



IBM Software Group

WebSphere® Business Monitor V6

Dashboards – Configuring Reports and Dimensions Views



@business on demand.

© 2006 IBM Corporation
Updated February 9, 2006

This presentation covers the Reports and Dimension dashboard views in WebSphere Business Monitor V6

Goals

- Fully describe the following views provided with WebSphere Business Monitor V6
 - ▶ Reports View
 - ▶ Dimensions View

This presentation explains what the two views are and how to configure them to show data for specific process models.

Agenda

- Dimensions View
 - ▶ What are Dimensions?
 - ▶ What is multi-dimensional analysis
 - ▶ Overview
 - ▶ Configuration
 - ▶ Edit
 - ▶ Example
- Reports View
 - ▶ Overview
 - ▶ Configuration
 - ▶ Edit
 - ▶ Examples



The agenda for this presentation begins with a discussion of the concepts behind Dimensions and multi-dimensional analysis. Then it provides an overview of the Dimensions view itself before showing how to configure and edit that view. Then it looks at an example.

The Reports view is shown next. This is a subset of the Dimensions view capability. An overview of the capability of the view will be followed by configuration and edit guidance, and then examples

Section

Dimensions view ***What are dimensions?***



Here is a very quick description of what Dimensions are all about before going into more detail. Dimensions are basically a way of putting some structure around a set of measurements. For example you might have three measurements – the day a process was started, the month it was started and the year it was started. These can be grouped together into a Dimension called the ‘CreationTime’. You can then look at aggregate values for specific groups of processes by saying what the Dimension value is that you want to use. For example you could look for CreationTime = Jan 1st 2006 and then look at the average order price for that day.

What are dimensions?

- Process data can be described in terms of:
 - ▶ Quantitative Data (what you measure/count)
 - ▶ Dimensions (how you divide up the data)
- Dimensions provide structure that summarizes measures
- Example Quantitative Data:
 - ▶ Order Price, Number of Sales, Shipping Time ...
- Example Dimensions:
 - ▶ Customer, Address, Product ...



Begin by looking at what Dimensions provide for you in this analysis. The measurements might be quantitative data, for example 'account balance'. They might also be more related to a grouping, for example 'customer type'. The groupings are Dimensions. They allow you to look at quantitative aggregates like averages for specific groups of process instances. The groups are dimensions. The structure that the dimensions provide is a set of possible groupings and you can use these to look at your quantitative aggregates for individual groups of data.

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**



Dimensional Analysis is when you look at aggregates for specific dimensions. You look at an aggregated measurement for a given group or dimension. The aggregated measurement is a 'function of a measure', for example 'average of profit' and then the dimension is the grouping, for example 'by customer'. So customer is a way of grouping your process data so it is a dimension.

Multi-dimensional analysis

- Look at measures by more than one grouping/dimension at a time
- **Average of Profit by Business Unit and by Country**
- Dimensions and Quantitative Data are defined in the Business Measures Editor in WebSphere Business Modeler
 - ▶ See Business Measures Editor presentation and lab



Multi-dimensions is simply slicing your data by more than one dimensional criteria. For example you could look at the average profit per business unit (one dimensional) but then you could add 'per country' to that analysis so you can see average profit broken down by both Business Unit *and* Location.

Dimension levels

- Dimensions can (optionally) have multiple levels
- Location
 - ▶ Continent
 - Country
 - Region
 - City
- Time
 - ▶ Century
 - Year
 - Month
 - Day
- Product
 - ▶ Category
 - Name



Yet another useful capability with Dimensions is multi-levelled dimensions. Instead of simply looking at the average profit by County, why not introduce different levels of an overall dimension called Location. Then you could look at the continent, country, region or even city level for example.

Time is a classic multi-levelled dimension.

Using the Business Measures Editor you define all your own dimensions and specify which measurements to add to the dimension and what order the different levels come in. For example you specify to measure the continent, country, region and city and then add all these metrics to the Location dimension you create, specifying the different level of each metric within that dimension.

Dimensional levels – Drill up and drill 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



Once you have created multi-leveled dimensions you can analyze your data at different levels and can drill up and down amongst these levels, providing bigger or smaller granularity to the analysis.

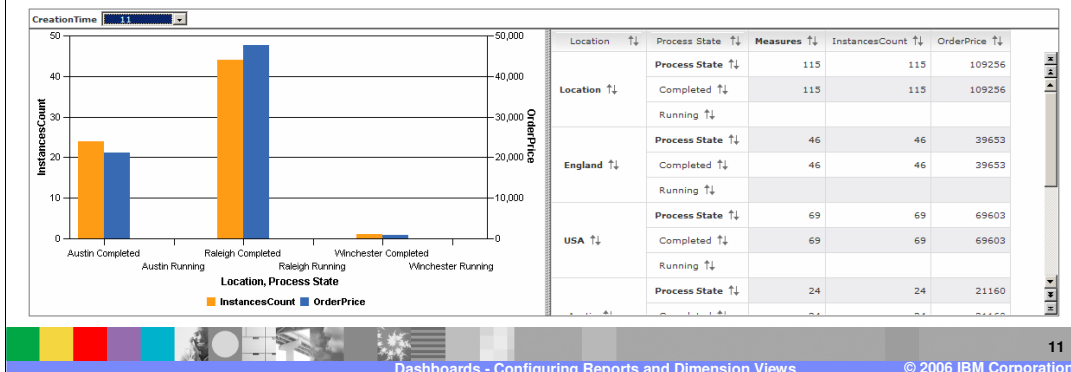
Section

Dimensions view overview

This section presents an overview of the dimensions view.

Dimensions view

- Generate multidimensional reports that analyze different business aspects of historical business-performance data
- Charts and tables present data for analysis against different dimensions
- Enables very powerful analysis of data



The Dimensions view is dedicated to performing dimensional analysis. It consists of a chart and a table. The chart can be many different types – a dual-axis vertical bar chart is shown in this example.

You can perform very sophisticated analysis with this view.

Dimensions view

- Built-in Dimensions
 - ▶ Start Time
 - ▶ Process State
 - ▶ CreationTime
 - ▶ TerminationTime
 - ▶ Measures

Every business measures model automatically contains certain dimensions and these are shown on this slide. The Time based dimensions contain year, month and day levels. The Process State dimension has one level and the possible values are: Completed, Running, Suspended while running, terminated.

The final dimension that is always provided is called 'Measures'. It is an important one and there is more detail on the next slide.

Measures dimension

- Measures is a special dimension that contains any measures that were specified as 'quantitative data for multidimensional analysis' in BME
 - ▶ It contains all quantitative measures
- Contains three built-in measures as well
 - ▶ InstancesCount
 - ▶ Elapsed Duration
 - ▶ Working Duration

The measures dimension is where all the quantitative measurements are kept. They all belong to this dimension automatically and it is a single leveled dimension. A quantitative measure is one that was defined in the Business Measures Editor (BME) as 'quantitative data for multidimensional analysis'.

There are three built-in quantitative measures that are automatically provided with all business measures models.

InstancesCount – the number of instances of that process

Elapsed Duration – the overall time taken to run a process instance

Working Duration – the time involved in actually running the activities in the process, rather than the overall elapsed time.

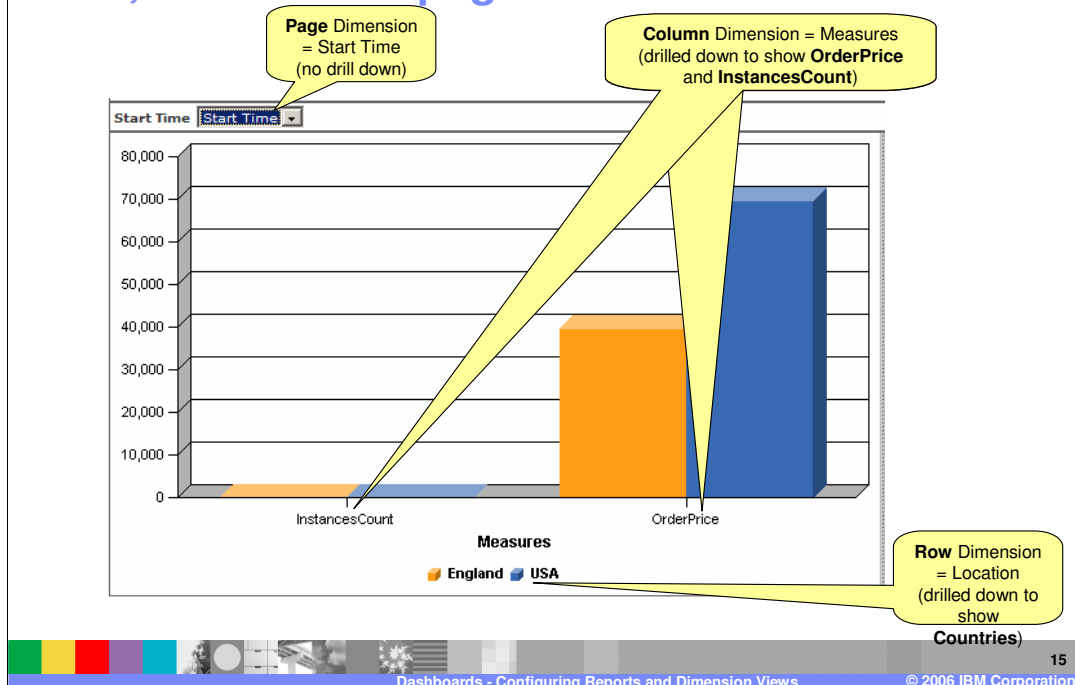
Row, column and page dimensions

- Three ways of using Dimensions
 - ▶ 'Row', 'Column' and 'Page'
- Row Dimension
 - ▶ Shown as separate bars on chart x-axis
- Column
 - ▶ Shown by bar height against y-axis
- Page
 - ▶ Drop-down selection box that filters chart based on select dimension value



The Dimensions View allow you to set each of your dimensions as either row, column or page dimensions. This affects how the chart and table looks. The column dimensions are typically quantitative and are shown on the y-axis. The row dimensions determine what the different items on the x-axis are. The page dimension is like a filter – a drop down selection box that allows you to select dimensional values/filter criteria for the data being shown.

Row, column and page dimensions



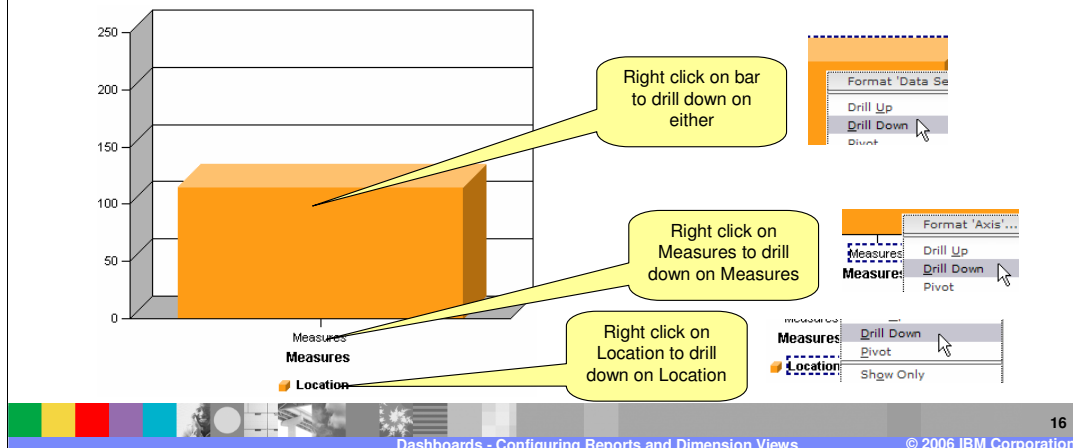
The Measures dimension has been specified as a Column dimension in this example so the y-axis measures this dimension. Because it has been drilled down it is showing two of its quantitative measurements – InstancesCount and OrderPrice.

The Location has been specified as a Row dimension and has also been drilled down, this time to the country level. So this causes the x-axis to break up into separate bars for the country.

Finally the Start Time dimension is specified as a Page dimension, meaning that the drop down box allows you to select a certain year, month or date by which the data will be filtered.

Drill up and drill down

- Chart is shown at highest level of Location and Measures dimension (fully drilled up)
- Requires multi-level dimension



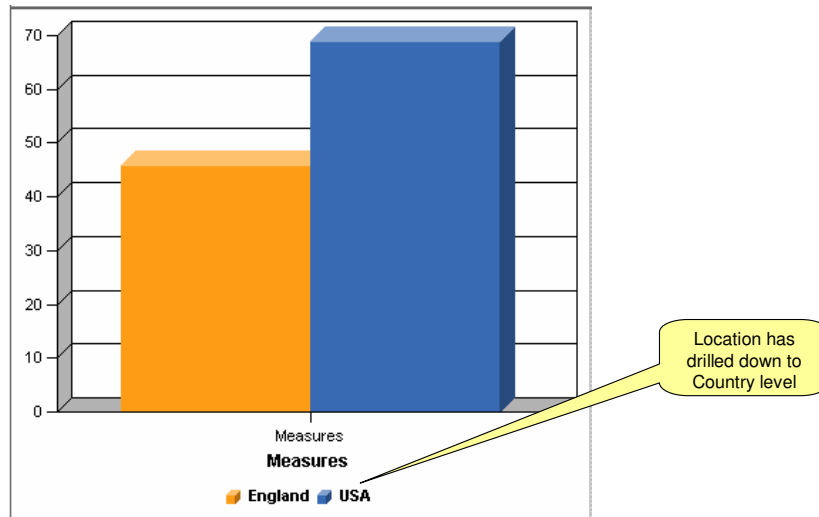
Now you can see the previous chart without any drill downs. The Measures and Location dimensions are at their top level so there is no breakdown into specific measurements or locations.

Right clicking on the bar itself will allow you to select Drill Down and then you are offered which dimension (Measures or Location) you would like to drill down on. Alternatively you can right click on the specific dimension and choose drill down to automatically drill down on the specified dimension.

Drill Up is the same, but must be performed on a non-root level of a dimension, otherwise an error message is displayed.

Drill down example

- Result of drilling down on Location in previous chart:



Here you can see that after drilling down on location, the country level is shown.

Section

Dimensions view configuration

This section covers the configuration of the dimensions view.

Dimensions view configuration

- Choose Subject Area
- Select dimensions, add to row, column or page
 - ▶ Column requires at least one dimension
 - ▶ Page, Row optional
- Typically add 'Measures' as Column dimension
 - ▶ Contains quantitative measures

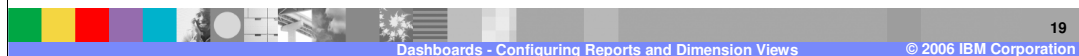
Available dimensions:

- Process State
- TerminationTime
- CreationTime
- Location
- Measures
- Start Time

Row dimensions:

Column dimensions:

Page dimensions:



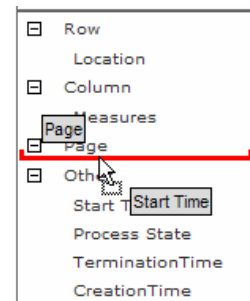
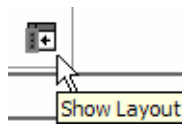
Click the Configure icon (as shown in the top right) for the Dimensions portlet to begin configuring it. You are asked to choose a Subject Area. The Subject Areas are 'monitoring contexts' and these will depend on your process design. Typically you will choose the process name here (or sub-process).

There is also an option of an aggregates subject area called 'processname aggregates' but this does not contain anything extra so you should not select that.

Then you can choose which dimensions to display as row, column or page. Typically you will put Measures as a Column dimension because these values are quantitative so will be measured on the y-axis. You must specify at least one column dimension or there is nothing to display.

Dimensions view configuration – Preview

- Customize the chart/table significantly using Alphablox tools
 - ▶ Titles, Colors, Axis, Chart Type, Grid Lines ...
- Further changes to page/row/column dimensions can be done using 'Layout' editor
 - ▶ Click Show Layout icon
 - ▶ Drag and drop of dimensions



The next configuration page is a preview, but you can make many changes even in the preview mode before finally clicking Finish. You can even dynamically change the choices of row, column and page dimensions by clicking the 'show layout' button and then dragging and dropping.

Right clicking on the chart brings up some further self explanatory options for customizing the appearance, changing fonts, titles, axes, gridlines and so on. Most important is the ability to display other chart types like pie charts, waterfalls, radars, histograms and so on. You are not restricted to a bar chart.

Dimensions view configuration – Preview



- Drill up/down appropriately when configuring view
 - ▶ Drill level changes in preview are saved (unlike Reports View)
 - ▶ The view user will also be able to drill up/down but configuration sets the default drill levels
- Show/Hide pieces of data
 - ▶ Right click, choose 'Show Only' 'Hide', 'Unhide All'
- Show/Hide chart or table



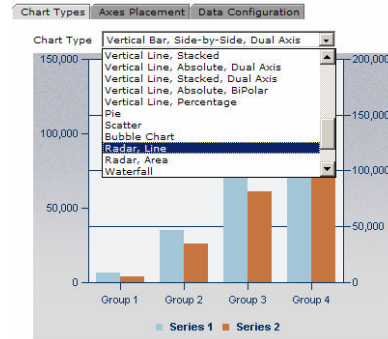
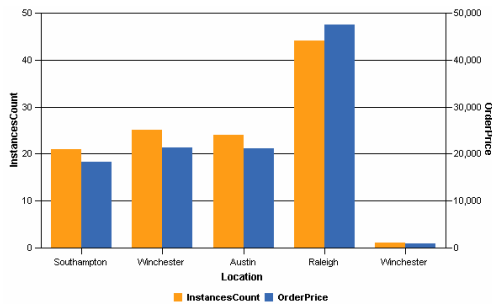
You can also set the drill down level on each dimension by changing it on the preview screen. The results will be saved so that a user who logs in will see this level of drill down. When the user is actually using (as opposed to configuring) the view, they can also change the drill level, but the configuration determines the default each time the user logs in.

You can also hide certain data points or rows/columns by clicking on them and using any of 'show only', 'hide' or 'unhide all'.

You can show or hide the whole table or chart as well, for example if you want to show the chart only or the table only.

Dimensions view configuration – Preview

- Change Chart Type
 - ▶ Right click, 'Chart Types'
- Also change axes placement
 - ▶ Controls what is shown on each axis
 - ▶ Useful for dual axis charts



There are many chart types and it is easy to change between them. Right click and select Chart Types, then choose from the extensive list. See the examples section for more.


Dimensions view configuration – Preview

- Make changes at the table level as well as chart
- Right click on cells
 - ▶ Drill Up/Down
 - ▶ Show/Hide
 - ▶ Pivot
 - ▶ Swap Axes

Location ↑↓	Measures ↑↓	InstancesCount ↑↓	OrderPrice ↑↓
Location ↑↓		15	109256
England ↑↓		46	39653
Southampton ↑↓		21	18282
Winchester ↑↓		25	21371
USA ↑↓		69	69603
Austin ↑↓		24	21160
Raleigh ↑↓		44	47573
Winchester ↑↓		1	870



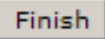
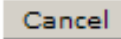
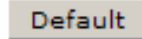
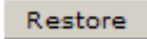
Sort...	Drill Up	Drill Down	Expand All	Pivot	Show Only	Hide	Unhide All	Keep Only	Remove Only	Advanced	Swap Axes	Member Filter...	Options...


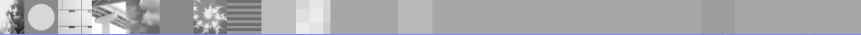
Instead of interacting with the chart when making your changes in preview mode, you can also interact with the table directly instead to achieve the same effects.

IBM Software Group 

Dimensions view configuration – Preview

- Changes are saved using ‘Finish’
- Changes can be discarded by clicking ‘Restore’
 - ▶ Switches back to previous save
- Default can be restored using ‘Default’

  24
Dashboards - Configuring Reports and Dimension Views © 2006 IBM Corporation

If you change the drill level on the reports view preview, it will be lost when you click Finish (the view always shows top level). For the dimensions view it is saved

Cancel stops the configuration

Back goes back to the dimensions selection

Default removes your changes and shows the default chart type, settings and drill levels.

Restore reverts back to the configuration that you used prior to making this set of changes. It is useful to undo any attempted changes you are making.

Finish saves the changes.

Section

Dimensions view edit

This section addresses editing the dimensions view.

Dimensions view edit



- Do not see the add/remove dimensions page but can still achieve this using the layout view on chart preview page
 - ▶ Click show layout
- Therefore perform all same customizations on chart preview page

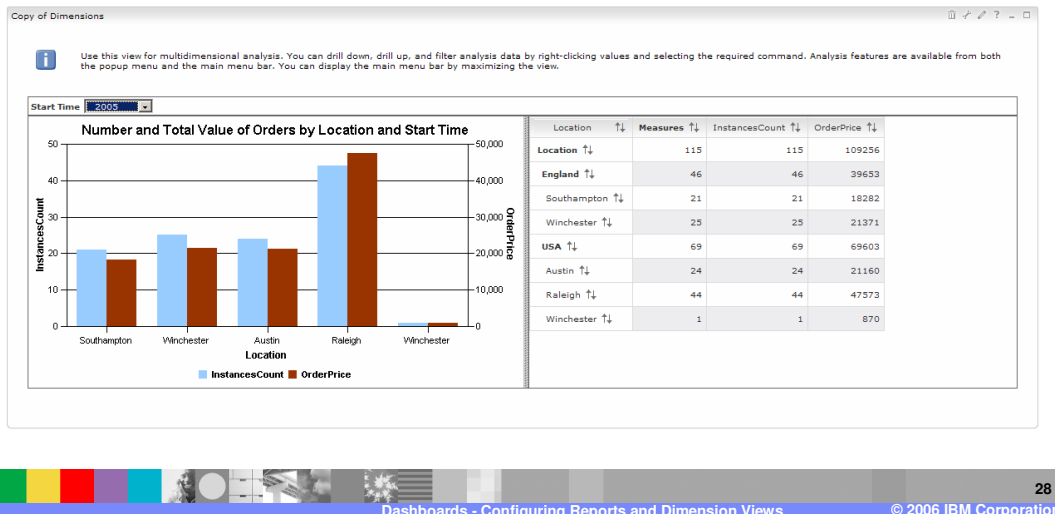
Edit mode does not give you the selections for adding and removing dimensions from row, column and page. However you can still access the preview mode which has the 'show layout' button. This then allows you to drag and drop dimensions to row, column or page anyway.

Section

Dimensions view example

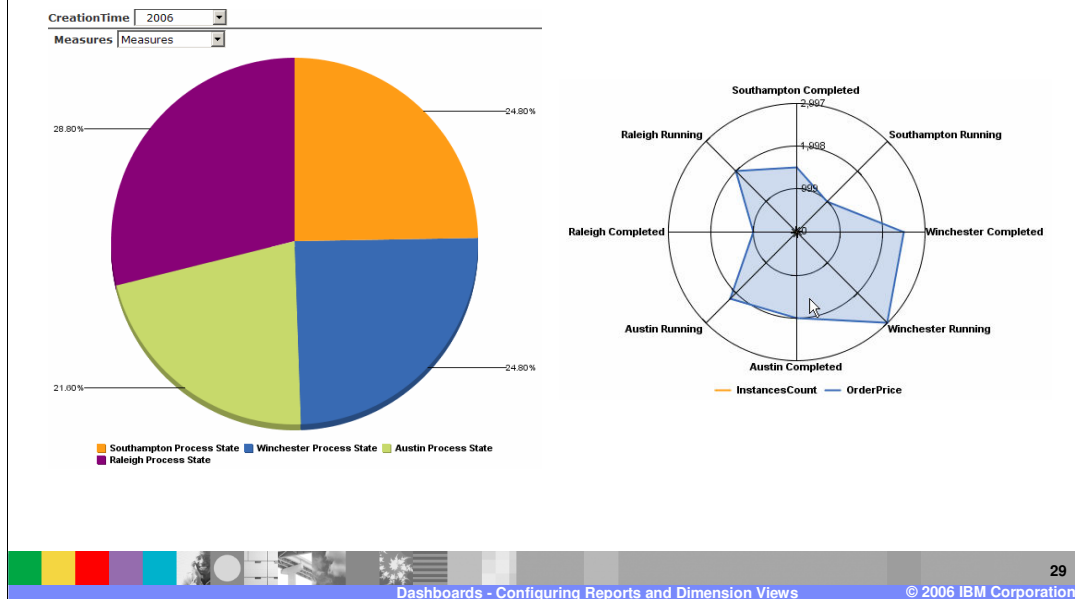
This section presents an example.

Dimensions view example



Use this view for multidimensional analysis. You can drill down, drill up, and filter analysis data by right clicking values and selecting the required command. Analysis features are available from both the popup menu and the main menu bar. You can display the main menu bar by maximizing the view.

Dimensions view example



Here are two other chart types – pie and radar area.

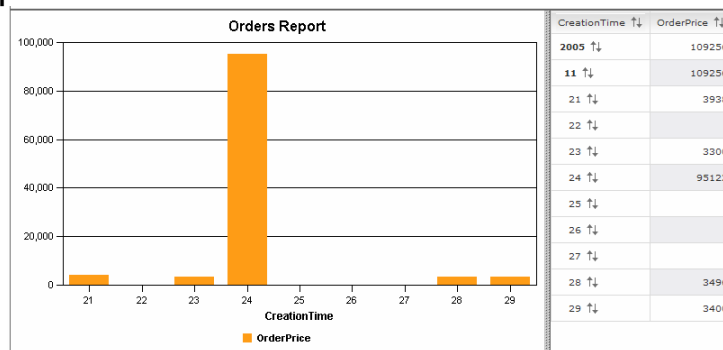
Section

Reports view overview

This section provides an overview of the reports view.

Reports view

- Shows performance reports on historical values of aggregate business measures, relative to time axis
- Analysis represented in tables and graphs
- A special case of the Dimensions View



31

Dashboards - Configuring Reports and Dimension Views

© 2006 IBM Corporation

The Reports view is simply a special case of the Dimensions view with pre-prepared analysis types and functionality to ease the configuration of the time aspect of the view. You should refer to the information on the Dimensions view before you look at the Reports view.

Reports views always have creation time on the x-axis. They show

Four types of reports view

- **Basic** Displays the business measures values
- **Quartile** Displays the value of the boundary at the 25th, 50th, or 75th percentiles of a frequency distribution divided into four parts, each containing a quarter of the population
- **Trend** Displays the analysis of the changes in a given item of information over a period of time using Exponentially Weighted Moving Average (EWMA). The EWMA is the average of historical values that are given weights (by a weighing factor), which exponentially decrease by time.
- **Control** Displays the variation in the business measures that you are measuring to help you understand and reduce the variation. It is mostly used for quality control. The allowable variation is three times the standard deviation of the data.



You can choose any of these four types of views.

Reports view

- Each measure that you want to analyze in the Reports view must be specified in Modeler BME as 'Quantitative data in dimensional analysis'
- Aggregation Function also specified in Modeler BME
 - ▶ Average, Sum, Minimum, Maximum, Count
- Some built-in measures
 - ▶ Sum of new items, Sum of resolved items, InstancesCount, Elapsed Duration, Working Duration



In Business Measures Editor, '**Quantitative data in dimensional analysis**' is specified in the '**Dimensional analysis and database schema settings**' section of an instance measure (metric, stopwatch, counter). This is how you specify that a measure is to be analyzed quantitatively in both the Dimensions and the Reports views. See the Business Measures Editor presentation and lab for further details.

In addition to the quantitative measures that you specify, there are also some built in measures provided with all business measures models

Reports view

- Specify time window and frequency
 - ▶ Start date, end date
 - Year-To-Date and Month-To-Date auto-configure options
 - ▶ Frequency (daily, monthly, yearly)
- Co-operate with Organizations view to filter report by employee
 - ▶ Requires specific measures be in the model
 - ▶ Requires LDAP configuration for Monitor and Runtime servers
 - ▶ Organizations view must be wired to Reports view

The Reports View allows you to specify a data range (start and end) and a frequency of data points (daily, monthly, yearly). You also specify which quantitative measures you want to analyze against this date range and then you specify the type of analysis

It is possible to link the Reports and Organizations view so that you can click a given user or organization in the Organizations view and cause the Reports view to show data from processes that belonged to that user or organization only. This requires some specific measures to be defined in the business measures model – refer to the Information Center for further details. It also requires an LDAP setup so that security is applied to the infrastructure.

Section

Reports view configuration

This section covers the configuration of the reports view.

Reports view configuration

- Choose Subject Area
- Optionally choose Dimension (Basic Analysis only)
 - ▶ Allows drill up/down on additional dimension
- Choose Analysis type
- Choose weighting factor (Trend Analysis only)
 - ▶ Affects the calculation of the weighted average

Subject area: ProcessScenario aggregates

Analysis type: Basic analysis

Dimension: None

Weighing factor: 0.18

36
Dashboards - Configuring Reports and Dimension Views © 2006 IBM Corporation

The first page of the Reports View edit is where you select the model and then the subject area. The Subject Areas are 'monitoring contexts' and these will depend on your process design. Typically you will choose the process name here (or sub-process).

There is also an option of an aggregates subject area called 'processname aggregates' but this does not contain anything extra so you should not choose that.

Then you can select the Analysis type. If you select Basic Analysis then you can also select one dimension which will be available in the view in addition to the Start Time that is always used on the x-axis. If you select Trend Analysis then you can specify the weighting factor for the trend calculation.

Reports view configuration



- Choose Measures from subject area
- Two sets of measures – reports view and modeled
 - ▶ Can only select from one set at a time
- Reports view measures
 - ▶ Measures provided automatically by the reports view
 - Sum of new items
 - Sum of resolved items
- Modeled Measures
 - ▶ Measures provided by the Business Measures Model
 - Three built-in – InstancesCount, Elapsed Duration, Working Duration
 - Any measures defined in BME as *'quantitative data for dimensional analysis'*



After you have configured the type of chart you must choose which measures to analyze. There are two types – the reports view built in ones or the ones that you modeled in WebSphere Business Modeler. The Reports View provides two built-in measures – the number of started processes (new items) and the number of resolved processes (finished processes). This is useful if you simply want to analyze how many process instances there have been.

The modeled measures are your own custom ones and some that are available for all business measures models.

IBM Software Group IBM

Reports view configuration

- Sum of new items – number of instances created
- Sum of resolved items – number of instances completed

Measures

- ProcessScenario
 - Reports view measures
 - Sum of new items (Provided by Reports View)
 - Sum of resolved items (Provided by Business Measures Model)
 - Modeled measures
 - InstancesCount (Built-in measures from BME)
 - OrderPrice (User Defined Measure from BME)
 - Elapsed Duration (Built-in measures from BME)
 - Working Duration (Built-in measures from BME)

38
Dashboards - Configuring Reports and Dimension Views © 2006 IBM Corporation

Here is the screen capture of the measures selection.

- Sum of new items: this measure reports the total number of new instances **created** in a specific duration. Say that you select the from date as Nov 1st and the to date as Nov 15th, and the frequency daily. In this case, the measure Sum of new items would show to the user the number of newly created instance in each day starting Nov.1st till Nov.15th.
- Sum of resolved items: this measure reports the total number of instances that are **completed** in a specific duration.

Reports view configuration – Date range

- Use the calendar icons to manually select a From date and a To date
 - ▶ Use 'Year-To-Date' (YTD) or 'Month-To-Date' (MTD) to auto configure From and To dates
- Specify frequency – Daily, Monthly, Yearly
- Click 'View Report' to preview chart based on selections

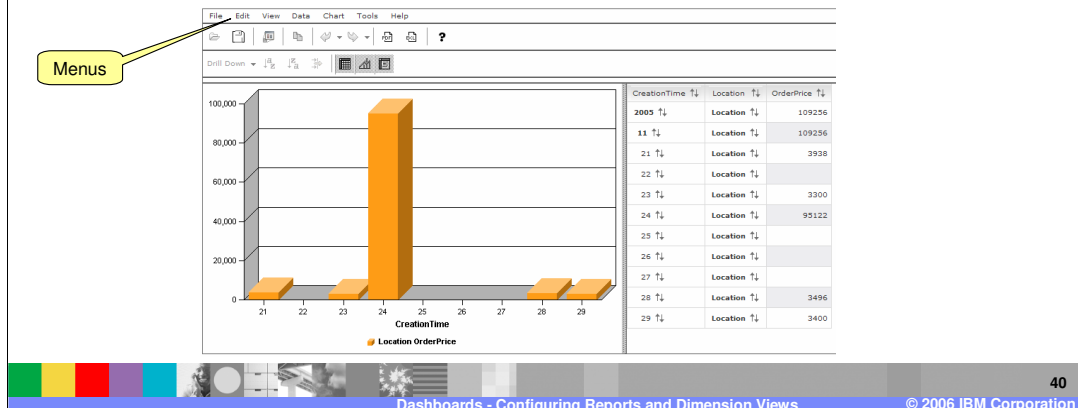
The screenshot shows a configuration interface for reports. It features three main sections: 'From', 'To', and 'Frequency'. The 'From' field contains the date 'November 21, 2005' and a calendar icon. The 'To' field contains the date 'November 29, 2005' and a calendar icon. Below these fields are two buttons: 'YTD' and 'MTD'. The 'Frequency' section has a dropdown menu currently set to 'Daily'. A 'View Report' button is located below the date fields.

Selecting the date range and frequency is easy. There are also two buttons to automatically setup the from and to dates – YTD = Year to date, MTD = Month to Date.

Once you have specified the range you **must** click View Report to actually update the view and see the range take effect.

Reports view configuration – Preview

- Edit chart using standard Alphablox tools
 - ▶ Right click on preview chart for options or use menus
 - ▶ Chart Type, Titles, Legends, axis, show/hide data ...
- Customize look



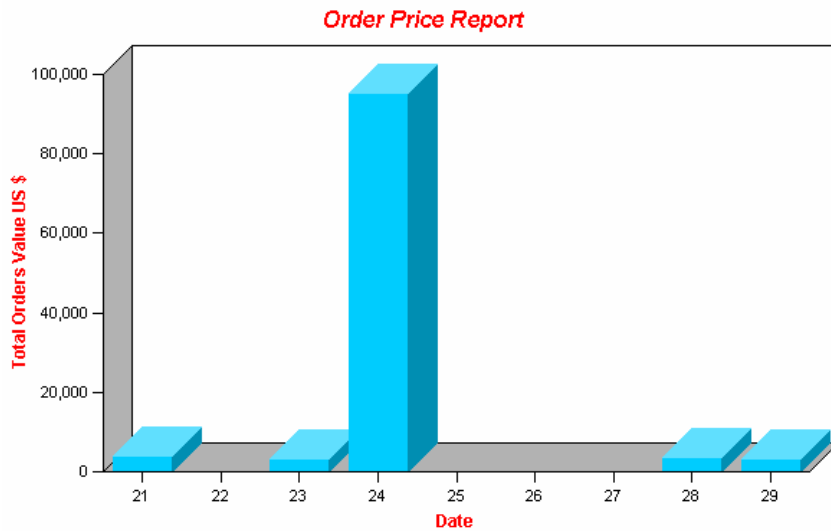
The default chart is created when you click 'view report'. You can then customize it using a variety of Alphablox functions in the same way as for the Dimensions view. Right click on the chart or table for options.

Note that **dimension drill-downs will not be preserved** whereas other changes will be preserved, unlike the Dimensions view.

Reports view configuration – Preview



- Example Customization



41

Dashboards - Configuring Reports and Dimension Views

© 2006 IBM Corporation

Here is an example of using the right click Alphablox menus to change colors, fonts, titles and legends.

Section

Reports view edit

The section covers editing in the reports view.

Reports view edit



- Cannot change measures or analysis type
- Can change date range and frequency
- Can change chart appearance



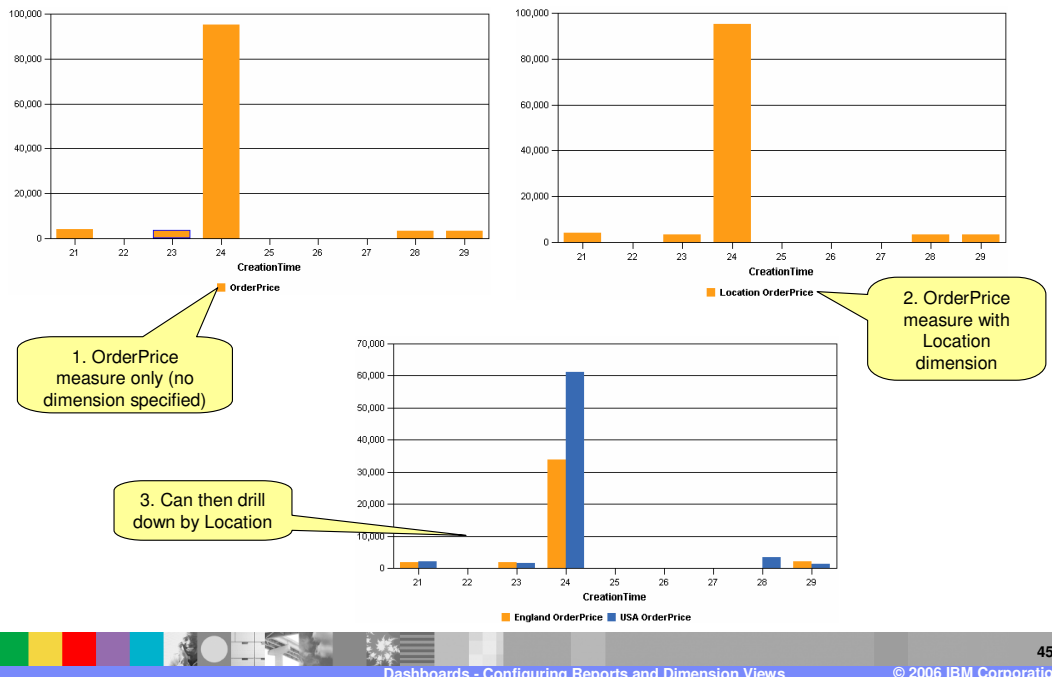
Edit mode has fewer options as described in the slide. Note that the YTD and MTD buttons don't work in edit mode

Section

Reports view examples

This section provides an example of the reports view.

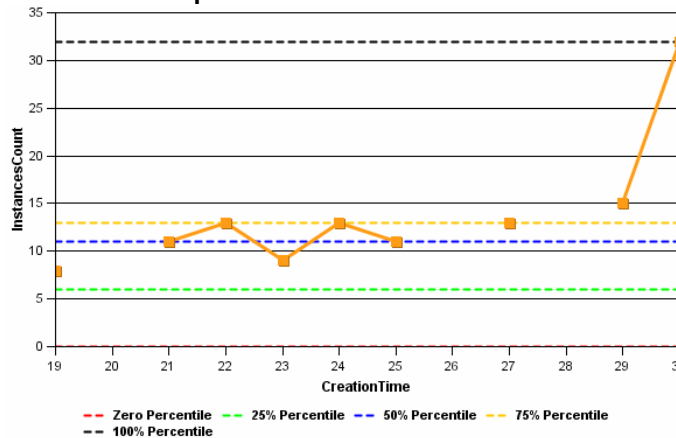
Basic analysis examples



The first chart is a basic analysis report against one measure (orderprice) with no dimension defined. Recall that the Basic Analysis report allows you to optionally add one dimension to the chart. This is shown in the second chart, another basic analysis but it has also specified the 'Location' dimension. The view will display at the parent level of this dimension but a user can drill down as shown in 3.

Quartile analysis example

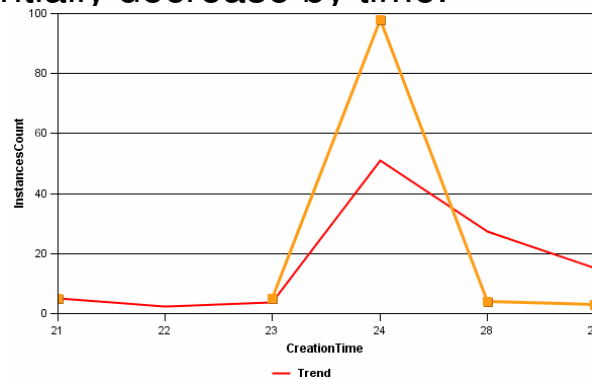
- Displays the value of the boundary at the 25th, 50th, or 75th percentiles of a frequency distribution divided into four parts



This analysis shows where the quartile boundaries are for the distribution. From this it can be seen that on the 29th and 30th of the month the number of processes each day was above 75% of the average day.

Trend analysis example

- Exponentially Weighted Moving Average (EWMA)
- EWMA is the average of historical values that are given weights (by a weighing factor), which exponentially decrease by time.



47

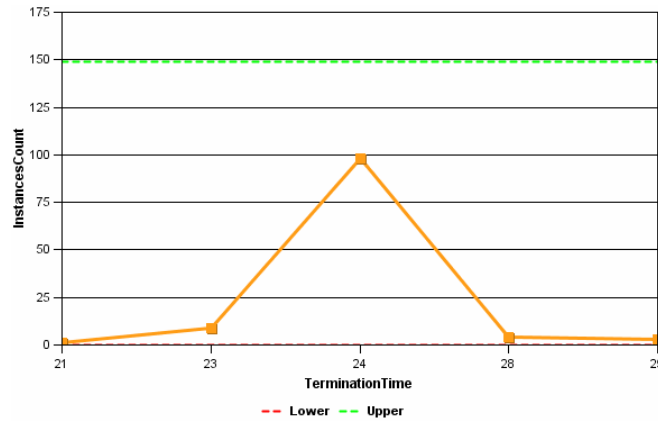
Dashboards - Configuring Reports and Dimension Views

© 2006 IBM Corporation

The weighting factor is part of the configuration settings when you select the Trend Analysis. The red line is a trend line whereas the actual values are also plotted in orange.

Control analysis example

- Shows boundaries at three times standard deviation – used to check that a measure is under control



Control Analysis draws boundaries and three times the standard deviation, above and below the average. It is useful for monitoring how stable a measure is over time. If it goes beyond these boundaries then it is a significant (>3 times standard) deviation from average.

Trademarks, Copyrights, and Disclaimers

The following terms are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both:

IBM	CICS	IMS	MQSeries	Tivoli
IBM (logo)	Cloudscape	Informix	OS/390	WebSphere
e(logo)/business	DB2	iSeries	OS/400	xSeries
AIX	DB2 Universal Database	Lotus	pSeries	zSeries

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Microsoft, Windows, Windows NT, and the Windows logo are registered trademarks of Microsoft Corporation in the United States, other countries, or both.

Intel, ActionMedia, LANDesk, MMX, Pentium and ProShare are trademarks of Intel Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds.

Other company, product and service names may be trademarks or service marks of others.

Product data has been reviewed for accuracy as of the date of initial publication. Product data is subject to change without notice. This document could include technical inaccuracies or typographical errors. IBM may make improvements and/or changes in the product(s) and/or program(s) described herein at any time without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM Program Product in this document is not intended to state or imply that only that program product may be used. Any functionally equivalent program, that does not infringe IBM's intellectual property rights, may be used instead.

Information is provided "AS IS" without warranty of any kind. THE INFORMATION PROVIDED IN THIS DOCUMENT IS DISTRIBUTED "AS IS" WITHOUT ANY WARRANTY, EITHER EXPRESS OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NONINFRINGEMENT. IBM shall have no responsibility to update this information. IBM products are warranted, if at all, according to the terms and conditions of the agreements (e.g., IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided. Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products in connection with this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. IBM makes no representations or warranties, express or implied, regarding non-IBM products and services.

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents or copyrights. Inquiries regarding patent or copyright licenses should be made, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. All customer examples described are presented as illustrations of how those customers have used IBM products and the results they may have achieved. The actual throughput or performance that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput or performance improvements equivalent to the ratios stated here.

© Copyright International Business Machines Corporation 2005,2006. All rights reserved.

Note to U.S. Government Users - Documentation related to restricted rights-Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract and IBM Corp.