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WebSphere® Business Monitor V6.0.2

Monitor Model Editor – Other Models



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This presentation covers using the Monitor Model Editor (MME) to create sub-models.

Goals

- Describe the functionality of the Monitor Model Editor (MME) as it relates to several of the sub-models in WebSphere Business Monitor V6.0.2.



The goal of this presentation is to describe use of the Monitor Model Editor to create several of the sub-models for WebSphere Business Monitor V6.0.2.

Agenda

- Data mart model
- KPI model
- Visual model
- Event model
- XML editor



The agenda includes in-depth coverage of four of the five different sub-models within a monitor model and coverage of the XML editor.

Section

Data Mart Model

This section describes the data mart model in the MME.

Data mart model

- Defines
 - ▶ Cubes
 - ▶ Dimensions
 - ▶ Facts
 - ▶ Measures

Dimensions
Add dimensions and their hierarchical attributes. Each attribute level enables you to aggregate the levels that are underneath it.

Cube / Dimension	Dimension Attribute	Source	Is Key
ClipsAndTacks MC Cube		ClipsAndTacks MC	
Start Time Dimension			
Order Status Dimension			
Location			

Details... Add Cube... Add Dimension... Add Attribute... Remove Move Up Move Down

Facts
A fact is required for each metric, counter, and stopwatch that is not a dimension attribute. Facts are the basis for any measures you create.

Cube / Fact Table	Fact Attribute	Source
ClipsAndTacks MC Cube		ClipsAndTacks MC
ClipsAndTacks MC Fact Table		
	ClipsAndTacks Key Fact	ClipsAndTacks Key
	Order End Time Fact	Order End Time
	Order Fulfillment Duration Fact	Order Fulfillment Duration
	Ship Percentage Fact	Ship Percentage

Details... Add Cube... Add Attribute... Remove

Measures
Add measures, which are calculations performed on facts to collect and combine them into a single value.

Cube	Measure	Source	Aggregation Function
ClipsAndTacks MC Cube		ClipsAndTacks MC	
	Average Order Fulfillment	Order Fulfillment Duration Fact	Average
	Average Ship Percentage	Ship Percentage Fact	Average
	Sum Order Price	totalPrice Fact	Sum
	Order Count	ClipsAndTacks Key Fact	Count

Monitor Details Model **Data Mart Model** KPI Model Visual Model Event Model ClipsAndTacks.mm

Shown here is a screen capture of the Data mart model in the MME, which is used to define cubes, dimensions, facts and measures.

Cubes

- Automatically created when MC is created
- Only one cube allowed per MC
- A cube can contain 0 or more dimensions



Cubes are automatically created when a monitoring context is created in the MME and only one cube is allowed per monitoring context. A cube can contain zero or more dimensions, which are used for multi-dimensional analysis.

Dimensions

- Contains one or more attributes
- Attribute source is metric, counter or stopwatch
- Order of attributes represents the level
- 'Is Key' used for indexing the data at runtime

▼ Dimensions
Add dimensions and their hierarchical attributes. Each attribute level enables you to aggregate the levels that are underneath it.

Cube / Dimension	Dimension Attribute	Source	Is Key
[-] ClipsAndTacks MC Cube		ClipsAndTacks MC	
[-] Start Time Dimension			
[-] Order Status Dimension			
[-] Location			
	Country	country	<input checked="" type="checkbox"/>
	City	city	<input checked="" type="checkbox"/>

Details... Add Cube... Add Dimension... Add Attribute... Remove Move Up



A dimension can contain one or more attributes, such as a metric, counter or a stopwatch. The order of the attributes is important and represents the level of each attribute. For example, in this screen capture, Location is a dimension and country and city are attributes of Location, allowing you to drill down on facts based on country first, then for a specific country to specific cities in that country. You can use the 'Is Key' checkbox to index the information for improved performance.

Facts

- Fact table is built automatically based on keys, metrics, counters, stopwatches that are defined in the MC
- Used as the source when defining measures
- Any metrics which are defined as dimensions are removed from the fact table

▼ Facts
A fact is required for each metric, counter, and stopwatch that is not a dimension attribute. Facts are the basis for any measures you create.

Cube / Fact Table	Fact Attribute	Source
[-] ClipsAndTacks MC Cube		ClipsAndTacks MC
[-] ClipsAndTacks MC Fact Table		
	ClipsAndTacks Key Fact	ClipsAndTacks Key
	Order End Time Fact	Order End Time
	Order Fulfillment Duration Fact	Order Fulfillment Duration
	Ship Percentage Fact	Ship Percentage

Details... Add Cube... Add Attribute... Re

Facts are metrics that will be used for aggregation purposes. The fact table is built automatically based on the keys, metrics, counters and stopwatches that you define in the monitoring context. When you create an aggregate measure in the data mart model, you pick one of the facts in the fact table to be used as the source for the aggregation. A metric can be used as a dimension or a fact, but not both.

Measures

- A cube can contain 0 or more measures which are used for aggregation
- Source is a fact which can be a key, metric, counter, stopwatch which is defined in the MC
 - Aggregation Function is average, count, max, min, sum
 - ▶ For user defined function, create calculated member in Alphablox
 - <http://publib.boulder.ibm.com/infocenter/abxhelp/v8r4m0/topic/com.ibm.db2.abx.dev.doc/abx-t-develop-320.html>
 - ▶ Percentage function
 - Create an integer metric with values 100 or 0 depending on triggers
 - Create a measure sourced on the metric with 'Average' aggregation function
- A metric can be a dimension or measure but not both

▼ Measures
Add measures, which are calculations performed on facts to collect and combine them into a single value.

Cube	Measure	Source	Aggregation Function
ClipsAndTacks MC Cube	Average Order Fulfillment	ClipsAndTacks MC	
	Average Ship Percentage	Order Fulfillment Duration Fact	Average
	Average Order Price	Ship Percentage Fact	Average
	Sum Order Price	totalPrice Fact	Average
	Order Count	totalPrice Fact	Sum
		ClipsAndTacks Key Fact	Count

Details... Add Cube... Add Measure... Remove

A measure is created to perform aggregations, especially as a source for a KPI. A cube can contain 0 or more measures. The source for the aggregate measure is a fact, which can be a key, metric, counter or stopwatch, in the fact table. The functions that are available for aggregation are average, count, max, min or sum. If a user-defined function is required, you can create what is called a calculated member in Alphablox.

If you need a percentage function, you can do this using a special integer metric which would contain value 100 or 0 depending on triggers within the model, which you can use to calculate the percentage using an average aggregation function on the metric.

A metric can be in a dimension or in a measure, but not both.

Section

KPI Model

This section describes the Key Performance Indicator (KPI) model in the MME.

KPI Modeling

- KPIs are driven by ***cubes***
- Data can be aggregated before terminating the monitoring context
- KPIs are defined with ***ranges***
 - ▶ Ranges can have a **range name**, a **start value** and an **end value**
- KPIs can only be of the types ***decimal*** and ***duration***



KPIs are aggregated metrics that have some acceptable range or target defined and allow you to calculate using some aggregation function such as min, max, sum, count, or average. They are driven by cubes in version 6.0.2, and data must be aggregated before terminating the MC. KPIs can be defined as type decimal or duration.

To work with KPI's in your model, you must click on the **KPI Model** Tab in MME. KPI values cannot be referenced directly from a Monitoring Context and likewise, Monitoring Context elements cannot be referenced directly from an element in a KPI context. Rather, outbound and inbound events must be created in the corresponding contexts to send and listen for this data.

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KPI Model

- One or more KPI Context definitions can be added to the KPI Model
- Right click on the model
 - ▶ New > KPI Context

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Shown here is a screen capture of the KPI model tab in the MME.

You can create one or more KPI contexts (KC), which are simply a container for your KPIs, per model. You can associate a separate SVG diagram in the visual model with each KC and MC in the model.

To create a new KC, right click on the model in the tree and select New, then KPI Context.

KPI Context

- You may view the details of KPIs, triggers, inbound events, outbound events (no edit)
- You may double click on an item in the table to open the editor for that item
- Single click on the item in the tree to open the editor

KPI Context Details
Edit the details of the KPI context, which contains KPIs.

ID:

Name:

Description:

KPIs

ID	Name	Type
Average_Order_Fulfilme...	Average Order Fulfilmen...	duration
Average_Order_Price_KP...	Average Order Price KPI...	decimal
Declined_Order_KPI	Declined Order KPI	decimal
Percent_of_Orders_Appr...	Percent of Orders Appr...	decimal

Triggers

Inbound Events

Outbound Events

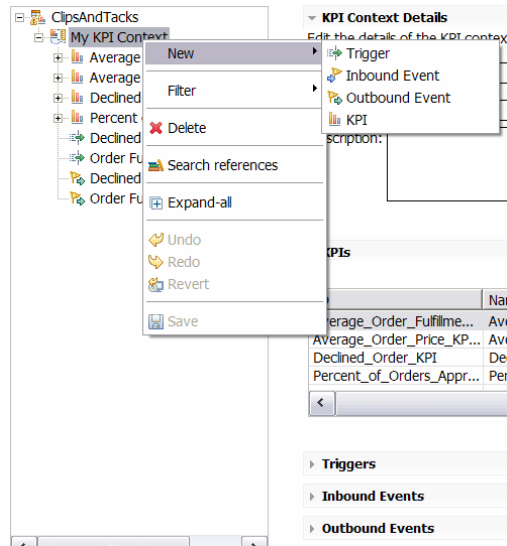
Single click to bring up the editor for the item

Double click to bring up the editor for the item

Shown here is a screen capture of the KPI Context page. You can define KPIs, triggers, inbound events and outbound events in the KC, so they are shown in the tree view. You can double click on an item in the table on the right side of the page or single click on the item in the tree to open the editor.

KPI Context

- Right click on the KPI context to create new KPI elements
 - ▶ Trigger
 - Like MC trigger, except cannot terminate MC and condition based on KPIs only
 - ▶ Inbound Event
 - Like MC inbound event, except condition/trigger based on KPI context artifacts not MC
 - ▶ Outbound Event
 - Like MC outbound event, except condition/trigger based on KPI context artifacts not MC
 - ▶ KPI



In the KPI Context, you can define triggers, inbound events, outbound events or KPIs. KC triggers can be evaluated based on inbound events or periodic evaluations, but they cannot terminate an MC and a KPI condition must be based on KPI values. An inbound event is used to trigger KPI calculations or outbound events in the KC. An outbound event can be used to emit business situation events or other events, based on triggers or inbound events defined in the KC. KPIs are defined in the KC to support key performance indicators for your business.

To create the four elements of the KC, right click on the KC in the tree and select New, then the element type.

KPIs



- A cube is automatically created when the model is created
- You may want to define the measure in the cube before creating the KPI, but you can create the measure on-the-fly in the KPI wizard

A KPI is based on cubes for version 6.0.2 and when you create a model, a cube is created for you in the model. You can create the measure in the data mart model for the cube prior to creation of the KPI, but you can also create the measure while you are using the KPI creation wizard.

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KPI Page Part 1

- Type is decimal or duration
- Target
 - ▶ Specify value
- Ranges
 - ▶ Actual value – upper/lower values
 - ▶ Percentage of target value – target margins expressed as percentage of target (target = 100%)
 - ▶ Range name, start value, end value
 - ▶ No gaps/overlaps allowed in ranges

ID:

Name:

Description:

Type:

KPI Target and Ranges
Specify a target, which is an exact value for the KPI to achieve, or ranges against which to track the KPI, or both.

Target:

Ranges:

Range name	Start value	End value
Day 1	0 Milliseconds	< 1 Days
Day 2	1 Days	< 2 Days
Day 3	2 Days	< 3 Days
Day 4	3 Days	< 4 Days

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Shown here is a screen capture of the top portion of the KPI page in the MME, where the type can be defined as decimal or duration. You can optionally specify a target value for the KPI. For ranges, you can specify actual value or percentage of target value. For actual value, ranges will reference upper and lower bounds for the KPI range. For percentage of target value, the ranges will specify target margins as a percentage of the target where the target is 100 percent. For each range, you specify a name, start value and end value. Ranges must be contiguous so there cannot be any gaps in the ranges and ranges cannot overlap one another.

KPI Page Part 2

- Select a cube in any MC in the model
- Select a measure existing in the cube
- Time dimension – select a dimension with source type Date or DateTime
- Time period
 - ▶ Repeating – daily, monthly, yearly; last period or period in progress (UTC time zone)
 - ▶ Rolling – number of days (max 100 days); last period or period in progress (UTC time zone)
 - ▶ Fixed – start date, end date (max 100 days)
- Dimensions – to use as a filter
 - ▶ No quotes on string values

KPI Definition
Specify how the value of the KPI is set.

Cube:

Measure:

Time dimension:

Specify time period Repeating Rolling Fixed

Start date:

End date:

Dimensions:

Name	Attribute	Type	Value
Order Sta...	Order Status	String	Shipped



Shown here is the second part of the KPI definition page in the MME, where you select the cube from any monitoring context and a measure that was defined in the data mart model for that cube. You can optionally choose a time dimension to be used to restrict the KPI aggregation to specific time periods. The time periods can be repeating, rolling or fixed. Repeating periods can be daily, monthly, or yearly and based on the last completed period or the period in progress. Rolling periods are specified as a number of days and fixed periods are specified as a specific start date and end date. The repeating and rolling periods are based on the UTC time zone, and the rolling and fixed periods have a limit of 100 days.

You can optionally specify a dimension to be used as a filter. In the example you see that this KPI is only going to show values where the Order Status metric is set to 'Shipped' and you do not use quotes here for specifying the attribute value.

Best practice is to name the KPI to include the time period information and dimension filter information. On the KPI views, this information is available, but you have to navigate to edit mode in the view to find it.

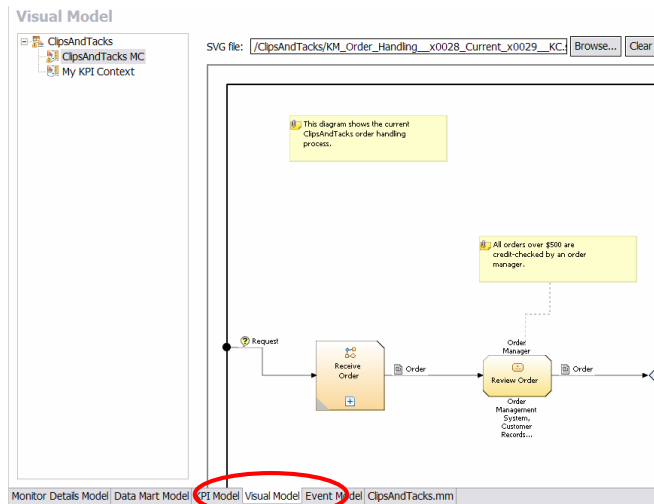
Section

Other Models

This section describes other models not previously covered in this presentation.

Visual model

- You can associate a diagram with MC or KPI context
- Diagram is an SVG file
- Displayed in Diagram view on the dashboards



By clicking the Visual Model tab in the model, you can associate one SVG diagram with each monitoring context and each KPI context in the model. These diagrams are displayed on the Diagram view on the Monitor dashboard. You can also use the XML model editor to add visual model constructs to the XML model, so you can annotate the SVG diagrams to display metric values or KPI values or to perform other functions such as changing the colors of shapes or performing inter-diagram navigation.

Event model

- Lists the event definitions in the model
 - ▶ Common Base Event file name
 - ▶ Event definitions in each file – the same as the event definitions listed in Project Explorer for the model

Event Model

This table lists the event definition files that are included in the event model.

Import Location	Event Definition Name	
ActivityEvent.cbe		
NewOrderEvent.cbe		
DeclinedOrderEvent.cbe		
LateAverageOrderShippedEvent.cbe		

Add Remove

Monitor Details Model | Data Mart Model | KPI Model | Visual Model | **Event Model** | Clips and Tacks.mm

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By clicking on the Event Model tab in the MME, you can see the event definitions that have been imported into the project. Each event definition is a filename that ends with the .cbe extension. There may be one or more Common Base Event definitions in each file and you will see the event types listed in the project explorer view.

Section

Other Editors/Views

This section describes other editors and views in the MME.

XML editor

- Text based view of the GUI form editors
- Updates can be made in the GUI editors or the XML editor or both
- Useful for copy/paste functions between models

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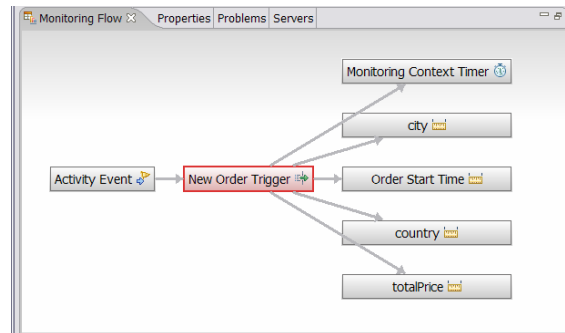
<?xml version="1.0" encoding="UTF-8"?>
<mm:monitor xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" id="MDM">
  <monitorDetailsModel displayName="ClipsAndTacks" id="MDM">
    <monitoringContext displayName="ClipsAndTacks MC" id="Clip">
      <trigger displayName="Ship Order to Customer Trigger" id="Ship_Order_to_Customer_Trigger">
        <onEvent ref="Activity_Event"/>
        <gatingCondition expression="Activity_Event/extendedData/Activity_Event"/>
      </trigger>
      <trigger displayName="Cancel Trigger" id="Cancel_Trigger">
        <onEvent ref="Activity_Event"/>
        <gatingCondition expression="Activity_Event/extendedData/Activity_Event"/>
      </trigger>
      <trigger displayName="New Order Trigger" id="New_Order_Trigger">
        <onEvent ref="Activity_Event"/>
        <gatingCondition expression="Activity_Event/extendedData/Activity_Event"/>
      </trigger>
      <inboundEvent displayName="Activity Event" id="Activity_Event">
        <correlationPredicate expression="ClipsAndTacks_Key = ClipsAndTacks_Key"/>
        <filter expression="Activity_Event/extendedData/Activity_Event"/>
      </inboundEvent>
      <metric displayName="ClipsAndTacks Key" id="ClipsAndTacks_Key">
        <map>
          <outputValue>
            <singleValue expression="Activity_Event/extendedData/Activity_Event"/>
          </outputValue>
        </map>
      </metric>
      <metric displayName="Order Start Time" id="Order_Start_Time">
        <map>
          <trigger ref="New_Order_Trigger"/>
          <outputValue>
            <singleValue expression="Activity_Event/extendedData/Activity_Event"/>
          </outputValue>
        </map>
      </metric>
    </monitoringContext>
  </monitorDetailsModel>
</mm:monitor>

```

By clicking on the modelName.mm tab in the MME, you will open the XML text editor for the monitor model file. When updating the monitor model using the graphical pages, the XML mm file is created for you in the background. You can use the graphical pages or the XML editor to update the model. The XML text editor is useful if you need to copy portions of another model into a new model. Just like for the graphical pages, when you make changes using the XML editor then save the changes, validation occurs immediately and you can see errors in the problems view.

Monitoring Flow View

- For a selected element, this view shows other elements that activate it or are activated by it
- Double click on an element to bring up its flow view
- Applies to Monitoring Context and KPI Context to these elements:
 - ▶ Key
 - ▶ Metric
 - ▶ Counter
 - ▶ Stopwatch
 - ▶ Trigger
 - ▶ Inbound event
 - ▶ Outbound event



The Monitoring Flow view shows the relationship that exists between elements in the model, so if you select an element in the tree of the Monitor Details model or the KPI model, you will see that element and any other elements that it activates or that activate it. To see the flow view for any other element of the flow view, double click on an element in the flow.

The monitoring flow view applies to MCs and KCs and only to keys, metrics, counters, stopwatches, triggers, and inbound and outbound events.

Summary

- You have reviewed how to use the MME for the data mart model, KPI model, visual model, event model, along with the XML editor



In summary, this presentation provided a review of how to use the MME to maintain four of the five sub-models in WebSphere Business Monitor V6.0.2, along with the XML editor and Monitoring flow view.

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