WebSphere® Business Monitor V6

Dimensions in the Business Measures Editor

IBM Software Group

This presentation will cover dimensions in the Business Measures Editor.

Goals

- Show how to use the Business Measures Editor to work with Dimensions

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The goal of this presentation is to demonstrate how to use the Business Measures Editor with data dimensions.

Agenda

- Define Dimensions

- Using dimensions in analysis

- Creating and configuring dimensions

The agenda of this presentation begins with defining dimensions, then covers using dimensions for analyzing data. The last section covers creating and configuring the dimensions in the Business Measures Editor.

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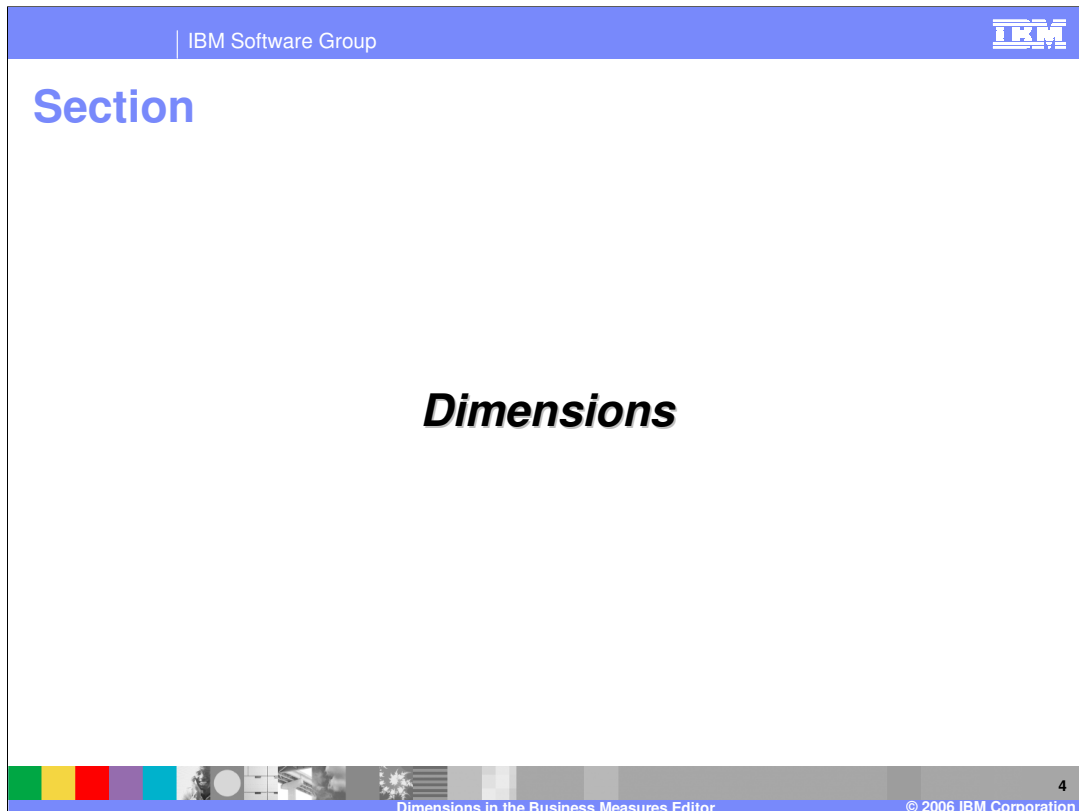
Dimensions

Before describing how to configure Dimensions in WebSphere Business Modeler, it is necessary to provide an explanation of what they are and what they enable.

A 'Dimension' is a way in which you can group together your process instances.

For example, you could group order processes together by 'Customer Location'. You could group Utility Bill Complaint Processes by 'Account Type'.

You can perform powerful analysis of your data by looking at it 'by dimension'. For example OrderPrice **by customer**, Complaint Resolution Time **by Country**, or Call Handle Time **by employee.**

What are Dimensions?

- Process data can be described in terms of:
  - Aggregated Quantitative Data (what you measure/count)
  - Dimensions (how you divide up the data)

- Dimensions provide structure that summarizes measures

- Example Aggregated Quantitative Data:
  - Average Order Price, Total Sales, Longest Shipping Time …

- Example Dimensions:
  - Customer, Address, Product …

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The Dimension is a grouping or structure for you to summarize data. Dimensional Analysis is a much more powerful mechanism for performing **aggregation** than the simple 'Aggregated Metrics/KPIs' that only look at **all finished instances**. Dimensions allow you to make similar calculations **for a specific group of processes**, where the Dimension defines what that group is.

Dimensional analysis takes some **quantitative data** (that is calculated for every process instance) and then **aggregates** it across a group of processes (where the group is defined by a dimension)

What is Dimensional Analysis?

- Dimensional Analysis enables a breakdown of quantitative measures by some grouping (dimension)

- Typically this format:
  - 'function' of a 'measure' by a 'dimension'

- For example:
  - **Average** of **Profit** by **City**
  - **Total** of **Order Value** by **Customer**
  - **Maximum** of **Employee Salary** by **Time**

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The pattern: 'function' of a 'measure' by a 'dimension' is a useful one to remember.

The 'function of a measure' gives you the **Aggregated Quantitative Data**

Multi-Dimensional Analysis
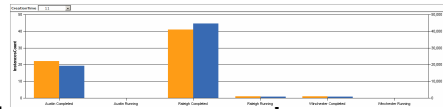
- Look at measures by **more than one** grouping or dimension at a time

- **Average** of **Profit** by **Business Unit** and by **Country**

- Sophisticated analysis is done using the WebSphere Business Monitor dashboards (see Dashboards presentation)

- Business Measures Editor is used to define which measures to analyze and the dimensional groups to use

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Multi-Dimensional Analysis is fully supported in WebSphere Business Monitor. You can look at measures by more than one grouping or dimension at a time and display the results graphically. The Business Measures Editor is used to define which groups to analyze.

Dimension Levels

- Dimensions can (optionally) have multiple levels

- Location   - Time   - Product
  - Continent   - Century   - Category
    - Country   - Year   - Name
      - Region   - Month
        - City   - Day

- Levels are defined in the BME
  - Level 0 is the top level (Continent)
  - Level 1 is the second level (Country)
  - …

By defining levels to a dimension, you enable the concepts of drill up and drill down – very powerful ways in which you can narrow down, or zoom out the particular subset of the overall data that you are looking at.

Dimensional Levels – Drill Up/Down

- Due to the layered structure of dimensions, analysis can be done at different levels

- For example, analyze order value by Continent, Country, or City

- Drill-Down means to move down to a lower level of analysis
  - ▶ Drill-Down on Country to see information by City

- Drill-Up is the opposite
  - ▶ Drill-Up from City to see information by Country

If you set up the Location dimension and give it three levels, Continent, Country, City, then you can drill up and down to show data by continent at first, then by country after drilling down, and then by City after drilling down further still.

Defining and Using Dimensions

- Dimensions are defined in the BME

- WebSphere Business Monitor then uses these definitions to create structured data stores (DB2® Cube Views) using star schemas

- Runtime data is captured, analyzed and persisted into these structured data stores

- WebSphere Business Monitor dashboards allow the user to graphically display and interactively analyze this data

In the Business Measures Editor it is only necessary to define all the dimensions and their layers. In the WebSphere Business Monitor you start to do all the analysis against each dimension – determining what drill down you want to look at that day. The Business Measures Editor defines the dimensional structure only, such as the dimensions and their layers.

When you import the Business Measures Model to WebSphere Business Monitor, it will read the dimensions you defined and create database schemas to store information in the right format to support analysis against those dimensions.

The dashboards in WebSphere Business Monitor then display the data and your users can interact with the dashboard to perform whatever multi dimensional analysis they want to.

Creating a Dimension

- The General page of the Attributes view in BME allows you to add Dimensions

- Simply add and name a Dimension

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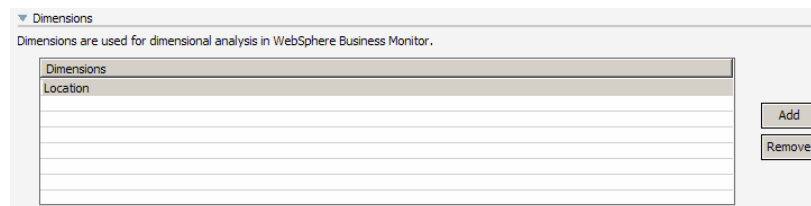
Defining a Dimension is simply a matter of giving the Dimension group a name. You subsequently will add the levels to it, and each level will need to be associated with some data.

An example might help to explain this. An in-built dimension is pre-defined and it is called 'Process State'. There is no such thing as a process that is in process state 'Process State'. This is just the title of the dimension. The 'Process State' dimension has one level called 'state' which can be either 'completed' or 'running'.

Take 'Location' as another example. This is the **title** of the Dimension, but it's first level is 'Country' and then 'City'.

So defining a Dimension is just a matter of giving a name.

Configuring Dimensions

- Instance Measures (Metric, Stopwatch, Counter) are used for dimensional analysis

- In the Business Measures Editor, each of these instance measures has a **'Dimensional analysis and database schema settings'** section

- In this section, to use dimensional analysis, define each instance measure as either:
  - ▸ 'Quantitative data in dimensional analysis' (measure)
  - ▸ 'Aggregation group in dimensional analysis' (dimension)

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Remember that Dimensions are used to **aggregate instance measures for a group of processes**. So you need to specify which **instance measures** you want to aggregate. And you also need to specify which **instance measures** you will use for your **groups or Dimensions.**

In the attributes for the instance measure types, Metric, Stopwatch or Counter, you have a section for setting the Dimension properties.

Example Aggregated Quantitative Measure

- OrderPrice is a measure that will be analyzed by dimension

Here is an example of the Dimension settings for a Metric.

If you choose that this metric is used as **quantitative data** then you must specify how you will aggregate that quantitative data by providing an **Aggregation Function** and the name of this aggregated measure

Example Dimension

- City is the second level in the Location dimension – levels start at zero

- Length 50 configures database constraint

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You specify that a measure is to be used in a Dimension by saying that it is part of an 'Aggregation Group'

You must also specify some basic information for the database so that Monitor will know what kind of schema to generate (this is quite technical for the Modeler product, but it is the only place you could define it as this model will be exported from Modeler and then be deployed immediately into Monitor (there are no more tools involved))

Select which dimension the metric is used for (for example Location is the dimension created earlier).

Notice the 'level'. This says what level within that dimension. The top level is 0, then 1 is the next down and so on.

Specify which fields belong to the dimension key .You need to set as many fields as possible to guarantee uniqueness. For example there might be a city called England in one country, and yet England is also a country itself. So displaying all orders for England does not specify enough information. So you have to combine City and Country (make both part of the dimension key) to guarantee uniqueness.

Summary

- Defined Dimensions

- Examined using dimensions in analysis

- Explored creating and configuring dimensions

In summary, this presentation has described dimensions and how they are used in data analysis, and looked at creating and configuring dimensions within the Business Measures Editor.

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