Prepare for the IBM Certification Test 992, IBM WebSphere Business Modeler Advanced V6.1, Business Analysis and Design. Learn about the predefined queries shipped with Modeler, as well as how to create and execute custom queries. You'll also learn how to generate, print and export reports.

Section 1. Before you start

About this series

IBM WebSphere Business Modeler (hereafter called Modeler) is the IBM business process development platform that enables you to quickly perform organization and resource modeling, analyze and simulate processes, create reports, and build business measures to address productivity and performance management. This series of six tutorials helps you prepare to take the IBM certification Test 992, IBM WebSphere Business Modeler Advanced V6.1, Business Analysis and Design to become an IBM Certified Business Process Analyst.

This certification targets intermediate-level business analysts who have developed skills in Business Process Management (BPM), including process design, organization and resource modeling, process analysis and simulation, identification of business measures to address productivity and performance management and
generate reports. It is expected that they will be able to perform the tasks involved in the role independently, with limited assistance from peers, product documentation and vendor support services.

About this tutorial

This tutorial is the fifth in the series designed to help you prepare for the IBM Certification Test 992: IBM WebSphere Business Modeler Advanced V6.1, Business Analysis and Design. Part 4 of this series described the Modeler analysis functions you can use to ensure that your model meets your business requirements. This tutorial focuses on how to leverage queries to further analyze your model, and how to use formal reports to document the analysis results. After you complete this tutorial, continue with the sixth tutorial covering the business measures model, which allows you to monitor, analyze, and report on actual runtime data.

Prerequisites

This tutorial is written for analysts whose skills and experience are at an intermediate to advanced level. You should have a general familiarity with using an integrated development environment.

System requirements

To run the examples in this tutorial, you need to install WebSphere Business Modeler Software V6.1. Download a free trial version of WebSphere Business Modeler if you don't already have a copy of it. You can find the hardware and software requirements for Modeler at WebSphere Business Modeler Advanced: System Requirements.

Section 2. Queries

Queries let you extract and view selected information on model elements and provide a data source for reports. Use queries to:

- Confirm that your models accurately represent your business
- Gather required information for making business decisions
- Document and propagate specific types of information
• Define report content

Predefined queries

There are three main categories of predefined queries provided with the Modeler:

• **Details queries** return the elements of other types, such as resources, roles, organization units, locations, and business items that are associated with the selected element. You can use these queries to view and validate the relationships between model elements.

• **Statistics queries** return the number of each element associated with the selected model element. Use these queries to evaluate the complexity and the degree of interconnection of model elements.

• **Specification queries** return the values contained in the specification of the selected element. You can use these queries to view and validate model elements of specific types.

When you execute a query, the results appear in the **Query** view. You can also use queries as a source of data when you generate reports.

The following predefined queries are provided for you to use:

• Business item instance specification
• Business item specification
• Business item template specification
• Location definition specification
• Location definition template specification
• Location specification
• Notification specification
• Organization definition specification
• Organization definition template specification
• Organization unit specification
• Process details
• Process specification
• Process statistics
• Repository specification
• Resource definition specification
• Resource definition template specification
• Resource specification
• Role specification
• Service details
• Service specification
• Service statistics
• Task details
• Task specification
• Task statistics
• Timetable specification

For more information on query support, see Querying, reporting and printing in the Modeler Information Center.

Creating queries

Modeler includes a Query Builder, shown in Figure 1, that you can use to create your own queries. Within a query, you can use expressions to retrieve information regarding specific model elements and, for each result item, you can define the type of information the query should display.

**Figure 1. Query Builder**
You can create two types of queries: one type is based on predefined criteria and results definition, and the other is based on user-defined criteria and results definition. The former is created in the Basic Profile Query catalog, and the latter is created in the Intermediate or Advanced Profile Query catalog.

Query constructs include:

- **Scope**: Defines which part of the Project is the focus of the query; the entire project or a specific model catalog within the project. You can also delegate the scope definition to the user at runtime.

- **Search for type**: Identifies the Project element type that is targeted by the query. This list is determined by the Scope selection:
  - A category of model element (for example, a business item)
  - A customized definition (for example, a resource definition)
  - A part of a model element (for example, a connection within a
• **Criteria:** Defines the logical expression associated with the query. Depending on the type of query, it can be a boolean expression or a user-defined expression.

• **Results definition:** Formats the generated contents of the query results. Depending on the type of query, it can be a selectable set of contents or user-defined contents.

Once you've defined a custom query, it can be run in a similar manner to a predefined query. For more information on creating queries, see Querying, reporting and printing > Creating queries in the Modeler Information Center.

### Running queries

Queries extract and display a predefined set of information about a type of model element. The results of the query appear in the Query view. If the query does not find any matches, a message appears indicating that the query returned no results. From the Query view, double-click the row containing any model element that you want to open in the editor. You can also copy the results from this view to a spreadsheet application. Completed queries can be persisted, and these saved queries can be used to create reports on the query output. We'll discuss this further in Custom Reports.

For more information on running queries, see the Modeler Information Center topic Querying, reporting and printing > Running queries.

### Creating a custom query using the Quickstart Finance sample

We'll use the Quickstart Finance sample shipped with the product to create a custom query that shows all tasks that have the individual resource “Kim Lee” associated as a requirement (see Figure 1):

1. Import the Quickstart Finance sample.
2. To create a query, right-click on the Query catalog in the project tree, and select New => Query.
3. Select the Advanced profile query catalog and name the query Resource Usage, as shown in Figure 2.

**Figure 2. Create a new query**
4. Specify the following values in the query builder (see Figure 1):
   - Check **Define the scope when running the query**
   - **Search for type**: Select Task.
• Select **Edit Expression** and specify the following in the Expression Builder, as shown in Figure 3:
  
  - Click **Add** to add an expression.
  - Select **Modeling artifact** as the **First term**. This is used to access the relevant schema attributes for the search type (Task attributes in this example).
  - Select **Individual resource requirement => Individual resource => Name** for **First term details**.
  - Select **is equal to** for the **Operator**.
  - Select **Text** as the **Second term** and specify **Kim Lee**.
  - Click **Apply** to save the expression and **OK** to return to the Query Builder dialog.

**Figure 3. Define query criteria using Expression Builder**

5. Save the query.

If you run the query, you'll be prompted to enter the scope, as shown in Figure 4.
Select the default process catalog.

**Figure 4. Define scope at runtime**

You'll see the task name in the query view, but won't be able to tell what process contains it or any other details about the task by default, as shown in Figure 5.

**Figure 5: Default query results**
Format the query results as follows:

1. Check **Query results definition.**

2. Click **Add** to add the following custom fields to the results follows:
   
   - Change the first term name to **Task** and associate it with the expression **Modeling artifact => Name**, then select **Apply** and **OK** to save the changes. **Note:** You don't have to specify an operator or a second term.

   - Add a second attribute with the name of **Process** with the expression **Modeling artifact => Parent global process**, the apply and save the changes.

3. The results definition should now include two fields, as shown in Figure 6. **Figure 6. Define custom query results**
4. Rerun the query and you should see the customized results in the query view, as shown in Figure 7.

**Figure 7. Custom query results**

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**Useful default functions**

There are two useful built-in functions available from the project tree context menu: **Search** and **Used by**. The **Search** function, shown in Figure 8, allows you to search for elements within the workspace that contain the specified text value, as shown in Figure 9.

**Figure 8. Search function**
Figure 9. Search dialog
The results are displayed in a pop-up dialog, shown in Figure 10, and can be exported to a file for reference. You can also select one of the result rows and either show the result item in the project tree or open it using the relevant editor.

**Figure 10. Search results**

The **Used by** function, shown in Figure 11, can help you identify whether a project element is being referenced by another element in the workspace.

**Figure 11. Used by function**
The results of the Used by function are also displayed in a pop-up dialog, as shown in Figure 12.

**Figure 12. Used by results**
Note that this information corroborates what we found in our custom query (see Figure 7). In other words, these functions are actually forms of predefined queries with parameters that can be specified at runtime by the user.

**Classifiers**

In Part 2 we discussed how you can use classifiers to categorize elements that share a common characteristic. You can then assign a color to each category to visually emphasize the relevant tasks in the process diagram. You can also display each classifier value in a different row using swimlanes. Note that the classifier represents the category or general characteristic. The user must define distinct classifier values to represent discrete instances of the classifier category, which can then be assigned to tasks or processes.

Classifiers can also be used to create custom queries targeting these user-defined characteristics. The Used by function can help you identify global project elements that contain a specific classifier. The Activities by classifier static analysis function, shown in Figure 13, is also useful for identifying the classifiers used in a specific process (note that it must be executed from within the process editor).

**Figure 13. Service Fee activities by classifier results**
In contrast, you can use a custom query for the Service Fee classifier, as shown in Figures 14 and 15, across multiple user-defined scopes.

**Figure 14. Service Fee custom classifier query expression**
Figure 15. Service Fee custom classifier query
Figure 16 shows the results for the default process catalog (that is, all processes in the Quickstart Finance project).

**Figure 16. Service Fee custom classifier query results**
Section 3. Reports

A report is the formatted presentation of information relating to a model or the results of analyzing a process. Reports provide a way for you to view, share, and print information derived from the models you've created. Report categories include documentation, static analysis, and dynamic analysis.

Modeler provides a variety of predefined report templates that you can use to generate reports based on your models. Alternatively, you can design your own report templates from scratch or use the predefined report templates as a basis for your custom reports by copying them to a different report catalog where you can edit them.

Report Designer

The Report Designer, shown in Figure 17, lets you create report templates that contain the content and presentation you require. The Report Designer, like the process and structure editors, is a drag-and-drop graphical editor with a palette that contains elements you can add to your report template. When you create a new report template, you can specify the source of data for the report or create a blank report.

Figure 17. Report Designer
Report elements include:

- **Report catalog**: A folder structure used for organizing report elements within the project
- **Data source**: The information source that forms the basis of the report
- **Report type**: Standard blank reports or tabular
- **Fields**: The relevant attribute values used for the reports
- **Group**: Optionally group data by field

**Data sources** are defined sets of information that you can derive from elements of your project. Use data sources as the basis for defining report templates. Depending on the contents of your model, select from the following categories of data sources:

- No data source (to create a blank report)
- Business measures predefined reports
- Predefined query
- Business model
- Dynamic analysis
• User defined query
• Simulation description
• Static analysis
• Team support

You can include the following elements in your report templates:

• Pages and page breaks
• Page headers and footers
• Tables
• Shapes, including lines, rectangles, circles, and ellipses
• Static text fields
• Pictures
• Charts
• Table of contents
• Summary statistics fields (such as counts, sums, and averages for selected data fields)
• Report special fields (such as page numbers, print date, and record number)

You can also use groups in a report template to further organize your data. A group is a set of reporting elements, such as labels and data fields, that can be repeated multiple times in a generated report. Finally, you can define how tables display information about multiple elements by specifying a data field to use for grouping information in the table.

Report Designer provides many options for you to customize the appearance of elements that you add to the report template. When you select an element in the report template, the Attributes view, shown in Figure 18, displays the editable properties for the element.

Figure 18. Report attributes view
Report templates

By designing your own report templates you can customize the content and presentation of a report. You can define the content and organization of data fields, add elements from the palette, and specify formatting options. Customization tasks include:

- Add text labels to report
- Add tables to report
- Add charts
- Add images
- Add summary statistics fields
- Add data fields
- Add groups
- Add a table of contents to a report template
- Add report information fields
- Add parameter fields
- Format report elements
- Set global report preferences

You can’t change the predefined report templates provided by Modeler. However, you can copy a predefined report template and customize it to create a custom report.
Using Crystal Reports

The WebSphere Business Modeler tool also supports the third party product SAP Business Objects Crystal Reports as an alternative way of creating and generating report templates. You can use the Crystal Designer to create report templates that can be leveraged by the Crystal Reports product.

The following activities related to Crystal Reports are supported:

- Create new report templates, define their content using Modeler data sources, and start the Crystal Reports design environment to specify report template details
- Copy, rename, and delete report templates
- Generate and export reports based on existing report templates
- View and print generated reports
- Import report templates defined by another user
- Export report templates for use or customization by another user
- Check in and check out CVS versions of report templates

Modeler does not provide documentation templates for Crystal Reports. In order to use the documentation report templates, you must generate and export them directly from the project without using Crystal Reports. Only the schema and report files are exported for development outside of Modeler with the Crystal Reports import/export function.

Printing and exporting reports

You can print and export reports based on your models, simulation profiles, and analysis results. Exporting reports lets you share the model information for a variety of purposes, and to a variety of different media, including the Web.

Modeler supports the following export formats:

<table>
<thead>
<tr>
<th>Table 1. Modeler export formats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Format</td>
</tr>
<tr>
<td>SVG, JPEG</td>
</tr>
<tr>
<td>PDF</td>
</tr>
<tr>
<td>DOCX</td>
</tr>
</tbody>
</table>
Table 1. File export formats

Modeler supports the generation and export of reports in either PDF or Microsoft Word docx formats. The docx format can be used to produce editable reports.

All predefined elements including queries and reports are located in the Modeler predefined elements project created for each workspace. To generate a documentation report, select the desired report template in the project tree and select either Generate or Generate and Export from the context menu, as shown in Figure 19. Alternatively, you can open the report template in the Report Designer and use the context menu from the editor view. Use Generate to print the report contents. If you want to create a document to share, use the Generate and Export option.

Figure 19. Documentation report context menu
For dynamic and static analysis reports, you must first run the analysis and then you can print or export the report using the Print or Generate and Export Report context menu options, as shown in Figure 20, directly from the Analysis view.

**Figure 20. Dynamic analysis report context menu**
How you print or export a custom report depends on the report type. If it's based on a documentation report format or template, you can use the same context menus. If it is an analysis report, you need to generate the relevant analysis results and use the context menu from the Analysis view, shown in Figure 21, and select **Customized report templates**.

**Figure 21. Generating a custom analysis report**
To print and export history reports, you must first display the history for a model element in the History view, as shown in Figure 22.

**Figure 22. History report**

See [Querying, reporting and printing > Printing and exporting reports](#) in the Modeler Information Center for more information on report support.
Section 4. Documentation reports

The predefined documentation report templates let you quickly generate reports based on predefined queries of model elements. Documentation reports show the content of your models and process simulation profile settings.

There are three main types of documentation reports:

- **Details reports** show the elements of other types, such as resources, roles, organization units, locations, and business items that are associated with the selected element.
- **Statistics reports** shows the number of each element associated with the selected model element.
- **Specification reports** show the values contained in the specification of the selected element.

The following documentation reports are available for various categories of model elements:

- **Data reports** provide several predefined reports for data models. Use these predefined reports to extract information about business items and notifications that you have defined in your project.
- **Organization reports** provide several predefined reports for organization models. Use these predefined reports to extract information about the contents of organizations and locations.
- **Process reports** provide several predefined reports for process models. Use these predefined reports to extract information about processes, tasks, services, and repositories that you have defined in your project.
- **Resource reports** provide several predefined reports for resource models. Use these predefined reports to extract information about resources, roles, and timetables that you have defined in your project.
- **Simulation profile report** shows the settings for the specified simulation profile.

Modeler also supports history reports that capture the version history of your model elements. Note that the history report is only relevant if you are using the team support with the product.
Business measures reports

The business measure support for Modeler has been revised significantly with each version. No business measure reports are supported at this time. The next tutorial in this series will detail the existing business measure model support in Modeler V6.1.

Data reports

Modeler provides several predefined reports for data models. Use these predefined reports to extract information about business items and notifications that you have defined in your project.

Data reports include:

Table 2. Data reports

<table>
<thead>
<tr>
<th>Report</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business item instance specification</td>
<td>Displays the information contained in a business item instance specification.</td>
</tr>
<tr>
<td>Business item specification</td>
<td>Displays the information contained in a business item specification.</td>
</tr>
<tr>
<td>Business item template specification</td>
<td>Displays the information contained in a business item template specification.</td>
</tr>
<tr>
<td>Business item utilization</td>
<td>Displays information for all the business items in a model, including information about the utilization of each business item.</td>
</tr>
<tr>
<td>Data catalog statistics</td>
<td>Displays the quantities of elements contained in a data catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Notification specification</td>
<td>Shows the information contained in a notification specification.</td>
</tr>
</tbody>
</table>

Organization reports

Modeler provides several predefined reports for organization models. Use these predefined reports to extract information about the contents of organizations and locations.

Organization reports include:

Table 3. Organization reports

<table>
<thead>
<tr>
<th>Report</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location definition specification</td>
<td>Displays the information contained in a location</td>
</tr>
</tbody>
</table>
Process reports

Modeler provides several predefined reports for process models. Use these predefined reports to extract information about processes, tasks, services, and repositories that you have defined in your project.

Process reports include:

### Table 4. Process reports

<table>
<thead>
<tr>
<th>Report</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business rules task details</td>
<td>Displays the names of elements contained in one or more business rules task details in the process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Business rules task specification</td>
<td>Displays the information contained in a business rules task specification.</td>
</tr>
<tr>
<td>Human task details</td>
<td>Displays the names of elements contained in a human task or in multiple human tasks in the process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Human task specification</td>
<td>Displays the information contained in a human task specification.</td>
</tr>
<tr>
<td>Process annotation</td>
<td>Displays the complete text of all annotations contained in one or more processes in a process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Process details</td>
<td>Displays the names of elements contained in one or more processes in a process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Process level details</td>
<td>Displays the details about a main process and all</td>
</tr>
</tbody>
</table>
of its component activities and subprocesses.

<table>
<thead>
<tr>
<th>Process procedure</th>
<th>Shows the sequence of steps within a process, and the relationships of a process to other processes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process specification</td>
<td>Shows the information contained in a process specification.</td>
</tr>
<tr>
<td>Process statistics</td>
<td>Displays the quantities of elements contained in one or more processes in a process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Process summary</td>
<td>Displays summary information for a selected process.</td>
</tr>
<tr>
<td>Repository specification</td>
<td>Shows the information contained in a repository specification.</td>
</tr>
<tr>
<td>Service details</td>
<td>Displays the names of elements contained in one or more services in a process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Service specification</td>
<td>Shows the information contained in a service specification.</td>
</tr>
<tr>
<td>Service statistics</td>
<td>Displays the quantities of elements contained in one or more services in a process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Task details</td>
<td>Displays the names of elements contained in one or more tasks in a process catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Task specification</td>
<td>Shows the information contained in a task specification.</td>
</tr>
<tr>
<td>Task statistics</td>
<td>Displays the quantities of elements contained in one or more tasks in a task catalog that you select for inclusion in the report.</td>
</tr>
</tbody>
</table>

## Resource reports

Modeler provides several predefined reports for resource models. Use these predefined reports to extract information on resources, roles, and timetables that you have defined in your project.

The following resource model predefined reports are available:

### Table 5. Resource reports

<table>
<thead>
<tr>
<th>Report</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource catalog statistics</td>
<td>Displays the quantities of elements contained in a resource catalog that you select for inclusion in the report.</td>
</tr>
<tr>
<td>Resource definition specification</td>
<td>Shows the information contained in a resource definition specification.</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Resource definition template specification</td>
<td>Shows the information contained in a resource definition template specification.</td>
</tr>
<tr>
<td>Resource specification</td>
<td>Shows the information contained in a resource specification.</td>
</tr>
<tr>
<td>Role specification</td>
<td>Shows the information contained in a role specification.</td>
</tr>
<tr>
<td>Timetable specification</td>
<td>Shows the information contained in a timetable specification.</td>
</tr>
</tbody>
</table>

Simulation profile report

The simulation profile report shows the settings specified for a simulation profile. This report shows the values for the general settings, and for the interrupts that apply to the process as a whole. The report does not display the simulation attributes settings for activities within the simulation profile.

See Querying, reporting and printing > Reports > Predefined reports > Documentation reports in the Modeler Information Center for more information on documentation reports.

Section 5. Dynamic analysis reports

Dynamic analysis reports provide a way for you to view, share, and print process simulation analysis results. Dynamic analysis reports include the same information as displayed in the Analysis view when you run a dynamic analysis of simulation results.

Dynamic analysis reports have a cover page that displays the report title, date, description, optional company information, and the following details about the contents of the report:

- Process name
- Simulation snapshot name
- Simulation profile name
- Simulation result name
- Process case name
- Process case distribution
- Process instance name
- Parameters used for the analysis
- Simulation mode, based upon the output path selection:
  - Randomly to single path: Random
  - Based on probabilities to single path: Probability
  - Based on an expression: Expression
- Simulation time
- Used process instances

The following dynamic analysis reports are available:

**Table 6. Dynamic analysis reports**

<table>
<thead>
<tr>
<th>Report</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity cost</td>
<td>Displays the results of the activity cost analysis.</td>
</tr>
<tr>
<td>Activity cost per time unit</td>
<td>Displays the results of the activity cost per time unit analysis.</td>
</tr>
<tr>
<td>Activity duration</td>
<td>Displays the results of the activity duration analysis.</td>
</tr>
<tr>
<td>Activity resource allocation</td>
<td>Displays the results of the activity resource allocation analysis.</td>
</tr>
<tr>
<td>Activity statistics</td>
<td>Displays the results of the activity statistics analysis.</td>
</tr>
<tr>
<td>Classifier cost and duration</td>
<td>Displays the costs and durations of activities associated with each classifier value used in a process.</td>
</tr>
<tr>
<td>Process activities total time</td>
<td>Displays the results of the process activities total time analysis.</td>
</tr>
<tr>
<td>Process break even</td>
<td>Displays the results of the process break even analysis.</td>
</tr>
<tr>
<td>Process cases summary</td>
<td>Displays the results of the process cases summary analysis.</td>
</tr>
<tr>
<td>Process classifier cost and duration</td>
<td>Displays the results of the process classifier cost and duration analysis.</td>
</tr>
<tr>
<td>Process cost</td>
<td>Displays the results of the process cost analysis.</td>
</tr>
<tr>
<td>Process duration</td>
<td>Displays the results of the process duration analysis.</td>
</tr>
<tr>
<td><strong>Processes activities total time comparison</strong></td>
<td>Displays the results of the processes activities total time comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes break even comparison</strong></td>
<td>Displays the results of the processes break even comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes classifier cost comparison</strong></td>
<td>Displays the results of the processes classifier weighted average cost comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes classifier duration comparison</strong></td>
<td>Displays the results of the processes classifier weighted average duration comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes cost comparison</strong></td>
<td>Displays the results of the processes cost comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes duration comparison</strong></td>
<td>Displays the results of the processes duration comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes NPV and IRR comparison</strong></td>
<td>Displays the results of the processes NPV and IRR comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes resources cost comparison</strong></td>
<td>Displays the results of the processes resources cost comparison analysis.</td>
</tr>
<tr>
<td><strong>Processes resources time comparison</strong></td>
<td>Displays the results of the processes resources time comparison analysis.</td>
</tr>
<tr>
<td><strong>Process instance activities free float</strong></td>
<td>Displays the results of the process instance activities free float analysis.</td>
</tr>
<tr>
<td><strong>Process instance cost</strong></td>
<td>Displays the results of the process instance cost analysis.</td>
</tr>
<tr>
<td><strong>Process instance critical path</strong></td>
<td>Displays the results of the process instance critical path analysis.</td>
</tr>
<tr>
<td><strong>Process instance resource allocation</strong></td>
<td>Displays the results of the process instance resource allocation analysis.</td>
</tr>
<tr>
<td><strong>Process instance shortest path</strong></td>
<td>Displays the results of the process instance shortest path analysis.</td>
</tr>
<tr>
<td><strong>Process instances summary</strong></td>
<td>Displays the results of the process instances summary analysis.</td>
</tr>
<tr>
<td><strong>Process instance time</strong></td>
<td>Displays the results of the process instance time analysis.</td>
</tr>
<tr>
<td><strong>Process NPV and IRR</strong></td>
<td>Displays the results of the process NPV and IRR analysis, which calculates the net present value of a process and the internal rate of return necessary to produce a net present value of zero.</td>
</tr>
<tr>
<td><strong>Process resource</strong></td>
<td>Displays the results of the process resource analysis.</td>
</tr>
<tr>
<td><strong>Process resource allocation</strong></td>
<td>Displays the weighted average resource allocation information for all activities in all process instances generated during a simulation.</td>
</tr>
<tr>
<td><strong>Profile specification</strong></td>
<td>Displays the results of the profile specification analysis.</td>
</tr>
</tbody>
</table>
Resource allocation summary
Displays information regarding the usage of resources in fulfilling the resource and role requirements of the process during simulation.

Resource usage
Displays the results of the resource usage analysis.

Resource usage summary
Displays information about which bulk and individual resources are being used, or are sitting idle during a simulation, and to get a high-level picture of the costs associated with their use.

Static process cases summary
Displays information about the costs and revenue generated by each possible path and expected relative frequencies of each path being followed.

See Querying, reporting and printing > Reports > Predefined reports > Dynamic analysis reports in the Modeler Information Center for more information on dynamic analysis reports.

Section 6. Static analysis reports

Static analysis reports provide a way for you to print, store, and share the results of analysis of process models and other project elements. Static analysis reports include the same information as displayed in the Analysis view when you run a static analysis of model contents.

The reports also have a cover page that displays the report title, date, description, optional company information, and parameters you specified when defining the analysis.

The following static analysis reports are available:

<table>
<thead>
<tr>
<th>Report</th>
<th>Usage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities by classifier</td>
<td>Displays the results of the activities by classifier analysis.</td>
</tr>
<tr>
<td>Activities by location</td>
<td>Displays the results of the activities by location analysis.</td>
</tr>
<tr>
<td>Activities by organization unit</td>
<td>Displays the results of the activities by organization unit analysis.</td>
</tr>
<tr>
<td>Activities unable to start</td>
<td>Displays the results of the activities unable to start analysis.</td>
</tr>
<tr>
<td>Activity cost and duration</td>
<td>Displays the results of the activity cost and</td>
</tr>
<tr>
<td><strong>Activity resource and role leveling</strong></td>
<td>Displays the results of an activity resource and role leveling analysis.</td>
</tr>
<tr>
<td><strong>Activity throughput</strong></td>
<td>Displays the results of an activity throughput analysis.</td>
</tr>
<tr>
<td><strong>Entity structure</strong></td>
<td>Displays the results of the entity structure analysis.</td>
</tr>
<tr>
<td><strong>Input and output paths</strong></td>
<td>Displays the results of the input and output paths analysis.</td>
</tr>
<tr>
<td><strong>Path cycles</strong></td>
<td>Displays the results of the path cycles analysis.</td>
</tr>
<tr>
<td><strong>Paths unable to be followed</strong></td>
<td>Displays the results of the paths unable to be followed analysis.</td>
</tr>
<tr>
<td><strong>Qualified resource availability</strong></td>
<td>Displays the results of the qualified resource availability analysis.</td>
</tr>
<tr>
<td><strong>Qualified resource availability for duration</strong></td>
<td>Displays the results of the qualified resource availability for duration analysis.</td>
</tr>
<tr>
<td><strong>Qualified resource cost</strong></td>
<td>Displays the results of the qualified resource cost analysis.</td>
</tr>
<tr>
<td><strong>Qualified resources costs summary</strong></td>
<td>Displays the results of the qualified resources costs summary analysis.</td>
</tr>
<tr>
<td><strong>Qualified resources for role</strong></td>
<td>Displays the results of the qualified resources for role analysis.</td>
</tr>
<tr>
<td><strong>Resource availability</strong></td>
<td>Displays the results of the resource availability analysis.</td>
</tr>
<tr>
<td><strong>Resource availability for duration</strong></td>
<td>Displays the results of the resource availability for duration analysis.</td>
</tr>
<tr>
<td><strong>Resource cost</strong></td>
<td>Displays the results of the resource cost analysis.</td>
</tr>
<tr>
<td><strong>Resource roles</strong></td>
<td>Displays the results of the resource roles analysis.</td>
</tr>
<tr>
<td><strong>Resources costs summary</strong></td>
<td>Displays the results of the resources costs summary analysis.</td>
</tr>
<tr>
<td><strong>Role availability</strong></td>
<td>Displays the results of the role availability analysis.</td>
</tr>
<tr>
<td><strong>Role availability for duration</strong></td>
<td>Displays the results of the role availability for duration analysis.</td>
</tr>
<tr>
<td><strong>Role cost</strong></td>
<td>Displays the results of the role cost analysis.</td>
</tr>
<tr>
<td><strong>Role costs summary</strong></td>
<td>Displays the results of the role costs summary analysis.</td>
</tr>
<tr>
<td><strong>Type instance matching</strong></td>
<td>Displays the results of the type instance matching analysis.</td>
</tr>
<tr>
<td><strong>Type structure</strong></td>
<td>Displays the results of the type structure analysis.</td>
</tr>
</tbody>
</table>
See [Querying, reporting and printing > Reports > Predefined reports > Static analysis reports](https://www.ibm.com/support/knowledgecenter/SS9MFY_1.1.0/doc/psn/psn_7_custom_reports_on.html) in the Modeler Information Center for more information on static analysis reports.

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### Section 7. Custom reports

#### Report style masters

A report style master enables you to reuse header and footer information for multiple report templates by adding them once to the style master and then applying that to the relevant report templates. The same set of header and footer information appears on each page of the report template. Report style masters can be applied to predefined or user-defined report templates.

Note that the header and footer elements will not show in the report template until they are added using the `New => Page Header` and `New => Page Footer` options, as shown in Figure 23, in the Report Designer.

**Figure 23. Adding a page header to a report**

![Adding a page header to a report](image)
Creating a custom report

To create a custom report from scratch, select **New => Report Template** from the Report catalog context menu. The report creation wizard guides you through naming the report, selecting a data source, designating which report designer tool to use, and selection of a report style master. You must provide a name for your report template, but you can add the data source and style master later if not done at initial report creation.

You can add text fields, pictures, basic shapes, and charts by using the appropriate icon from the palette. In order to add data fields, you should first open the Fields view by selecting **Window => Show view => Other** and selecting **Fields View**, as shown in Figure 24, so you can explore the data source schema.

**Figure 24. Show fields view**

![Show fields view](image)
If you didn't add a data source when you created the report template, you can do so using the Fields view and selecting **New => Data Fields** from the context menu, as shown in Figure 25. If you wish to change the existing data source, select **Change data fields** from the context menu.

**Figure 25. Adding a data source**

![Adding a data source](image)

Then select the relevant data source from the **Data Source Selection** dialog, as shown in Figure 26.

**Figure 26. Select a data source**

![Select a data source](image)
Now you can browse the relevant model schema for the selected data source, as shown in Figure 27.

**Figure 27. Data source model schema**
Alternatively, if a data source has been configured, you can access the same view from the **Data Field Selection** dialog that appears when you select the data field icon ( ) directly from the palette.

**Grouping report elements**

You can add groups in a report template when you need to display the same report elements one or more times for multiple modeling artifacts of the same type. The group is defined using the **Grouped By Field** value in the **Attributes** view for the group element. You simply select the immediate parent of the data records that you want to show in the group. You can check **Is Breakable** if you want to allow the group to break across pages.

Alternatively, you can use tables to group related elements. Using a table allows you to further organize each element set as a row in the table in contrast to multiple sets of lists generated for each data field referenced within a basic group.

When you generate a report using a report template that contains a group or table, the data in that group is displayed in the sequence that it appears in your model. Alternatively, you can configure the way the data is sorted within your groups (for example, based on any numerical or text field).

**Creating a custom report using the Quickstart Finance sample**

Now let’s create a custom report to illustrate some of the concepts we’ve reviewed here.
1. If you haven't already done so, import the Quickstart Finance sample that is shipped with Modeler.

2. First, create a new report style master. Select **New => Report style master**, as shown in Figure 28, and name it **custom style master**.

Figure 28. Create a new report style master
Generate business process analysis queries and reports

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3. Add some fields to the header and footer as follows:
   - Add **Report Title** and **Print Date** fields to the header, as shown in Figure 29.
   - Add the **Page N of M** field to the footer.

![Figure 29. Add new fields to style master header](image)

4. Create a new report template by selecting the **New => Report template** from the project tree, as shown in Figure 28.

5. Complete the report template wizard as follows:
   - Specify the name of new report template as **Custom Report**.
   - For **Data Source**, select **Business Models => Process Specification Data Source**
   - For **Reporting designer**, select **WebSphere Modeler**.
   - For **Report Style Master**, select **custom style master**.

6. Add a header and footers to the new template (see Figure 23) to view the applied style master fields.

7. Add a text field with the contents **Using a group in a report template**. Format it as desired. For example, change the font size to 10 and make it bold.
8. Add a group element (appears as a red box) and group it by the field 
/Model/Process Model/Processes/Process/Flow Content/Connection. 
Resize it as needed to include the following:

- Add a line above the group element to delineate the first group.
- Add a text field with Connection.
- Add a data field that references /Model/Process 
  Model/Processes/Process/Flow Content/Connection/@Name.
- Add a text field with Source Node.
- Add a data field that references /Model/Process 
  Model/Processes/Process/Flow Content/Connection/Source/@node.
- Add a text field with Target Node.
- Add a data field that references /Model/Process 
  Model/Processes/Process/Flow Content/Connection/Target/@node.

- Feel free to format the fields. Indent each value by adding 0.1 inches 
to the left padding value. Realign the fields vertically as centered.
- Add a line at the end (inside) the group element to delineate each 
group set.

9. Add a text field with the contents Using a table to group 
elements in a report template:. Format it as desired.

10. Add a table with three columns and two rows and group it by the field 
/Model/Process Model/Processes/Process/Flow Content/Connection. 
Populate it as follows:

- Add a text field with Connection to column 1, row 1.
- Add a data field that references /Model/Process 
  Model/Processes/Process/Flow Content/Connection/@Name to 
column 1, row 2.
- Add a text field with Source Node to column 2, row 1.
- Add a data field that references /Model/Process 
  Model/Processes/Process/Flow Content/Connection/Source/@node to column 2, row 2.
- Add a text field with Target Node to column 3, row 1.
- Add a data field that references /Model/Process
11. Save the final report. It should look similar to Figure 30.

**Figure 30. Final custom report template**

12. Run the report for the Loan Application (As Is) process in the Quickstart Finance project. Note that the group results appear as a list of sets delineated by the lines you added, as shown in Figure 31.

**Figure 31. Custom report group results**
Note that the table contains the same information in a more compact and efficient format, as shown in Figure 32.

**Figure 32. Custom report table results**
Section 8. Summary

In this tutorial, you learned about the product query and report functions you can leverage to confirm and document that your model meets your business requirements. First, we discussed how queries can be used in addition to the predefined analysis functions discussed in Part 4 of this series to further analyze your model. Next, you learned how to use formal reports to document the analysis results. Finally, you saw how you can create custom queries and reports.

In the sixth and final part of this series, you'll learn about the business measures model support in Modeler, which allows you to monitor, analyze, and report on actual runtime data. The business measures model can be used to validate that the business objectives are being met in a quantifiable manner.
Resources

Learn

- **Test 992, IBM WebSphere Business Modeler Advanced V6.1, Business Analysis and Design:** Become an IBM-Certified Business Process Analyst. Check out the objectives, sample assessment tests, and training resources for Test 992.


- **developerWorks WebSphere business process management zone:** Get the latest technical resources for WebSphere BPM solutions, including articles, tutorials, events, downloads, and more.

- **Business Process Management: Modeling through Monitoring Using WebSphere V6.0.2 Products:** This IBM Redbook introduces the concepts of business process management, the IBM products that support business process management, and examines a detailed case study.

- **Tutorials and Samples for WebSphere Business Modeler Version 6.1: Creating Report Templates with Report Designer:** This tutorial presents a series of exercises that show you how to create reusable report templates with Report Designer.

- **IBM Training:** Check out this site for more information on training opportunities for IBM products and technologies.

Get products and technologies

- **WebSphere Business Modeler Advanced Version 6.1:** Download a free trial version.

- **Downloads:** Build your next development project with IBM trial software, available for download directly from developerWorks.

Discuss

- **WebSphere Business Modeler forum:** Ask questions and talk to other Modeler users in this developerWorks forum.

- **Forums and community:** Participate in developerWorks blogs and get involved in the developerWorks community.

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