustomEAR] [/	ClipsAndTacksHumanCus	conWeb] [/myCancellations.jsp]:	
	[12/13/06 10:02:13:328 EST] 0000005e System0	t O Tap	k: CancelOrderandSend	dNotification_01780893	102 for customer Shan	teren /price: 856.0	
	[12/13/06 10:02:13:328 EST] 0000005e Systemo: [12/13/06 10:02:19:625 EST] 0000005b Systemo:	it 0 rou	cel=9883				
	[12/13/06 10:02:19:625 EST] 0000005b System0	tt O Can	cel order: 9883			×	
						2	
A real second						60	

4. Next, for the metrics that update when this trigger fires, add a map on the associated metric that sets the metric from the value in the inbound event. Shown here is the map for the **City** metric (shown in vertical orientation to show the complete map expression):

#### Figure 68. Map for City metric

Business	Monitoring	- ClipsAndTacksMergedSample - IBM WebSphere Integration Developer	_ 🗆 🔀						
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PH CO	ClipsAndTack	sample 🔍 ClipsAndTacksSampleKPI 🎗 OrderHandlingFuture1 🦉 ClipsAndTacksBPELMM 🖗 Admin Console 🚺 🔨 ClipsAndTacksMergedSample 🗙							
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7. C	- D - Process Instance ID								
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🗷 🥵 ITMM		OrderHandlingHiture1_Input/Citering_Termination_Tringer	100						
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NewPati NewPati	Edit the details	s of the metric, which is a holding spot for information used in other calculations.							
R S NewPati	ID:	City.	Edit						
NewPau									
<ul> <li>NewPati</li> </ul>	Name:	Gty							
🔹 🗁 NewPati	Description:		(A)						
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🔹 🍅 Patient '			1						
B Patient     Patient	Type:	String	•						
a w ruuchty		Maximum String Length: 256							
		Allocate additional space in database to accommodate Unicode string for globalization	10						
	Default Value:	'Durham'	Editio.						
	This metric	can be used for sorting							
	- Hetric Value M Specify the ex	nps proscions that set the value of the metric. If a trianer is snarified, the man is evaluated when the trianer fires							
K ()	Specify the ex	Incluins that set the value of the metric. If a drugger is specified, the map is evaluated when the original mes.							
200 CO	ingger	Expression							
Ξ	Input Data II	igger Orderhandling-duret_inputChtendin/Orderhandling-duret_inputChtendin_Extractededdata/message/input/Customer/Cus							
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information is available		Add Re	move						
a available.	Monitor Details	Andel Data Mart Model KPI Model Visual Model Event Model ClipsAndTacksMergedSample.mm	-						
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112/13/06 10:02:09:078 EST] 0000005b SystemOut O Completed order: 9883									
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1			G						

- \_\_\_\_ 5. Add the map for the Company, Country, Order Amount, and Order Number that get set by this trigger. The Order Amount is set to the **Total Price** field from the inbound event.
- 6. Next, add the triggers that set the Current Status metric. The Current Status metric is set to one the following values (depending upon the location of the order in the order process): Started, Cancelled, Shipped, Cancel Order, Check Account, Checked Account, Review Order, Reviewed, Check Order Handling Policy, Checked Order Handling Policy, and Ship Order.

Following is the list of the triggers that are used to set the status. The termination triggers are generated for you in the BPEL model, but you need to add the other triggers. For triggers that need to be added, the monitor context where the trigger is to be added, and the event source for the trigger are specified here:

- New Order Trigger
  - Monitor Context: OrderHandling Future1
  - Event Source: OrderHandlingFuture1 ENTRY inbound event
  - This trigger needs to be added.
- CancelOrderandSendNotification\_InputCriterion Termination Trigger
  - Monitor Context:
  - CancelOrderandSendNotification\_InputCriterion
  - This trigger should already exist in the model because termination triggers are automatically created in the default BPEL model.
- ShipOrdertoCustomer\_InputCriterion Termination Trigger
  - Monitor Context:
    - ShipOrdertoCustomerInputCriterion
  - This trigger should already exist.
- Cancel Order Started Trigger
  - Monitor Context:
    - CancelOrderandSendNotification\_InputCriterion
  - Event Source: CancelOrderandSendNotification\_InputCriterion ENTRY inbound event
  - This trigger needs to be created. The specified inbound event should be in the generated model.
- Check Account Status Started Trigger
  - Monitor Context:
    - CheckCustomerAccountStatus\_InputCriterionEvent Source:
    - CheckCustomerAccountStatus\_InputCriterion ENTRY inbound event
    - This trigger needs to be created. The specified inbound event should already exist in the specified model.
- CheckCustomerAccountStatus\_InputCriterion Termination Trigger
  - Monitor Context:
  - CheckCustomerAccountStatus\_InputCriterionThis trigger should already exist.
  - Review Order Started Trigger
    - Monitor Context: ReviewOrder\_InputCritierion
    - Event Source: ReviewOrder\_InputCriterion ENTRY inbound event
    - This trigger needs to be created.
- The specified inbound event should already exist in the generated model.
- Review Order\_InputCriterion Termination Trigger
  - Monitor Context: ReviewOrder\_InputCriterion MC
  - This trigger should already exist.
- Check Order Handling Policy Started Trigger
  - **Monitor Context:** in the CheckOrderHandlingPolicyforAutomaticApproval \_InputCriterion MC
  - Event Source:
  - CheckOrderHandlingPolicyforAutomaticApproval \_InputCriterion ENTRY inbound event
  - This trigger needs to be created. The specified inbound event should already exist in the generated model.
- CheckOrderHandlingPolicyforAutomaticApproval\_Inp utCriterion Termination Trigger
  - Monitor Context:
    - CheckOrderHandlingPolicyforAutomaticApproval \_InputCriterion MC
  - o This trigger should already exist.
- Ship Order Started Trigger
  - Monitor Context:
    - ShipOrdertoCustomer\_InputCriterion MC
  - Event Source: ShipOrdertoCustomer\_InputCriterion ENTRY event
  - This trigger needs to be created.
- 7. After adding the new triggers, add the maps to the Current Status metric to set the correct value for each trigger. Listed here are each trigger and the values that should be specified for the expression when that triggers fires:
  - New Order Trigger Started
  - CancelOrderandSendNotification\_InputCriterion Termination Trigger – Cancelled
  - ShipOrdertoCustomer\_InputCriterion Termination Trigger - Shipped
  - Cancel Order Started Trigger Cancel Order
  - Check Account Status Started Trigger Check Account
  - CheckCustomerAccountStatus\_InputCriterion Termination Trigger – Checked Account
  - Review Order Started Trigger Review Order
  - ReviewOrder\_InputCriterion Termination Trigger –
     Reviewed
  - Check Order Handling Policy Started Trigger Check Order Handling Policy
  - CheckOrderHandlingPolicyforAutomaticApproval\_Inp utCriterion Termination Trigger – Checked Order Handling Policy
  - Ship Order Started Trigger Ship Order

Shown here is the **Current Status** metric with the Metric Value Maps displayed for the **New Order Trigger** and the **CancelOrderandSendNotification\_InputCriterion Termination Trigger**:

Figure 69. Current Status metric with Metric Value Maps

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ClipsAndTacksSample	2 OrderHandlingF	iture1 SclipsAndTack	BPELMM Admin (	Console	ClipsAndTacksMergedSa	nple ×	#
Monitor Details Model							服用
IndTacksMergedSample  derHandlingFuture1	<ul> <li>Hetric Details</li> <li>Edit the details</li> </ul>	of the metric, which is a h	olding spot for information	tion used	d in other calculations.		
CancelOrderandSendNotification_InputCriterion CheckCustomerAccountStatus_InputCriterion	ID:	Current_Status					Edit
CheckOrderHandlingPolicyforAutomaticApproval_Inc	Name:	Current Status					
OrderHandlingFuture1_InputCriterion ReviewOrder_InputCriterion	Description:						6
ShipOrdertoCustomer_InputCriterion	Anna ann an anna ann						
Process Instance ID							×.
Company	Type:	String					-
Country		Maximum String Length:	256			]	
Current Status		Allocate additional space	e in database to accomi	modate l	Unicode string for globalization	1	
Is Approval Step Completed Order Amount	Default Value:						Edit
Order Date							
Order Number	L This metric	an be used for sorting					
Ship Percentage							
OrderHandlingEuture1 Termination Trigger	- Hetric Value May	в 					
NotificationVariable CHANGED	Specify the exp	ressions that set the value	or the metric. If a trigge	er is spec	cified, the map is evaluated wi	ten the trigger fires.	1
OrderHandlingFuture1_OutputCriterion EXIT	Trigger	B	pression				
OrderHandlingFuture1 ENTRY	New Order Tri	gger Si dSendNotification I VC	arted				
OrderHandlingFuture1 EXIT	Canceronderan	doendroomcation_1 C	ancened				×
OrderVariable CHANGED						Add	Remove
ProductShipmentVariable CHANGED							
Declined Order Counter							
3							
Monitor Details Model Data Mart Model KPI Model Visual	Model Event Model	ClipsAndTacksMergedSam	ple.mm				
1.11							ő

8. Now the map for the Order Date needs to be set, use the date function with the creationTime field in the OrderHandlingFuture1 ENTRY inbound event, as shown here (the creationTime is a dateTime field that must be converted to a Date type before it can be placed in the Order Date metric, which is of type Date):

🚾 Country	<ul> <li>Metric Details</li> <li>Edit the detail</li> <li>Dedoctanding Entries</li> </ul>	metric, which	h is a holding spot for information used in other calculations.
is Approval Step Completed?	Name: OrderHandlingFuture1	ure1 EXIT Order_Date	E
	Name:	Order Date	
Ship Percentage	Description:		
<ul> <li>ApprovalStepCompletedUpdat</li> <li>DeclinedOrderCtrUpdated</li> </ul>			
<ul> <li>New Order Trigger</li> <li>OrderHandlingFuture1 Termin</li> <li>Received Order Variable Chan</li> </ul>	Type:	Date	
<ul> <li>ShipPercentageUpdated</li> <li>StatusUpdate</li> </ul>	Default Value	:	E
<ul> <li>NotificationVariable CHANGEE</li> <li>OrderHandlingFuture1 ENTRY</li> </ul>	□ This metric	can be used for sort	ting
OrderHandlingFuture1 EXI     ProductShipmentVariable CHANGED     Now Order To KDI	<ul> <li>Metric Value M Specify the ex fires.</li> </ul>	aps pressions that set the	e value of the metric. If a trigger is specified, the map is evaluated when the tr
	Trigger		Expression
Receive Order To KPI	New Order T	rigger	date(OrderHandlingFuture1_ENTRY/predefinedData/creationTime)
ShipPercentageUpdateToKPI	<		
WpdateApprovalStepCompletic     WpdateStatus			Add Rem
Declined Order Counter			
🔄 🝈 Order Fulfillment Timer	*		

#### Figure 70. Setting Order Date

9. The Is Approval Step Completed metric is also set by triggers, so add the maps to set this value next. This metric is set to Completed when either the Ship Order Started Trigger or the Cancel Order Started Trigger is fired. Shown here is this metric with the added metric maps for the triggers:

Figure 71. Is Approval Step Completed metric with added metric maps for triggers

ClipsAndTacksBPELMM × ElipsAndTacksBPEL	MM			Ð
Monitor Details Model				III ==
v Folder Structure	- Matrie Datails			
	Edit the detail	s of the metric whic	h is a holding spot for information used in other calculations	
	Luit the detail		in bla nording sportor information abea in other careatations.	
<ul> <li>Activity Instance ID</li> </ul>	ID:	isApprovalStepCor	npleted	Edit
	Name:	is Approval Step C	iompleted?	
CancelOrderandSendNotificatio	Description:			~
Cancel Order Started Trigger				
CancelOrderandSendNotificatio				~
	_			
CheckOrderHandlingPolicyforAuto	lype:	String		•
OrderHandlingFuture1 InputCrite		Maximum String Le	ength: 256	]
El ReviewOrder_InputCriterion		Allocate addition	nal space in database to accommodate Unicode string for globalization	
ShipOrdertoCustomer_InputCrite			······································	
	Default Value	Not Completed		Edit
	This motrie	con he used for sor	ting	
		. can be used for sor	ung	
ShipOrdertoCustomer_InputCi				
ShipOrdertoCustomer_InputCi	✓ Metric Value M	aps		
ShipOrdertoCustomer_InputCi	Specify the ex	pressions that set the	e value of the metric. If a trigger is specified, the map is evaluated wh	en the trigger fires.
	Trigger		Expression	
Company	Ship Order S	tarted Trigger	'Completed'	
	Cancel Order	Started Trigger	'Completed'	
Current Status			· · · · · · · · · · · · · · · · · · ·	
is Approval Step Completed?				Add Remove
Order Amount				
- imi Order Date				
🚽 🔤 Order Number				
Shin Dercentage				
Monitor Details Model Data Mart Model KPI Model	/isual Model Eve	nt Model ClipsAndTa	acksBPELMM.mm	

The **Ship Percentage** metric is set to 100 when the **Ship Order Started Trigger** is fired. Shown here is the **Ship Percentage** metric with its map:

## Figure 72. Ship Percentage metric with its map

	MIM				
Monitor Dotails Model Clins And Tacks DualModel/Clins And Tacks BDELM	Mmm				
	Metric Details				
ReviewOrder InputCriterion	Edit the detail	s of the metric, wh	ich is a holding spot for	information used in other calcu	ulations.
Process Instance ID	ID:	Ship_Percentage			Edit
ReviewOrder InputCriterion T	Names	Chin Dessents as			
Review Order Started Trigger	Name:	Ship Percentage			
ReviewOrder InputCriterion E	Description:				<u>^</u>
ReviewOrder_InputCriterion E					
ShipOrdertoCustomer_InputCrite					~
	Type:	Integer			•
izzi City	.,,,.				
izzi Country	Default Value:	: 0			Edit
Current Status	This matric	con he used for a	orting		
is Approval Step Completed?		. can be used for s	orung		
Order Amount					
in Order Number	<ul> <li>Metric Value M</li> </ul>	aps			
Ship Percentage	Specify the ex	pressions that set	the value of the metric. If	f a trigger is specified, the map	p is evaluated when the trigger fires.
New Order Trigger	Trigger		Expression		
OrderHandlingFuture1 Terminatic	Ship Order S	tarted Trigger	100		
Received Order Variable Changed					
🚽 OrderHandlingFuture1 ENTRY 🔍					Add Remove
< · · · · · · · · · · · · · · · · · · ·					
Manifest Dataile Madel Data Mart Madel VDT Madel V	Coursel Mandall True	at Mardal Cline Are			
Monitor Details Model Data Mart Model KPI Model V	ISUAI MODEL EVE	nt moder ClipsAnd	TTACKSBPELIMM.MM		

10. Next, add the trigger for the **Declined Order Counter**. Whenever the **Cancel Order Started Trigger** is fired, the **Declined Order Counter trigger** should be incremented. This is illustrated in the following example:

## Figure 73. Add trigger for the Declined Order Counter

A ClipsAnd LacksBPELMM X Le ClipsAnd LacksBPELMM	8
Monitor Details Model	
Review Order Started Trigger     ReviewOrder_InputCriterion E     ReviewOrder_InputCriterion E     Process Instance ID     Name: Declined Order Counter	lit
- 🔤 City Description: - 🔤 Company Description: - 🔤 Country - 🔤 Current Status	~ >
- 🖮 is Approval Step Completed? - 🖮 Order Amount - 🖮 Order Date	
Order Number     Counter Controls     Spacify what cause the counter to change and what action is taken	
A ship Fridemage     A ship for thing of the case	
Add     Removement	ove
Monitor Details Model Data Mart Model Visual Model Event Model ClincAndTacksRDEI MM mm	

11.Next, add the triggers that start and stop the Order Fulfillment Timer. This timer is started when the order is received, so the New Order Trigger starts the timer and the timer is stopped with the process is terminated, so the OrderHandlingFuture1 Termination Trigger is used to stop the timer. This is seen in the following figure:

#### Figure 74. OrderHandlingFuture1 Termination Trigger used to stop the timer

ChackOrderHandlingDolig for Auto	<ul> <li>Stopwatch D</li> </ul>	etails			
Set CheckOrder HandlingPolicyTorAut      Set CheckOrder HandlingPolicyTor	Edit the deta start and sto	ils of the stopwatch, which keeps trac p times, the durations are added toge	k of elapsed time. If an accumulating ther to produce an accumulated time.	stopwatch is given two or	more
ShipOrdertoCustomer_InputCrite     Process Instance ID	ID:	Order_Fulfillment_Timer			Edit
- City	Name:	Order Fulfillment Timer			
	Description:				
	□ This stop	watch is an accumulating stopwatch			
uni Order Date	□ This stop	watch can be used for sorting			
New Order Trigger     OrderHandlingFuture1 Terminatic	<ul> <li>Stopwatch C</li> <li>Specify what</li> </ul>	ontrols t causes the stopwatch to change and	what action is taken.		
Received Order Variable Changed	Trigger / In	bound Event	Resulting Action		
NotificationVariable CHANGED	New Ord	er Trigger	Start		
OrderHandlingFuture1 ENTRY     OrderHandlingFuture1 EXIT     OrderVariable CHANGED     ProductSbipmontVariable CHANGE	📫 OrderHar	ndlingFuture1 Termination Trigger	Stop		
Produces inpinent variable of NANC     Declined Order Counter     Order Fulfillment Timer					

12. At this point, in the BPEL model, begin the merge from the KPI model. To merge the KPI model, select the model that is exported from BMV that contains the KPI model. As shown in this example, click the tab named **modelName.mm** and find the section of the .mm file that contains the following line: <kpiModel id="KM">

#### Figure 75. Find this section of the .mm file



13. Now copy the text between the **<kpiModel id="KM">** and the end tag **</kpiModel>** and paste this text into the BPEL model after the **</monitorDetailsModel>** tag in the XML view of the merged model.

# Setting up the Data Mart model

Now update the Data Mart model to set up the dimensions, facts, and measures.

- 1. First, set these dimensions on the Order Handling cube. The dimension should already be specified, but the dimension attributes and dimension sources are missing. These dimensions are used in the KPI model, so they need to be completed here.
  - **Country**: for Dimension Attribute and Source, specify Country; select the Is Key check box.
  - Order Status: for Dimension Attribute, specify Order Status; for Source, specify Current Status; select the Is Key check box.
  - **Order Date**: for Dimension Attribute and Source, specify Order Date; select the Is Key check box.
  - Is Approval Step Completed: for Dimension Attribute and Source, specify Is Approval Step Completed; select the Is Key check box.

Shown here is the Data Mart model page showing the details for the **Country and Order Status dimensions**:

Figure 76. Data Mart model page details for Country and Order Status dimensions

Dimensions add dimensions and their hierarchical at	tributes. Each attribute level ena	bles you to aggregate the levels that are unde	rneath it.		
Cube / Dimension	Dimension Attribute	Source	Is Key		
Order Handling (Future 1) MC Cube Country		Order Handling (Future 1) MC			
water and	Country	🖃 Country	M		
○ Order Status	Order Status	🖴 Current Status	2		

2. Now, fix the facts. The following facts should be in the fact table: Process ID, Order Amount, Ship Percentage, Declined Order Counter, and Order Fulfillment Timer. For details, see Setting up the Data Mart model on page 58.Some of these are shown here:

Figure 77. Process ID, Order Amount, Ship Percentage in fact table

✓ Facts						
A fact is required for each metric, counter, and sto	pwatch that is not a dimension attribute. Facts a	re the basis for any measures you o	create.			
Cube / Fact Table	Fact Attribute	Source				^
ClipsAndTacksKPIMM MC Cube		🕙 ClipsAndTacksKPIMM MC				
ClipsAndTacksKPIMM MC Cube Fact Table						
	ProcessID Fact	ProcessID				
	Order Amount Fact	🔤 Order Amount				
	Ship Percentage? Fact	Ship Percentage				¥
		ma 1 1 a 1 a 1				 _
			Details	Add Cube	Add Attribute	

- 3. Now, ensure the measures are correct. These measures need to be created in the OrderHandlingFuture1 cube:
  - Total Order Amount Source Attribute is Order Amount Fact and the Aggregation Function is Sum.
  - Average Order Amount Source Attribute is Order Amount Fact and the Aggregation Function is Average.
  - Average Order Fulfillment Time Source Attribute is Order Fulfillment Timer Fact and the Aggregation Function is Average
  - Number of Orders Source Attribute is ProcessID Fact and the Aggregation Function is Count.
  - Ship Percentage Source Attribute is Ship Percentage Fact and the Aggregation Function is Average.
  - **Declined Orders** Source Attribute is Declined Order Counter Fact and the Aggregation Function is Sum.

# The following figure shows the Measures:

## Figure 78. Measures in OrderHandlingFuture1 cube

<ul> <li>Measures</li> </ul>			
Add measures, which are calculations pe	rformed on facts to collect and combine them into a	single value.	
Cube	Measure	Source	Aggregation Function
Order Handling (Future 1) MC Cube		Order Handling (Future 1) MC	
	Total Order Amount	I Order Amount Fact	Sum
	Average Order Amount	In Order Amount Fact	Average
	Average Order Fulfillment Time	In Order Fulfillment Timer Fact	Average
	Number of Orders	ProcessID Fact	Count
		Details Add Cul	e Add Measure Remove

# Setting up the KPI model

1. Next, go to the KPI model view and complete the KPI model. For the KPI Average Order Fulfillment Time, the Cube, Order Handling Future1 and the Measure, Average Order Fulfillment Time needs to be specified. Also, the dimension value that is used needs to be specified. Add the value Shipped to the Order Status Dimension, as illustrated below:

### Figure 79. Add value Shipped to Order Status Dimension

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Eile Edit Navigate Search Project Run Window	Help							
🗅 🕶 🖬 🗁   🖉 🎝 🎝 🎝 🎝 🖓   🖉   🖉   🂁 🕇 📝   🗸	$\Rightarrow \Rightarrow \Rightarrow \Rightarrow \Rightarrow$				🖺 🎯 Web 🕒	Resource	ce 🖪 Business *Debug 🗔 J2EE 🕫 Business	
ClipsAndTacksSample	2 OrderHandlingFut	ure1 🖪	ClipsAndTa	ksBPELMM	Admin Consol	le 🔼	*ClipsAndTacksMergedS × 🖓 Order Handling	) (Future 1 🖉
KPI Model								H #
□ B ClipsAndTacksMergedSample	<ul> <li>KPI Details</li> </ul>							^
In the second	Edit the details of	f the KPI, v	vhich is a pe	rformance meas	surement used t	to track t	business objectives.	
Average Order Fulfillment Time     Average Order Price (US Dollars)	ID: Ave	erage_Orde	er_Fulfillmer	t_Time				Edit
Belined Orders This Month	Name: Ave	erage Orde	r Fulfillment	Time				
Number of Sales This Month	Description:							~
- di Order Count Cancel								_
- in Order Count Check Account								~
Order Count Check Handling Policy     Order Count Parian	Type: Dur	ation						-
- Order Count Review								
- 👍 Order Count Shipped	* KPI Target and Ran	iges						
Percent of Orders Approved This Month     Total Sales Amount This Year	Specify a target,	which is ar	exact value	for the KPI to a	chieve, or rang	es again	nst which to track the KPI, or both.	
Total Sales Amount This Year - Canada	Target: 3 Days							Details
🛛 🍌 Total Sales Amount This Year - US	Ranges: Actual v	value						▼ Details
☐ Average Order Fulfillment Time Trigger 1	Range	name			Start value		End value	
	One Da	ly			0 Milliseconds	5	< 1 Days	
	Two Da	ays			1 Days		< 2 Days	e
	Four Da	ays			2 Days 3 Days		< 4 Days	
							Add Remov	Sort
	Specify how the v	value of the	e KPI is set.					
	Cube:	OrderHar	ndlinaFuture	1 Cube				Browse
			0.1.5.101					
	Measure:	Average	Order Fulfill	nent Time				browse
	Time dimension:							Browse
		Specify ti	me period C	Repeating <b>O</b> R	olling <b>O</b> Fixed			
	Dimensions:	Na	me	Attribute	Type	Value	e	
		B Or	der Status					
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- 2. For the Average Order Price KPI, specify the OrderHandlingFuture1 cube and specify a measure of Average Order Amount. (It may also be necessary to use
  - the XML editor to delete and extraneous <dimension/> tag in the XML. Make ID and Name as short as possible.

For example, you can change the ID to Average\_Order\_Price\_US\_Dollars.

3. For the Declined Orders This Month, specify the OrderHandlingFuture1 Cube, the Declined Order Measure and the Order Date Time dimension. Also make sure the type of Decimal is specified. You may also need to specify Target of 3, a High Range from 3 to 10 and a Low Range from 0 to 3. When entering the Ranges, a Name for each range attribute should also be specified.

#### Figure 80. Specify a Name for each range attribute

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	Time dimer	nsion: Ord	er Date						Browse
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Monitor Details Model Data Mart Model KPI Model Visua	Model Event Mo	del ClipsA	ndTacksMergeo	tSample.mm					×
I I									5

# 4. For the Number of Sales This Month KPI, add the OrderHandlingFuture1 Cube, and set Measure to Number of Orders and Time dimension to Order Date as shown:

1 IUUIE 01. DEL MEASUIE LO MUITIDEL OL OLUEIS ATIU TITTE UTITETISTOTI LO OLUEL DA	Figure 81	. Set	Measure to	o Number	of Orders	and Time	dimension to	o Order	Dat
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KPI Model									10 H
	Name: Descriptio Type: • KPI Targe Specify a	Name:         [Declined Orders This Month]           Description:							
Order Count Check Handling Policy	Target:	3							Details
- in Order Count Review	Ranges:	Actual v	/alue						Details
Order Count Ship     Order Count Shipped		B			Chart volue		Enduque		
Percent of Orders Approved This Month		High Ra	name		3 Start Value		< 10		
🛛 🍻 Total Sales Amount This Year		Low Ra	nge		0		< 3		
Total Sales Amount This Year - Canada									
Average Order Fulfillment Time Trigger 1									
	<ul> <li>КРІ Defin Specify hr Cube: Measure: Time dim</li> </ul>	tion ow the v ension:	value of the KPI is OrderHandlingFu Declined Orders Order Date Specify time period	set. ture1 Cube od © Repeating © R	olling O Fixed	1			Browse Browse Browse
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onitor Details model Data Mart Model KPI Model Visual	Model Event M	Iodel C	lipsAnd LacksMerg	edSample.mm					

5. For the Order Count Cancel KPI, specify the OrderHandlingFuture1 Cube and set Measure to Number of Orders. Next add the Cancel Order value string to the Order Status dimension and set Type to Decimal, as shown here:

# Figure 82. Set Type to Decimal

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KPI Model									II 🗄
■		Out of Co	and Control						^
B 🛃 Order Handling (Future 1) KC	Name:	Order Co	unt Cancel						
Average Order Fulfillment Time	Description:	Status eq	ual to Cancel O	rder					<u>^</u>
Average Order Price (US Dollars)     P									
e target	Turner	Decimal							
Belined Orders This Month	Type:	Decimar							
Number of Sales This Month									
- de Order Count Cancelled	<ul> <li>KPI Target a Specify a tar</li> </ul>	nd Ranges	is an evact valu	e for the KDI to	achieve or range	a against which to	track the KDL o	ar both	
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Order Count Check Handling Policy	Target:								Details
- B Order Count Review	Ranges:								<ul> <li>Details</li> </ul>
- B Order Count Shipped	Ra	inge name			Start value		End value		
Percent of Orders Approved This Month									
I otal Sales Amount This Year - Canada									
B di Total Sales Amount This Year - US									
Average Order Fulfillment Time Trigger 1									
								Add Remo	ve Sort
	- KDI Definikia	_							
	Specify how	the value	of the KPI is set						
	Cube:	Ord	erHandlingFutu	re1 Cube					Browse
	Measure:	Nun	nber of Orders						Browse
	Time dimen	sion:							Browse
		Spec	ify time period	• Repeating •	Rolling O Fixed				
	Dimensions		Name	Attribute	Time	Value			
	Diffensions	8	Order Status	Attribute	туре	value			
				Order Status	String	Cancel Order			
		_							
								Ad	d Remove
									~
Monitor Details Model Data Mart Model KPI Model Visua	Model Event Mod	del ClipsAi	ndTacksMerged	Sample.mm					
									6

6. Now, make sure each of these KPIs has Type set to Decimal, has Cube set to OrderHandlingFuture1, has Measure set to the Number of Order, and this value in the Order Status dimension check:

- Order Count Cancelled Cancelled
- Order Count Check Account Check Account
- Order Count Check Handling Policy Check Order Handling Policy
- Order Count Review Review Order
- Order Count Ship Ship Order
- Order Count Shipped Shipped

7. For the Percent of Order Approved This Month KPI, add the OrderHandlingFuture1 Cube, set Measure to Ship Percentage, set Time Dimension to Order Date, and add the Completed string to the is Approval Step Completed dimension. This is shown here:

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)

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KPI Model						
GlipsAndTacksMergedSample	Name:	Percent of Orders Approve	d This Month			
	Description:					< >
<ul> <li>In Declined Orders This Month</li> <li>In Number of Sales This Month</li> </ul>	Type:	Decimal				
- In Order Count Cancel	<ul> <li>KPI Target a</li> </ul>	nd Ranges				
Order Count Check Account	Specify a tar	rget, which is an exact value	for the KPI to achieve	e, or range	es against which to track the KPI, or both.	
- In Order Count Check Handling Policy	Target: 90	1.0				Details
Order Count Review     Order Count Shin	Ranges: Ac	tual value			•	Details
- III Order Count Shipped	Ra	ange name	Star	t value	End value	
🛛 🍓 Percent of Orders Approved This Month	Hi	gh Range	90		< 100	
Total Sales Amount This Year - Canada	Lo	w Range	0		< 90	
• I Total Sales Amount This Year - US						
	- KPI Definition Specify how	n the value of the KPI is set.			Add Remove	Sort
	Cube:	OrderHandlingFuture:	L Cube			Browse
	Measure:	Ship Percentage				Browse
	Time dimen	ision: Order Date				Browse
		Specify time period O	Repeating O Rolling	O Fixed		,
		Period type M Base period on O	onthly ▼ Last full period ♥ Pe	riod in pro	ogress	
	Dimensions	Name	Attribute	Туре	Value	
		Is Approval	Is Approval Step	String	Completed	
					Add	Remove
Monitor Details Model Data Mart Model KPI Model Visual	Model Event Mo	del ClipsAndTacksMergedSa	mple.mm			
						<b>90</b>

8. Change the ID and Name values to be as short as possible. For example, you can change the ID to Perc\_of\_Orders\_Approved\_Month and the Name to Perc of

Orders Approve Month.

9. For the Total Sales Amount This Year, specify the OrderHandlingFuture1 cube, set Measure to Total Order Amount and Time dimension to Order Date, as seen here:

Figure 84. Set Measure to Total Order A	Amount and Time dimension to Order Date
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KPI Model									
GlipsAndTacksMergedSample     BI Order Handling (Future 1) KC	Name:	Total Sale	es Amount This	Year					^
Average Order Fulfillment Time     Average Order Price (US Dollars)	Description:								< >
target     Heclined Orders This Month     Heclined Orders This Month	Type:	Decimal							•
Order Count Cancel     Order Count Cancelled     Order Count Cancelled	<ul> <li>KPI Target an Specify a target</li> </ul>	d Ranges get, which	is an exact valu	ie for the KPI t	o achieve, or ran	ges agains	st which to track the KPI, o	r both.	
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In Order Count Review     In Order Count Ship	Ranges: Ad	ual value							▼ Details
- li Order Count Shipped	Ra	nge name			Start value		End value		
Percent of Orders Approved This Month	Po	Dr			0		< 100000		
Total Sales Amount This Year     Total Sales Amount This Year	Fai	r ed			100000		< 200000		
Total Sales Amount This Year - US	Ex	cellent			300000		< 400000		
Average Order Fulfillment Time Trigger 1									
								Add Remo	ve Sort
	Specify how	the value	of the KPI is set						
	Cube:	Orde	erHandlingFutur	re1 Cube					Browse
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			base period on	C Last ruit per	oa 🛛 Perioa in p	rogress			
	Dimensions:		Name	Attribute	Type	Value			
								Add	1 Remove
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			gen.						G

10. For the Total Sales Amount This Year – Canada KPI and the Total Sales Amount This Year – US KPI, specify the OrderHandlingFuture1 Cube, set Measure to Total Order Amount and Time dimension to Order Date. Also, add the string Canada or US for the Country dimension. The Canada KPI is shown here:

Figure 85. Add the string	Canada or US for the Count	y dimension
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PI Model									10		
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All Order Handling (Future 1) KC     And Average Order Fulfillment Time     In Average Order Price (US Dollars)     A arages	Description:								(K. 18		
le target     Jeclined Orders This Month     Junction Sales This Month	Type: D	Type: Decimal									
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Order Count Check Handling Policy     Border Count Review     Order Count Rip     Order Count Ship     Order Count Shipped     Berecent of Orders Approved This Month     Borde Sche Chemistry This Month	Target: [1500	0.0							Details		
	Ranges: Actua	l value							Details		
	Rang	Range name			Start value		End value		2		
	Poor	Poor					< 50000				
- In Total Sales Amount This Year - Canada	Good	od			100000 < 1500		< 150000				
* 谢 Total Sales Amount This Year - US 🚽 Average Order Fulfillment Time Trigger 1	Excell	lent			150000		< 200000				
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	Measure:	Measure: Total Order Amount									
	Time dimension: Order Date								Browse		
		Spec	ify time perio	d 🛛 Repeating	O Rolling O Fixed						
		1	Derlord type	Yearly							
		Base period on O Last full period $\Theta$ Period in progress									
	Dimensions:		Name	Attribute	Type	Value					
		В	Country	Country	Christe	Canada					
				Country	Suing	Callaua					
		-									
								Add	Remove		

- 11. Make ID and Name as short as possible. For example, to Total Sales Amount This Year – Canada KPI, you can change the ID to Total\_Sales\_Amount\_This\_Year\_Ca and the Name to Total Sales Amount This Year Ca.
- \_\_\_\_\_ 12. Finally, delete the **Average Order Fulfillment Time Trigger 1**. This completes the merging of the KPI model and the BPEL model.

# Part 5. Deciding which approach to use

The dual-model approach is certainly the more complex approach. The data required in the KPI model must be duplicated in the BPEL model, and the events needed to keep the KPI model up-to-date must be created and debugged. The dual-model approach requires more upfront development time, including the creation and deployment of multiple models with the associated databases. The dual-model approach results in performance less than the mergedmodel approach.

Maintenance is another consideration for deciding which approach to use.

- If the data that is being generated is relatively static, but the BPEL process is changing, it might be easier from a maintenance standpoint to use the dual-model approach. If the BPEL model changes, you can make the required changes to the BPEL, but you might not have to make any changes to the KPI model.
- Otherwise, the simpler maintenance for the merged model makes it the better approach to use for most situations.

# Part 6. How to run the sample

Follow these steps to run data through the process.

- \_\_\_\_\_1. Start Monitor Server, Business Process Server and Dashboard Server.
- \_\_\_\_\_2. After deploying the EAR files, run these BPEL process steps.
  - \_\_\_\_a. Create the database and tables: <u>http://localhost:9082/ClipsAndTacksFrontWeb/Creat</u> <u>eDatabaseServlet</u>
  - \_\_\_\_b. Place orders: http://localhost:9082/ClipsAndTacksFrontWeb
  - \_\_\_\_ c. Process orders: <u>http://localhost:9082/ClipsAndTacksHumanCustom</u> Web/.

Run the custom human task applications to process the human tasks. You can review orders and approve or decline them.

The server name and port in the URL may need to be changed according to your server configuration.

For detailed information, see the document for the sample scenario entitled **Generating a Monitor Model for a BPEL process**.



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