MAGICDRAW REPORT WIZARD

18.1

user guide

No Magic, Inc.

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1. MagicDraw Report Wizard Overview

Report Wizard is a report engine for MagicDraw version 14.0 and greater. It is designed to solve several problems of our legacy report engines (XSL/XSLT and JPython).

The Report Wizard report engine is built on top of Velocity Engine (Open Source Templating engine) and is integrated with the MagicDraw application. To make the best of Report Wizard, you need to understand the Report Wizard UI, the Velocity Template Language (VTL), the application's Open API, and the helper modules.

Report Wizard supports text-based templates to generate reports. Each report file format depends on the type of the templates. The type of template files that Report Wizard supports includes plain text, RTF, HTML, Office Open XML (ISO/IEC 29500:2008), OpenDocument format (ISO/IEC 26300), and XML template (DocBook or FO). It also supports the MS Word template in VBA Editor on Windows 8.

All commercial MagicDraw editions will have full use of all features within Report Wizard. The MagicDraw Community edition allows you to generate reports with watermarks.

Before generating a report, you need to open Report Wizard.

To open **Report Wizard**:

- On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will appear.

1.1 Report Wizard Dialog

The **Report Wizard** dialog (Figure 1) consists of 2 panes: (1.1.1) Control buttons and (1.1.2) Content Management pane.

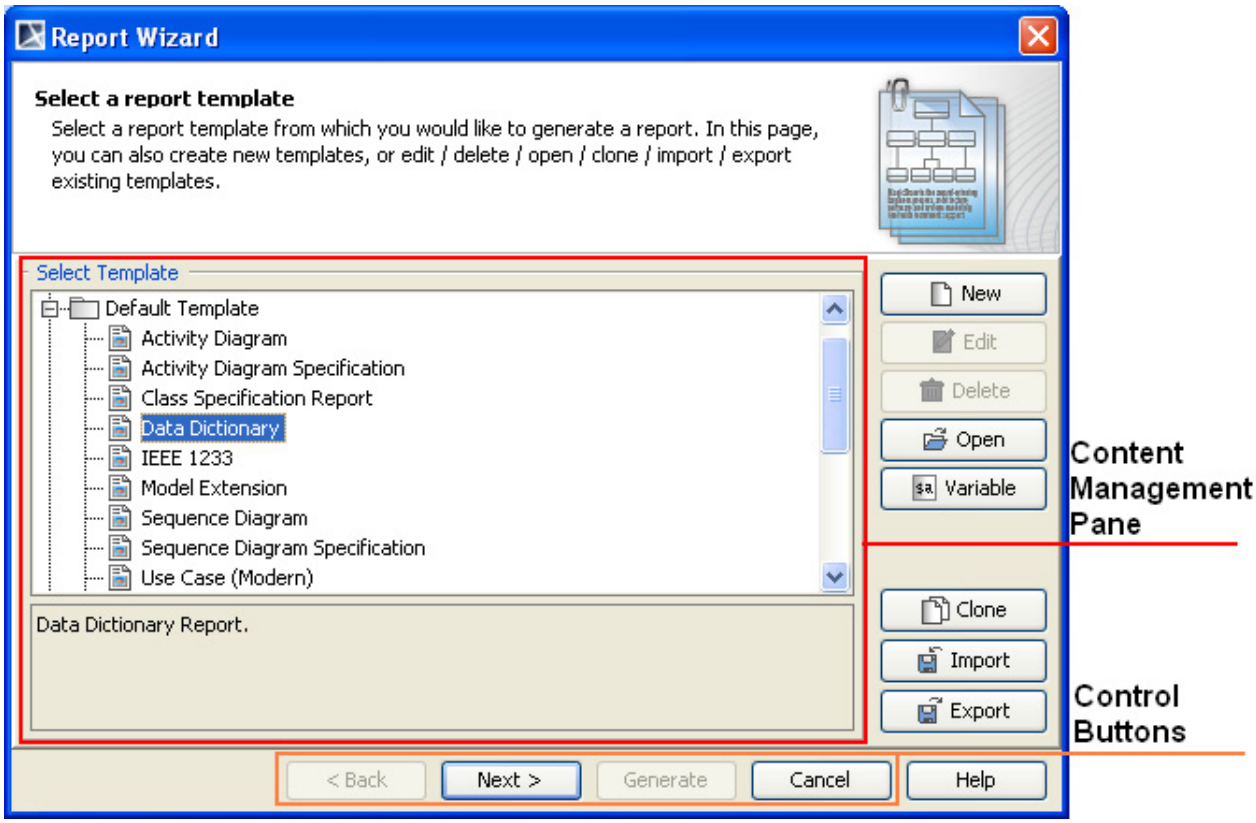


Figure 1 -- Report Wizard Dialog

1.1.1 Control Buttons

There are 4 control buttons:

(i) The **Back** button is used for proceeding to the previous content management pane.
(ii) The **Next** button is used for proceeding to the next content management pane.
(iii) The **Generate** button is used for generating a report.
(iv) The **Cancel** button is used for cancelling the report generation process.

1.1.2 Content Management Pane

This pane is used for managing the template content and includes the following sub-panes:

(1.1.2.1) Template Management pane
(1.1.2.2) Report Data Management pane
(1.1.2.3) Select Element Scope pane
(1.1.2.4) Generate Output pane

Click the **Back** or **Next** button to go to a specific pane.

1.1.2.1 Template Management Pane

The Template Management pane lists all report templates that you can use to generate your report in the **Select Template** sub-pane (Figure 2).

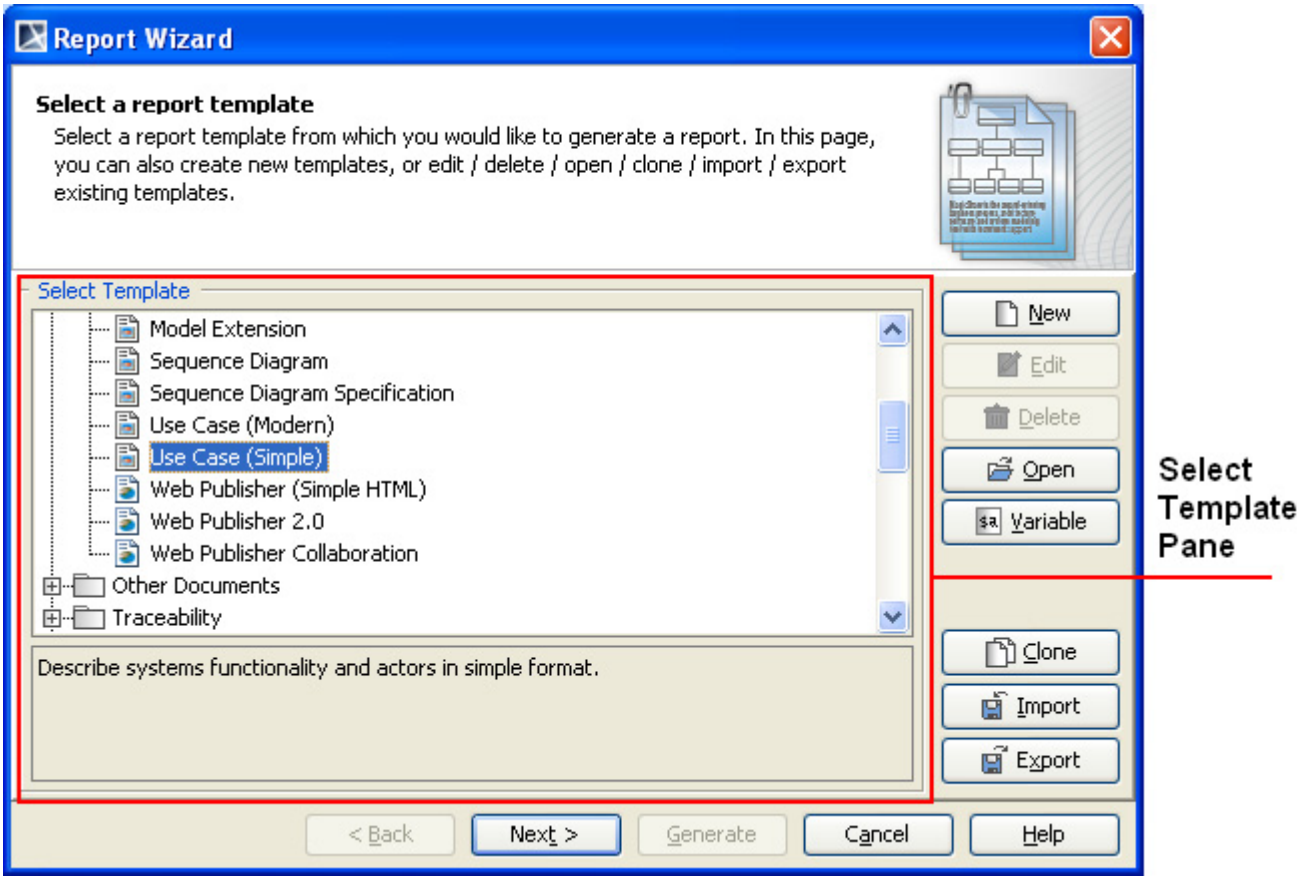


Figure 2 -- Select Template Pane

Report Wizard provides predefined templates such as *Use Case*, *Model Extension, Data Dictionary, IEEE 1233, Class Specification Diagram, Business Process Diagram, and Web Publisher* templates. Choose the relevant template to manage or generate a report.

To select a template:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. In the **Select Template** pane (Figure 2), select a template. A template description will be displayed in the lower part of the **Select Template** pane.

You can manage the template from the **Template Management** pane or click the **Next** button to go to the next step for generating the report.

This pane contains 8 buttons: (a) **New**, (b) **Edit**, (c) **Delete**, (d) **Open**, (e) **Variable**, (f) **Clone**, (g) **Import**, and (h) **Export**.

(a) New button

The function of **New** button (Figure 2) is to open the **New Template** dialog through which you can create a new template.

To create a new template:

1. In the **Report Wizard** dialog, click the **New** button. The **New Template** dialog will open (Figure 3).

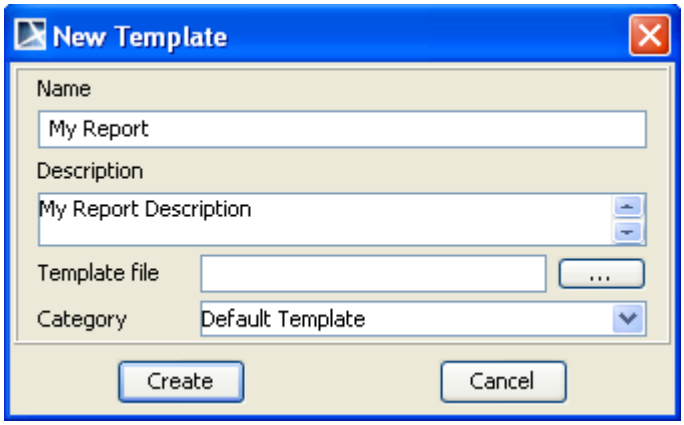


Figure 3 -- New Template Dialog

2. Enter the template name, description, and location of the new template in the **New Template** dialog.

Table 1 -- New Template Dialog Fields and Buttons

Field Name	Description	Default Value	Type	Required
Name	Enter a new template name.	Blank	Text	Yes
Description	Enter a template description.	Blank	Text	No
Template file	Select an RTF template.	Blank	Text	Yes
Create	Create a new template under the Template tree.	Disable	-	-
Cancel	Close the dialog.	Enable	-	-
Category	Choose the existing category or enter a new category name.	-	Text	No

3. Click the "**...**" button. The **Select Location** dialog will appear (Figure 4).

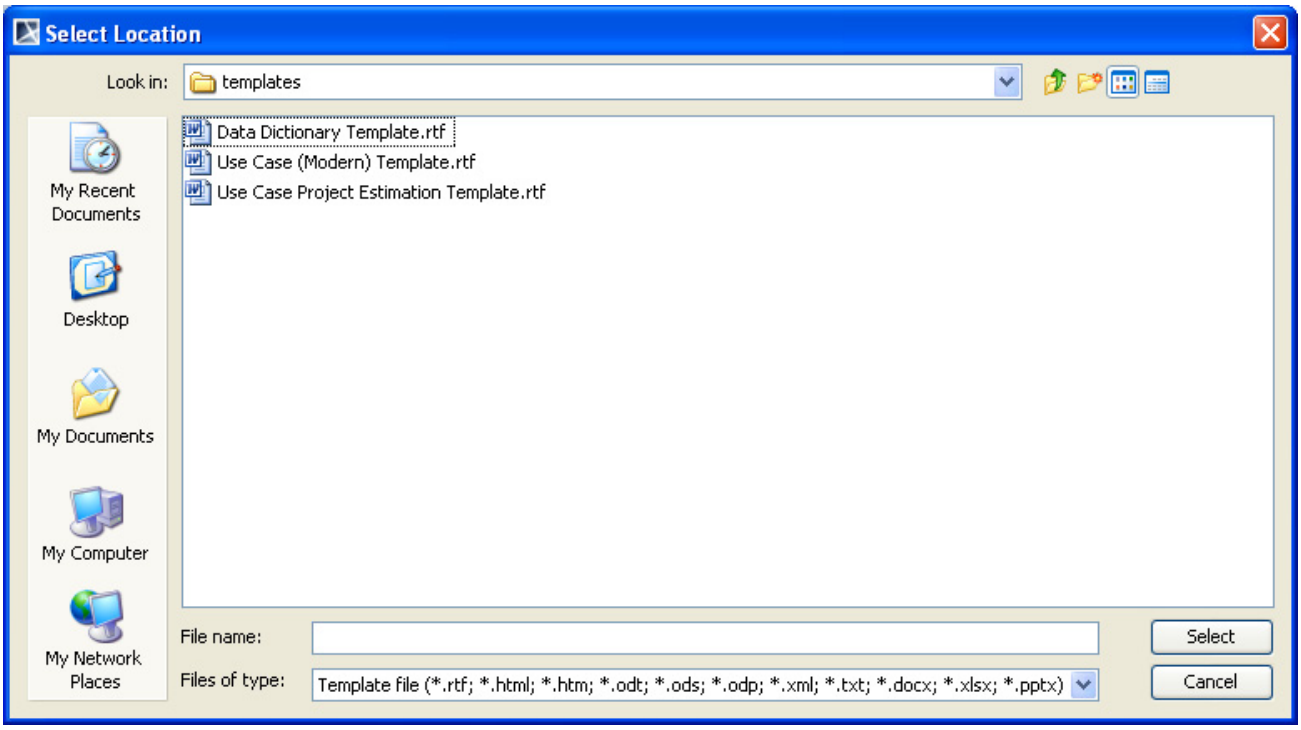


Figure 4 -- Selecting Template File in the Select Location Dialog

4. Select the template file location and type. Enter the filename and click **Select**.

(b) **Edit** button

The **Edit** button (Figure 2) is used for editing a template and save it in Report Wizard.

To edit a template:

1. In the **Report Wizard** dialog, select a template and click the **Edit** button. The **Edit Template** dialog will appear (Figure 5).

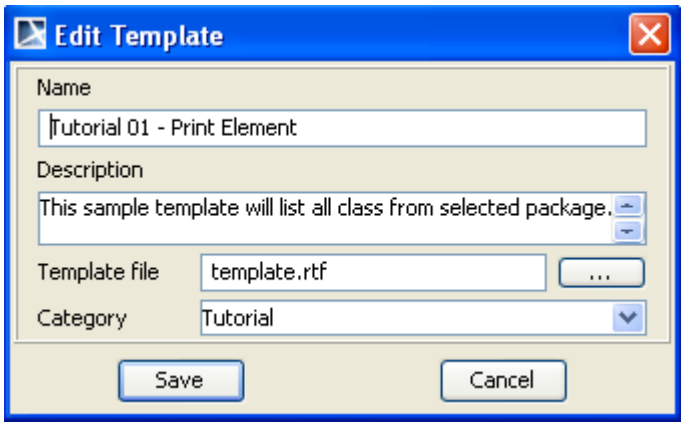


Figure 5 -- Edit Template Dialog

2. Edit the template name and description and locate the template file's location.

Table 2 -- Edit Template Dialog Fields and Buttons

Field Name	Description	Default Value	Type	Required
Name	Edit the template name.	Existing name	Text	Yes
Description	Edit the template description.	Existing description	Text	No
Template file	Change the RTF template.	Existing template file	Text	Yes
Save	Save the edited template under the Template tree.	Enable	-	-
Cancel	Close the dialog.	Enable	-	-
Category	Choose an existing category or enter a new category name.	Existing category	Text	No

(c) **Delete** button

You can delete a template from Report Wizard by clicking the **Delete** button (Figure 2).

To delete a template:

1. In the **Report Wizard** dialog, select a template and click the **Delete** button. The **Confirm delete** dialog will appear (Figure 6).

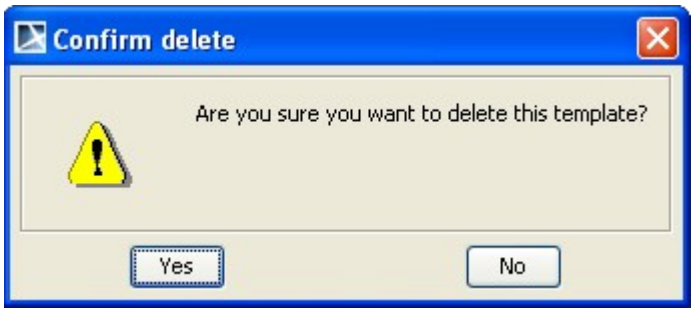


Figure 6 -- Confirm Delete Dialog

2. Click either **Yes** to delete the selected template from the template list or **No** to cancel the operation.

(d) **Open** button

The **Open** button (Figure 2) opens a template file in the default editor.

To open a template field in the default editor:

- In the **Report Wizard** dialog, select a template and click the **Open** button. The template file will open in the default editor.

(e) **Variable** button

If you click the **Variable** button (Figure 2) in the **Template Management** pane, the **Template Variable** dialog (Figure 7) will appear, allowing you to create a new template variable and modify or delete an existing template variable.

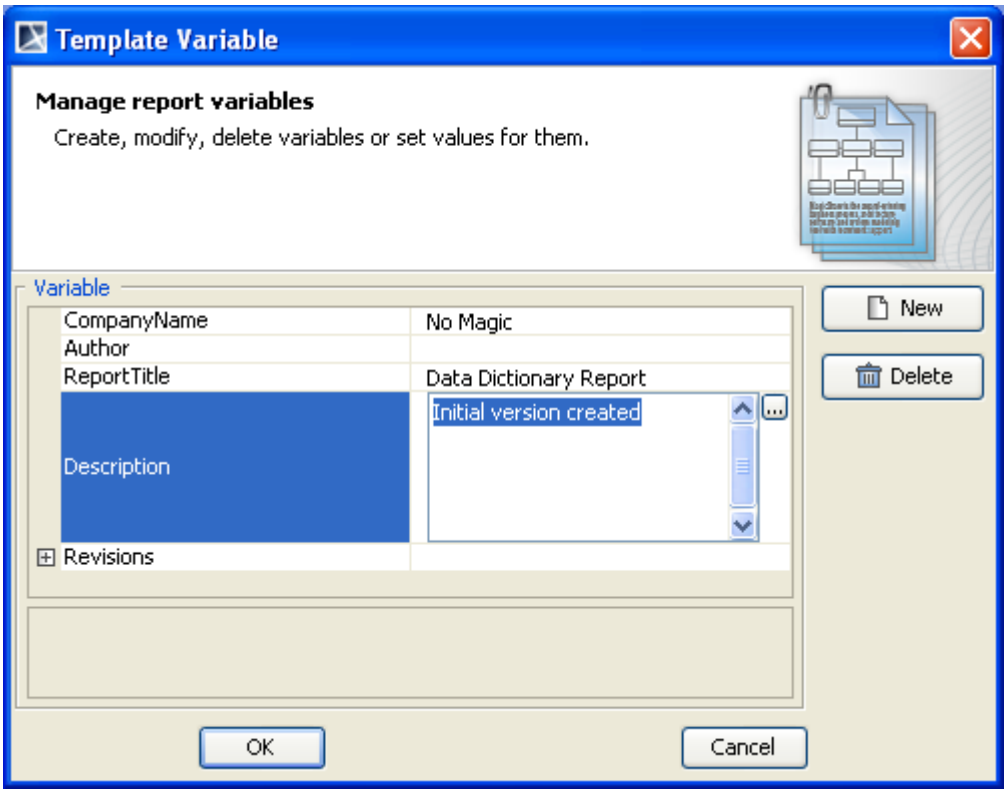


Figure 7 -- Template Variable Dialog

Table 3 -- Variable Dialog Fields and Buttons

Field Name	Description	Default Value	Type	Required
Name	Enter the variable name.	Blank	Text	Yes
Value	Enter the variable description.	Blank	Text	No
New	Create a new template description.	Enable	-	-
Cancel	Close the dialog.	Enable	-	-

The **Template Variable** dialog (Figure 7) contains 1.1.2.1.1 Variable Pane and 1.1.2.1.2 Control Buttons.

1.1.2.1.1 Variable Pane

This pane consists of a report description table and the **Variable Value** text box. The first column of the table is the variable name, and the second column is the variable value. You can use the **Variable Value** text box or the second column of the table to view the value of a selected variable. To edit the value, please do so in the second column of the table.

1.1.2.1.2 Control Buttons

There are two control buttons in the Template Variable dialog: **OK** and **Cancel**.

To create a new variable:

1. In the **Template Variable** dialog, click the **New** button. The **New Variable** dialog will appear (Figure 8).

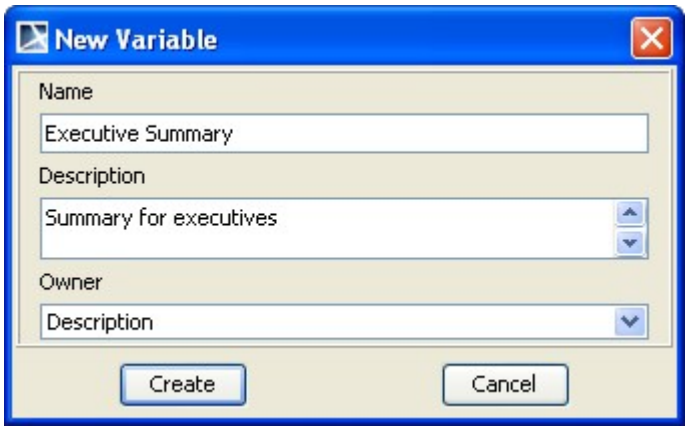


Figure 8 -- New Variable Dialog

2. Enter the variable name and value. Next, select an owner for this new variable from the Owner drop-down list and then click **Create**. You will see the newly-created variable's name and value in the **Variable** pane.
3. In the **Template Variables** dialog, click **OK**.

You can modify a variable value in either the (i) **Variable** pane or (ii) **Variable Value** dialog.

(i) To modify a value in the **Variable** pane:

- Click a variable name column in the **Variable** pane and modify the variable value in the table (Figure 9).

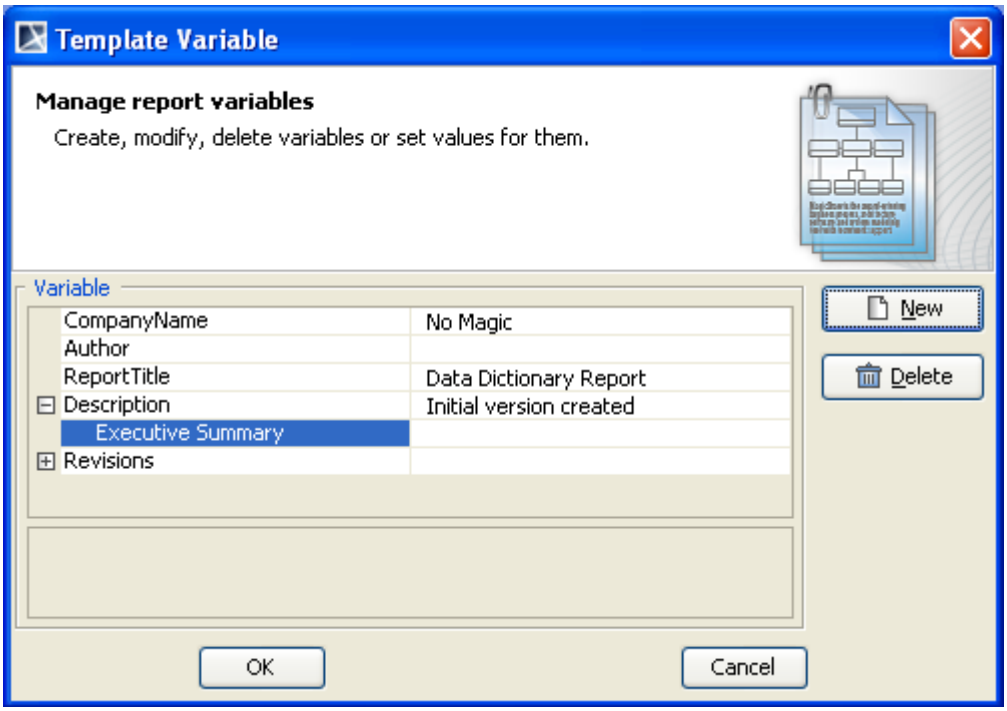


Figure 9 -- Modifying a Variable Value in the Variable Pane

(ii) To modify a variable value in the **Variable Value** dialog:

1. Click a variable value column in the table in the **Variable** pane and click the "**...**" button (Figure 10). The **Variable Value** dialog will appear (Figure 11).

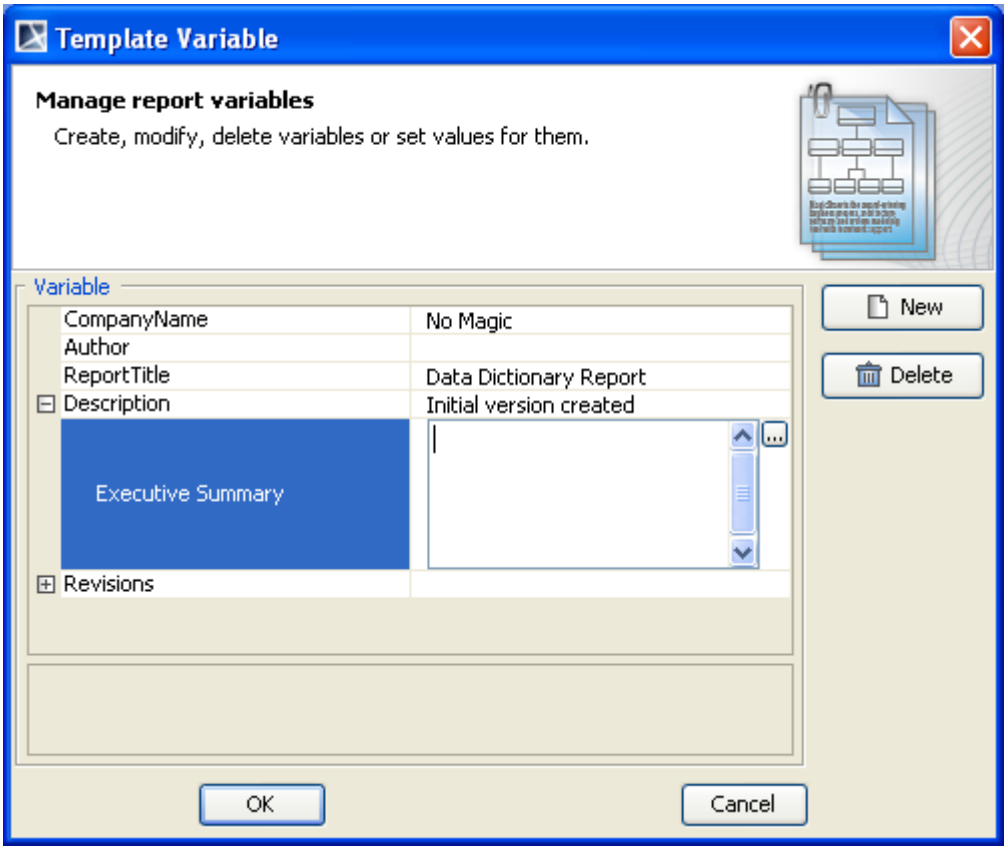


Figure 10 -- Modifying a Variable Value with the "..." Button

2. Modify the variable value and click **OK** (Figure 11).

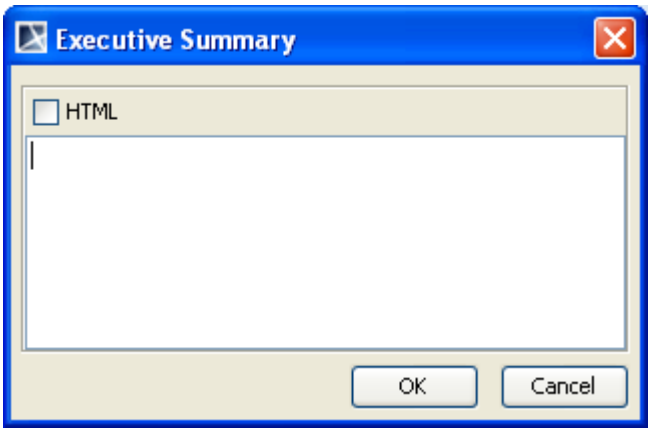


Figure 11 -- Variable Value Dialog

3. When you finish modifying variables and their values in the **Template Variable** dialog, click either **OK** to confirm the changes or **Cancel** to discard them.

You can enter the value of a report variable in either plain text or HTML. You can switch from plain text to HTML or vice versa by selecting the **HTML** check box in the **Variable Value** dialog (Figure 13).

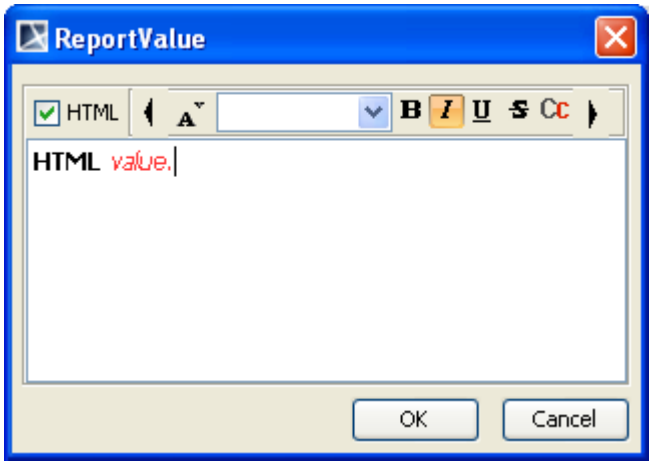


Figure 12 -- Entering Report Variable Value in HTML

To delete a variable:

1. Select a variable in the table and click the **Delete** button. The **Question** dialog will appear prompting you for confirmation before deleting the selected variable.
2. Click **Yes** to delete the selected variable (Figure 13).

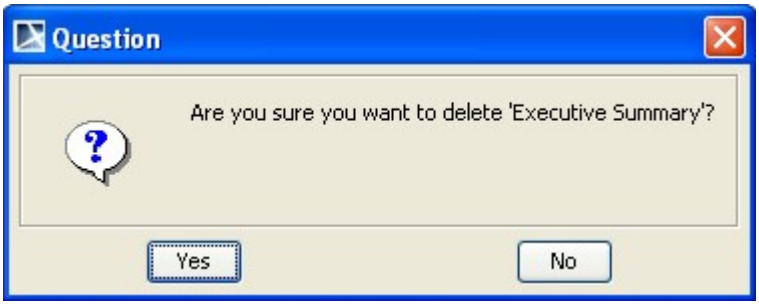


Figure 13 -- Deleting A Variable

(f) **Clone** button

Click the **Clone** button (Figure 2) to clone a template.

To clone a template:

1. In the **Report Wizard** dialog, select a template and click the **Clone** button. The **Clone Template** dialog will appear (Figure 14).

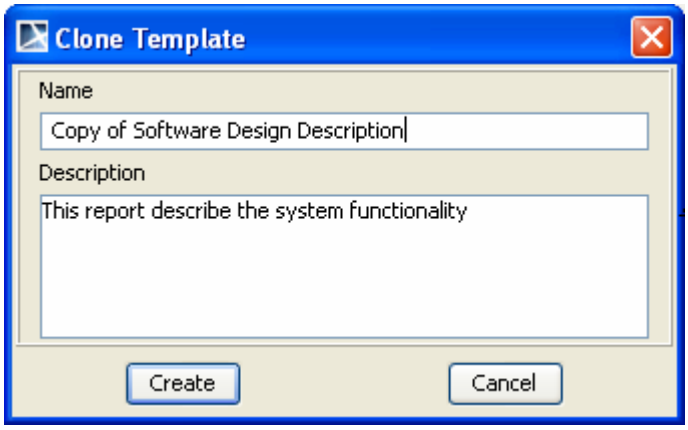


Figure 14 -- Clone Template Dialog

2. Enter the name and description. The name of the cloned template should begin with **Copy of** (name of template).
3. Click the **Create** button to clone the template.

Table 4 -- Clone Template Dialog Fields and Buttons

Field Name	Description	Default Value	Type	Required
Name	Enter a new template name.	Copy of the selected template name	Text	Yes
Description	Enter the template description.	Existing description	Text	No
Create	Create a template.	Enable	-	-
Cancel	Close the dialog.	Enable	-	-

(g) **Import** button

Click the **Import** button (Figure 2) to import a template.

To import a template:

1. In the **Report Wizard** dialog, click the **Import** button. The **Select Location** dialog will appear (Figure 15).

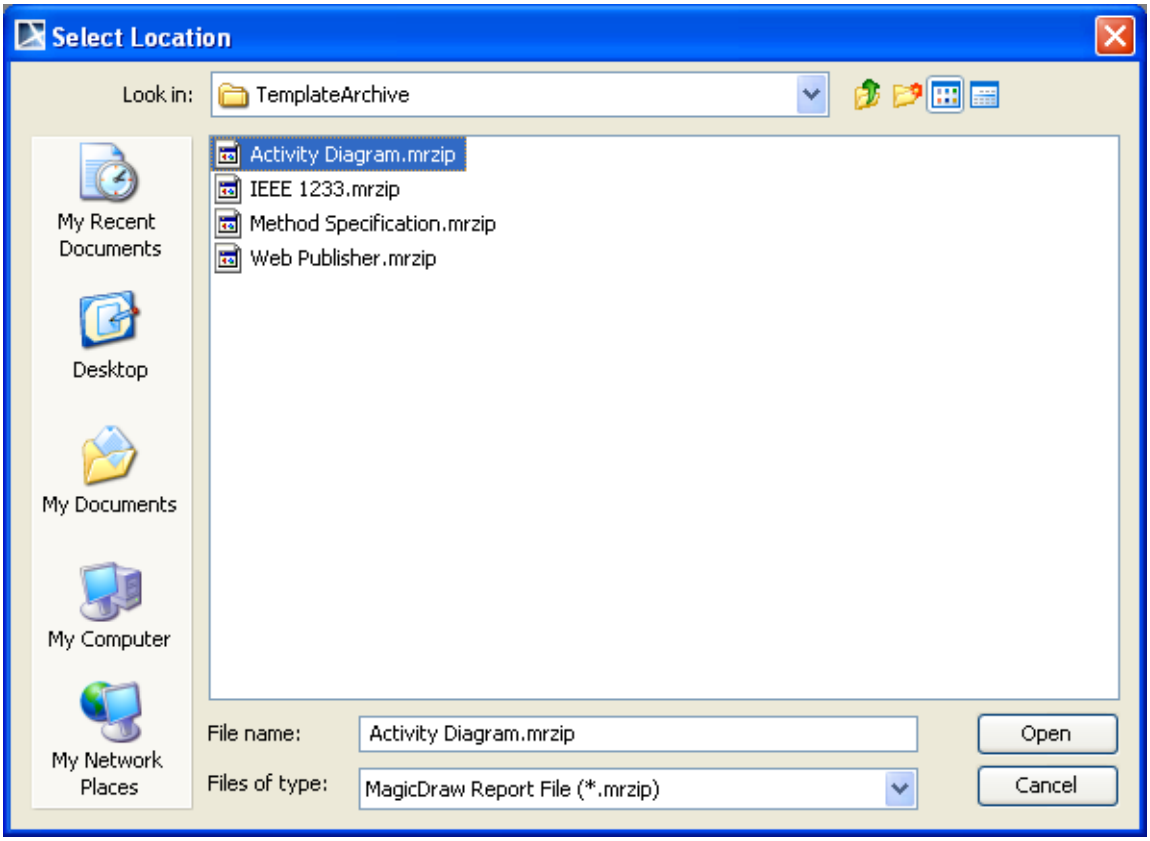


Figure 15 -- Select Location Dialog

2. Select a Report Wizard template with the filename extension ***.mrzip** and click **Open**. The following **Message** dialog will open (Figure 16).

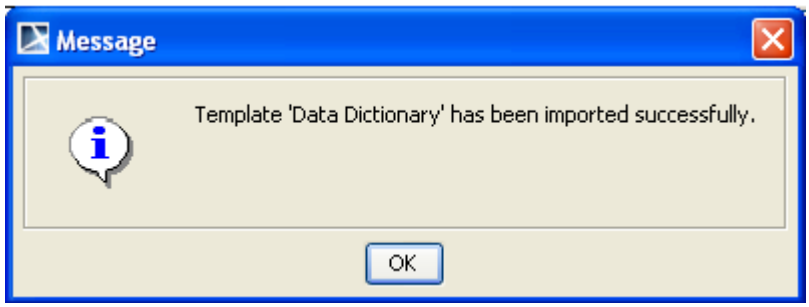


Figure 16 -- Message Dialog of Successful Import

(h) **Export** button

Click the **Export** button (Figure 2) in the **Report Wizard** dialog to export a template.

To export a template:

1. In the **Report Wizard** dialog, select a template and click the **Export** button. The **Select Location** dialog will open (Figure 17).

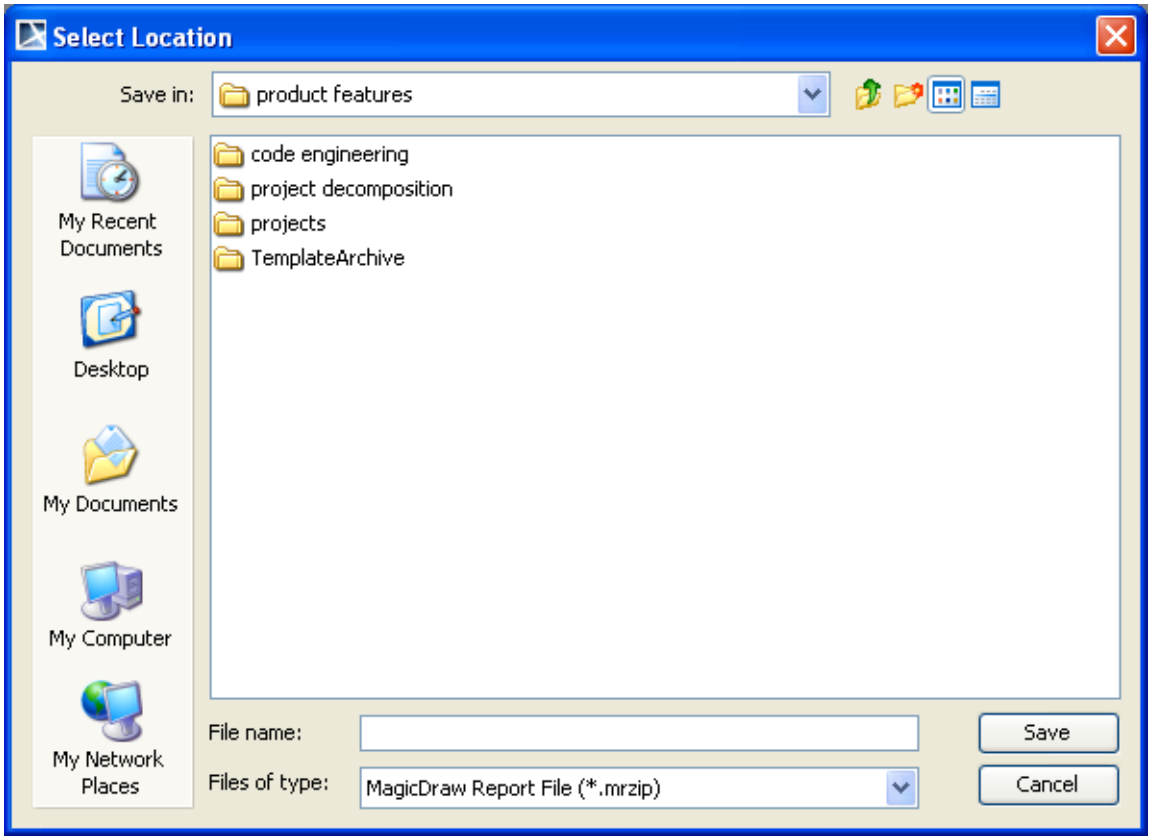


Figure 17 -- Select Location Dialog

2. Select a directory or folder where you want to export the template.
3. Type the filename and click **Save**.
4. The following **Message** dialog will open (Figure 18). Click **OK**.

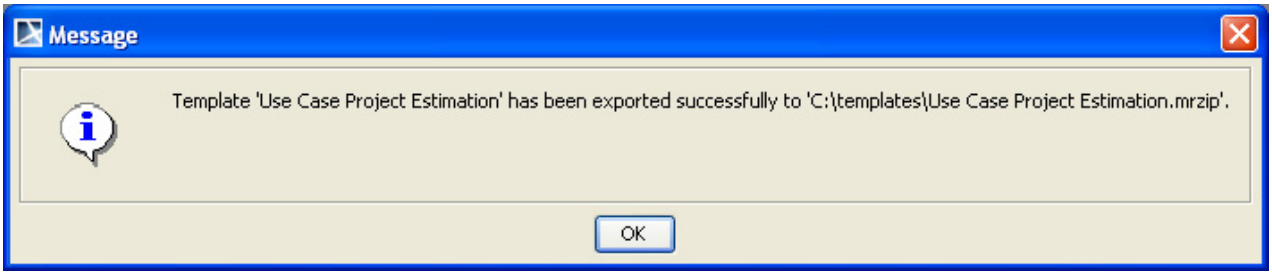


Figure 18 -- Message Dialog of Successful Export

1.1.2.2 Report Data Management Pane

A Report Data is a collection of variables. You can create a Report Data and organize its variables through the **Report Data Management** pane in the **Report Wizard** dialog. You can now create a Report Data as an element in the Containment tree inside a MagicDraw project with the use of profiles, allowing you to commit the Report Data to Teamwork Server and share it with other users.

You can also create child variables under any variables. This will help you organize information into groups, keep revision history, and many more.

Figure 19 below shows the **Report Data Management** pane in the **Report Wizard** dialog.

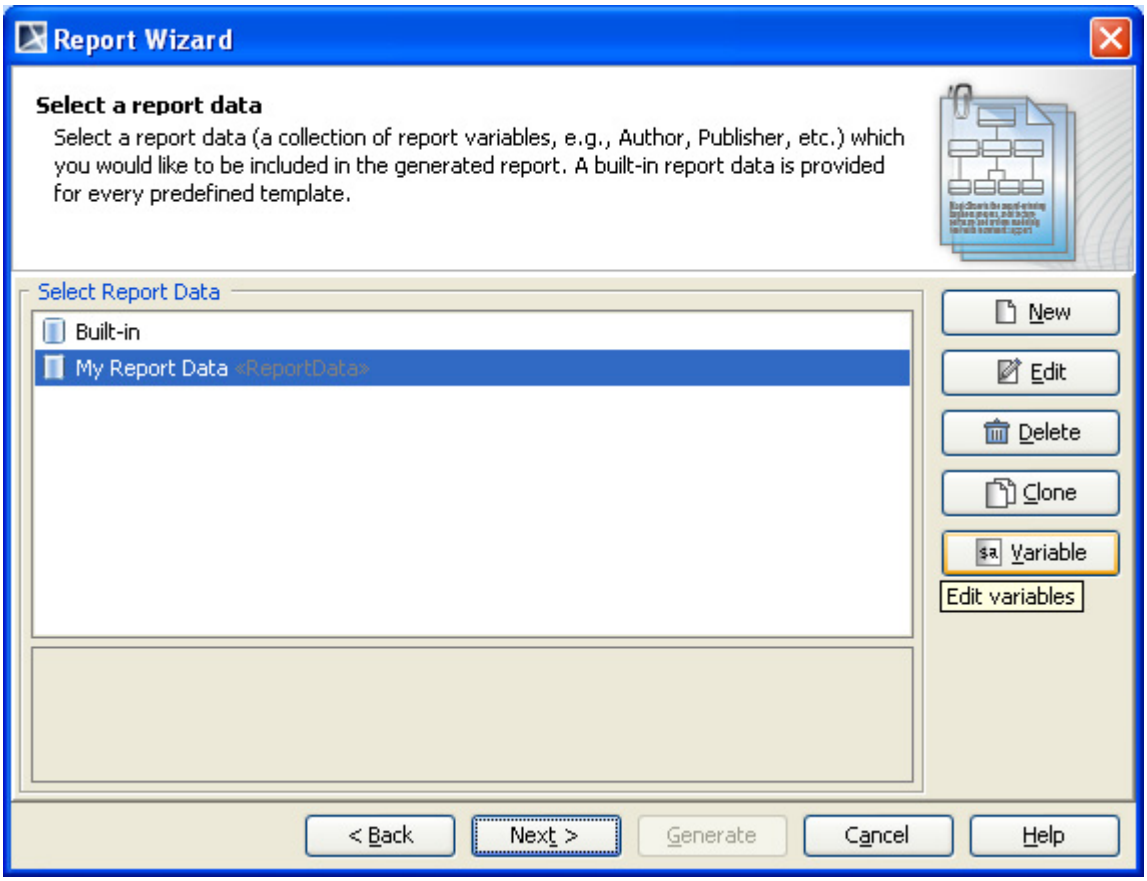


Figure 19 -- Report Data Management Pane

Use the **Report Data Management** pane to select and organize a Report Data and its variables. Report Wizard provides a built-in Report Data for every predefined template. A detailed description of the Report Data will be displayed in the **Select Report Data** pane.

The **Report Data Management** pane allows you to:

- create, edit, delete, or clone a Report Data
- create or organize variables in a Report Data.

The **Report Data Management** pane contains several buttons: (a) **New**, (b) **Edit**, (c) **Delete**, (d) **Clone**, and (e) **Variable** buttons (Figure 19). These buttons can help you create a Report Data and its variables.

(a) **New** button

Click the **New** button to create a new Report Data (Figure 19).

To create a new report:

1. Click the **New** button. The **New Report Data** dialog will appear (Figure 20).

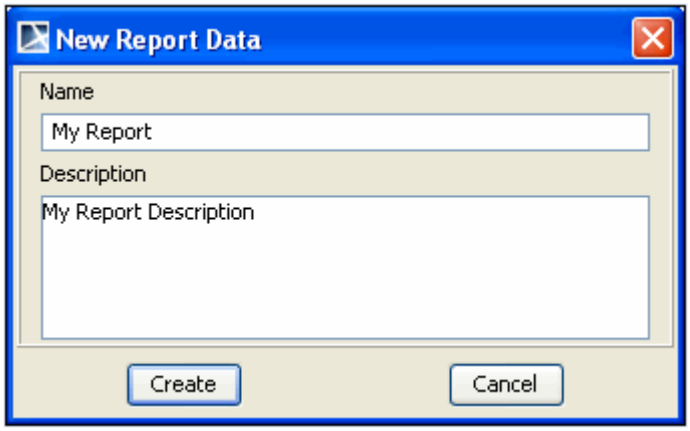


Figure 20 -- New Report Data Dialog

2. Enter a new report name and description, and then click **Create**.

Table 5 -- New Report Data Fields and Buttons

Field Name	Description	Default Value	Type	Required
Name	Enter the report's name.	Blank	Text	Yes
Description	Enter the report's description.	Blank	Text	No
Create	Create the report.	Disable	-	-
Cancel	Close the dialog.	Enable	-	-

(b) Edit button

Click the **Edit** button to edit a Report Data (Figure 19).

To edit a Report Data:

1. Click the **Edit** button. The **Edit Report Data** dialog will appear (Figure 21).

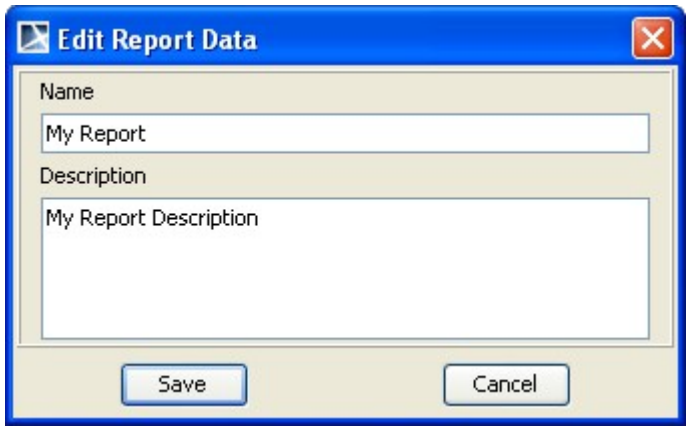


Figure 21 -- Edit Report Data Dialog

2. Edit the report's name and description, and then click **Save**.

Table 6 -- Edit Report Data Dialog Fields and Buttons

Field Name	Description	Default Value	Possible Value	Required
Name	Edit the report's name.	Existing Name	Text	Yes
Description	Edit the report's description.	Existing Description	Text	No
Save	Save the report.	Enable	Enable/Disable	-
Cancel	Close the dialog.	Enable	Enable/Disable	-

(c) **Delete** button

Click the **Delete** button to delete a Report Data (Figure 19).

To delete a report:

1. Click the **Delete** button. The **Confirm delete** dialog will appear (Figure 22).

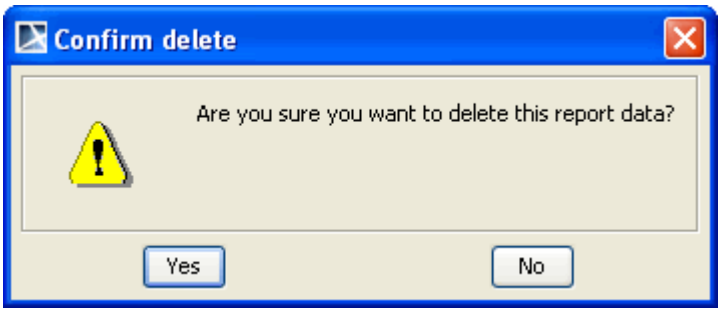


Figure 22 -- Confirm Delete Dialog

2. Click either **Yes** to delete the selected data or **No** to cancel the operation.

(d) **Clone** button

Click the **Clone** button to clone a Report Data (Figure 19).

To clone a report:

1. Click the **Clone** button. The **Clone Report** dialog will appear (Figure 23).

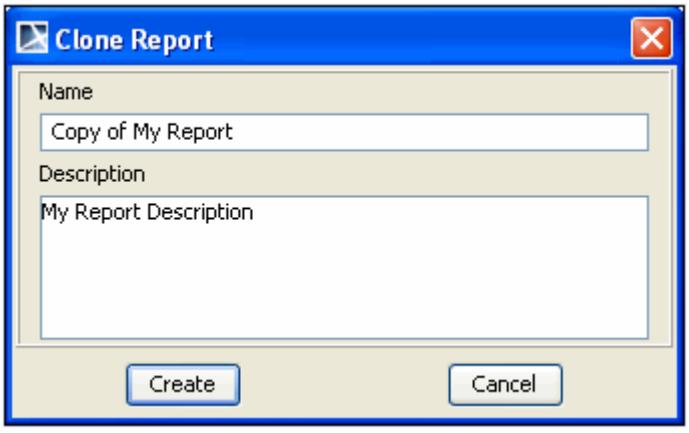


Figure 23 -- Clone Report Dialog

2. Enter the name and description of the report. The name should begin with **Copy of** (cloned report name).
3. Click the **Create** button. The cloned Report Data will then be created (Figure 24).

Table 7 -- Clone Report Dialog Fields and Buttons

Field Name	Description	Default Value	Type	Required
Name	Enter the report name.	Copy of the selected report name	Text	Yes
Description	Enter the report description.	Existing Description	Text	No
Create	Create the clone report.	Enable	-	-
Cancel	Close the dialog.	Enable	-	-

NOTE	Whenever a cloned Report Data is created, a copy of the Report Data (variable) will also be created.

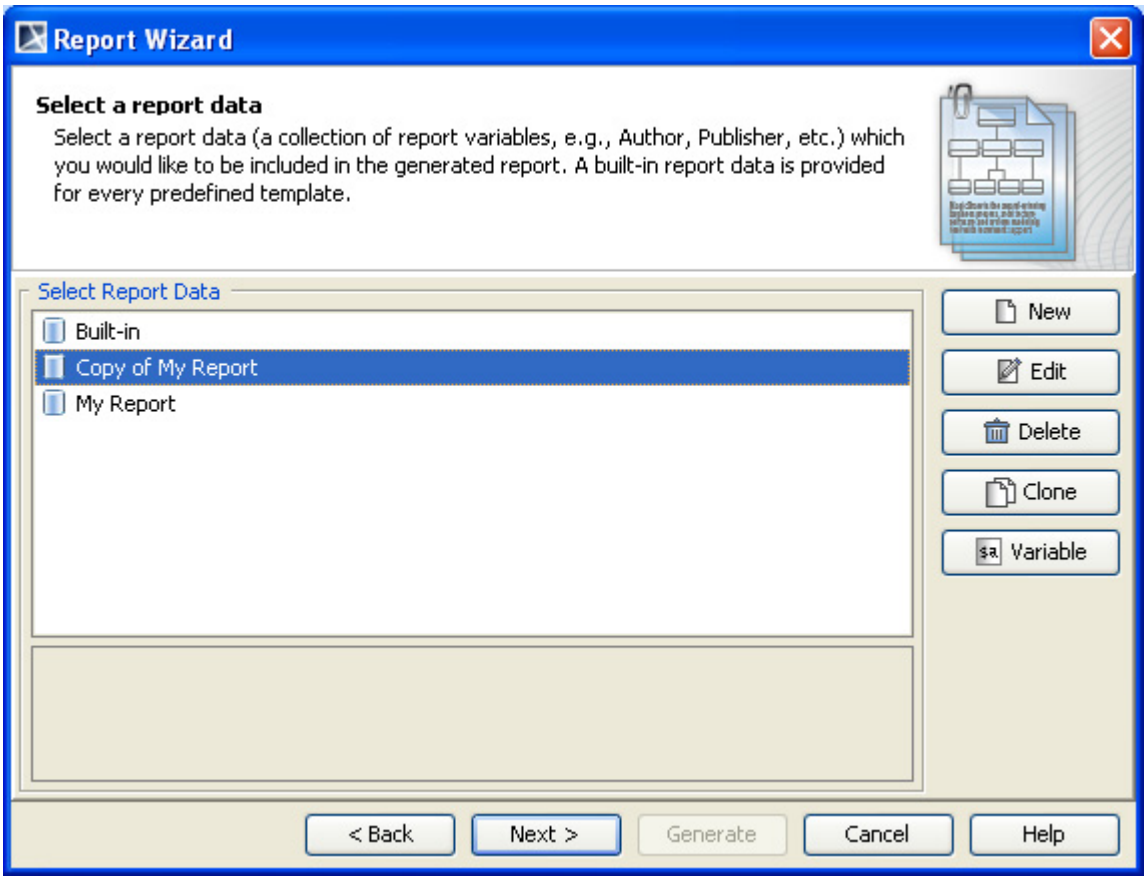


Figure 24 -- Copy of My Report Created in the Report Data Management Pane

(e) **Variable** button

Click the **Variable** button to create a new variable (Figure 19).

To create a new variable:

1. Click the **Variable** button. The **New Variable** dialog will then open.
2. Type the variable name and value, and then click **Create**.

You can create report data in either (i) Report Wizard where all data will be saved into an XML file or (ii) a MagicDraw project, in which case the report data will be saved with the project itself. Saving report data in a project will enable you to commit the report to Teamwork Server.

1.1.2.2.1 Creating a Report Data in Report Wizard

To create report data in Report Wizard:

1. Open the **Select Report Data** pane.
2. Click the **New** button (Figure 25).

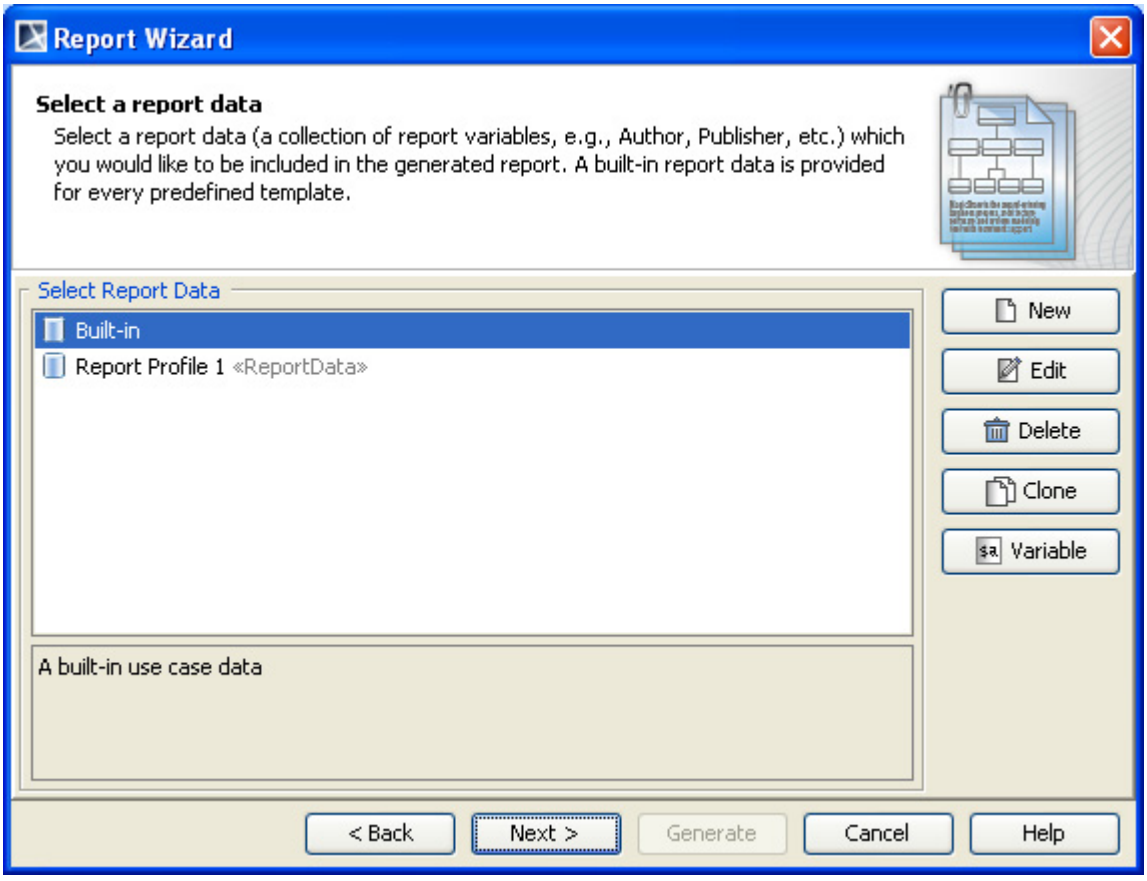


Figure 25 -- Creating Report Data in Report Wizard

3. Enter the new report's name and description in the **New Report Data** dialog (Figure 26).

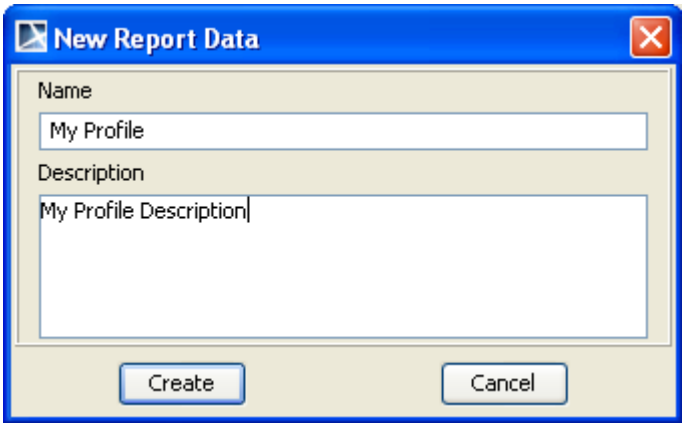


Figure 26 -- Entering Report's Name and Description in the New Report Data Dialog

4. Click **Create**.

1.1.2.2.2 Creating a Report Data in a MagicDraw Project

Before creating report data in a MagicDraw project, you need to use a report profile, `Report Profile.mdzip`, which is located in the `<install.root>\profiles` folder.

To use a report profile (Report Profile.mdzip):

1. Click **File** > **Use Project...** on the MagicDraw main menu (Figure 27). The **Use Project** dialog will open and the project module path **<install.root>\profiles** will be selected by default (Figure 28).

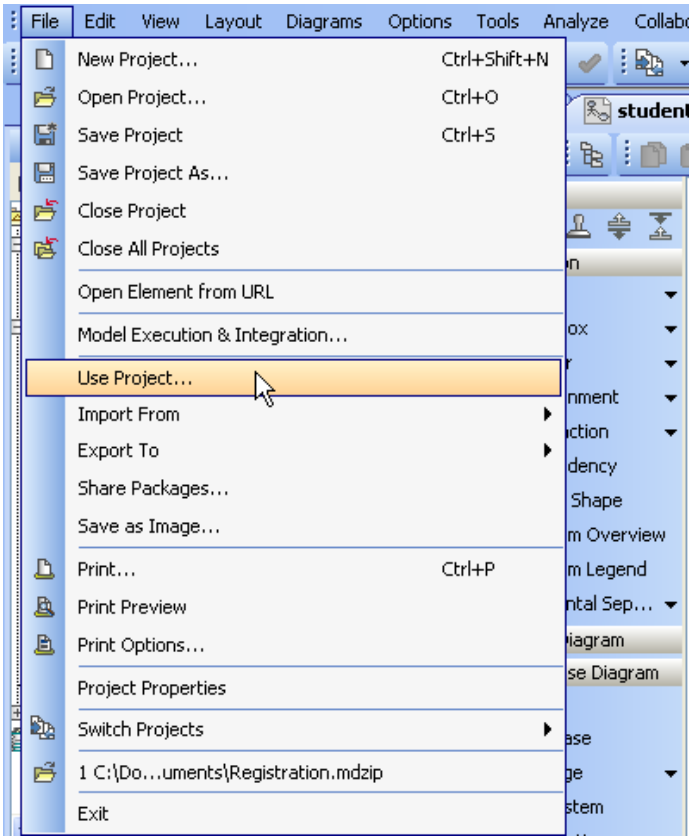


Figure 27 -- The Use Project Menu

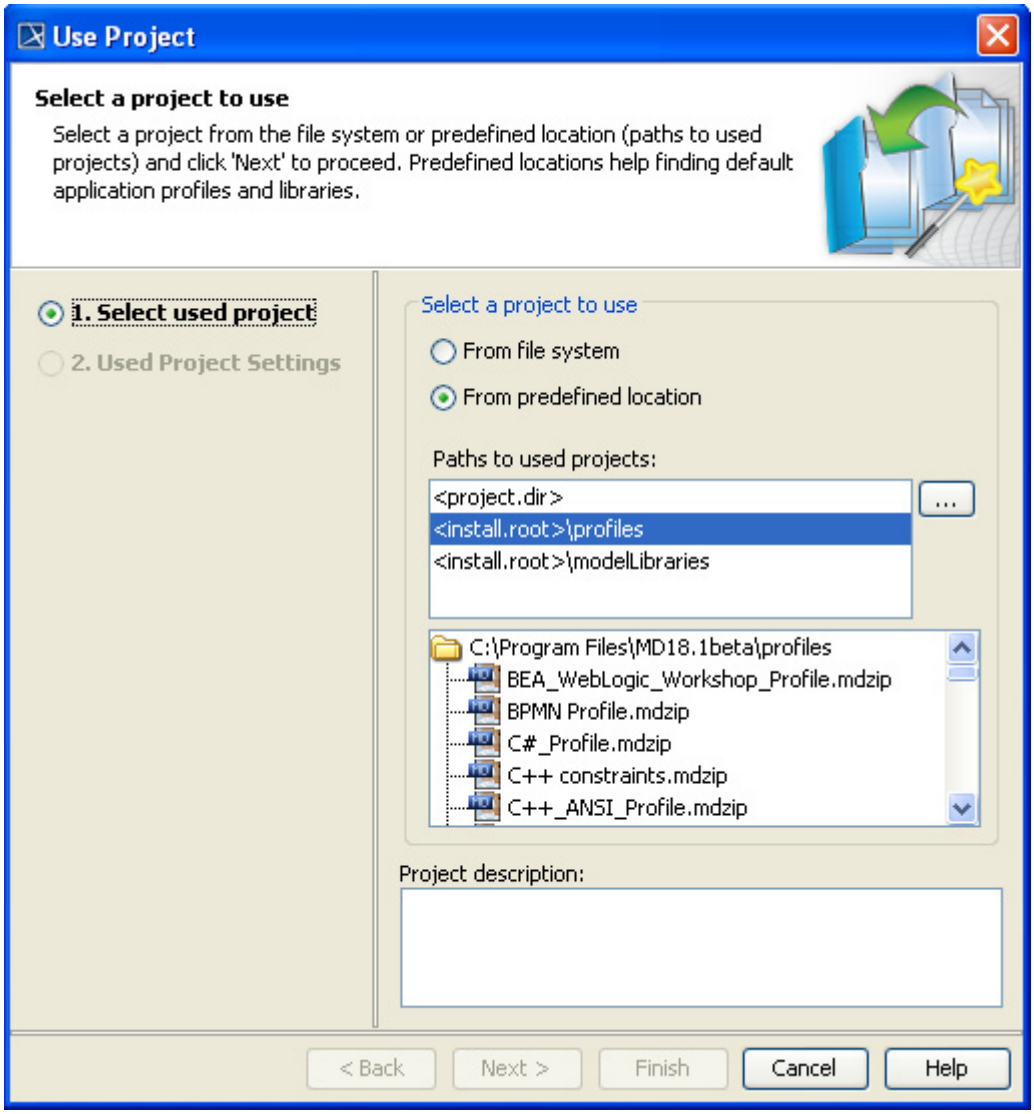


Figure 28 -- The Use Project Dialog

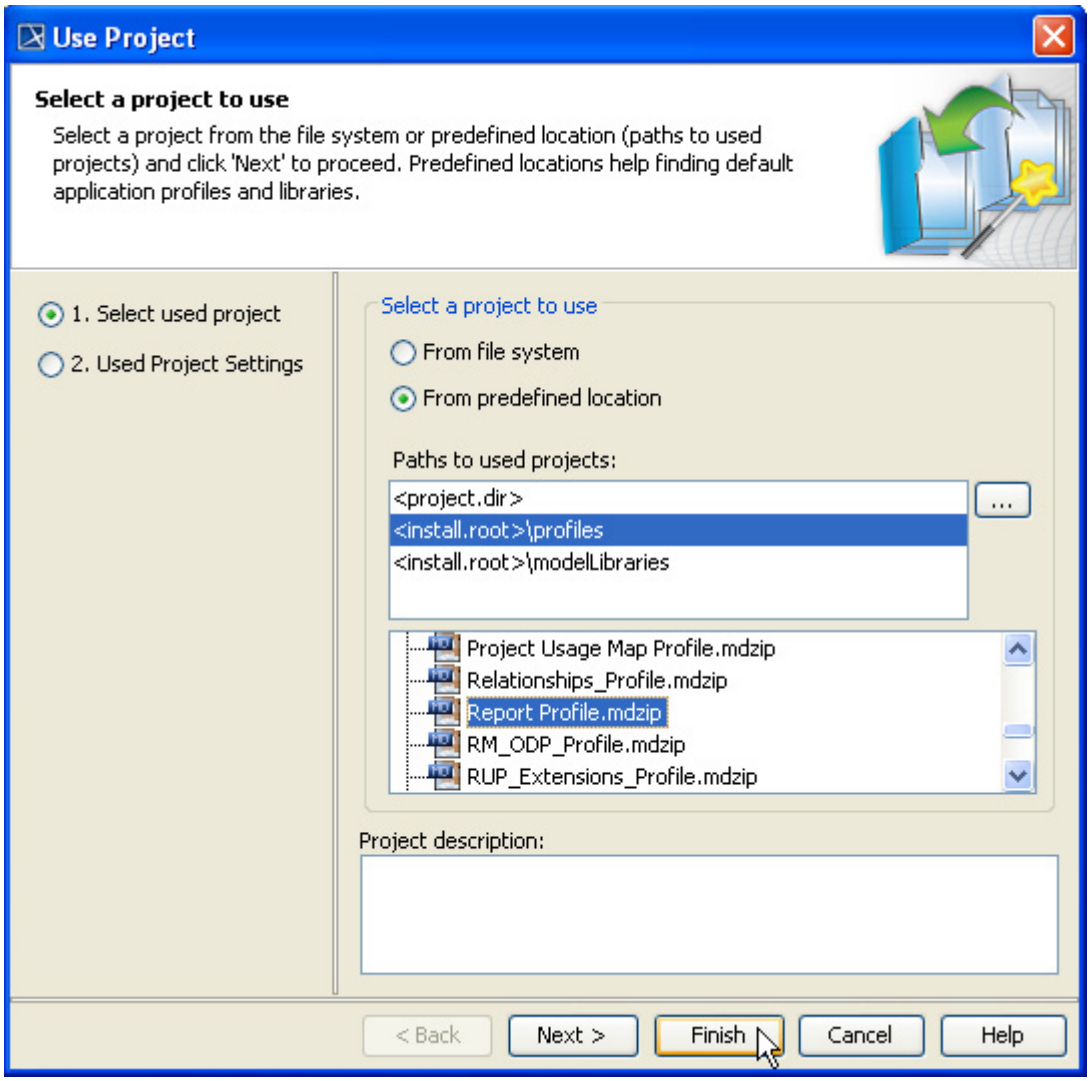


Figure 29 -- Selecting Project Module Path

2. Select **Report Profile.mdzip** and click **Finish**. The “Report Profile” profile will open in the Containment tree as a read-only profile. You can now use it in your project.

To create a Report Data in a MagicDraw project:

1. Use **Report Profile.mdzip** in your MagicDraw project (see "To use a report profile (Report Profile.mdzip):", on page 33).
2. Right-click a data model in the Containment tree and select **Create Element** > **Report Profile** > **Report Data** from the shortcut menu (Figure 30).

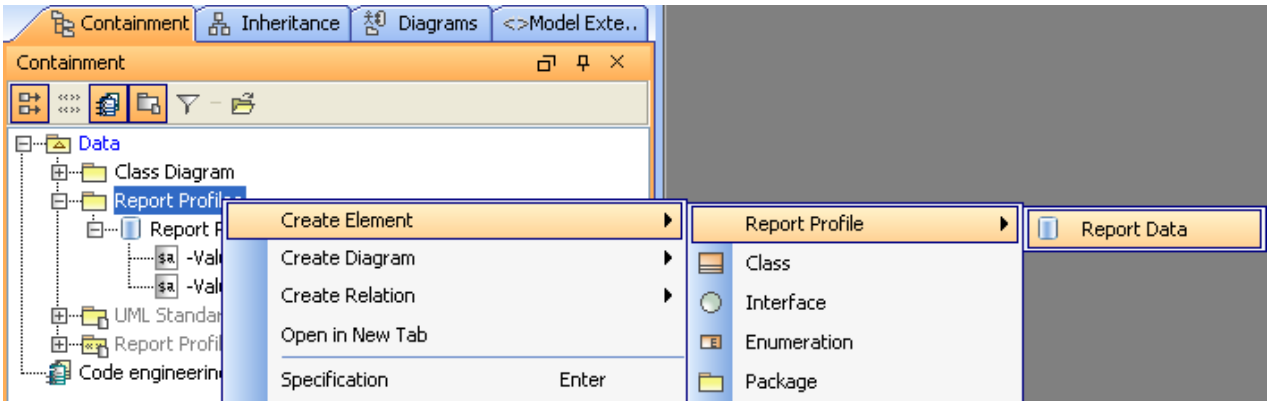


Figure 30 -- Creating Report Data in MagicDraw Project

3. Type the name of the Report Data element in the Containment tree.

NOTE	You can right-click a data model, a package, or a profile in the Containment tree to create a Report Data.

Table 8 -- Tag Values of Report Data

Tag Values	Function
autoImageSize	Change the image size.
imageFormat	Select an image format, either JPEG or PNG.
emptyText	Store a string value that will be replaced with an empty variable.
data	Contain elements that will be published by Report Wizard.
template	Determine which template to use a particular Report Data.
generateRecursively	Determine whether or not a report will be generated recursively.

1.1.2.2.3 Creating and Modifying Report Data Variables

Variables are created because some information is not “naturally” contained in a model such as the company's name, author's name, revisions, and many more. Although you can put all the information in a model's specification (Document/Hyperlinks in the **Specification** dialog), it is very hard and tedious to get data from the model's specification, as this results in more lines of codes and scripts in the report templates. Therefore, instead of writing lines of codes, you can simply create a variable, give it a name, and call it directly from the template. For example, you can create a variable called “Author” in Report Wizard and write `$Author` in the template. When you generate the report, you will see the value inside “Author.” In short, a variable is used to represent data, which you want to include in the report, not in the model.

Variables contain information that you want to store in a project, such as names and dates.

To create a variable for a Report Data:

- Right-click a Report Data in the Containment tree and select **Create Element** > **Variable** (Figure 31). The variable will appear inside the Report Data.

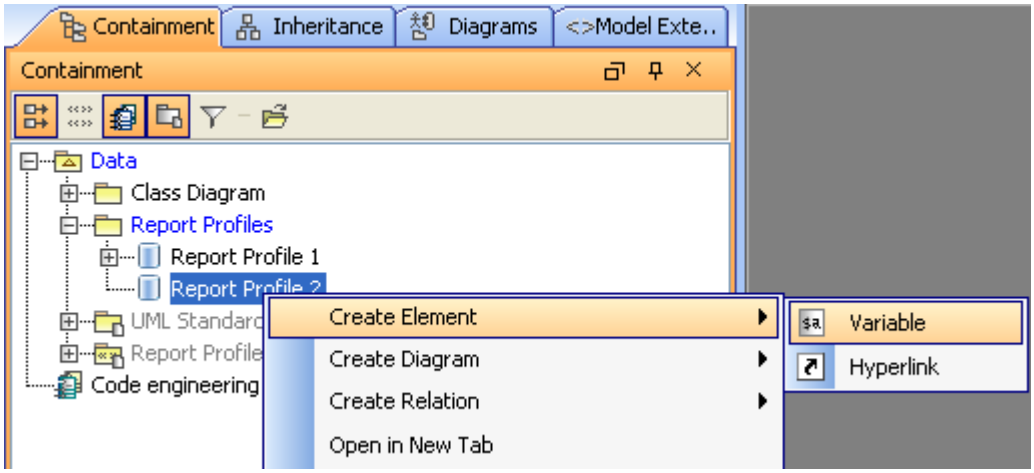


Figure 31 -- Creating Variable for Report Data

You can also create, edit, and delete variables through the **Report Variable** dialog in Report Wizard.

To open the **Report Variable** dialog:

1. Click **Tools** > **Report Wizard...** on the MagicDraw main menu.
2. Select a report template and click **Next** (Figure 32).

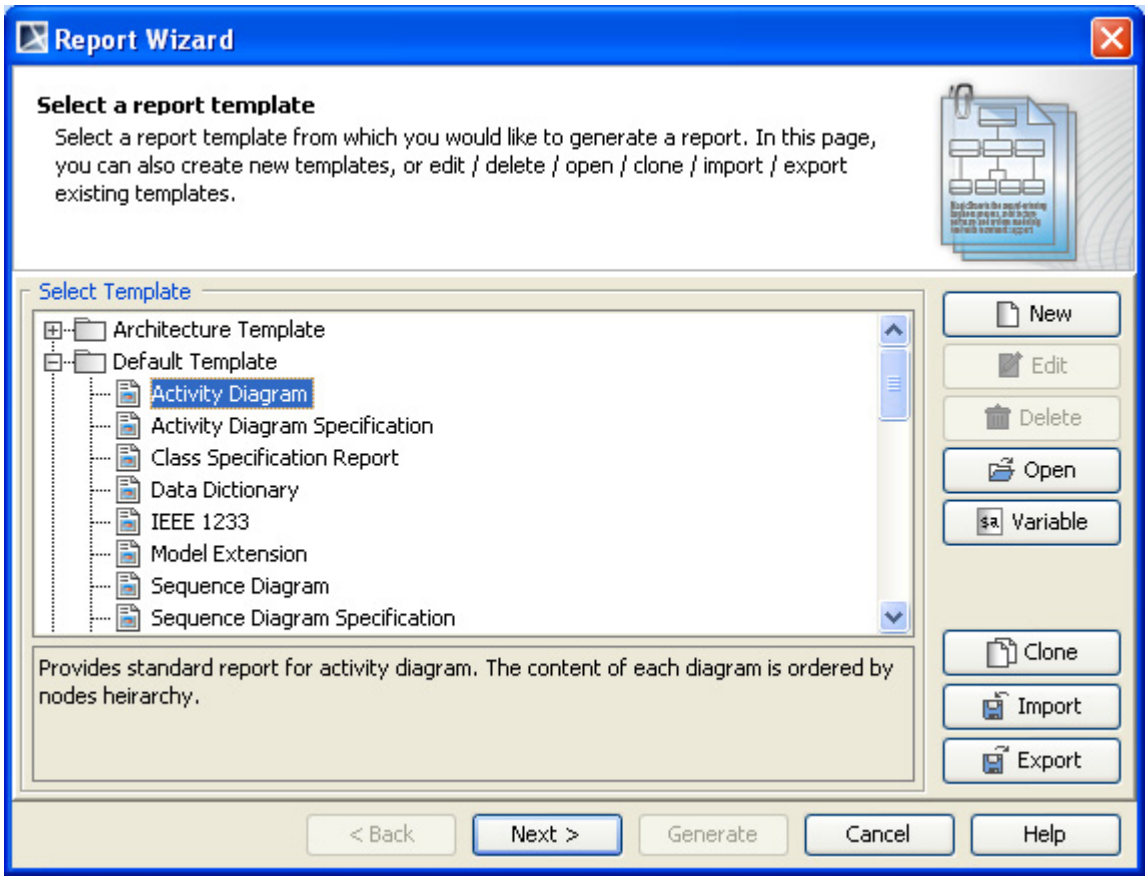


Figure 32 -- Opening Report Wizard Dialog

3. Either create (with the **New** button) or select a Report Data and click the **Variable** button (Figure 33). The **Report Variable** dialog will open (Figure 34).

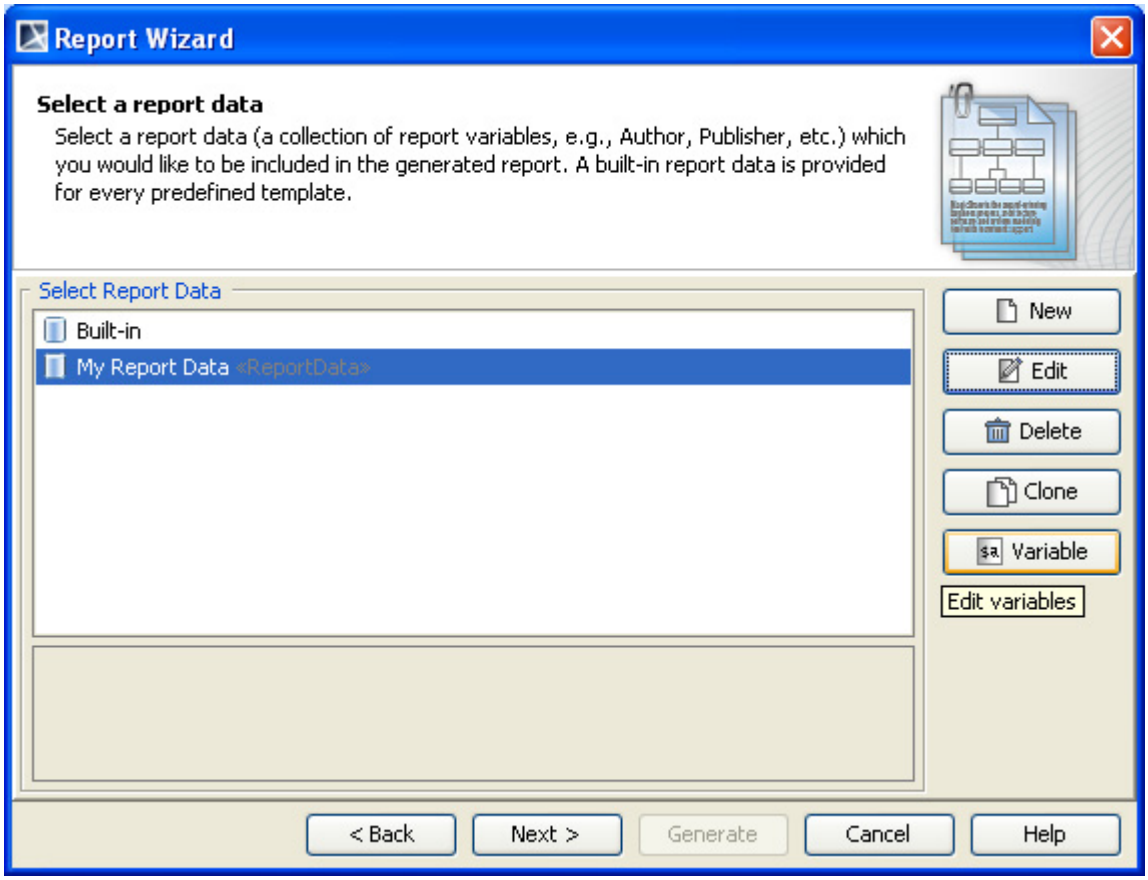


Figure 33 -- Opening the Variable Dialog

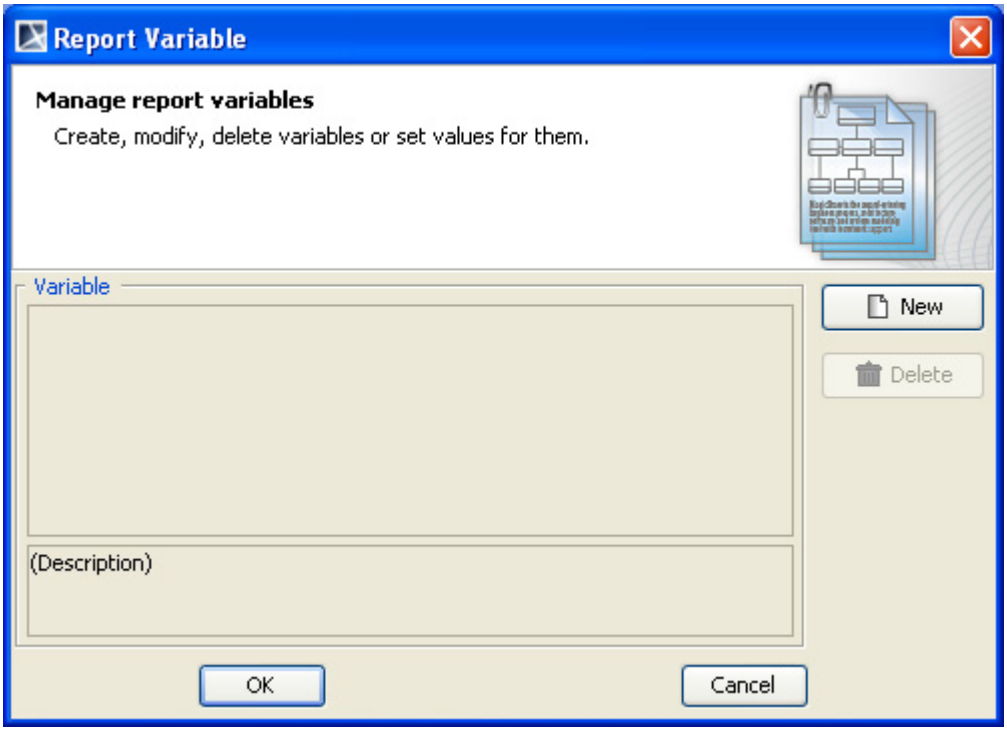


Figure 34 -- The Report Variable Dialog

To create a variable in Report Wizard:

1. Open the **Report Variable** dialog (see "To open the Report Variable dialog:", on page 37 above).
2. Click **New**. The **New Variable** dialog will open. Fill in the variable name and description (Figure 35). You can create either (i) a parent variable or (ii) a child variable in the **Owner** box.

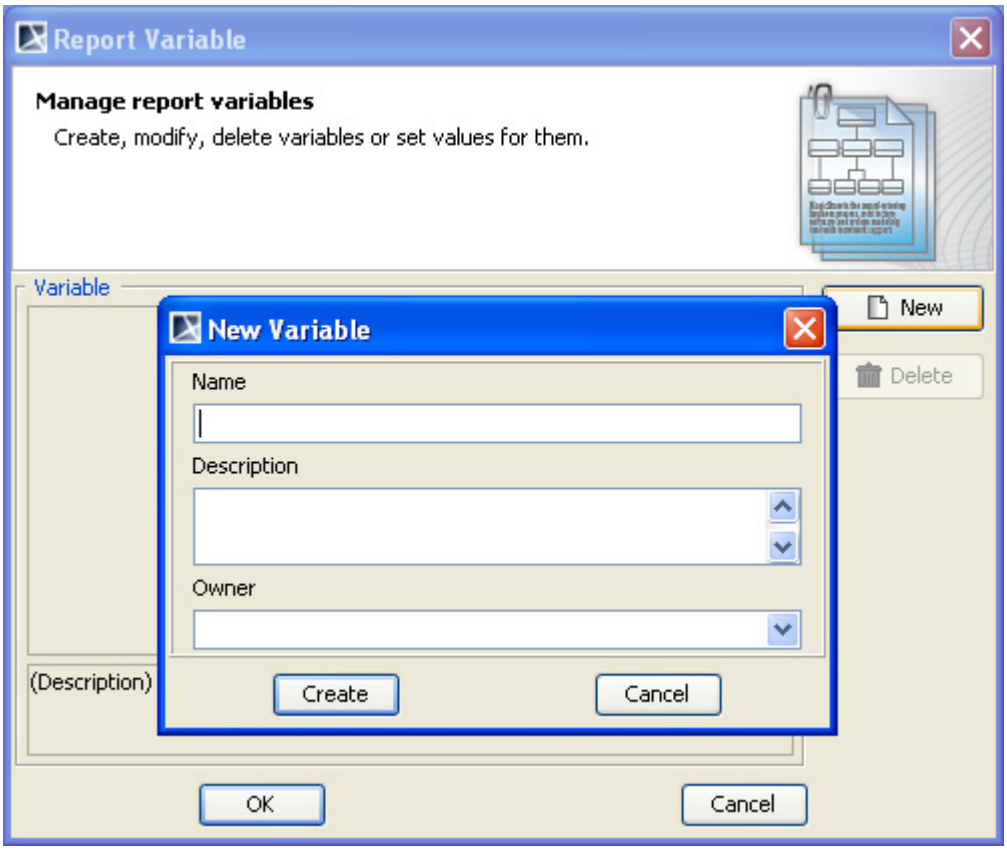


Figure 35 -- New Variable Dialog

(i) To create a parent variable, type the variable name in the **Name** box, enter the description, select an empty value in the **Owner** box, and then click **Create** (Figure 36).

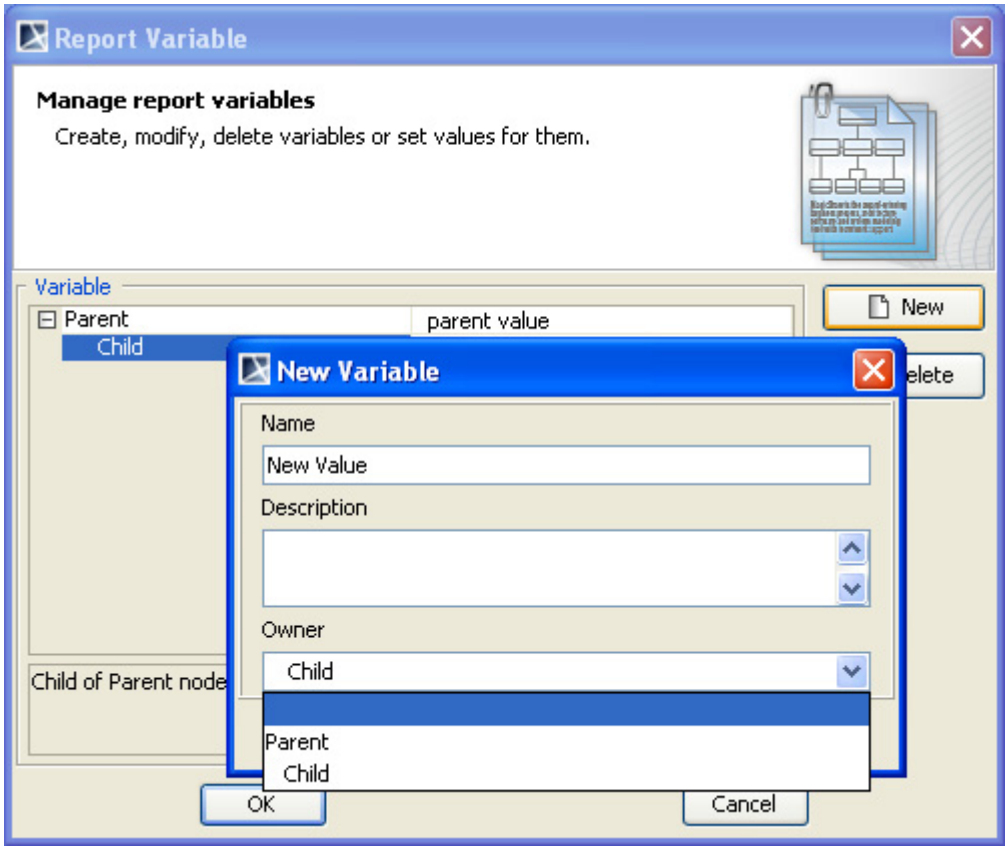


Figure 36 -- Creating a Parent Variable

(ii) To create a child variable, type the variable name in the **Name** box, enter the description, select **Parent** in the **Owner** box, and then click **Create** (Figure 37).

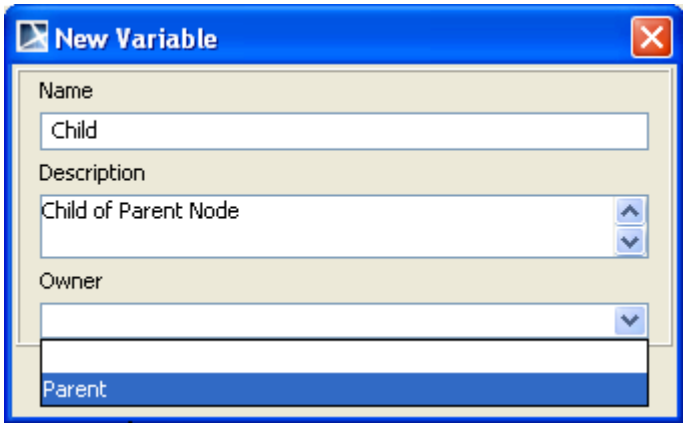


Figure 37 -- Creating a Child Variable

3. The new variable will appear in the table in the **Report Variable** dialog.
4. Click **OK** to save the variables in the Report Data.

To edit a variable in Report Wizard:

1. Open the **Report Variable** dialog (see "To open the Report Variable dialog:", on page 37 above).

2. Double-click the column next to the variable name column and click the ... button (Figure 38). A dialog will open for you to edit the variable value.

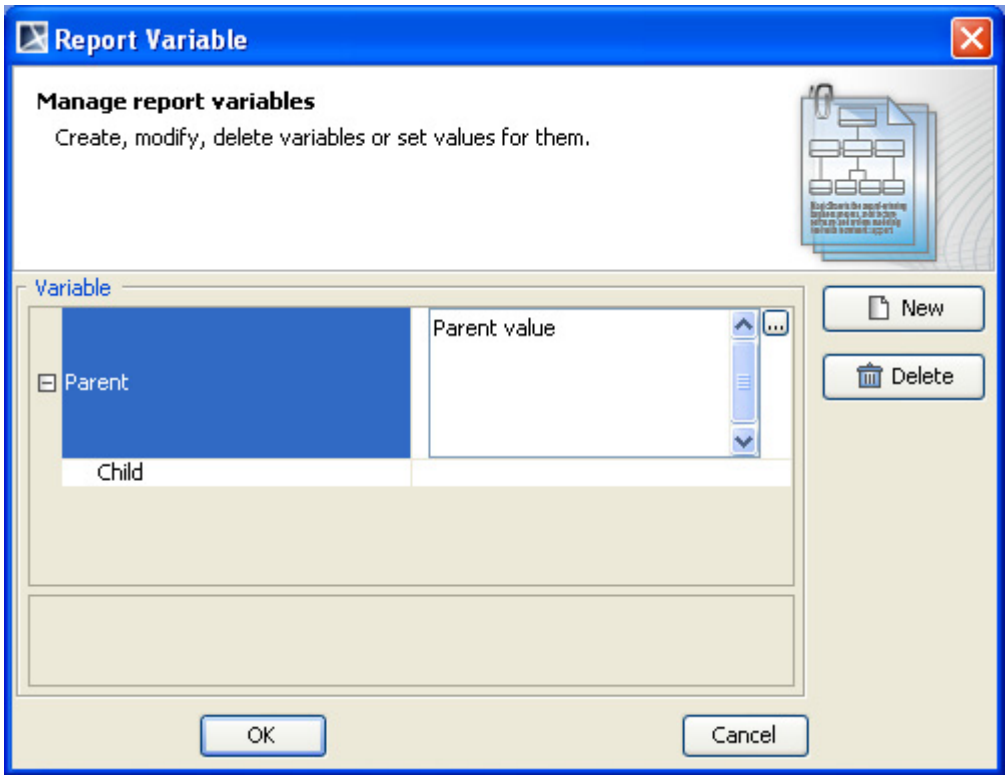


Figure 38 -- Editing Variables

3. Click **OK**. The new variable value will appear in the column next to the variable name column.

To delete a variable in Report Wizard:

1. Open the **Report Variable** dialog.
2. Click a variable in the table, and then click **Delete**. A dialog will open prompting you for confirmation before deleting the selected variable (Figure 39).

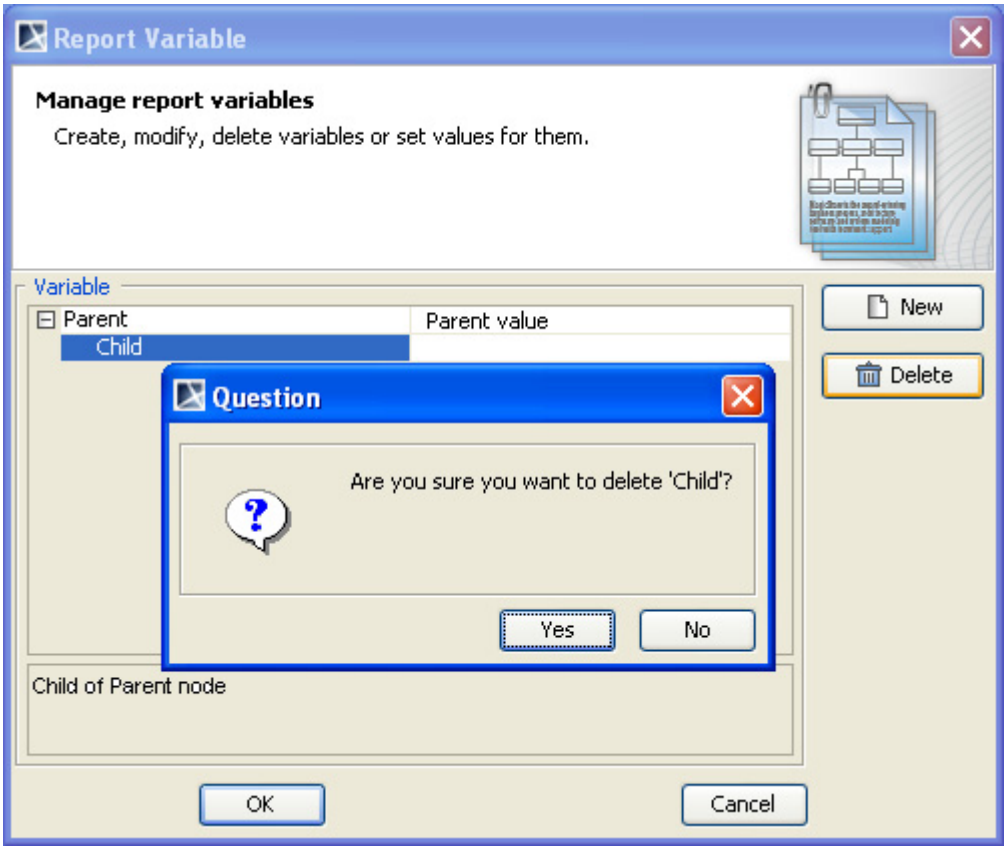


Figure 39 -- Deleting Variable

3. Click **Yes**, and the variable will be deleted.

1.1.2.2.4 Including Variables in a Template

When you include the variables you have created in a template, you will have each variable value included in the generated report. This section will use the following Report Data as an example (Figure 40).

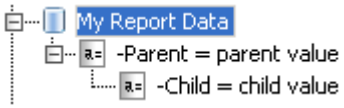


Figure 40 -- Sample of Report Data

To get the value of a top-level variable:

1. Open a blank document in Microsoft Word.
2. Type: **$Parent** (Figure 41).

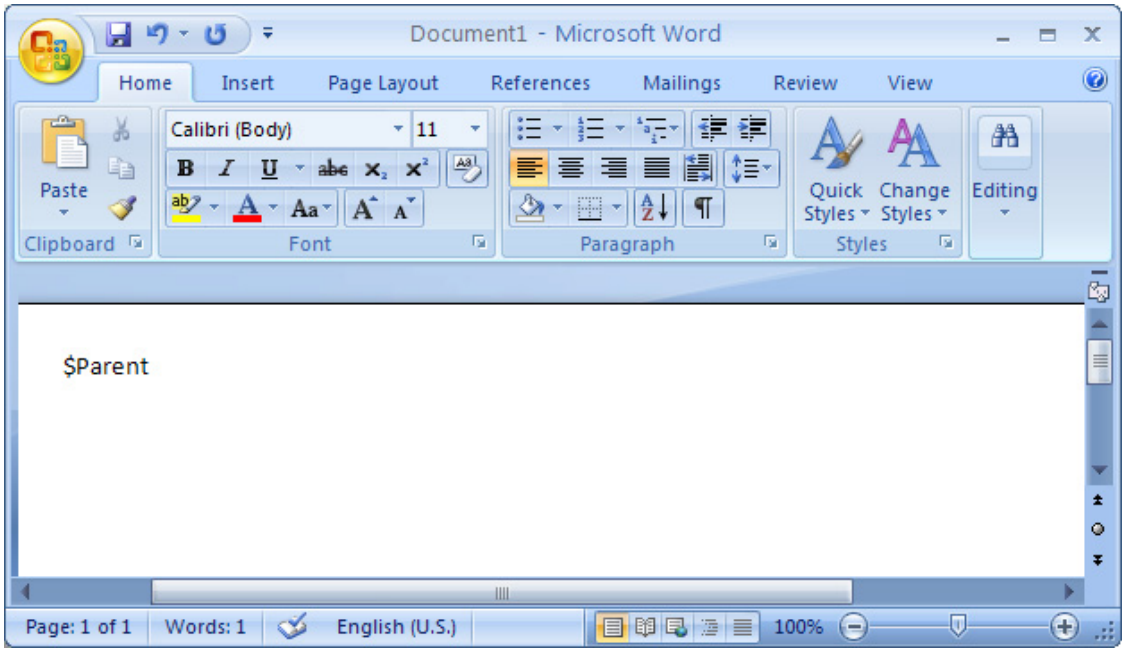


Figure 41 -- Referencing to Parent Variable in the Template

3. Save the file as “sampletemplate.rtf”. Choose **Rich Text Format** (*.rtf) as the file type (Figure 42).

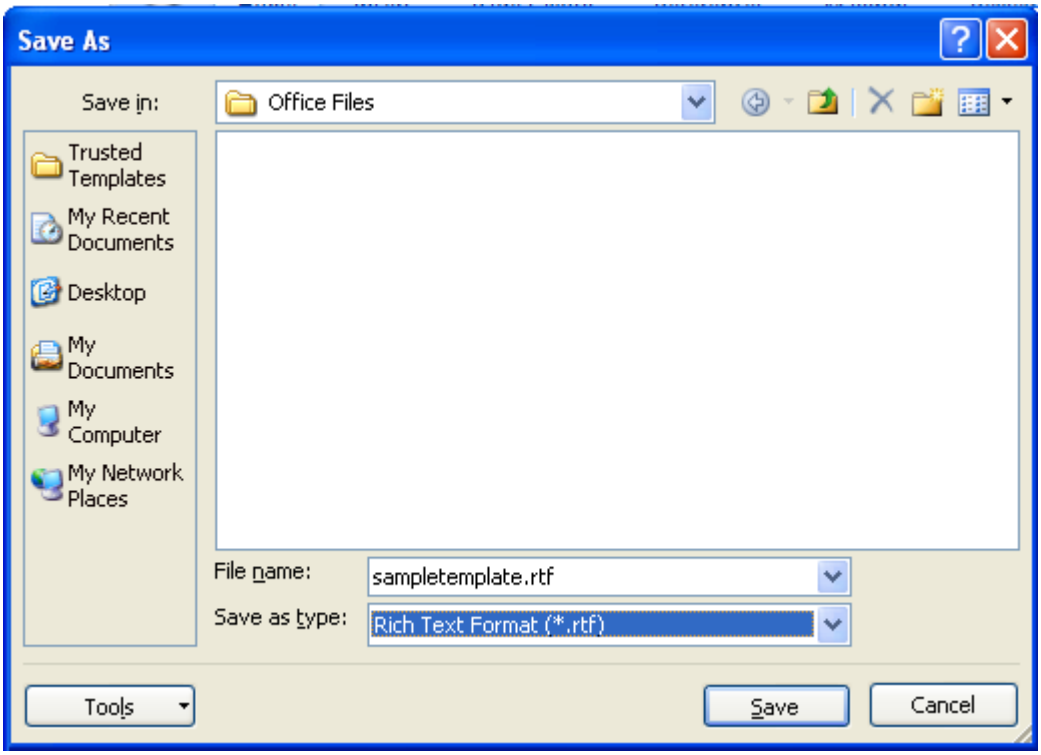


Figure 42 -- Saving Template as .rtf File in Microsoft Word

4. Open the **Report Wizard** dialog and create a new template with the **New** button. The **New Template** dialog will open.
5. Type the name and description of the new template. Click the “**...**” button to select “sampletemplate.rtf” as the template file.

6. Click **Create** > **Next**. The **Select Report Data** pane will open.
7. Select **My Report Data** and click **Generate** to generate a report. The output of the generated report will be as shown in Figure 43:

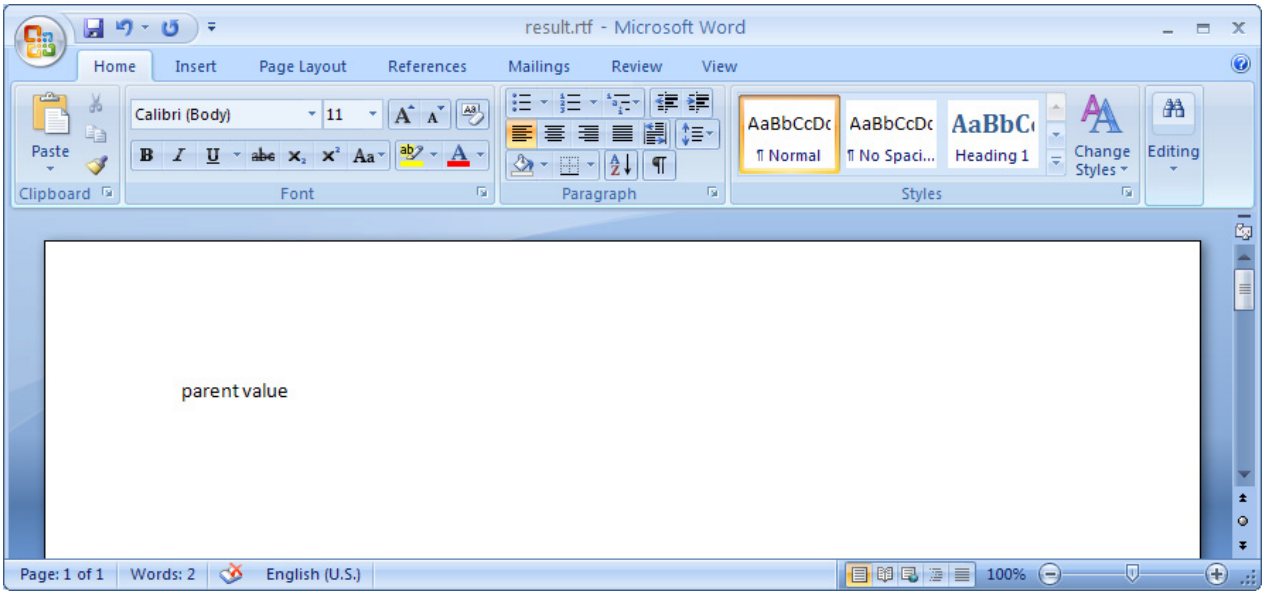


Figure 43 -- Output of $parent after Report Generation

To get the value of the child of a variable:

1. Open a blank document in Microsoft Word.
2. Type any of the following to print a child variable (Figure 44):

   (i) **$Parent.get(1)**: to get a child value by index.

   (ii) **$Parent.get("Child")**: to get a child value by name comparison.

   (iii) **$Parent.Child**: to get a child value by referencing its name (in this case "Child").

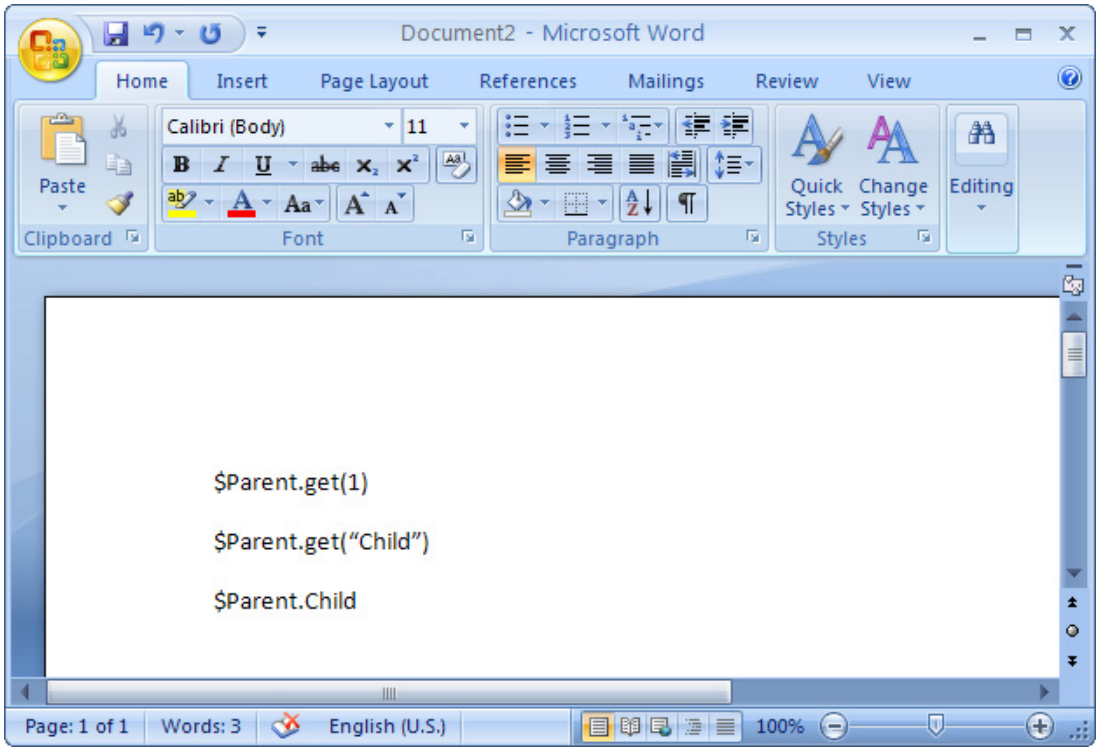


Figure 44 -- Referencing to Child Variable in the Template

3. Save the file as "sampletemplate.rtf". Choose **Rich Text Format** (*.rtf) as the file type.
4. Open the **Report Wizard** dialog and create a new template by clicking the **New** button. The **New Template** dialog will open.
5. Type the name and description of the new template. Click the "**...**" button to select "sampletemplate.rtf" as the template file.
6. Click **Create** > **Next**. The **Select Report Data** pane will open.
7. Select **My Report Data** and click **Generate** to generate a report. The output of the generated report will be as shown in Figure 45:

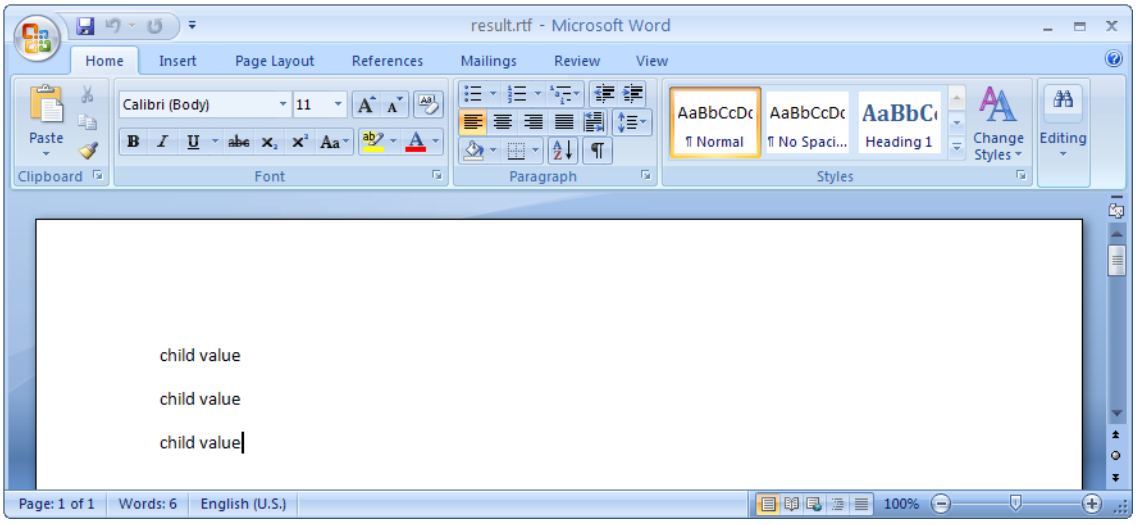


Figure 45 -- Output of $Parent.get(1), $Parent.get("Child"), and $Parent.Child

1.1.2.3 Select Element Scope Pane

The **Select Element Scope** pane (Figure 46) allows you to select the scope of MagicDraw data to generate a report.

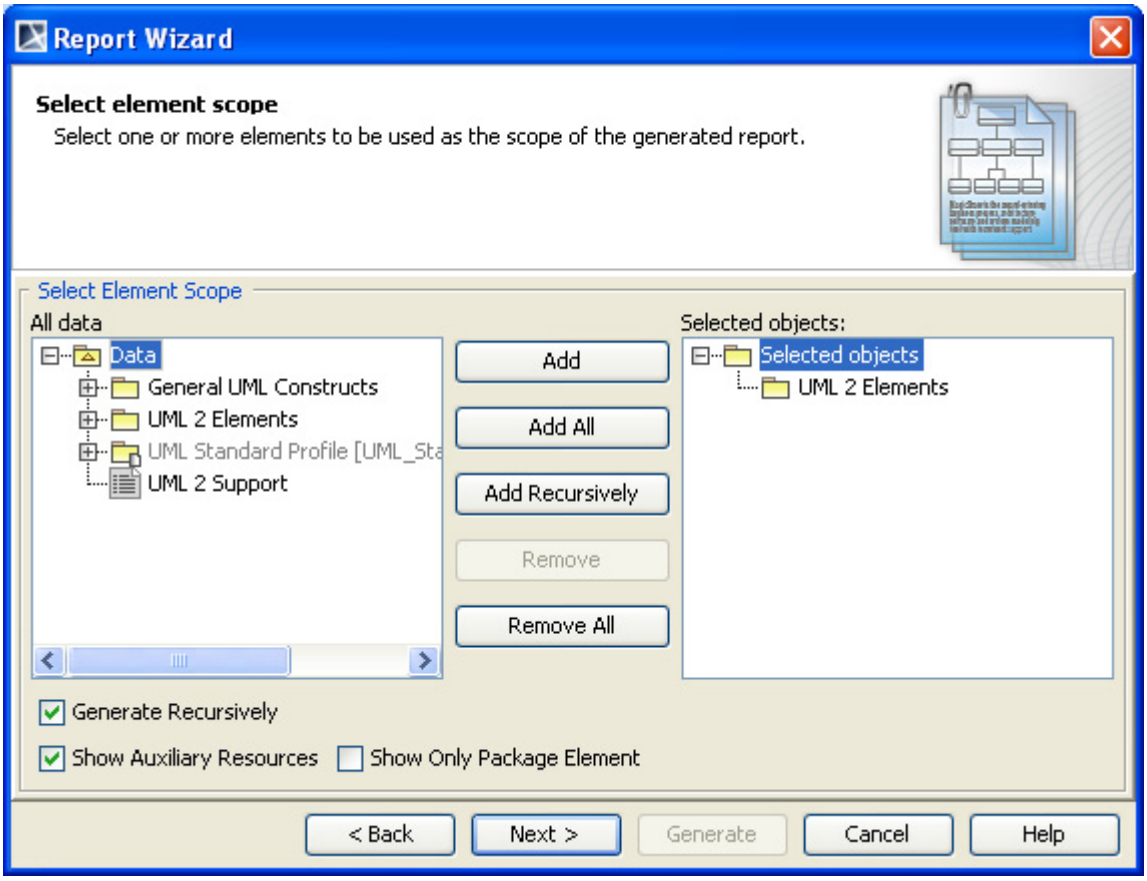


Figure 46 -- Select Element Scope Pane

Table 9 below describes the detail of each component in the **Select Element Scope** pane.

Table 9 -- Components in the Select Element Scope Pane

Component Name	Description
All data tree	Select the desired packages from the **All data** tree then add them to the **Selected objects** tree.
Selected objects tree	Select packages and click the **Add**, **Add All**, or **Add Recursively** button. The selected packages will be added to the **Selected objects** tree.
Add button	Select packages and click **Add**. The selected packages will be added to the **Selected objects** tree.
Add All button	Select packages and click **Add All**. The selected packages and the elements directly owned by those packages will be added to the **Selected objects** tree.
Add Recursive button	Select packages and click **Add Recursively**. The selected packages and its recursive packages will be added to the **Selected objects** tree.
Remove button	Select packages and click **Remove**. The selected packages will be removed from the **Selected objects** tree.

Component Name	Description
Remove All button	Click **Remove All** and all packages in the **Selected objects** tree will be removed.

You can perform the following operations in the **Select Element Scope** pane:

(i) Add packages into the selected object tree.

(ii) Remove a selected package from the selected object tree.

(iii) Select or clear the Generate Recursively option.

(iv) Show auxiliary resources.

(v) Show only package elements.

(i) To add packages:

- In the **Select Element Scope** pane (Figure 46), select the packages from the **All data** tree and click **Add**, **Add All**, or **Add Recursively** to add them into the **Selected objects** tree.

(ii) To remove packages:

- In the **Select Element Scope** pane (Figure 46), select the packages from the **Selected objects** tree and click **Remove** or **Remove All** to remove them from the **Selected objects** tree.

(iii) To select or clear the **Generate Recursively** option:

- Select or clear the **Generate Recursively** check box in Figure 46.

(iv) To show auxiliary resources:

- Select or clear the **Auxiliary Resources** check box in Figure 46.

(v) To show only package elements:

- Select or clear the **Show Only Package Element** check box in Figure 46.

NOTE	Figure 46 shows the UML 2 Elements package and the **Generate Recursively** check box were selected. It means that the UML 2 Elements package and its subpackages will be generated in the report.

1.1.2.4 Generate Output Pane

The **Generate Output** pane in Report Wizard allows you to configure report files, for example, to select the report files' output location and image format and to display the report in the viewer (Figure 47).

Figure 47 -- Generate Output Pane

Table 10 below describes the function of each option in the Generate Output pane of Report Wizard.

Table 10 -- Components in the Generate Output Pane

Component Name	Description
Report File	Show the report file's location and name. The default report location will be **\data\template_folder\reports**. The default report name will be the same as the report name defined by the user.
... button	Open the **Select Location** dialog in order to locate the report file.
Report Image Format	Select an image format for your report: JPG, PNG, SVG, EMF, or WMF. **Note:** • Use *.JPG and *.PNG for any template format. • Use *.SVG for text and HTML templates. • Use *.EMF and *.WMF for text and Microsoft Office templates (RTF, DOCX, XLSX, and PPTX).

Component Name	Description
Auto image size	Change the size and orientation of an image before inserting it into a document. There are 4 options available: • **No Resize**: Image will not be resized or rotated. • **Fit image to paper (large only)**: Large image will be fitted within the paper size. • **Fit and rotate (clockwise) image to paper (large only)**: Large image will be fitted within the paper size and rotated clockwise. • **Fit and rotate (counter-clockwise) image to paper (large only)**: Large image will be fitted within the paper size and rotated counter-clockwise.
Display empty value as	• **Empty text**: Leave an empty value of the report output blank. • **Custom text as**: Enter a custom value for an empty value. The default value is **NA**.
Display in viewer after generating report	Display a complete report in the viewer. Otherwise, the report will be created and kept in a selected location.
Generate	Generate a report.
Cancel	Cancel the report generation process and close the **Report Wizard** dialog.
Help	Provide the Help content.

NOTE	• Displaying an empty value with a text feature (displaying empty value as) was deprecated. This feature will be removed in the next version of MagicDraw. Alternatively, you can select one of the following two options.
	(i) Use a template code to replace empty value with text. For example:
	Using normal code.
	`#if (!$var || $var ==  "")`
	`Empty`
	`#end`
	
	Using macro code.
	`#macro (replaceNullValueWithText $var)`
	`#if (!var || $var == "")`
	`EMPTY`
	`#end`
	`#end`
	(ii) Use report wizard environment option to configure empty.
	Add the property “template.output.on.blank.field” and value in the Report Wizard Environment option to enable this feature. The value of this property will be inserted in the generated output when the variable is empty (see 10 Report Wizard Environment Options).

1.2 MRZIP File Automatic Deployment

An MRZIP file is a report template package file. You can place an MRZIP file into your template folder “<user folder>/data/reports”, and MagicDraw will automatically deploy the template into the Report Wizard dialog.

Figure 48, 49, and 50 below will show you how Report Wizard can automatically deploy an MRZIP file.

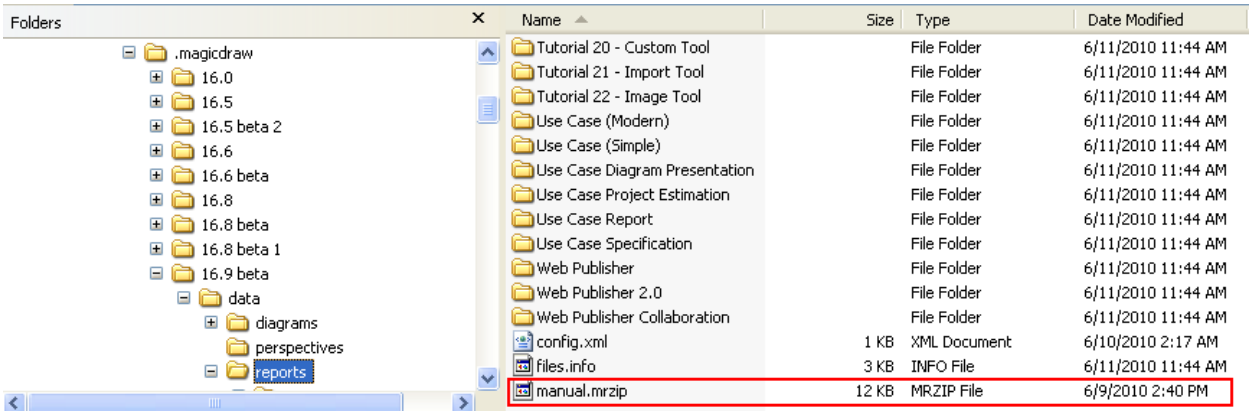


Figure 48 -- Copying MRZIP File into a Template Folder

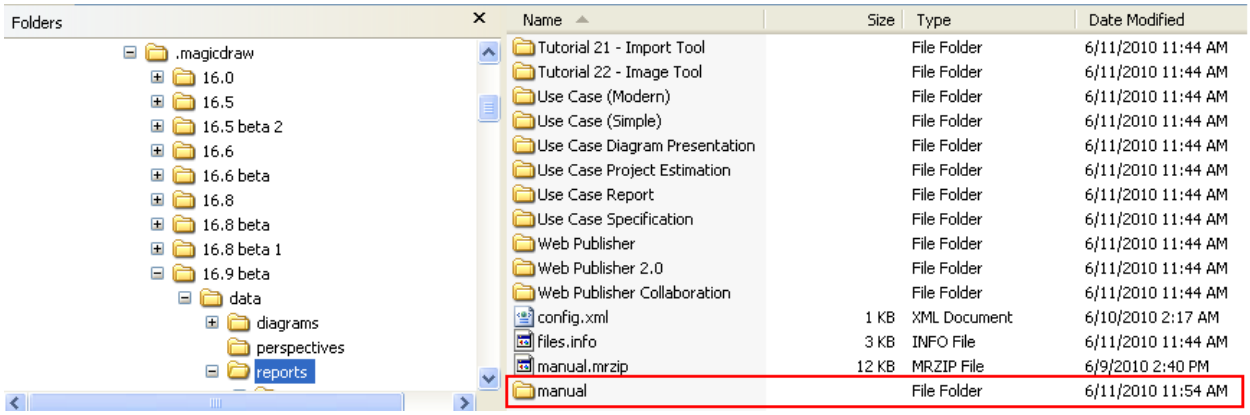


Figure 49 -- Automatic Deployment of MRZIP File

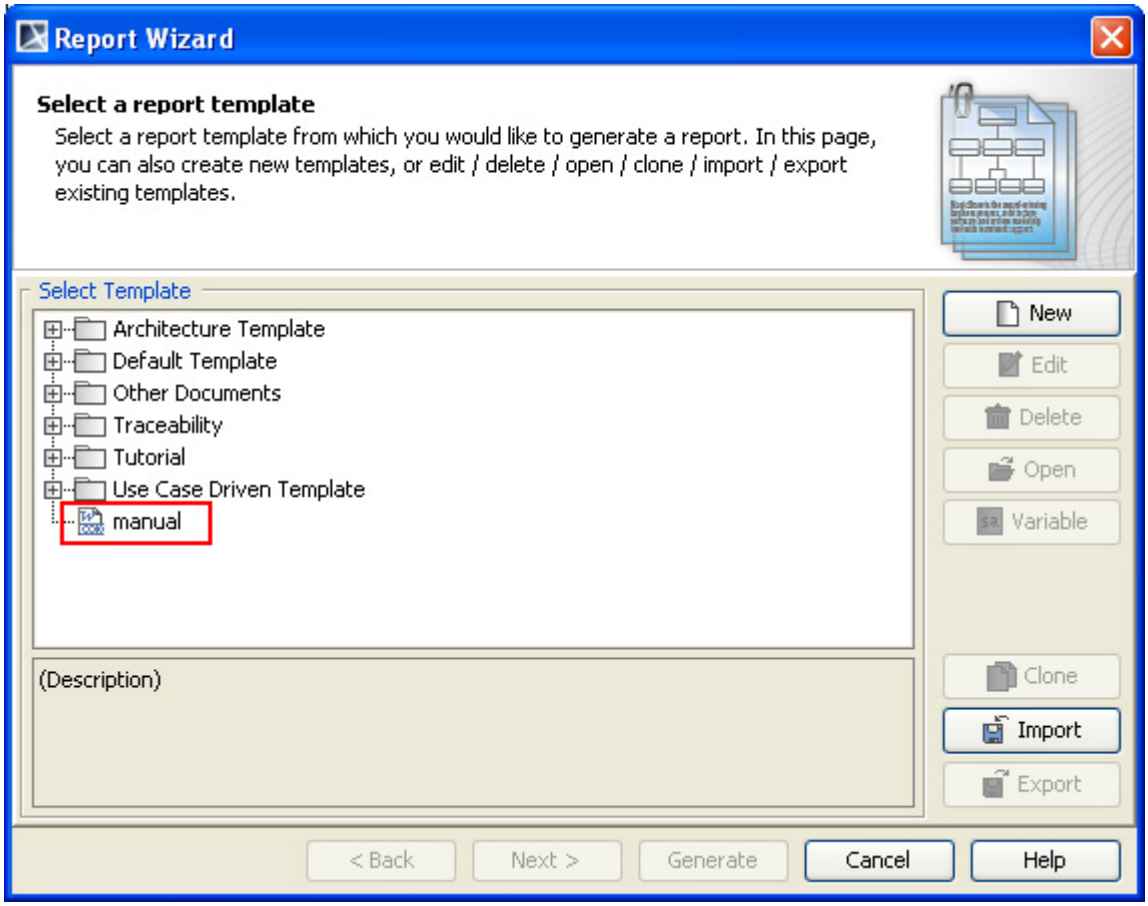


Figure 50 -- Report Template Installed in the Report Wizard Dialog

2. Report Wizard Template Language

Report Wizard is built on Velocity Engine. Knowledge of the Velocity Template Language and the Report Wizard Custom Language used within the Report Wizard template is necessary for understanding, editing, or creating templates.

2.1 Velocity Template Language

The user guide for Velocity (VTL) can be found at: **http://velocity.apache.org/engine/devel/user-guide.html**.

NOTE	• The formal reference such as `${hello}` is not supported in RTF templates. • A macro cannot be used as macro parameter in any RTF report template. This is a limitation of VTL itself: Velocity treats a macro like copy-and-paste content defined in the macro (between #macro and #end) at the inserted position. • In an RTF report template, the style and formatting defined on a directive will have no effect on the report output. In addition, the paragraph symbol at the end of a line will also be removed.

2.2 Report Wizard Custom Language

2.2.1 #forrow Directive

The Velocity Template Language does not support loops inside a table structure. However, the Report Wizard engine introduces a new custom syntax that allows looping inside the table structure in order to clone the table rows.

The syntax is : `#forrow <query data> #endrow`

For example:

Name	Owner
`#forrow ($uc in $UseCase) $uc.name`	`$uc.owner.humanName #endrow`

The output will be:

Name	Owner
UC1	Package Requirement
UC2	Package Requirement

2.2.2 #forpage Directive

The `#forpage` directive is used to provide a loop over the codes within a page. This directive provides implementation like `#forrow`, but it creates a loop over a page instead of a row. For example:

```
#forpage($uc in $UseCase)
$uc.name
#endpage
```

The report will contain a UseCase name for each document page.

2.2.2.1 OpenDocument Specific Usage

When this directive appears in the OpenDocument Presentation template, it will create a loop over all directives that are present on the current page. All directives on this page will be included inside `#forpage` (Figure 52).

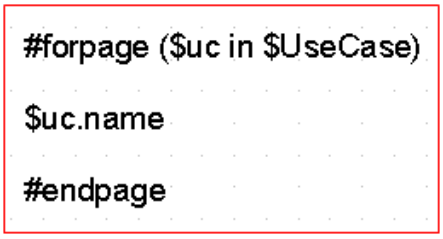


Figure 51 -- OpenDocument Presentation #forpage Template

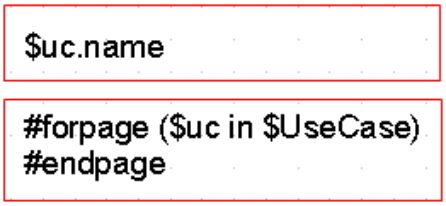


Figure 52 -- OpenDocument Presentation #forpage Template - UseCase

Figure 51 and Figure 52 are sample templates that generate the same output. For more information, see the OpenDocument Presentation template section.

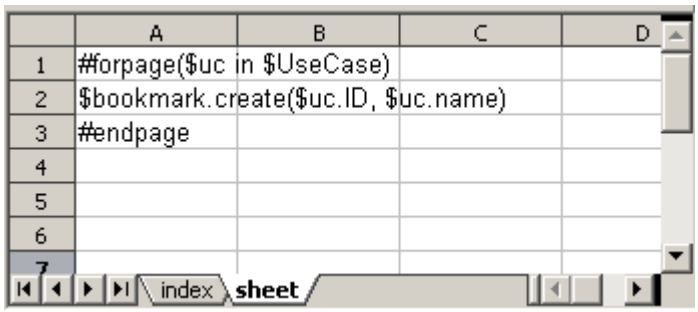


Figure 53 -- OpenDocument Spreadsheet for #forpage Template

Figure 53 displays an example of the `#forpage` directive inside an ODS file. When this directive is used in an ODS template, it will create a sheet for codes within the template sheet.

Figure 54 shows the output produced from the template.

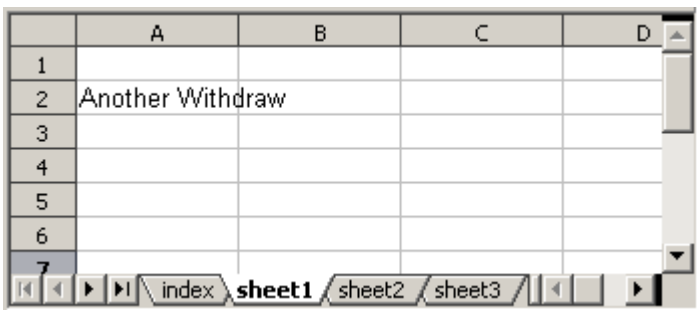


Figure 54 -- OpenDocument Spreadsheet Output for #forpage Template

2.2.3 #forcol Directives

This directive is designed only for the Spreadsheet templates, which are ODS and XLSX. This directive provides looping over the column.

	A	B	C
1	#forcol($uc in $UseCase)	$uc.name	#endcol
2			

Figure 55 -- OpenDocument Spreadsheet #forcol Template

Based on the sample in Figure 55, the engine will generate a report with different columns for each Use Case name. The output from this sample will be as shown in Figure 56:

	A	B	C	D
1	Use Case A	Use Case B	Use Case C	Use Case D
2				

Figure 56 -- OpenDocument Spreadsheet #forcol Output

You can combine both `#forrow` and `#forcol` (Figure 57) and produce a more complex report output.

	A	B	C
1	#forrow($p in $Package)	#forcol($e in $p.ownedElement)$e.name#endcol	#endrow

Figure 57 -- OpenDocument Spreadsheet #forrow and #forcol Templates

Figure 58 shows an output generated from the Magic Library sample project.

	A	B	C	D	E	F
1	Domain Analysis	Diagram Loan Collaboration	Diagram Loa	Diagram Obj	Dependency	Dependency
2	conceptual perspective					
3	Implementation	Node Remote Web Client	Node Remot	Artifact Interr	Artifact Magi	Artifact Magi
4	High Level Domain Analysis	Diagram conceptualPerspective1	Diagram con	Class Penalt	Association I	Association I
5	collaboration	Collaboration Loan Library Item				
6	Analysis and Design	Diagram Analysis and Design	Package Hig	Package Dor	Package Dor	Package Tech
7	object diagram	Instance Specification	Instance Spe	Instance Spe	Instance Spe	Instance Spe
8	Technical Design	Diagram domain.user	Diagram dom	Diagram dom	Diagram Mag	Package Magi
9	MagicLibrary	Instance Specification	Class Library	Class Books	Class VideoP	Class AudioP
10	Domain Design	Diagram Package Dependencies	Diagram Imp	Dependency	Dependency	Package Impl
11	composite structure	Collaboration Loan	Class Partici	Collaboration	ReadingItem	Loan
12						

Figure 58 -- OpenDocument Spreadsheet #forrow and #forcol Output Report

Since the `#forrow` syntax is similar to the `#foreach` syntax, the `#foreach` syntax can then be used in `#forrow`.

You can find more samples about the usage of `#forrow` and `#forcol` in the **Report Wizard** dialog, “Other Documents” templates.

2.2.4 #includeSection Directive

The original Velocity Engine provides two include directives: (i) `#include` and (ii) `#parse`.

(i) `#include` allows you to import another template. The contents of the file will not be rendered through the template engine.

(ii) `#parse` allows you to import another template. The contents of the file will be rendered through the template engine. However, the file being included will be inserted with all contents.

Report Wizard introduces a statement, which allows a template to include any section of a document from another template. This statement requires the template to define the beginning and the end of the section.

The logical concept of the `#includeSection` and `#parse` directives is similar. Both directives allow a template to include another template and render it through the template engine. However, `#includeSection` can be used to specify only the section that you would like to include.

To declare a section, for example, type:

```
#sectionBegin (sectionName)
...
#sectionEnd
```

To include a section, for example, type:

```
#includeSection (templateFilename, sectionName)
```

2.2.5 #include, #parse, and #includeSection: A Comparison

The `#include` and `#parse` directives are built-in directives provided by Velocity. The `#includeSection` directive is a custom directive implemented by MagicDraw. Table 11 below shows the differences among these three directives.

Table 11 -- Directives Differences

	#include	#parse	#includeSection
Execution Time	Executed at runtime.	Executed as a separate template at runtime.	Executed at translation time.
Variable Scope	Variables declared in the parent template are not accessible in the included page.	Variables declared in the parent template can be accessed in the included page.	Variables declared in the parent template can be accessed in the included page.
Rendering	The Include template is not rendered through the template engine.	The Include template is rendered through the template engine as a separate process.	The Include template is rendered through the template engine as a single process.
Include only required section	No	No	Yes
Size of parent template	The size of the parent template remains unchanged.	The size of the parent template remains unchanged.	The size of the parent template is increased by the included section.
Processing overhead	The #include directive increases the processing overhead with the necessity of an additional call to the template engine.	The #parse directive increases the processing overhead with the necessity of an additional call to the template engine.	The #includeSection directive does not increase the processing overhead.
Support RTF template	No	No	Yes
Support ODF template	No	No	Yes
Support DOCX template	No	No	Yes
Support XLSX template	No	No	No
Support PPTX template	No	No	No

2.3 Formatting Template Code

Report Wizard supports the **Tab** key to help you format template code at ease. The **Tab** key is useful to indent velocity code. You can press the **Tab** key after the symbol "#" or "$" followed by the velocity code. The **Tab** key can help you format the template code, but it does not affect the output of a generated report. See Figure 59 for example.

```
#foreach($c in $Class)¶
# → if($c.name == "Target Class")¶
$ →   →  c.name¶
# → end¶
#end¶
```

Figure 59 -- Indented Template Code

The velocity code in Figure 59 uses the **Tab** key to indent code. However, the generated report does not include those indents. The **Tab** key support is available in RTF, DOCX, and ODT format files.

2.4 Unparsed Code

Velocity allows the template designer to easily use a large amount of uninterpreted and unparsed content in VTL code. This is especially useful if you want to avoid multiple directives or sections whose content would otherwise be invalid (and thus unparseable) VTL.

The syntax is as follows:

```
#[[ Unparsed Code ]]#
```

For example, the following code:

```
#[[
#foreach($c in $Class)
$c.name
#end
]]#
```

Will be rendered as:

```
#foreach($c in $Class)
$c.name
#end
```

Note	The Unparsed Code support is available in HTML, XML, and text files only.

3. Template Variables

The variables imported to the template are collected by the type of element selected in the package scope. Use the fourth step in the **Report Wizard** dialog to select the package scope (see subsection 1.1.2.3 above).

In this example, we take a class diagram with the class name Customer (Figure 60) to print it in a report.

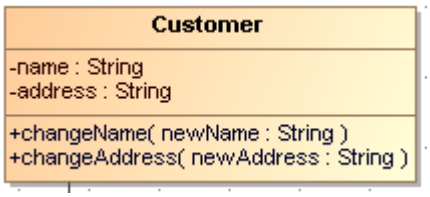


Figure 60 -- Class Diagram: Customer

To print attributes of the Customer class in a report:

- Right-click the **Customer** class diagram and open the **Specification** dialog. The element type will appear on the dialog title, and the attribute names will appear on the right-hand side of the dialog box (Figure 61).

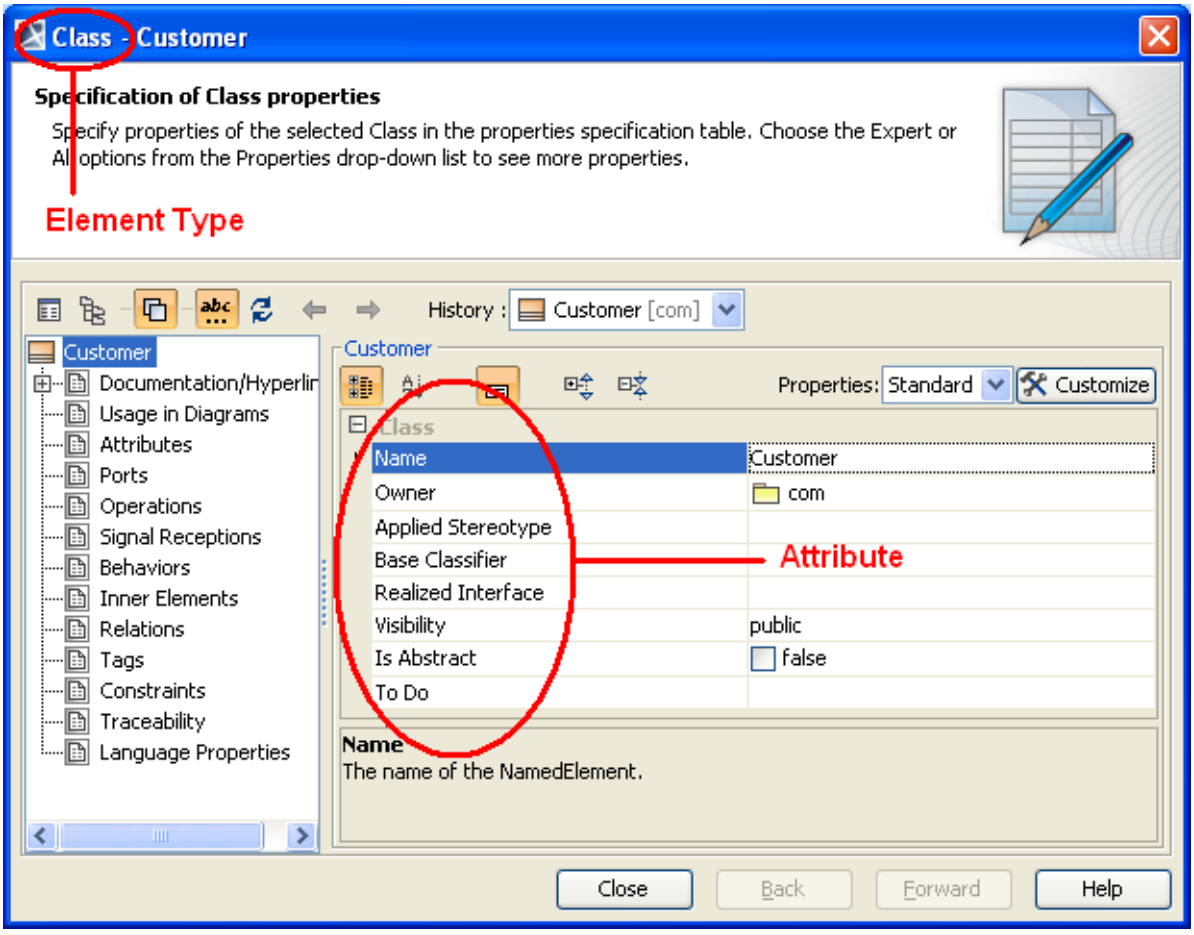


Figure 61 -- Specification Dialog

With the following VTL code, you can print the attributes of the Class element:

```
#foreach ($class in $Class)
   Name: $class.name
   Owner:  $class.owner.name
   Visibility: $class.visibility
   Is Abstract: $class.isAbstract
#end
```

The output will be as follows:

```
Name: Customer
Owner:  com
Visibility: public
Is Abstract: false
```

Table 12 gives and explains the additional properties which are not part of the UML specifications, but retrievable by Report Wizard.

Table 12 -- Additional Properties Retrievable by Report Wizard

Element Owner	Property Name	Function
Diagram	image	To return the diagram's image.
Diagram	diagramType	To return the diagram's type.
Element	image	To generate the element's image or to print an empty text if the element does not refer to any diagram.
Element	elementType	To return a name of an element's type (metaclass / stereotype) in lowercase letters and without spaces. For example: • return "usecase" for a Use Case • return "class" for a Class • return "callbehavioraction" for a Call Behavior Action • return "flowport" for a Flow Port (a stereotype defined in SysML)
Element	humanName	To return an element's human readable name, which is a string concatenation between the human element type and the element's name.
Element	humanType	To return an element's type in a human readable format.
Element	appliedStereotype	To return an applied stereotype of an element.
Element	activeHyperlink	To return an active hyperlink of an element.
Element	hyperlinks	To return all hyperlinks attached to an element.
Element	toDo	To return an element's ToDo attribute in text format.
Element	elementID	To return an element's ID.
Element	documentation	To return an element's comment/documentation.
Element	presentationElement	To return a presentation element.
Element	typeModifier	To return an element's type modifier.
Element	tags	To return a list of element tags.

Element Owner	Property Name	Function
Element	text	To return a text representation of an element. In general, a 'text' property returns a string which “textually represents” the element. The string may vary depending on the symbol properties and environment options. This property returns the result from OpenAPI `RepresentationTextCreator.getRepresentedText(Element element)`.
Element	slots	To return a list of element’s slots.
Element	elementURL	To return an element’s URL.
Classifier	baseClassifier	To return a base classifier of an element.
BehavioredClassifier	realizedInterface	To return a Classifier’s Realized Interface.
Package	appliedProfile	To return a list of profiles applied to a package.
Stereotype	metaClass	To return a Meta Class of a stereotype.
DurationConstraint	min	To return a minimum value of the Duration Constraint.
DurationConstraint	max	To return a maximum value of the Duration Constraint.
TimeConstraint	min	To return a minimum value of the Time Constraint.
TimeConstraint	max	To return a maximum value of the Time Constraint.
MultiplicityElement	multiplicity	To return a multiplicity value.
Property	navigable	To return a navigable value.
Property	ownedBy	To return a property’s owner.
Lifeline	type	To return a lifeline type.
Message	event	To return a message event.
Message	operation	To return a message operation.
Message	signal	To return a message signal.
Message	number	To return a message number.
Trigger	eventType	To trigger an event type.
RequirementsUse Case	number	To return a use case number.

Some predefined variables, which are not part of the UML specifications, are usable in the templates:

- `$elements` contains a list of all the elements selected from the element scope.
- `$packageScope` contains a selected package from the element scope.
- `$elementScope` contains selected elements from the element scope.
- `$empty` contains a String for empty value, which is specified from the **Output Options** pane.

NOTE	`humanName` and `humanType` are locale-specific text. If you plan to generate a report in different languages, try to avoid `humanType` and `humanName`. Instead, use `elementType` for a non-locale-specific report.

3.1 Retrieving Slot Value

Instead of using Stereotype and Tag, some projects may use Instance Specification and Slot to define new attributes of an element.

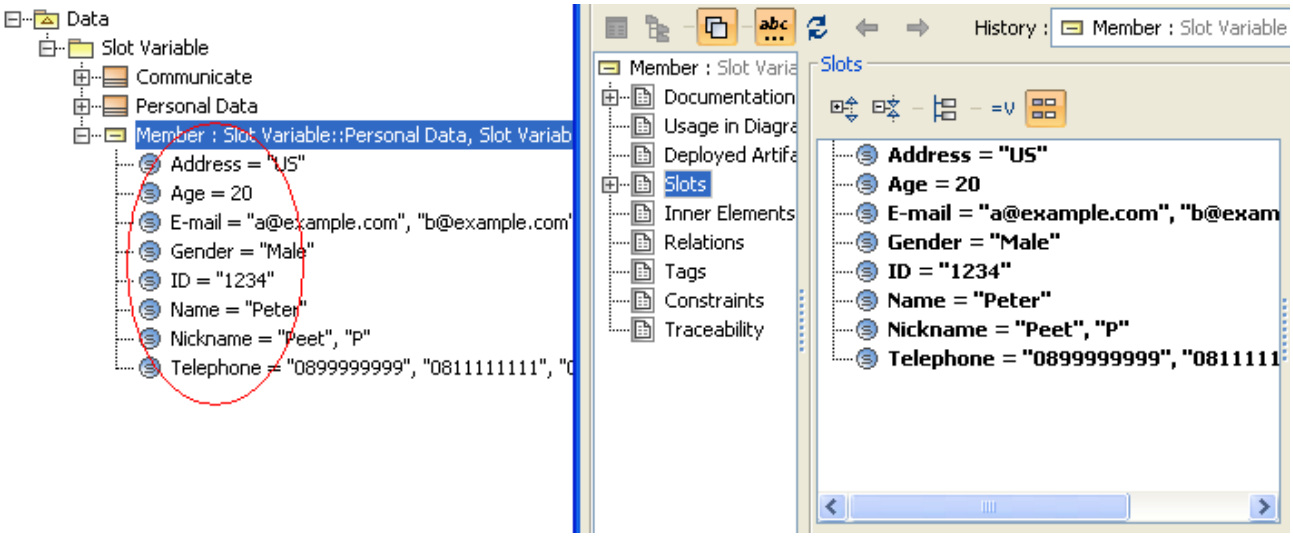


Figure 62 -- Instance Specification and Slot Defining Element Attributes

There are two ways to retrieve a slot value. One is to use a normal UML Specification structure. The other one is to use a slot property.

3.1.1 Using Normal UML Specification to Retrieve Slot Values

To retrieve `Name` slot value, for example, type:

```
#foreach($instance in $InstanceSpecification)
    #foreach($slot in $instance.slot)
        #if($slot.definingFeature.name == 'Name')
            #if($slot.value.size() > 0)
                #set($v =
$slot.value.get(0).text)
            #else
                #set($v = "")
            #end
            Slot value is $v
        #end
    #end
#end
```

3.1.2 Using Slot Property to Retrieve Slot Values

You can use a slot property as a shortcut to get the following information from a slot.

3.1.2.1 Retrieving Slot Information from an Element

The following code retrieves slot information from an element.

```
$element.slots
```

Where:

- `$element` is an element.
- `slots` is a property for getting slots variable.

If you want to obtain a collection of slots variable of an element, for example, type:

```
#foreach($slot in $instanceSpecification.slots)
    $slot.name
#end
```

3.1.2.2 Retrieving Slot Information from an Element and a Classifier's Name

The following code retrieves slot information from an element and a classifier's name.

```
$element.slots.ClassifierName
or
$element.slots.get("ClassifierName")
```

Where:

- `$element` is an element.
- `slots` is a property for getting the slots variable.
- `ClassifierName` is the classifier's name.

The code returns:

- A list of slot variables whose classifier name are ClassifierName.
- If there are multiple classifiers match the ClassifierName, the code returns the slot property of the first classifier.
- If there is no classifier that matches the ClassifierName, the code returns null.

If you want to retrieve all slot values from the "Communicate" classifier, for example, type:

```
$instanceSpecification.slots.Communicate
$instanceSpecification.slots.get("Communicate")
```

3.1.2.3 Retrieving Slot Value from an Element, a Classifier's Name, and a Defining Feature Name

```
$element.slots.ClassifierName.DefiningFeatureName
or
$element.slots.ClassifierName.get("DefiningFeatureName")
or
$element.slots.get("ClassifierName").DefiningFeatureName
or
$element.slots.get("ClassifierName").get("DefiningFeatureName")
```

Where:

- `$element` is an element.
- `slots` is a property for getting slots variable.
- `ClassifierName` is the classifier's name.
- `DefiningFeatureName` is the name of a slot.

The code returns:

- A slot value whose name is `DefiningFeatureName` and a classifier whose name is `ClassifierName`.
- If the slot multiplicity is < =1 (less than or equals to 1), it will return the value in ValueSpecification.
- If the slot multiplicity is > 1, it will return the value in array of ValueSpecification.

If you want to retrieve the values of a slot whose name is "Address" and those of a classifier whose name is "Communicate", for example, type:

```
$instanceSpecification.slots.Communicate.Address
$instanceSpecification.slots.Communicate.get("Address")
$instanceSpecification.slots.get("Communicate").Address
$instanceSpecification.slots.get("Communicate").get("Address")
```

NOTE	• ClassifierName and DefiningFeatureName are case-sensitive properties. • You can use: `$report.getSlotValue($element, ClassifierName, DefiningFeatureName)` to retrieve the slot value. See **4.1 $report** below for further details.

3.1.2.4 Code Examples to Retrieve Slot Values

This section demonstrates how to get the value of an instance slot from a classifier. Figure 63 shows the elements of a slot variable in the Containment tree in MagicDraw. You can see the values of the element **Member** in the tree or you can right-click it and open the Specification dialog to see the values in the dialog.

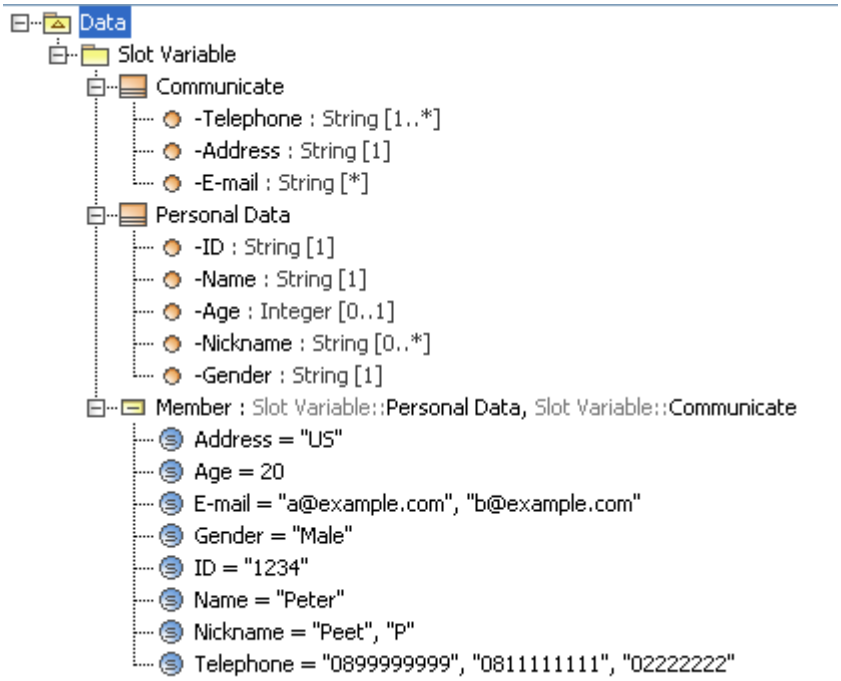


Figure 63 -- Example of Elements in the Containment Tree

Figure 64 shows the Instance Specification dialog of the element **Member** of the slot variable. As you can see in the dialog, the element **Member** of the slot variable contains slot names and values.

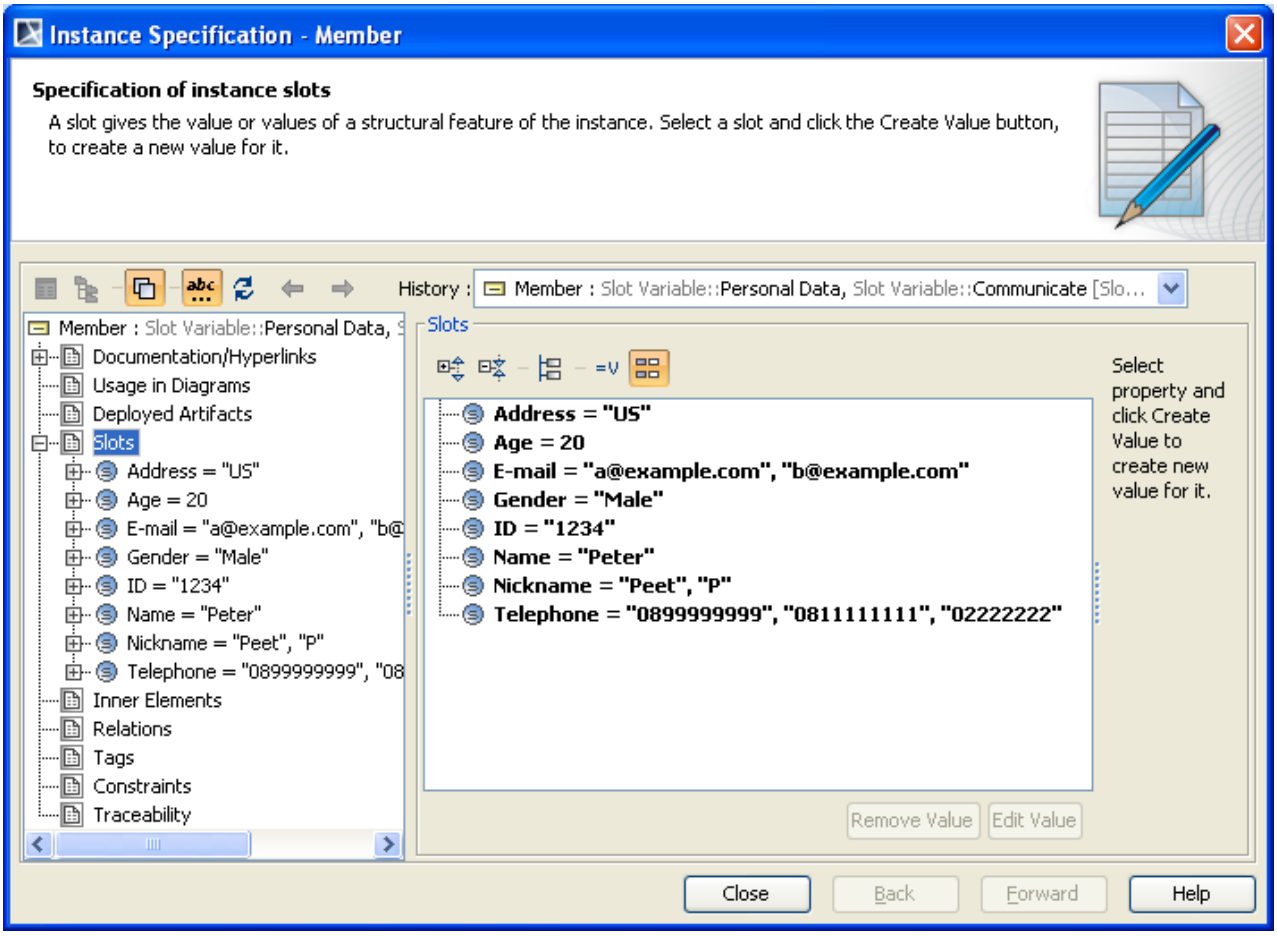


Figure 64 -- All Slots of Instance Specification

The following are the examples of using the code to retrieve a value of a slot.

Example 1

If you want to print the value of a slot **Address** of the element **Member** from the classifier **Communicate**, for example, you can use the following template code as a shortcut. Note that the slot multiplicity = 1.

```
#foreach($instance in $InstanceSpecification)
     Slot value is $instance.slots.Communicate.Address
#end
```

The output of the above code is as follows:

```
     Slot value is US
```

Example 2

If you want to print the value of a slot **Telephone** of the element **Member** from the classifier **Communicate**, for example, you can use the following template code as a shortcut. Note that the slot multiplicity is > 1, [1..*].

```
#foreach($instance in $InstanceSpecification)
     Slot value is $instance.slots.Communicate.Telephone
#end
```

The output of the above code is as follows:

```
     Slot value is [0899999999, 0811111111, 02222222]
```

Example 3

If you want to print the value of a slot **Name** of the element **Member** from the classifier **Personal Data**, for example, you can use the following template code as a shortcut. Note that the slot multiplicity = 1.

```
#foreach($instance in $InstanceSpecification)
     Slot value is $instance.slots.get("Personal Data").get("Name")
#end
```

The output of the above code is as follows:

```
     Slot value is Peter
```

Example 4

If you want to print the value of a slot **Nickname** of the element **Member** from the classifier **Personal Data**, for example, you can use the following template code as a shortcut. Note that the slot multiplicity is > 1, [0..*].

```
#foreach($instance in $InstanceSpecification)
     Slot value is $instance.slots.get("Personal
Data").get("Nickname")
#end
```

The output of the above code is as follows:

```
     Slot value is [Peet, P]
```

Example 5

If you want to use `$Report` method to print the value of a slot **Name** of the element **Member** from the classifier **Personal Data**, for example, you can use the following template code.

```
#foreach($instance in $InstanceSpecification)
     Slot value is $report.getSlotValue($instance, "Personal Data",
"Name")
#end
```

The output of the above code is as follows:

```
     Slot value is [Peter]
```

Example 6

If you want to use `$Report` method to print the value of a slot **Nickname** of the element **Member** from the classifier **Personal Data**, for example, you can use the following template code.

```
#foreach($instance in $InstanceSpecification)
     Slot value is $report.getSlotValue($instance, "Personal Data",
"Name")
#end
```

The output of the above code is as follows:

```
     Slot value is [Peet, P]
```

Example 7

If you want to print the names and values of all classifiers and the slot properties of all instance elements, for example, you can use the following template code as a shortcut.

```
#foreach($instance in $InstanceSpecification)
  #foreach($classifier in $instance.slots)
     Classifier name: $classifier.name
     Slots:
       #foreach($slot in $classifier)
         $slot.name : $slot.value
       #end

  #end
#end
```

The output of the above code is as follows:

```
Classifier name: Personal Data
     Slots:
        Name : Peter
        Age : 20
        Nickname : [Peet, P]
        Gender : Male
        ID : 1234

     Classifier name: Communicate
     Slots:
        Telephone : [0899999999, 0811111111, 02222222]
        E-mail : [a@example.com, b@example.com]
        Address : US
```

4. Helper Modules

For more details on element types, see **OpenAPI**.

4.1 $report

This module is a utility module enabling a template to get MagicDraw data.

$report.createValueSpecificationText(specification)

Create texts representing the ValueSpecification element.

	Name	Type	Description
Parameter(s)	specification	com.nomagic.uml2.ext.magic-draw.classes.mdkernel.Value-Specification	A given ValueSpecification.
Return	-	java.lang.String	A String value for Value-Specification.

$report.filterDiagram(diagramList, diagramTypes)

Return a collection of diagrams from a list of diagrams filtered by types.

	Name	Type	Description
Parameter(s)	diagramList	java.util.Collection	A collection of diagrams.
	diagramTypes	java.util.Collection	A collection of diagram types used as filters.
Return	-	java.util.Collection	A collection of filtered dia-grams.

For example:

```
#foreach($diagram in
$report.filterDiagram($Diagram,["Class
Diagram","Communication Diagram"]))
$diagram.name : $diagram.diagramType
#end
```

$report.filterElement(elementList, humanTypes)

Return a collection of elements from a list of elements filtered by human types.

	Name	Type	Description
Parameter(s)	elementList	java.util.Collection	A collection of elements.
	humanTypes	java.util.Collection	A collection of human types used as filters.
Return	-	java.util.Collection	A collection of filtered ele-ments.

For example:

```
#foreach($element in $report.filterElement($elements,
["Use Case", "Actor"]))
$element.name : $element.humanType
#end
```

$report.filter(elementList, propertyName, propertyValue)

Return a collection of elements filtered by a specified property name.

	Name	Type	Description
Parameter(s)	elementList	java.util.Collection	A collection of elements.
	propertyName	java.lang.String	A property name.
	propertyValue	java.util.Collection	A collection of property names used as filters.
Return		java.util.Collection	A collection of filtered elements.

For example:

```
#foreach ($e in $report.filter($elements, "name",
["foo", "bar"]))
   $e.name
#end
```

$report.findElementInCollection(elementList, name)

Find an element from a collection of elements by name.

	Name	Type	Description
Parameter(s)	elementList	java.util.Collection	A collection of elements.
	name	java.lang.String	An element name.
Return	-	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element instance. If it cannot find the element, it will return a null value.

$report.findRelationship(modelPackage)

Search and return a collection of relationship elements inside a package.

	Name	Type	Description
Parameter(s)	modelPackage	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Package	A package element.
Return	-	java.util.Collection	A collection of relationships in a package.

$report.findRelationship(modelPackage, recursive)

Search and return a collection of relationship elements inside a package.

	Name	Type	Description
Parameter(s)	modelPackage	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Package	A package element.
	recursive	boolean	If true, performs recursively.
Return	-	java.util.Collection	A collection of relationships in a package.

$report.getAppliedStereotypeByName(element, stereotypeName)

Return a stereotype assigned to an element.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
	stereotypeName	java.lang.String	A stereotype name.
Return	-	com.nomagic.uml2.ext.magicdraw.mdprofiles.Stereotype	An assigned stereotype with a specified name.

$report.getBaseClassAssociations(classifier)

Obtain a collection of associations of a classifier.

	Name	Type	Description
Parameter(s)	classifier	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A classifier.
Return	-	java.util.Collection	A collection of associations.

$report.getBaseClassInheritableAttributes(classifier)

Get a collection of inheritable attributes of a classifier.

	Name	Type	Description
Parameter(s)	classifier	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A classifier.
Return	-	java.util.Collection	A collection of attributes.

$report.getBaseClassInheritableOperations(classifier)

Obtain a collection of inheritable operations of a classifier.

	Name	Type	Description
Parameter(s)	classifier	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A classifier.

	Name	Type	Description
Return	-	java.util.Collection	A collection of operations.

$report.getBaseClassPorts(classifier)

Find a collection of ports of a classifier.

	Name	Type	Description
Parameter(s)	classifier	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A classifier.
Return	-	java.util.Collection	A collection of ports.

$report.getBaseRealizedInterfaces(behavioredClassifier)

Find a collection of realized interfaces of a behaviored classifier.

	Name	Type	Description
Parameter(s)	behavioredClassifier	com.nomagic.uml2.ext.magicdraw.commonbehaviors.mdbasicbehaviors.BehavioredClassifier	A BehavioredClassifier.
Return	-	java.util.Collection	A collection of RealizedInterfaces.

$report.getBaseRelations(classifier)

Find a collection of relations of a classifier.

	Name	Type	Description
Parameter(s)	classifier	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A classifier.
Return	-	java.util.Collection	A collection of relations.

$report.getBaseClassifiers(child)

Return a collection of base elements of a classifier.

	Name	Type	Description
Parameter(s)	child	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A child class.
Return	-	java.util.Collection	A collection of base elements (classifiers).

$report.getClientElement(element)

Return a client of a relationship.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A relationship model element.

	Name	Type	Description
Return	-	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	The relationship's client.

$report.getComment(element)

Return a documentation of a given element.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	java.lang.String	The documentation of an element.

$report.getDerivedClassifiers(parent)

Return a collection of derived elements of a classifier.

	Name	Type	Description
Parameter(s)	parent	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A parent class.
Return	-	java.util.Collection	A collection of derived elements (classifiers).

$report.getDiagramElements(diagram)

Get a collection of elements from a diagram.

	Name	Type	Description
Parameter(s)	diagram	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Diagram	A diagram instance.
Return	-	java.util.Collection	A collection of elements in a diagram.

$report.getDiagramType(diagram)

Return a diagram type.

	Name	Type	Description
Parameter(s)	diagram	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Diagram	A diagram instance.
Return	-	java.lang.String	A diagram type.

$report.getDSLProperty(element, propertyName)

Return a DSL Property.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.Object	A property value.

$report.getElementComment(element)

Return a comment attached to an element. If no comment is attached, it will return a null value.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Comment	A comment instance of the element.

$report.getElementName(element)

Get an element's name. If the name is empty, it will return "<unnamed>". This method performs the following procedures:

- If the element is generalized from the NamedElement metaclass, it will return `$element.name`
- If the element is generalized from the Slot metaclass, it will return `$element.definingFeature.name`
- If the element is a UML element, it will return `$element.humanName`
- Else returns `$element.toString()`

	Name	Type	Description
Parameter(s)	element	java.lang.Object	An element.
Return	-	java.lang.String	An element name.

$report.getIconFor(element)

Return an image icon of an element with a default icon filename ("icon_"+element type).

	Name	Type	Description
Parameter(s)	element	com.nomagic.magicdraw.uml.BaseElement	A MagicDraw element.
Return	-	com.nomagic.magicreport.Image	An image object of the element's icon.

For example:

```
$report.getIconFor($classObject)
```

This results in an Image object of a class whose name is “icon_class”.

$report.getIconFor(element, prefix, suffix, hashCode)

Return an image icon of an element. The icon name depends on the `hashCode` value if `hashCode` equals true, the icon’s name is set as `”icon_”+hash code value` of the icon. If the hashCode value equals false, the icon name is set as `prefix + element type + suffix`.

	Name	Type	Description
Parameter(s)	element	com.nomagic.magic-draw.uml.BaseElement	A MagicDraw element.
	prefix	java.lang.String	A prefix of an icon name.
	suffix	java.lang.String	A suffix of an icon name.
	hashCode	boolean	If true, use hash code of an icon as the icon name and exclude a prefix or suffix from the name.
Return	-	com.nomagic.magicrep-ort.Image	An image object of an element’s icon.

For example:

(i) To get an icon and set a name for hash code:

`$report.getIconFor($classObject, “prefix_”, “_suffix”, true)`
This results in an Image object of a class whose name “icon_24676200”. The number in the icon name is hash code, which is regenerated whenever MagicDraw starts.

(ii) To get an icon and set a name for prefix and suffix:

`$report.getIconFor($classObject, “prefix_”, “_suffix”, false)`
This results in an Image object of a class whose name is “prefix_class_suffix”.

$report.getIconFor(type)

Return an image icon for an element type with a default icon’s filename ((“icon_”+element type).

	Name	Type	Description
Parameter(s)	type	java.lang.String	A type name.
Return	-	com.nomagic.magicrep-ort.Image	An image object for the element’s icon.

For example:

`$report.getIconFor(“class”)`
This results in an Image object of a class whose name is “icon_class”.

$report.getIconFor(type, prefix, suffix, hashCode)

Return an image icon for an element type. The icon's name depends on the `hashCode` value if `hashCode` equals true, the icon name is set as `"icon_"+hash code value` of the icon. If the hashCode value equals false, the icon name is set as `prefix + element type + suffix`.

	Name	Type	Description
Parameter(s)	type	java.lang.String	A type name.
	prefix	java.lang.String	A prefix for an icon name.
	suffix	java.lang.String	A suffix for an icon name.
	hashCode	boolean	If true, use hash code of an icon as the icon's name and exclude a prefix or suffix from the name.
Return	-	com.nomagic.magicreport.Image	An image object for an element's icon.

For example:

(i) To get an icon and set a name for hash code:

```
$report.getIconFor("class", "prefix_", "_suffix", true)
```

This results in an Image object of a class whose name "icon_24676200". The number in the icon name is hash code, which is regenerated whenever MagicDraw starts.

(ii) To get an icon and set a name for prefix and suffix:

```
$report.getIconFor("class", "prefix_", "_suffix", false)
```

This results in an Image object of a class whose name is "prefix_class_suffix".

$report.getIncludeUseCase(useCase)

Return a collection of included elements of a UseCase.

	Name	Type	Description
Parameter(s)	useCase	com.nomagic.uml2.ext.magicdraw.mdusecases.UseCase	A UseCase instance.
Return	-	java.util.Collection	A collection of included UseCases.

$report.getInnerElement(element)

Return a collection of inner elements.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.

	Name	Type	Description
Return	-	java.util.Collection	A collection of inner elements.

$report.getInteractionMessageType(message)

Return an interaction message type.

	Name	Type	Description
Parameter(s)	message	com.nomagic.uml2.ext.magicdraw.interactions.mdbasicinteractions.Message	A message instance.
Return	-	java.lang.String	A message type.

$report.getMetaClass(stereotype)

Return a stereotype meta class.

	Name	Type	Description
Parameter(s)	stereotype	com.nomagic.uml2.ext.magicdraw.mdprofiles.Stereotype	A stereotype instance.
Return	-	java.util.Collection	A collection of Meta Classes.

$report.getPresentationDiagramElements(diagram)

Return presentation elements in a diagram. This method will return all presentation elements from the diagram, except non-manipulator symbols.

	Name	Type	Description
Parameter(s)	diagram	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Diagram	A diagram instance.
Return	-	java.util.Collection	A collection of elements.

$report.getPresentationDiagramElements(diagram, includeNonManipulator)

Return presentation elements in a diagram.

	Name	Type	Description
Parameter(s)	diagram	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Diagram	A diagram.
	include NonManipulator	boolean	True to include all non-manipulator elements.
Return	-	java.util.Collection	A collection of elements.

$report.getPresentationElementBounds(diagram, element)

Return the polygonal bounds of an element. The bounds specify the component coordinates to its diagram.

	Name	Type	Description
Parameter(s)	diagram	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Diagram	A target diagram.
	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A presentation element on a given diagram.
Return	-	java.util.List	Returns the polygonal bounds of an element. If the element is not found in the diagram, it will return null.

$report.getPresentationElementBounds(element)

Return the polygonal bounds of an element. The bounds specify this component's coordinate to its diagram.

	Name	Type	Description
Parameter(s)	element	com.nomagic.magicdraw.uml.symbols.PresentationElement	A presentation element on a diagram.
Return	-	com.nomagic.magicdraw.magicreport.helper.Polygon	Returns the polygonal bounds of an element.

$report.getPresentationElementRectangle(diagram, element)

Return the rectangular bounds of an element. The bounds specify the component coordinates to its diagram.

	Name	Type	Description
Parameter(s)	diagram	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Diagram	A target diagram.
	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A presentation element on a given diagram.
Return	-	java.util.List	Returns the rectangular bounds of an element. If the element is not found in the diagram, it will return null.

$report.getQualifiedName(namedElement, separator)

Get a qualified name. A qualified name is the name that allows a NamedElement to be identified within a hierarchy of nested Namespaces. It is constructed from the names of the containing namespaces starting at the root of the hierarchy and ending with the name of the NamedElement itself.

	Name	Type	Description
Parameter(s)	namedElement	NamedElement	A NamedElement.
	separator	java.lang.String	A separator symbol. If the value is null or an empty string, the '::' will be used.
Return	-	java.lang.String	A qualified name.

$report.getPackageQualifiedName(namedElement, separator)

Get a qualified name by considering only Packages and a given element. Models and Profiles will not be included in the qualified name.

For example, given the element hierarchy:

```
Design : Model -> com : Package -> nomagic : Package -> ui ->
Package -> BaseDialog : Class
```

and the template code:

```
$report.getPackageQualifiedName($class, ".")
```

If `$class` is a "`BaseDialog`" element, the result from the above template code will be:

```
com.nomagic.ui.BaseDialog
```

	Name	Type	Description
Parameter(s)	namedElement	NamedElement	A NamedElement.
	separator	java.lang.String	A separator symbol. If the value is null or an empty string, the '::' will be used.
Return	-	java.lang.String	A qualified name.

$report.getReceivingOperationalNode(element)

Get the needline association ends.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A needline association instance.

$report.getRelationship(element)

Return an element's relationship.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	java.util.Collection	A collection of relationships.

$report.getRelationship(element, recursive)

Return a collection of element relationships.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.element	An element.
	recursive	boolean	If true, performs recursively.
Return	-	java.util.Collection	A collection of relationships.

$report.getRelativeActor(element)

Return an element's relative actor.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	java.util.Collection	A collection of actors.

$report.getSendingOperationalNode(element)

Return the needline's association ends.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A needline association instance.

$report.getSlotValue(element, ClassifierName, DefiningFeatureName)

Find and retrieve the values of a slot whose name and classifier's name are `DefiningFeatureName` and `ClassifierName` respectively. The code enables case-sensitivity queries such that only those case-sensitive matches will return.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element whose slot value you want to find.
	ClassifierName	java.lang.String	A classifier name.
	DefiningFeatureName	java.lang.String	A slot name.
Return	-	java.util.Collection	A collection of ValueSpecifications of a slot.

For example:

Use the code to retrieve the value of a slot whose name and classifier's name are `Name` and `Personal Data` respectively.

```
#foreach($instance in $InstanceSpecification)
  Slot value is $report.getSlotValue($instance, "Personal Data",
   "Name")
#end
```

- `"Personal Data"` is the name of the classifier.
- `"Name"` is the name of the slot.

$report.getStereotypeProperty(element, stereotypeName, propertyName)

Get a stereotype property.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
	stereotypeName	java.lang.String	A stereotype name.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.Object	A property value.

$report.getStereotypeProperty(element, profileName, stereotypeName, propertyName)

Get a stereotype property.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element instance.
	profileName	java.lang.String	A profile name.
	stereotypeName	java.lang.String	A stereotype name.
	propertyName	java.lang.String	A property name.

	Name	Type	Description
Return	-	java.lang.Object	A property value.

$report.getStereotypePropertyString(element, stereotypeName, propertyName)

Return a stereotype property as String value.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element instance.
	stereotypeName	java.lang.String	A stereotype name.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.Object	A property value.

$report.getStereotypes(element)

Return all stereotypes applied to an element. This method is replaced by `$element.appliedStereotype`.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	java.util.List	A list of stereotype instances.

$report.getSupplierElement(element)

Return the supplier of a relationship.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A relationship model element.
Return	-	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	The relationship’s supplier.

$report.getUsageElements(usagesMap, element)

Return the usage of a specified element.

	Name	Type	Description
Parameter(s)	usagesMap	java.util.Map	The Usage Map of MD.
	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	java.util.Collection	A collection of element usages.

$report.getUsages(selectedObjects)

Return the Usage Map of MagicDraw. It uses the getUsageElements method to return the usage of a specified element.

	Name	Type	Description
Parameter(s)	selectedObjects	java.lang.Object	An element.
Return	-	java.util.Map	A Map instance of element usages.

$report.hasStereotype(element)

Check if an element has stereotypes.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element to check.
Return	-	boolean	True if it has a stereotype.

$report.containsStereotype(element, stereotypeName)

Return true if an element contains a stereotype (including all derived stereotypes) for a specified stereotype name.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element to check.
	stereotypeName	java.lang.String	A stereotype name to be tested.
Return	-	boolean	True if the element contains a stereotype for the specified stereotype name.

$report.containsStereotype(element, stereotypeName, includeDerived)

Return true if an element contains a stereotype for a specified stereotype name.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element to test.
	stereotypeName	java.lang.String	A stereotype name to be tested.
	includeDerived	boolean	True if the searched target includes all derived stereotypes; otherwise, false.
Return	-	boolean	True if the element contains a stereotype for the specified stereotype name.

$report.isDerivedClassifier(parent, child)

Check if a child is derived from the parent by generalization.

	Name	Type	Description
Parameter(s)	parent	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A parent.
	child	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Classifier	A possible child.
Return	-	boolean	True if it is derived from the parent by generalization.

$report.isNamedElement(element)

Return whether an element is a NamedElement.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element to test.
Return	-	boolean	True if the given element is a NamedElement; otherwise, false.

$report.isNull(obj)

Test and return true if an object is null.

	Name	Type	Description
Parameter(s)	obj	java.lang.Object	An object being tested.
Return	-	boolean	True if the object is null.

$report.isRelationship(element)

Test and return true if an element is a relationship.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element being tested.
Return	-	boolean	True if the object is a relationship.

$report.serialize(hyperlink)

Convert **com.nomagic.magicdraw.hyperlinks.Hyperlink** to **com.nomagic.magicdraw.plugins.impl.magicreport.helper.Hyperlink**. Report Wizard needs the *com.nomagic.magicdraw.plugins.impl.magicreport.helper.Hyperlink* class wrapper to return *com.nomagic.magicdraw.hyperlinks.Hyperlink* data.

	Name	Type	Description
Parameter(s)	hyperlink	com.nomagic.magicdraw.hyperlinks.Hyperlink	A MagicDraw hyperlink.

	Name	Type	Description
Return	-	com.nomagic.magicdraw.plugins.impl.magicreport.helper.Hyperlink	A Report Wizard hyperlink instance.

$report.getUsedBy(element)

Return a list of element(s) used by this element (except diagrams).

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element of which to determine the usage.
Return	-	java.util.Collection	A collection of elements used by an input element.

$report.hasProperty(element, propertyName)

Return true when a property with a given name is specified in this element, otherwise returns false.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.Boolean	Return true when a property with a given name is specified in this element, otherwise returns false.

For example:

```
#foreach($element in $elements)
$report.hasProperty($element, "data")
#end
```

Figure 65 -- Sample of $report.hasProperty(element, propertyName)

- `$element` is the element.
- `data` is the name of the property.

$report.findElementByName(source, regex)

Search and return elements that match the name using a regular expression.

	Name	Type	Description
Parameter(s)	source	java.util.Collection	A collection of elements.
	regex	java.lang.String	A regular expression with which the name is to be matched.
Return	-	java.util.Collection	A collection of matching elements.

For example:

```
#foreach($ele in $report.findElementByName($elements, "[A]+.*"))
$ele.name
#end
```

Figure 66 -- Sample of $report.findElementByName(source, regex)

- `$elements` is a collection of elements to be found.
- "`[A]+.*`" is a regular expression to find which element matches the name. In this example, the following are the names that match, such as Auxiliary, AppServer, and Alternative Fragment.

$report.getPresentationElements(diagram)

Get a presentation element in a diagram. This method is equivalent to `$report.getPresentationDiagramElements(diagram)`.

	Name	Type	Description
Parameter(s)	diagram	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Diagram	A diagram instance.
Return	-	java.util.Collection	A collection of elements.

For example:

```
#foreach($diagram in $Diagram)
#foreach($d in $report.getPresentationElements($diagram))
$d.name
#end
#end
```

Figure 67 -- Sample of $report.getPresentationElements(diagram)

- `$diagram` is the diagram instance.

$report.getUsageRepresentationText(baseElement, bool)

Format the usage subject. The output string is the same as the Result column of Used by table in Magic Draw.

	Name	Type	Description
Parameter(s)	baseElement	com.nomagic.magicdraw.uml.BaseElement	A model element to be formatted.
	bool	java.lang.Boolean	True if a full path is used, otherwise false.
Return	-	java.lang.String	A formatted element.

For example:

```
#foreach($baseElement in $elements)
$report.getUsageRepresentationText($baseElement, false)
#end
```

Figure 68 -- Sample of $report.getUsageRepresentationText(baseElement, bool)

- `$baseElement` is the model element to be formatted.
- `false` if a full path is not used. In this example, a full path is not used.

$report.getUseCaseNumber(element)

Return a use case number of an element.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A model element.
Return	-	java.lang.String	A use case number.

For example:

```
#foreach ($uc in $RequirementsUseCase)
$report.getUseCaseNumber($uc) $uc.name
#end
```

Figure 69 -- Sample of $report.getUseCaseNumber(element)

$report.getElementURL(element)

Return a MagicDraw's element URL.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	elementURL	java.lang.String	An element URL.

For example:

```
#foreach ($element in $elements)
$report.getElementURL($element)
#end
```

Figure 70 -- Sample of $report.getElementURL(element)

$report.isEmpty(obj)

Test and return true if an object is null, empty string, or empty collection.

	Name	Type	Description
Parameter(s)	obj	java.lang.Object	An object being tested.
Return	-	boolean	True if the object is null, empty string, or empty collection.

For example:

```
#if ($report.isEmpty($var))
Object is null, empty string or empty collection
#end
```

Figure 71 -- Sample of $report.isEmpty(obj)

$report.getBasicFlows(usecase:UseCase) : List<FlowStep>

Find and return a list of basic flows from a given use case. If a use case scenario is not being used, it will retrieve the value from "requirementUseCase" stereotype tags.

	Name	Type	Description
Parameter(s)	usecase	com.nomagic.uml2.ext.magicdraw.mdusecases.UseCase	A targeted Use Case.
Return	-	List<com.nomagic.magicdraw.usecasescenarios.scenarios.FlowStep>	A list of flow steps. A Flow Step is an object representing each step of a Use Case flow.

The `<FlowStep>` is a MagicDraw "com.nomagic.magicdraw.usecasescenarios.scenarios.FlowStep" class.

The important properties of `<FlowStep>` are as follows:

- `name` prints a name of a current step, for example: `$flowStep.name`.
- `element` returns an element associates with a current step, for example: `#set ($e = $flowStep.element)`.
- `alternativeConditions` returns a list of alternative steps <AlternativeCondition> from a current step, for example: `#foreach ($alter in $flowStep.alternativeConditions) #end`.
- `exceptionTypes` returns a list of exception steps <ExceptionType> from a current step, for example: `#foreach ($alter in $flowStep.exceptionTypes) #end`.

For example:

```
#set ($basicFlowList = $report.getBasicFlows($useCase))
#foreach ($flowStep in $basicFlowList)
   $flowStep.name
   #foreach ($alter in $flowStep.alternativeConditions)
      - $alter.name
   #end
#end
```

Figure 72 -- Sample of $report.getBasicFlows(usecase:UseCase) : List<FlowStep>

$report.getAlternativeFlows(usecase:UseCase) : List<FlowStep>

Find and return all alternative flows from a given use case. The alternative flows will be listed from all possible branches of basic flows. If a use case scenario is not being used, it will retrieve the value from "requirementUseCase" stereotype tags.

	Name	Type	Description
Parameter(s)	usecase	com.nomagic.uml2.ext.magicdraw.mdusecases.UseCase	A targeted Use Case.
Return	-	List<com.nomagic.magicdraw.usecasescenarios.scenarios.FlowStep>	A list of flow steps. A Flow Step is an object representing each step of a Use Case flow.

For example:

```
#set ($basicFlowList = $report.getBasicFlows($useCase))
#foreach ($flowStep in $basicFlowList)
   $flowStep.name
   #foreach ($alternative =
$flowStep.alternativeConditions)
      $alternative.name
      #foreach ($alternativeFlow in
$alternative.alternativeFlowSteps)
         $alternativeFlow.name
      #end
   #end
#end
```

Figure 73 -- Sample of $report.getAlternativeFlows(usecase:UseCase) : List<FlowStep>

$report.getExceptionalFlows(usecase:UseCase) : List<FlowStep>

Find and return all exceptional flows from a given use case. The alternative flows will be listed from all possible branches of basic flows. If the use case scenario is not being used, it will retrieve the value from "requirementUseCase" stereotype tags.

	Name	Type	Description
Parameter(s)	usecase	com.nomagic.uml2.ext.magicdraw.mdusecases.UseCase	A targeted Use Case.
Return	-	List<com.nomagic.magicdraw.usecasescenarios.scenarios.FlowStep>	A list of flow steps. A flow step is an object representing each steps of a Use Case flow.

For example:

```
#set ($basicFlowList = $report.getBasicFlows($useCase))
#foreach ($flowStep in $basicFlowList)
   $flowStep.name
   #foreach ($exception = $flowStep.exceptionTypes)
      $exception.name
      #foreach ($exceptionalFlow in
$exception.exceptionalFlowSteps)
         $exceptionalFlow.name
      #end
   #end
#end
```

Figure 74 -- Sample of $report.getExceptionalFlows(usecase:UseCase) : List<FlowStep>

$report.getOwnedElementsIncludingAdditional(element, includePureOwned) : List<Element>

This code returns owned elements of a given element including additional owned elements defined in the DSL specification by additionalContentProperty.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	A model element.
	includePureOwned	java.lang.Boolean	**True** if includes an element owned directly in the ownedElement UML metaproperty. Otherwise **False**.
Return	-	java.util.List	A list of owned elements of a given element.

The following are the examples of using the code.

Example 1

```
#foreach($e in $elements)
$e.name : $e.humanType
  #foreach($child in
$report.getOwnedElementsIncludingAdditional($e, true))
    $child.name : $child.humanType
  #end
#end
```

Example 2

```
#foreach($e in $SmartPackage)
$e.name : $e.humanType
    #foreach($child in
$report.getOwnedElementsIncludingAdditional($e, true))
       $child.name : $child.humanType
    #end
#end
```

Example 3

```
#set($packages = $array.createArray())
#set($void = $array.addCollection($packages, $Package))
#set($void = $array.addCollection($packages,
$SmartPackage))

#foreach($e in $packages)
$e.name : $e.humanType
    #foreach($child in
$report.getOwnedElementsIncludingAdditional($e, true))
        $child.name : $child.humanType
    #end
#end
```

4.2 $project

This module is a project reference enabling a template to return the project information.

$project.getName()

Return a project name.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	A project name.

$project.getTitle()

Get a project title.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	A project title.

$project.getFileName()

Get a project filename.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	A project filename.

$project.getExtension()

Get a project filename extension.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	A project filename extension.

$project.getDirectory()

Get a project directory name.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	A project directory name.

$project.getVersionList()

Return a list of version information from an open Teamwork Server project.

	Name	Type	Description
Return	-	java.util.List<Version>	A list of com.nomagic.teamwork.common.projects.Version.

NOTE	Version information consists of the following attributes:
	• comment: a version committed comment
	• date: a committed date
	• dateAsString: a committed date as text
	• number: a committed version
	• numberAsString: a committed version as text
	• user: a committer's name
	
	The following is sample code:
	`Current version : $project.version`
	`All version:`
	`----------`
	`#foreach ($version in $project.versionList)`
	`Date : $version.date`
	`Number : $version.number`
	`Number as String : $version.numberAsString`
	`User : $version.user`
	`Comment : $version.comment`
	`----------`
	`#end`

$project.getType()

Return a file type. A file type is one of the following values:

- 0 – UNDEF
- 2 – XML_NATIVE
- 3 – UNSIYS_XMI

	Name	Type	Description
Return	-	int	The value of a file type.

$project.getDiagrams()

Return all existing diagrams stored in a particular project.

	Name	Type	Description
Return	-	java.util.Collection	A collection of diagram instances.

$project.getDiagrams(type)

Return existing diagrams of a given type stored in a particular project.

	Name	Type	Description
Parameter(s)	type	java.lang.String	A diagram type.
Return	-	java.util.Collection	A collection of diagram instances.

For example:

```
#set($classDiagram = $project.getDiagrams("Class Diagram"))
#foreach($cl in $classDiagram)
$cl.name
#end
```

Figure 75 -- Sample of $project.getDiagrams(type)

- "Class Diagram" is a diagram type

$project.getPresentationDiagrams()

Return all existing presentation diagrams stored in a particular project.

	Name	Type	Description
Return	-	java.util.Collection	A collection of diagram views.

$project.getPresentationDiagrams(type)

Return all existing presentation diagrams of a given type stored in a particular project.

	Name	Type	Description
Parameter(s)	type	java.lang.String	A diagram type.
Return	-	java.util.Collection	A collection of diagram views.

For example:

```
#set($classDiagram = $project.getPresentationDiagrams("Class Diagram"))
#foreach($cl in $classDiagram)
$cl.name
#end
```

Figure 76 -- Sample of $project.getPresentationDiagrams(type)

- "Class Diagram" is a diagram type.

$project.isRemote()

Return the remote or non-remote state of a project.

	Name	Type	Description
Return	-	java.lang.Boolean	Return true if a project is a remote project, otherwise false.

$project.isDirty()

Return true if that particular project was modified after it had been saved or loaded.

	Name	Type	Description
Return	-	java.lang.Boolean	Return true if a project was modified after it had been saved/loaded, otherwise false.

$project.getElementByID(id)

Return an element with a given ID.

	Name	Type	Description
Parameter(s)	ID	java.lang.String	An element ID.
Return	-	com.nomagic.magicdraw.uml.BaseElement	An element with a given ID or null if the element with such ID is not registered in the project.

For example:

```
#set($ele = $project.getElementByID("_9_0_62a020a_1105704887361_983947_8206"))
$ele.name
$ele.humanType
```

Figure 77 -- Sample of $project.getElementByID(id)

- "`_9_0_62a020a_1105704887361_983947_8206`" is the element's ID number.

$project.getAllElementId()

Return a collection of all element IDs in a project.

	Name	Type	Description
Return	-	java.util.Collection	A collection of all element IDs in a project.

$project.getXmiVersion()

Return the XMI version of a project.

	Name	Type	Description
Return	-	int	An XMI version.

$project.getVersion()

Return a project version number.

	Name	Type	Description
Return	-	long	A project version number.

$project.getModel()

Return a model (the root container of all model structures).

	Name	Type	Description
Return	-	com.nomagic.uml2.ext.magicdraw.auxiliaryconstructs.mdmodels.Model	A model.

$project.getModuleList()

Return a list of ModuleDescriptors from an open Teamwork Server project.

	Name	Type	Description
Return	-	java.util.Collection	A list of com.nomagic.magicdraw.core.modules.ModuleDescriptor.

$project.getSharedModule(module)

Return a list of shared modules from a specified module.

	Name	Type	Description
Parameter(s)	module	com.nomagic.magicdraw.core.modules.ModuleDescriptor	A module.
Return	-	java.util.Collection	A list of com.nomagic.magicdraw.core.modules.ModuleDescriptor.

For example:

```
#foreach ($module in $project.getModuleList())
name             : $module.representationString
description      : $module.description
version          : $module.version
required version : $module.requiredVersion
shared module    :
#foreach ($child in $project.getSharedModule($module))
   - $child.representationString
#end
========================
#end
```

Figure 78 -- Sample of $project.getSharedModule(module)

- `$module` is the module from Teamwork Server.

4.3 $iterator

This module is used with the `#foreach` loops. It wraps a list to let you specify a condition to terminate the loop and reuse the same list in a different loop. The following example shows how to use `$iterator`.

```
#set ($list = [1, 2, 3, 5, 8, 13])
#set ($numbers = $iterator.wrap($list))
#foreach ($item in $numbers)
#if ($item < 8) $numbers.more()#end
#end
$numbers.more()

Output
------
1 2 3 5
8
```

$iterator.wrap(list)

Wrap a list with the tool.

	Name	Type	Description
Parameter(s)	list	java.util.List	An array or a list instance.
Return	-	IteratorTool	Return an IteratorTool instance.

$<IteratorTool instance>.hasMore()

Check if the iteration has more elements.

	Name	Type	Description
Return	-	boolean	Return true if there are more elements in the wrapped list.

$<IteratorTool instance>.more()

Ask for the next element in the list.

	Name	Type	Description
Return	-	java.lang.Object	An element instance.

$<IteratorTool instance>.remove()

Remove the current element from the list.

$<IteratorTool instance>.reset()

Reset the wrapper so that it will start over at the beginning of the list.

$<IteratorTool instance>.stop()

Put a condition to break off a loop.

$<IteratorTool instance>.toString()

Return an object as a string.

4.4 $list

This module is a list module used to work with lists and arrays in a template. It provides a method to get and manage specified elements. You can also use it as a means to perform some actions on a list or array such as:

- Check if it is empty.
- Check if it contains certain elements.

For example:

`$primes`	-> new int[] {2, 3, 5, 7}
`$list.size($primes)`	-> 4
`$list.get($primes, 2)`	-> 5
`$list.set($primes, 2, 1)`	-> (primes [2] becomes 1)
`$list.get($primes, 2)`	-> 1
`$list.isEmpty($primes)`	-> false
`$list.contains($primes, 7)`	-> true

$list.contains(list, element)

Check if a list or array contains certain elements.

	Name	Type	Description
Parameter(s)	list	-	A list or array instance.
	element	-	An element instance.
Return	-	boolean	Return true if a list or array contains certain elements. Otherwise, return false.

$list.get(list, index)

Return a specified element of a list or array.

	Name	Type	Description
Parameter(s)	list	-	A list or array instance.
	index	-	An index of an object in a list.
Return	-	object	Return an object in a list.

$list.isArray(object)

Check if an object is an array.

	Name	Type	Description
Parameter(s)	object	-	An object

	Name	Type	Description
Return	-	boolean	Return true if the object is an array. Otherwise, returns false.

$list.isEmpty(list)

Check if a list or array is empty.

	Name	Type	Description
Parameter(s)	list	-	A list of objects
Return	-	boolean	Return true if the list or array is empty. Otherwise, returns false.

$list.isList(object)

Check if an object is a list.

	Name	Type	Description
Parameter(s)	object	-	An object
Return	-	boolean	Return true, if the object is a List. Otherwise, return false.

$list.set(list, index, value)

Set a specified element of a List/array.

	Name	Type	Description
Parameter(s)	list	-	A list of objects.
	index	-	An index of an object in the list.
	value	-	An object to be set toReturn aReturn a the list.
Return	-	object	An object at the previously-specified position with the set value.

$list.size(list)

Return the size of a List or array.

	Name	Type	Description
Parameter(s)	list	-	A list of objects.
Return	-	Integer	Return the size of the list as an Integer.

4.5 $bookmark

This module contains utility functions for bookmarking. The functions of this module are accessible from templates through `$bookmark`.

NOTE	In RTF reports, the default style of bookmarks depends on the RTF editor used. For example, Microsoft Word 2003 displays hyperlinks in blue.

$bookmark.openURL(url, content)

Create a hyperlink to open a URL. For example:

```
$bookmark.openURL("http://www.nomagicasia.com","NoMagic Asia")
```

	Name	Type	Description
Parameter(s)	url	java.lang.String	A URL text.
	content	java.lang.Object	The text content.
Return	-	com.nomagic.magicreport.Link	The text content with a hyperlink in the RTF format.

$bookmark.openURL(url, content)

Create a hyperlink to open a URL. For example:

```
$bookmark.openURL($url, "NoMagic Asia")
```

	Name	Type	Description
Parameter(s)	url	java.net.URL	A URL instance.
	content	java.lang.Object	The text content.
Return	-	com.nomagic.magicreport.Link	The text content with a hyperlink in the RTF format.

$bookmark.openURL(uri, content)

Create a hyperlink to open a URI. For example:

```
$bookmark.openURL($uri, "NoMagic Asia")
```

	Name	Type	Description
Parameter(s)	uri	java.net.URI	A URI instance.
	content	java.lang.Object	The text content.
Return	-	com.nomagic.magicreport.Link	The content with a hyperlink in the RTF format.

$bookmark.open(content)

Create a hyperlink for a bookmark. The bookmark ID will be automatically generated from the content.

	Name	Type	Description
Parameter(s)	content	java.lang.Object	The text content.
Return	-	com.nomagic.magicreport.Link	The text content with a hyperlink in the RTF format.

$bookmark.open(bookmarkId, content)

Create a hyperlink for a bookmark. The bookmark ID value must match the parameter bookmark ID that passes onto the link.

	Name	Type	Description
Parameter(s)	bookmarkId	java.lang.String	The bookmark ID.
	content	java.lang.Object	The text content.
Return	-	com.nomagic.magicreport.Link	The text content with a hyperlink in the RTF format.

$bookmark.create(bookmarkObject)

Create a bookmark. The bookmark ID will be automatically generated from the bookmark object.

	Name	Type	Description
Parameter(s)	bookmarkObject	java.lang.Object	A bookmark object or content.
Return	-	com.nomagic.magicreport.Bookmark	The content with a bookmark in the RTF format.

$bookmark.create(bookmarkId, bookmarkObject)

Create a bookmark. The default element type for this function is "label".

	Name	Type	Description
Parameter(s)	bookmarkId	java.lang.String	The bookmark ID.
	bookmarkObject	java.lang.Object	A bookmark object or content.
Return	-	com.nomagic.magicreport.Bookmark	The content with a bookmark in the RTF format.

$bookmark.create(bookmarkId, bookmarkObject, elementType)

Create a bookmark by specifying an element type.

	Name	Type	Description
Parameter(s)	bookmarkId	java.lang.String	The bookmark ID.
	bookmarkObject	java.lang.Object	A bookmark object or content.
	elementType	java.lang.String	An element type name, for example, html tag.
Return	-	com.nomagic.magicreport.Bookmark	The content with a bookmark in the RTF format.

$bookmark.getBookmarkId(id)

Return a bookmark ID from a given string.

	Name	Type	Description
Parameter(s)	id	java.lang.String	An original string value.
Return	-	com.nomagic.magicrep-ort.Bookmark	The bookmark ID.

4.6 $sorter

This module is used to sort a collection of report templates.

$sorter.sort(Collection, fieldName)

The sort function for report templates. The context name of this class is "`sorter`". Use `$sorter` to access public functions of this class through templates.

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection to be sorted
	fieldname	java.lang.String	A fieldName to be sorted and the sort direction.
Return	-	java.util.Collection	A sorted collection.

For example:

```
#foreach ($rel in $sorter.sort($package, "name"))
$rel.name
#end
```

- `$package` is the collection to be sorted.
- "`name:desc`" is separated by ":" in two parts:
  - The first part is to identify fieldName to be sorted.
  - The second part is the option to identify the sorting direction. Sometimes, the direction is not identified. It is ascending by default.

$sorter.sort(Collection)

This is the sort function for report templates. The context name of this class is "`sorter`". Use `$sorter` to access public functions of this class through the templates.

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection to be sorted.
Return	-	java.util.Collection	A sorted collection.

For example:

```
#foreach ($rel in $sorter.sort($package))
$rel.name
#end
```

- `$package` is a collection to be sorted.

$sorter.sortByFirstNumber(Collection, fieldName)

The `sortByFirstNumber` function is for report templates. The context name of this class is "`sorter`". Use `$sorter` to access public functions of this class through templates.

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection to be sorted.
	fieldName	java.lang.String	A fieldName to be sorted and the sorting direction.
Return	-	java.util.Collection	A sorted collection.

For example:

```
#foreach ($rel in $sorter.sortByFirstNumber($package,
"name:desc"))
$rel.name
#end
```

- `$package` is a collection to be sorted by **FirstNumber**.
- "`name:desc`" is separated by ":" in two parts:
  - The first part is to identify fieldName to be sorted.
  - The second part is the option to identify the sorting direction. Sometimes, the direction is not identified. It is ascending by default.

$sorter.sortByFirstNumber(Collection)

The `sortByFirstNumber` function for report templates. The context name of this class is "`sorter`". Use `$sorter` to access public functions of this class through templates.

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection to be sorted.
Return	-	java.util.Collection	A sorted collection.

For example:

```
#foreach ($rel in $sorter.sortByFirstNumber($package))
$rel.name
#end
```

- `$package` is a collection to be sorted by **FirstNumber**.

$sorter.sortByLocale(Collection, String)

This is a function to sort for report templates. The context name of this class is "`sorter`". Use `$sorter` to access public functions of this class through templates. To sort a given collection by a particular language, identify the country code to specify the language.

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection to be sorted.
	countryCode	java.lang.String	The country code to specify a language to perform sorting.
Return	-	java.util.Collection	A sorted collection.

For example:

```
#foreach ($p in $sorter.sortByLocale($package, "DE"))
$p.name
#end
```

- `$package` is a collection to be sorted by country code.
- "`DE`" is the country code for GERMANY (ISO country code).

NOTE	This method sorts a collection by “name” attribute of each element by default.

$sorter.sortByLocale(Collection, String, String)

This is a function to sort for report templates. The context name of this class is "`sorter`". Use `$sorter` to access public functions of this class through templates. To sort a given collection by a particular language, specify the language by identifying the country code and field name.

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection to be sorted.
	fieldName	java.lang.String	A fieldName to be sorted.
	countryCode	java.lang.String	The country code to specify a language to perform sorting.
Return	-	java.util.Collection	A sorted collection.

For example:

```
#foreach ($p in $sorter.sortByLocale($package, "name",
“DE”))
$p.name
#end
```

- `$package` is the collection to be sorted.
- “`name`” is the field name to be sorted.
- "`DE`" is the country code for GERMANY (ISO country code).

$sorter.humanSort(collection, fieldName)

This is a special function to sort text in a human-like order. It splits text into numeric and non-numeric chunks and sorts them in numerical order. For example, "`foo10`" is ordered after "`foo2`".

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection to be sorted.
	fieldName	java.lang.String	A fieldName to be sorted and the sorting direction.
Return		java.util.Collection	A sorted collection.

For example:

```
#foreach ($rel in $sorter.humanSort($package, "name:desc"))
$rel.name
#end
```

Figure 79 -- $sorter.humanSort(collection, fieldName)

- `$package` is the collection to be sorted.
- "`name:desc`" is separated by ":" in two parts:
  - The first part is to identify fieldName to be sorted.
  - The second part is the option to identify the sorting scheme. Sometimes, the order is not identified. It is ascending by default.

$sorter.humanSort(collection)

This is a special function to sort text in a human-like order. It splits text into numeric and non-numeric chunks and sorts them in numerical order. For example, "`foo10`" is ordered after "`foo2`".

	Name	Type	Description
Parameter(s)	Collection	java.util.Collection	A collection to be sorted.
Return	-	java.util.Collection	A sorted collection.

For example:

```
#foreach ($rel in $sorter.humanSort($package))
$rel.name
#end
```

Figure 80 -- Sample of $sorter.humanSort(collection)

- `$package` is the collection to be sorted.

4.7 $template

This module is the tool used for getting a template's information.

$template.getName()

Return the name of a template.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	Return a template name.

$template.getResourcesLocation()

Return the folder location of the resource file.

	Name	Type	Description
Parameter(s)	-	-	-

	Name	Type	Description
Return	-	java.lang.String	The location of a resource file folder.

$template.getTemplateFile()

Return a template filename.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	Return a template filename.

$template.getTemplateLocation()

Return the folder location of a template file.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	The location of a template file folder.

$template.getOutputFile()

Return the output filename.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	Return an output filename.

$template.getOutputFileNoExt()

Return the output name.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	An output name without a filename extension.

$template.getOutputLocation()

Return the folder location of the output file.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.lang.String	Return the location of an output file folder.

4.8 $file

This module allows generating an output report file in a template file.

$file.silentCreate(template)

A shortcut to create a file, the output filename of which is the template name, not an import context object. For example:

```
$file.silentCreate('overview.html')
```

	Name	Type	Description
Parameter(s)	template	java.lang.String	An input template name.
Return	-	void	-

$file.silentCreate(template, importObject)

A shortcut to create a file, the output filename of which is the template name. For example:

```
$file.silentCreate('overview.html','')
```

	Name	Type	Description
Parameter(s)	template	java.lang.String	The input template name.
	importObject	java.lang.Object	An object reference, which will be `$importer` in the template file. You can use the $importer variable in the template file to get data.
Return	-	void	-

$file.silentCreate(template, outputFileName, importObject)

Generate a report output from a given template name. For example:

```
$file.silentCreate('overview.html','overview.html','')
```

	Name	Type	Description
Parameter(s)	template	java.lang.String	The input template name.
	outputFileName	java.lang.String	The output filename.
	importObject	java.lang.Object	An object reference, which will be `$importer` in the template file. You can use the `$importer` variable in the template file to get data.
Return	-	void	-

$file.silentCreate(templateType, template, outputname, importObject)

Generate a report output from a given template name. For example:

```
$file.silentCreate('html','overview','overview','')
```

	Name	Type	Description
Parameter(s)	templateType	java.lang.String	A template type such as rtf, html, or htm.
	template	java.lang.String	An input pathname string without a filename extension.
	outputFileName	java.lang.String	An output filename without a file-name extension.
	importObject	java.lang.Object	An object reference, which will be `$importer` in the template file. You can use the `$importer` variable in the template file to get data.
Return	-	void	-

$file.create(template)

A shortcut to create a file, the output filename of which is the template name, not an import context object. For example:

```
$file.create('overview.html')
```

	Name	Type	Description
Parameter(s)	template	java.lang.String	An input template name.
Return	-	java.lang.String	An output pathname. It will return an empty string if there is an error.

$file.create(template, importObject)

A shortcut to create a file, the output filename of which is the template name. For example:

```
$file.create('overview.html','')
```

	Name	Type	Description
Parameter(s)	template	java.lang.String	An input template name.
	importObject	java.lang.Object	An object reference, which will be importer in the template file. You can use the `$importer` variable in the template file to get data.
Return	-	java.lang.String	An output pathname. It will return an empty string if there is an error.

$file.create(template, outputFileName, importObject)

Generate a report output from a given template name. For example:

```
$file.create('overview.html','overview.html','')
```

	Name	Type	Description
Parameter(s)	template	java.lang.String	An input template name.
	outputFileName	java.lang.String	An output filename.
	importObject	java.lang.Object	An object reference, which will be `$importer` in the template file. You can use the `$importer` variable in the template file to get data.
Return	-	java.lang.String	An output pathname. It will return an empty string if there is an error.

$file.create(templateType, template, outputname, importObject)

Generate a report output from a given template name. For example:

```
$file.create('html','overview','overview','')
```

	Name	Type	Description
Parameter(s)	templateType	java.lang.String	A template type such rtf, html, and htm.
	template	java.lang.String	An input pathname string without a filename extension.
	outputname	java.lang.String	An output filename without a filename extension.
	importObject	java.lang.Object	An object reference, which will be `$importer` in the template file. You can use the `$importer` variable in the template file to get data.

	Name	Type	Description
Return	-	java.lang.String	An output pathname. It will return an empty string if there is an error.

$file.createAndWait(templateFilename)

Open a new template engine to generate a report and return a path to generate the file. The generated report will be given the template filename. For example:

```
$file.createAndWait('overview.html')
```

	Name	Type	Description
Parameter(s)	templateFilename	java.lang.String	An input template filename.
Return	-	java.lang.String	An absolute path to generate a file.

$file.createAndWait(template, contextValue)

Open a new template engine to generate a report and return a path to generate the file. The generated report will be named after the template filename. For example:

```
$file.createAndWait('overview.html',$var)
```

	Name	Type	Description
Parameter(s)	templateFilename	java.lang.String	An input template filename.
	contextValue	java.lang.Object	An additional object added to a new template context with a default `$importer` name.
Return		java.lang.String	An absolute path to generate a file.

$file.createAndWait(String templateFileName, String outputFileName, Object contextValue)

Open a new template engine to generate a report and return a path to generate the file. "importer" will be used as the name of a context value. For example:

```
$file.createAndWait('overview.html','overview.html',$var)
```

	Name	Type	Description
Parameter(s)	templateFilename	java.lang.String	An input template filename.
	outputFilename	java.lang.String	An output report filename.
	contextValue	java.lang.Object	An additional object added to a new template context with a default `$importer` name.
Return		java.lang.String	An absolute path to generate a file.

$file.createAndWait(String templateFileName, String outputFileName, String ContextName, Object contextValue)

Open a new template engine to generate a report and return a path to generate the file. For example:

```
$file.createAndWait('overview.html','overview.html','var',$var)
```

	Name	Type	Description
Parameter(s)	templateFilename	java.lang.String	An input template filename.
	outputFilename	java.lang.String	An output report filename.
	contextName	java.lang.String	Add an object context's name.
	contextValue	java.lang.Object	An additional object added to a new template context with a default `$importer` name.
Return	-	java.lang.String	An absolute path to generate a file.

$file.createAndWait(String templateFileName, String outputFileName, Map<String, Object> context)

Open a new template engine to generate a report and return a path to generate the file. For example:

```
$file.createAndWait('overview.html','overview.html',$map)
```

	Name	Type	Description
Parameter(s)	templateFilename	java.lang.String	An input template filename.
	outputFilename	java.lang.String	An output report filename.
	context	java.util.Map<String, Object>	An additional context added to a new template.
Return	-	java.lang.String	An absolute path to generate a file.

$file.copy(inputFilename)

Copy an input file to an output file using the same name in the binary format. For example:

```
$file.copy('icon.gif')
```

	Name	Type	Description
Parameter(s)	inputFilename	java.lang.String	An input filename
Return	-	java.lang.String	An output pathname. It will return an empty string if there is an error.

$file.copy(inputFilename, outputFilename)

Copy an input file to an output file in the binary format. For example:

```
$file.copy('icon.gif','icon.gif')
```

	Name	Type	Description
Parameter(s)	inputFilename	java.lang.String	An input filename.
	outputFilename:	java.lang.String	An output filename.
Return	-	java.lang.String	An output pathname. It will return an empty string if there is an error.

$file.exists(pathname)

Test if a file denoted by a specific pathname exists. By default, the current directory refers to a template location. For example:

```
$file.exists("$template.resourcesLocation/myimage.png")
$file.exists("C:/myfolder/myimage.png")
$file.exists("mytemplate.txt")
```

	Name	Type	Description
Parameter(s)	pathname	java.lang.String	A pathname string.
Return	-	java.lang.String	True if and only if a file or directory denoted by a specific pathname exists; otherwise, false.

$file.computeName(directory, name)

Create a pathname string from a given directory and name.

	Name	Type	Description
Parameter(s)	directory	java.lang.String	A parent directory of a file.
	name	java.lang.String	A filename (excludes the filename extension).
Return	-	java.lang.String	A pathname from the given directory and name.

For example:

```
$file.computeName('actors', $ac.ID, 'html')
output: 'actor/_123456789.html'
```

$file.computeName(directory, name, fileType)

Create a pathname string from a given directory, name, and file type.

	Name	Type	Description
Parameter(s)	directory	java.lang.String	A parent directory of a file.
	name	java.lang.String	A filename (excluding the extension).
	fileType	java.lang.String	A file type, such as rtf, txt, and html.
Return	-	java.lang.String	A pathname from the given directory, name, and file type.

4.9 $array

Use `$array` to create an Array or a HashSet instance.

$array.createArray()

Create an empty ArrayList.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.util.List	An instance of ArrayList.

$array.createArray(collection)

Construct an ArrayList containing elements of the specified collection, in the order they are returned by the collection's iterator. Return a zero size ArrayList if the given collection is null.

	Name	Type	Description
Parameter(s)	collection	java.util.Collection	A collection of instances whose elements are to be placed into a list.
Return	-	java.util.List	An ArrayList containing elements of the specified collection.

$array.subList(list, size)

Create an ArrayList of a portion of the list in the given size.

	Name	Type	Description
Parameter(s)	list	java.util.List	An original list.
	size	int	A view size of a given list.
Return	-	java.util.List	An ArrayList of a specified view size within a given list.

$array.addCollection(parent, child)

Add a child list into a parent collection. It helps the template handle the case where the child is null.

	Name	Type	Description
Parameter(s)	parent	java.util.Collection	A parent collection.
	child	java.util.Collection	A child collection.
Return	-	void	-

$array.createHashSet()

Create a HashSet instance.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.util.Set	An instance of HashSet.

4.10 $group

$group.create()

Create a new instance of a group tool.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	GroupTool	An instance of a group tool.

$group.init()

Initialize a group tool.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	void	-

$group.groupNames()

Return a set of group names.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.util.Set	A set of group names.

$group.contains(groupName)

Test whether a group name is contained in a set of group names.

	Name	Type	Description
Parameter(s)	groupName	java.lang.String	A group name.

	Name	Type	Description
Return	-	-	True if the group name is contained in a set of group names, otherwise false.

$group.put(groupName, object)

Add an object into a group.

	Name	Type	Description
Parameter(s)	groupName	java.lang.String	A group name.
	object	java.lang.Object	An object being added.
Return	-	void	-

$group.get(groupName)

Return a list of group objects.

	Name	Type	Description
Parameter(s)	groupName	java.lang.String	A group name.
Return	-	java.util.List	A list of group objects.

$group.remove(groupName)

Remove a group from the specified group name.

	Name	Type	Description
Parameter(s)	groupName	java.lang.String	A group name.
Return	-	java.util.List	A list of group objects previously associated with a specified group name, or null if there is no group corresponding to the key.

$group.removeAll()

Remove all groups.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	void	-

$group.clear()

Remove all mappings.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	void	-

4.11 $map

$map.createHashMap()

Create a HashMap instance.

	Name	Type	Description
Parameter(s)	-	-	-
Return	-	java.util.HashMap	An instance of HashMap.

4.12 $date

`$date` is a method to display and format the current date and time.

$date

Display the current date and time, for example, Oct 19, 2003 and 9:54:50 PM respectively.

$date.long

Display the current date and time in a long form, for example, October 19, 2003 and 9:54:50 PM. respectively.

$date.full_date

Display the current date in a full form, for example, Sunday, October 19, 2003.

$date.get('format')

Display the current date in a specific format, for example, `$date.get('yyyy-M-d H:m:s')` is displayed as `2003-10-19 21:54:50`.

Table 13 -- Date and Time Format

Letter	Date or Time Component	Example
G	Era designator	AD
y	Year 1996	96
M	Month in year	July; Jul; 07
w	Week in year	27
W	Week in month	2
D	Day in year	189
d	Day in month	10
F	Day of week in month	2
E	Day in week	Tuesday; Tue
a	Am/pm marker	PM
H	Hour in day (0-23)	0
k	Hour in day (1-24)	24
K	Hour in am/pm (0-11)	0
h	Hour in am/pm (1-12)	12
m	Minute in hour	30
s	Second in minute	55
S	Millisecond	978
z	Time zone	Pacific Standard Time; PST; GMT-08:00
Z	Time zone	Time zone -0800

Year

- If the number of letters in a pattern letters is four or more, a calendar specific long form is used.
- Otherwise, a calendar specific short or abbreviated form is used.

Date and Time Pattern	Result
yy	10
yyyy	2010

Month

- If the number of letters in a pattern is less than 3, the number form is used.
- If the number of letters in a pattern is 3, a short or abbreviated form is used.
- If the number of letters in a pattern is 4 or more, the full form is used.

Date and Time Pattern	Result
M	4
MM	04
MMM	Apr
MMMM	April

Days

- If the number of letters in a pattern is four or more, the full form is used.

- Otherwise, a calendar specific short or abbreviated form is used.

Date and Time Pattern	Result
E	Mon
EEEE	Monday

4.13 $profiling

You can use `$profiling` to access MagicDraw meta-model information.

$profiling.getGeneralizationName(modelName)

Return a generalization model of modelName.

	Name	Type	Description
Parameter(s)	modelName	java.lang.String	A meta-model name.
Return	-	java.util.Collection<String>	A list of generalization model names.

$profiling.getDeclaringElementName (modelName, propertyName)

Retrieve the meta-model name which is the declared property name.

	Name	Type	Description
Parameter(s)	modelName	java.lang.String	A meta-model name.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.String	A meta-model name.

$profiling.getPropertyTypeName (modelName, propertyName)

Retrieve property types from meta-model names.

	Name	Type	Description
Parameter(s)	modelName	java.lang.String	A meta-model name.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.String	A property type name.

$profiling.getPropertyTypeName (element, propertyName)

Retrieve property types from an element.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.String	A property type name.

$profiling.getElementProperties(modelName)

Retrieve a collection of element property names from meta-model names.

	Name	Type	Description
Parameter(s)	modelName	java.lang.String	A meta-model name.
Return	-	java.util.Collection<String>	A collection of element property names.

$profiling.getElementProperties(element)

Retrieve a collection of element property names from elements.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	java.util.Collection<String>	A collection of element property names.

$profiling.getElementProperty(element, propertyName)

Retrieve property values of specified elements and property names.

	Name	Type	Description
Parameter(s)	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
	propertyName	java.lang.String	A property name.
Return	-	java.lang.Object	A property object.

$profiling. getHumanPropertyName(element, propertyName)

Return text representing a property name.

	Name	Type	Description
Parameter(s)	propertyName	java.lang.String	A property name.
	element	com.nomagic.uml2.ext.magicdraw.classes.mdkernel.Element	An element.
Return	-	java.lang.String	Text representing a property name.

4.14 $image

$image is an image tool that provides a rich set of image manipulation methods that enable you to transform images during report generation. With **$image**, you can scale, rotate, and resize images.

Syntax

These manipulation methods can be broadly divided into five categories:

Multiple image transformations will have cumulative effects. Desired sizes can be specified either as pixel counts or as measurements in inches, centimeters, or millimeters. While the parameters for resizing an image with a specific measurement (in, cm, mm, pt, or px) must be specified in a pair of quote marks, all other size parameters do not need to be specified in a pair of quote marks.

The **keepRatio** parameter takes either a true or false value; a true value will resize the image and keep the original image height/width ratio; a false value will only resize one axis, as set by the method name, resulting in a stretched image.

4.14.1 Scaling Images

There are two scaling methods that you can use to scale an image using a given factor, for example, Method 1 provides height and width parameters (**scaleWidth** and **scaleHeight**), while Method 2 provides a single parameter that will scale both axes equally (**scaleFactor**). These three parameters must be positive real numbers.

$image.scale(image, scaleWidth, scaleHeight)

Return an image icon for an element.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	scaleWidth	java.lang.Double	The width parameter of the image.
	scaleHeight	java.lang.Double	The height parameter of the image.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.scale(image, scaleFactor)

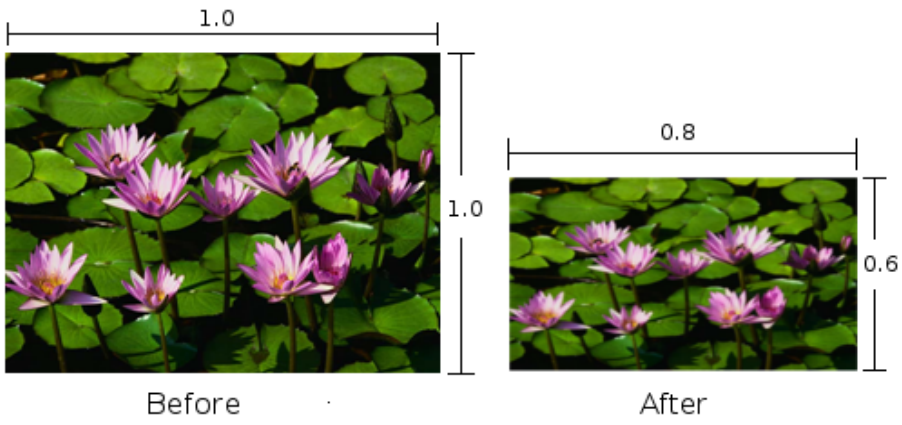
Return an image icon for an element.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	scaleFactor	java.lang.Double	The scaling parameter of the image.

	Name	Type	Description
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

Use **$image.scale($diagram.image, 0.5)**, for example, to scale down the image to half the original size. The following photos show the result.

Use **$image.scale($diagram.image, 0.8, 0.6)**to scale the image's width down to 80% and height to 60%. The following photos show the result.



Scaling Quality

Because the image tool provides several methods for scaling images, the quality of the scaled image depends on the used algorithm. To set the image scaling quality, **$image.setScalingQuality()** code must be inserted before scaling images. For example:

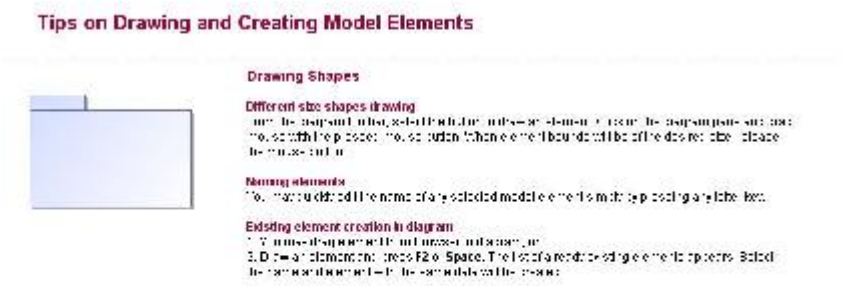
```
$image.setScalingQuality(5)
$image.scale(0.5)
```

The above code will set the image scaling quality to 'highest'. The possible values are from 1 to 5, where 5 is 'highest' and 1 is 'lowest'. The following table provides the description of each value.

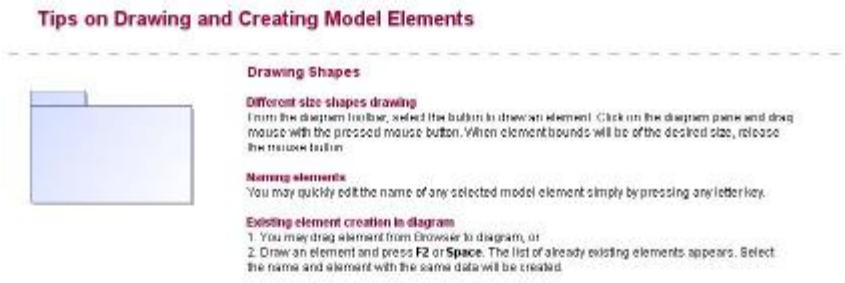
Value	Description
1	lowest' – Use one-step nearest neighbor interpolation.
2	'low' – Use one-step bi-cubic interpolation.
3	'medium – Use multi-step bi-linear interpolation.
4	'high' – Use area average image scaling algorithm.
5	'highest' – Use a lossless transformation when the template is ODF, DOCX, or RTF; otherwise, area average image scaling algorithm will be used instead.

Sample pictures from different image scaling qualities with their sizes scaled down to 50% are indicated in the pictures below (ranging from the value 1 ‘lowest’ to 5 ‘highest’):

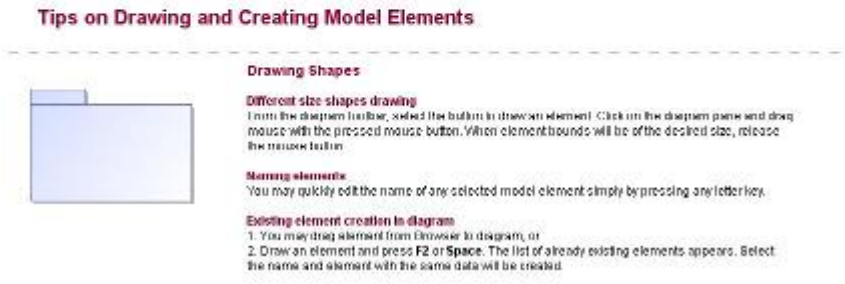
$image.setScalingQuality(1)



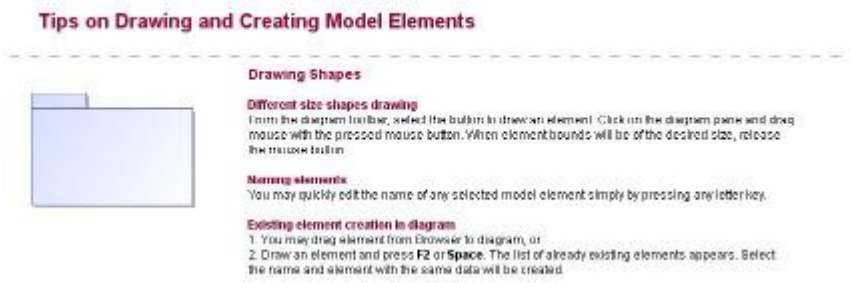
$image.setScalingQuality(2)



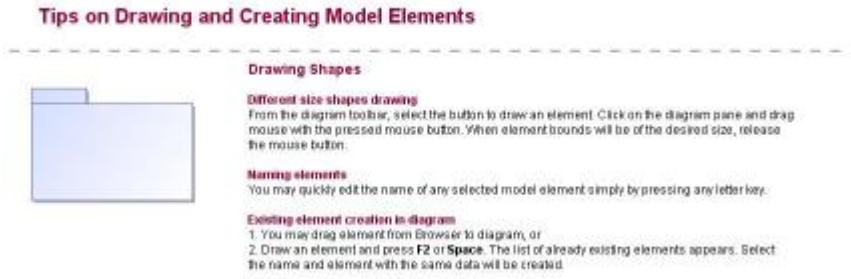
$image.setScalingQuality(3)



$image.setScalingQuality(4)



$image.setScalingQuality(5)



4.14.2 Rotating Images

There are two rotating methods that you can use to rotate a given image by 90 degrees: (i) **rotateRight** for clockwise rotation and (ii) **rotateLeft** for counterclockwise rotation.

$image.rotateRight(image)

Return an image icon for an element.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
Return	-	com.nomagic.magicreport.Image	The rotated image object for the element icon.

$image.rotateLeft(image)

Return an image icon for an element.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
Return	-	com.nomagic.magicreport.Image	The rotated image object for the element icon.

Use **$image.rotateRight($diagram.image)**, for example, to rotate the image 90 degrees clockwise. The following photos show the result.

Before

After

Use **$image.rotateLeft($diagram.image)**, for example, to rotate the image 90 degrees counterclockwise. The following photos show the result.

Before

After

NOTE	RTF Image rotation, with the scaling quality set to 'highest,' is not supported in any RTF document when opened with OpenOffice.org.

4.14.3 Fixed-Pixels Image Resizing

There are five methods to specify the resulting dimensions for an image to be resized in pixel size (the size parameters must be positive numbers or -1 number). If the value is -1, it will resize an image to the document paper dimensions. For example:

```
$image.setWidth($diagram.image, -1)
```

As shown by the example, the image will be resized to a paper width while maintaining the aspect ratio. The value -1 applies only to certain template types such as RTF, ODT, and DOCX.

If the value is -2, it will resize an image to document paper bounds if and only if image bounds are larger than paper bounds. For example:

```
$image.setWidth($diagram.image, -2)
```

Using the value -2 also maintains the image aspect ratio. However, it can only be applied to certain template types such as RTF, ODT, and DOCX.

$image.setSize(image, sizeWidth, sizeHeight)

Return an image icon for an element. This method is used to resize the image to an exact size; the width and height in pixels.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	sizeWidth	java.lang.Integer	The width of the image in pixels.
	sizeHeight	java.lang.Integer	The height of the image in pixels.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setHeight(image, size)

Return an image icon for an element. This method is used to resize the image to a specific height (in pixels), while maintaining the image aspect ratio.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	size	java.lang.Integer	The height of the image in pixels.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setHeight(image, size, keepRatio)

Return an image icon for an element. This method is used to resize the image to a specific height (in pixels) and to specify whether the image aspect ratio is to be maintained or not (depending on the **keepRatio** parameter).

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	size	java.lang.Integer	The height of the image in pixels.
	keepRatio	java.lang.Boolean	A flag to maintain the image aspect ratio
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setWidth(image, size)

Return an image icon for an element. This method is used to resize the image to a specific width (in pixels), while maintaining the image aspect ratio.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	size	java.lang.Integer	The width of the image in pixels.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

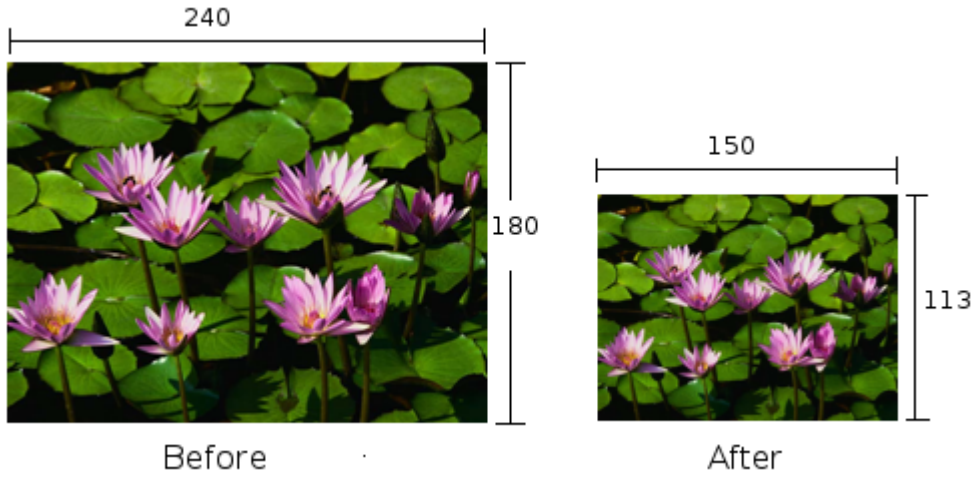
$image.setWidth(image, size, keepRatio)

Return an image icon for an element. This method is used to resize the image to a specific width (in pixels) and to specify whether the image aspect ratio is to be maintained or not (depending on the **keepRatio** parameter).

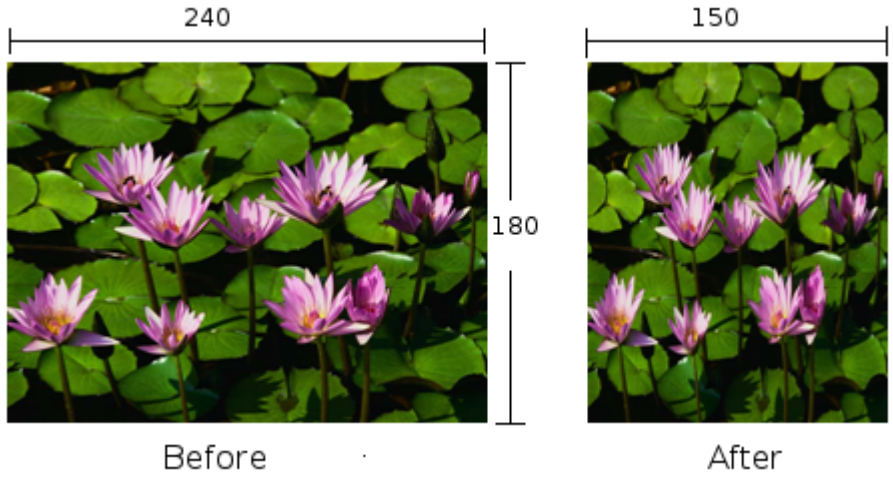
	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	size	java.lang.Integer	The width of the image in pixels.
	keepRatio	java.lang.Boolean	A flag to maintain the image aspect ratio
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

Use **$image.setSize($diagram.image, 200, 200)**, for example, to resize the image's width and height to 200 pixels. The following photos show the result.

Use either **$image.setWidth($diagram.image, 150)** or **$image.setWidth($diagram.image, 150, true)**, for example, to resize the image's width to 150 pixels and maintain the image aspect ratio. The following photos show the result.



Use **$image.setWidth($diagram.image, 150, false)**, for example, to resize the image's width to 150 pixels and ignore the image aspect ratio. The following photos show the result.



4.14.4 Fixed-Measurement Image Resizing

There are six methods to specify the resulting dimensions in terms of measurements to resize an image, for example, in inch (in), centimeter (cm), millimeter (mm), point (pt), or pixel (px)], and specifying the dot-per-inch (DPI) value. Every measurement parameter must be specified in a pair of quote marks.

$image.setSize(image, measureWidth, measureHeight)

Return an image icon for an element. This method is used to resize the image to an exact size; the width and height in terms of measurements.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
Parameter(s)	measureWidth	java.lang.String	The width of the image in a term of measurement.
	measure-Height	java.lang.String	The height of the image in a term of measurement.

	Name	Type	Description
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setHeight(image, measureSize)

Return an image icon for an element. This method is used to resize the image to a specific height in terms of measurement while maintaining the image aspect ratio.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	measureSize	java.lang.String	The height of the image in a term of measurement.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setHeight(image, measureSize, keepRatio)

Return an image icon for an element. This method is used to resize the image to a specific height (a term of measurement), and to specify whether the image aspect ratio is to be maintained or not (depending on the **keepRatio** parameter).

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	measureSize	java.lang.String	The height of the image in a term of measurement.
	keepRatio	java.lang.Boolean	A flag to maintain the image aspect ratio.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setWidth(image, measureSize)

Return an image icon for an element. This method is used to resize the image to a specific width in a term of measurement, while maintaining the image aspect ratio.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	measureSize	java.lang.String	The width of the image in a term of measurement.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setWidth(image, measureSize, keepRatio)

Return an image icon for an element. This method is used to resize the image to a specific width (a term of measurement), and to specify whether the image aspect ratio is to be maintained (depending on the **keepRatio** parameter).

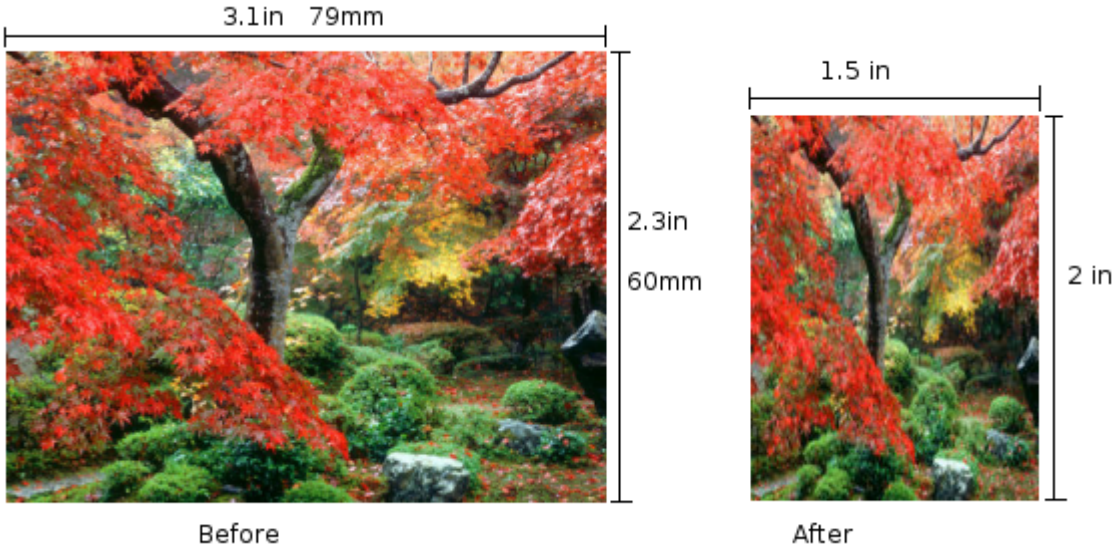
	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object for the element icon.
	measureSize	java.lang.String	The width of the image in a term of measurement.
	keepRatio	java.lang.Boolean	A flag to maintain the image aspect ratio.
Return	-	com.nomagic.magicreport.Image	The resized image object for the element icon.

$image.setDPI(dotsPerInches)

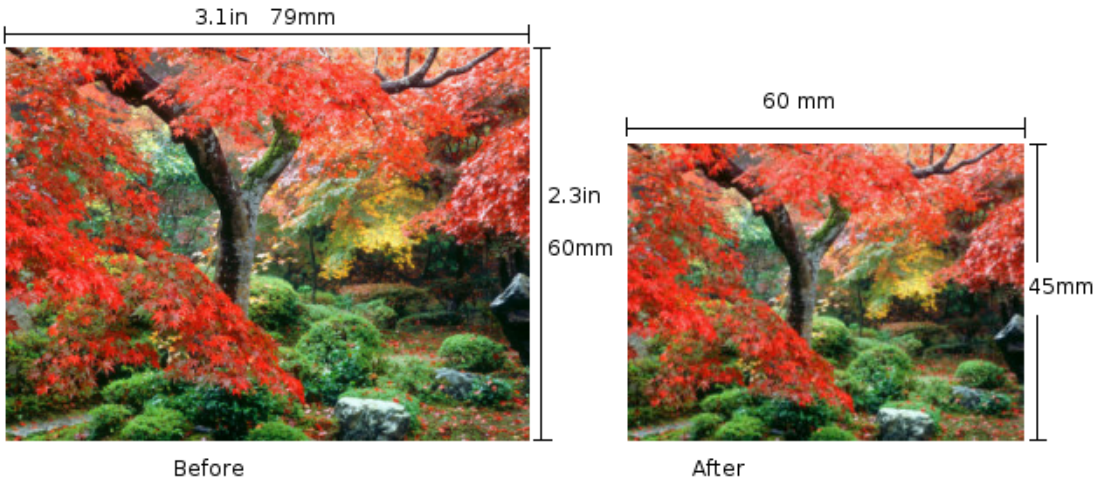
This method is used to set the resolution (dpi) of images. The default value is 96 dpi. The dpi value will only affect the methods that take inches, centimeters, and millimeters as their parameters.

	Name	Type	Description
Parameter(s)	dotsPerInches	java.lang.Integer	Image resolution (dpi).
Return	-	-	-

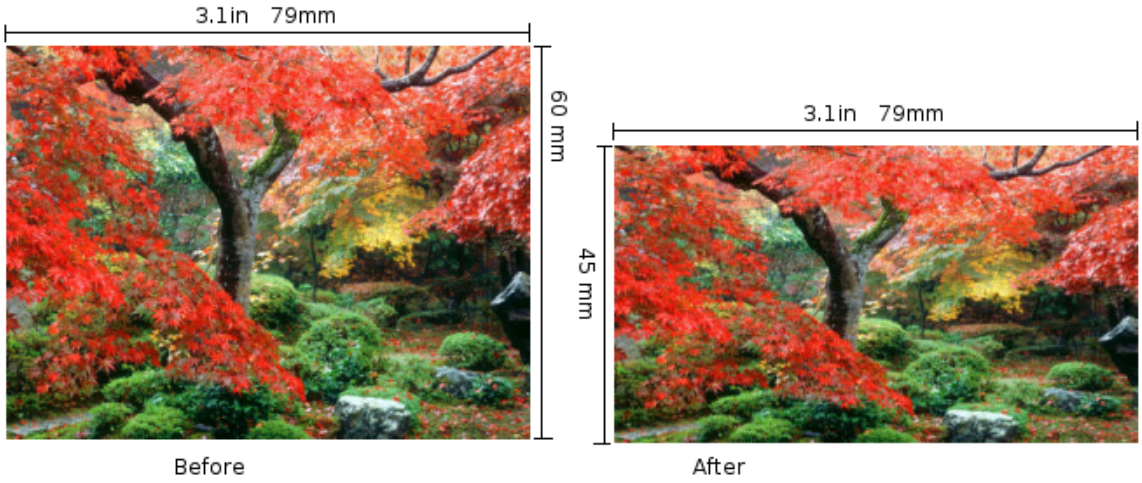
Use **$image.setSize($diagram.image, '1.5in', '2in')**, for example, to resize the image's width to 1.5 inches and height to 2 inches. The following photos show the result.



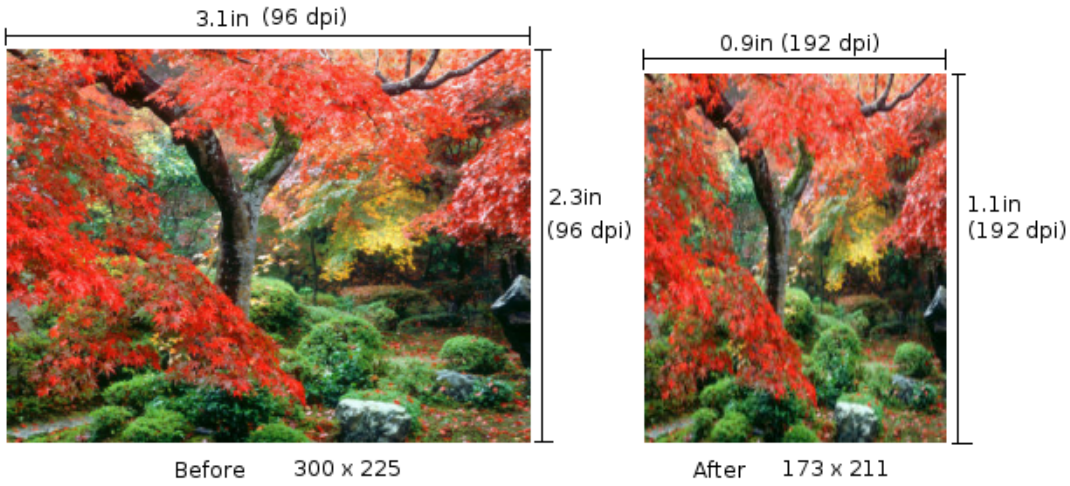
Use either **$image.setHeight($diagram.image, '45mm')** or **$image.setHeight($diagram.image, '45mm', true)**, for example, to resize the image's height to 45 millimeters and maintain the image aspect ratio. The following photos show the result.



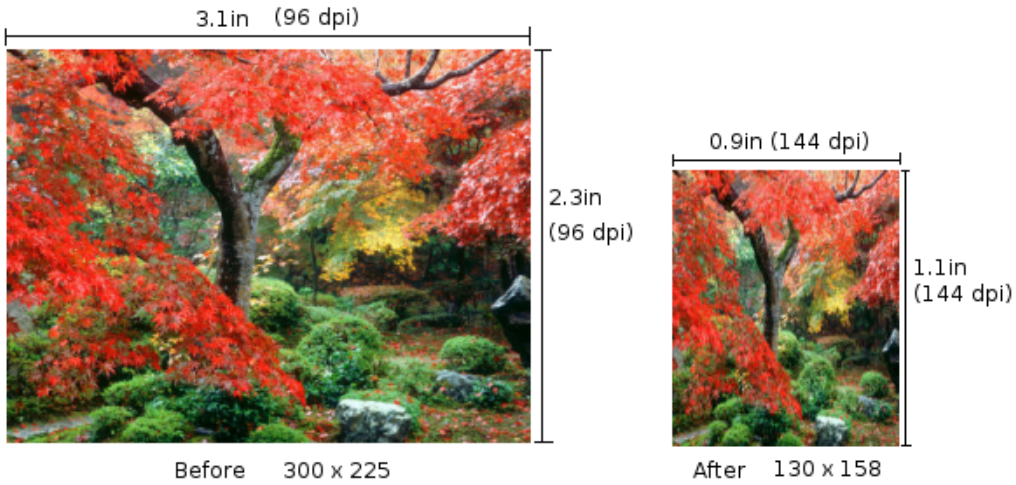
Use **$image.setHeight($diagram.image, '45mm', false)**, for example, to resize the image's height to 45 millimeters and ignore the image aspect ratio. The following photos show the result.



Use **$image.setDPI(192)** and then **$image.setSize($diagram.image, '0.9in', '1.1in')**, for example, to set the resolution (dpi) of the image to 192 dots per inch, and then resize the image width to 0.9 inches and height to 1.1 inches. The resulting image size will become 173x211 pixels. The following photos show the result.



Instead of using **$image.setDPI(192)**, if you set the resolution (dpi) to 144 using **$image.setDPI(144)**, the resulting image size will become 130x158 pixels. The following photos show the result.



4.14.5 Including External Images

You can include images from an external source in a report. The supported image types are BMP, JPG, WBMP, GIF, and PNG.

$image.include(location)

Include an external image from a local file or URL in a report.

	Name	Type	Description
Parameter(s)	location	java.lang.String	An image's location. The location format can be either a URL or a local file.
Return	-	com.nomagic.magicreport.Image	An image included in a report.

For example:

```
$image.include("c:/my document/logo.gif")
$image.include("http:/www.nomagic.com/images/
product_boxes/MD.gif")
```

4.14.6 Splitting Images

If you have an image that is larger than the paper size, you can split the image into smaller tiles.

$image.split($diagram.image, columns, rows)

Split an image into rows and columns. The returned array of the image contains chunks of images arranged from left-to-right and top-to-bottom.

Table 14 -- Splitting Image into Rows and Columns

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object.
	column	int	The number of columns. Specifies -1 to automate the calculated number of columns from the paper width.
	row	int	The number of rows. Specifies -1 to automate the calculated number of rows from the paper height.
Return		java.util.List<com.nomagic.magicreport.Image>	The array of the split image ordered from left-to-right and top-to-bottom.

To split an image into 3x2 tiles, for example, type:

```
#foreach ($d in $Diagram)
    #foreach ($chunk in $image.split($d.image, 3, 2))
        $chunk
    #end
#end
```

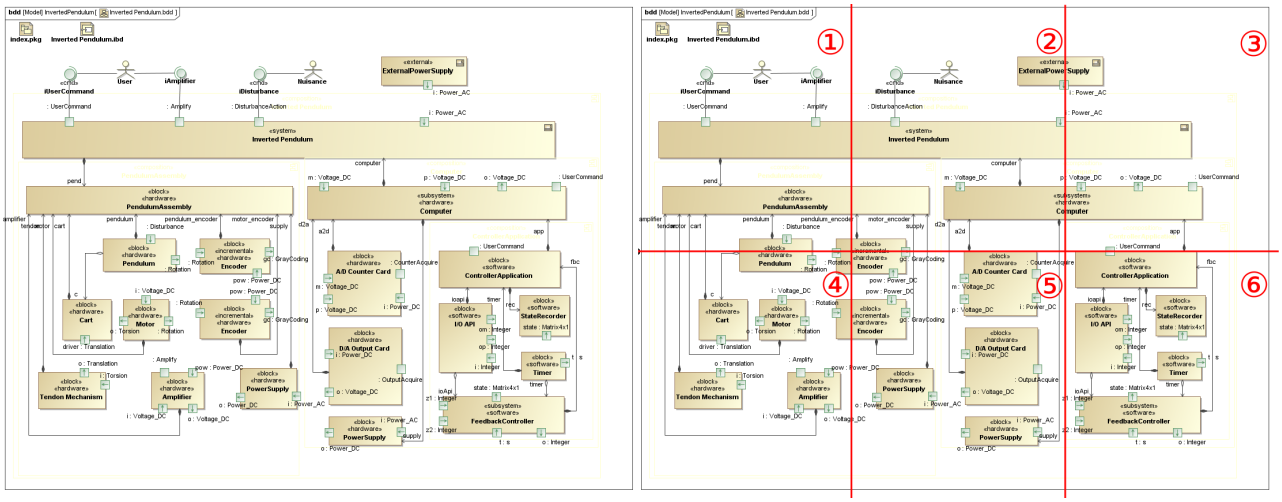


Figure 81 -- Original Image vs. 3x2 Tiled Image

$image.split($diagram.image)

Split an image into rows and columns by automatically calculating the number of rows and columns based on the paper size. The returned array of the image contains divided images arranged from left-to-right and top-to-bottom.

	Name	Type	Description
Parameter(s)	image	com.nomagic.magicreport.Image	An image object.
Return		java.util.List<com.nomagic.magicreport.Image>	The array of the split image ordered from left to right and top to bottom.

5. Report Wizard Template Editor

Template Editor is a Microsoft Word Add-In. It provides a list of fields that can be used in a Report Wizard template.

5.1 Installation

To install Report Wizard Template Editor in Microsoft Word:

1. Download and install Microsoft XML Services (MSXML) from the following URL (You can skip this step if the latest version of MSXML is already installed in your system):

   http://www.microsoft.com/downloads/details.aspx?FamilyID=d21c292c-368b-4ce1-9dab-3e9827b70604&DisplayLang=en

2. Copy all files and subdirectories from the **`<install.dir>\plugins\com.nomagic.magicdraw.reportwizard\vba`** folder to **`%APPDATA%\Microsoft\Word\STARTUP`** (%APPDATA% is the location where user data is stored). For example,
   - On Windows 2000 and Windows XP: **`C:\Documents and Settings\User Name\Application Data\Microsoft\Word\STARTUP`**
   - On Windows Vista: **`C:\Users\UserName\AppData\Roaming\Microsoft\Word\STARTUP`**
3. Restart Microsoft Word.

5.2 Opening Template Editor

After installation has been completed, the Template Editor menu will appear on the Microsoft Word menu bar (Figure 82).

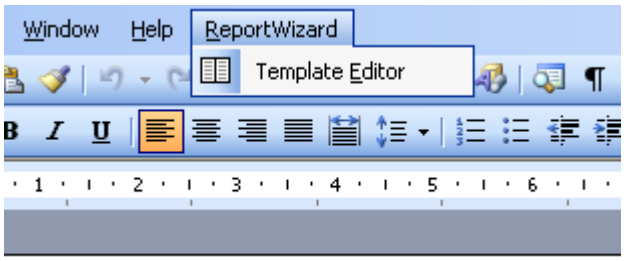


Figure 82 -- Microsoft Word 2003 Template Editor Menu

To open Template Editor, either:

- On the Microsoft Word 2000 – 2003 menu, click **ReportWizard** > **Template Editor** (Figure 82) or
- On the Microsoft Word 2007 menu, click **Add-Ins** > **ReportWizard** > **Template Editor** (Figure 83).

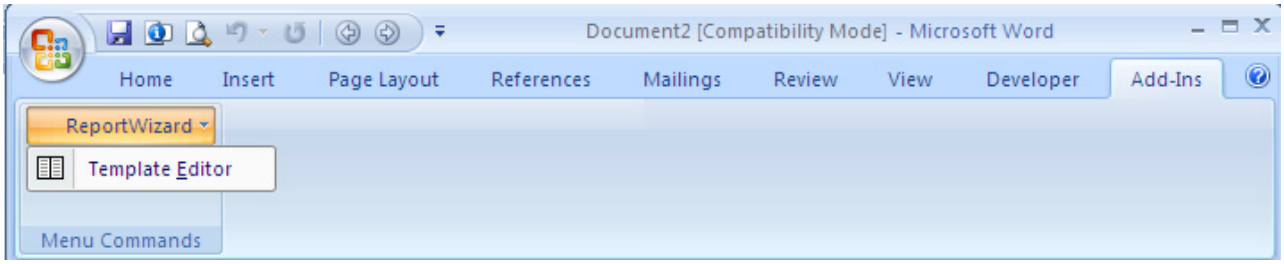


Figure 83 -- Microsoft Word 2007 Template Editor Menu

NOTE	The macro-enabled option in Microsoft Word is required to open Template Editor.

When Template Editor is open, the Report Wizard Template Editor dialog will open (Figure 84).

.

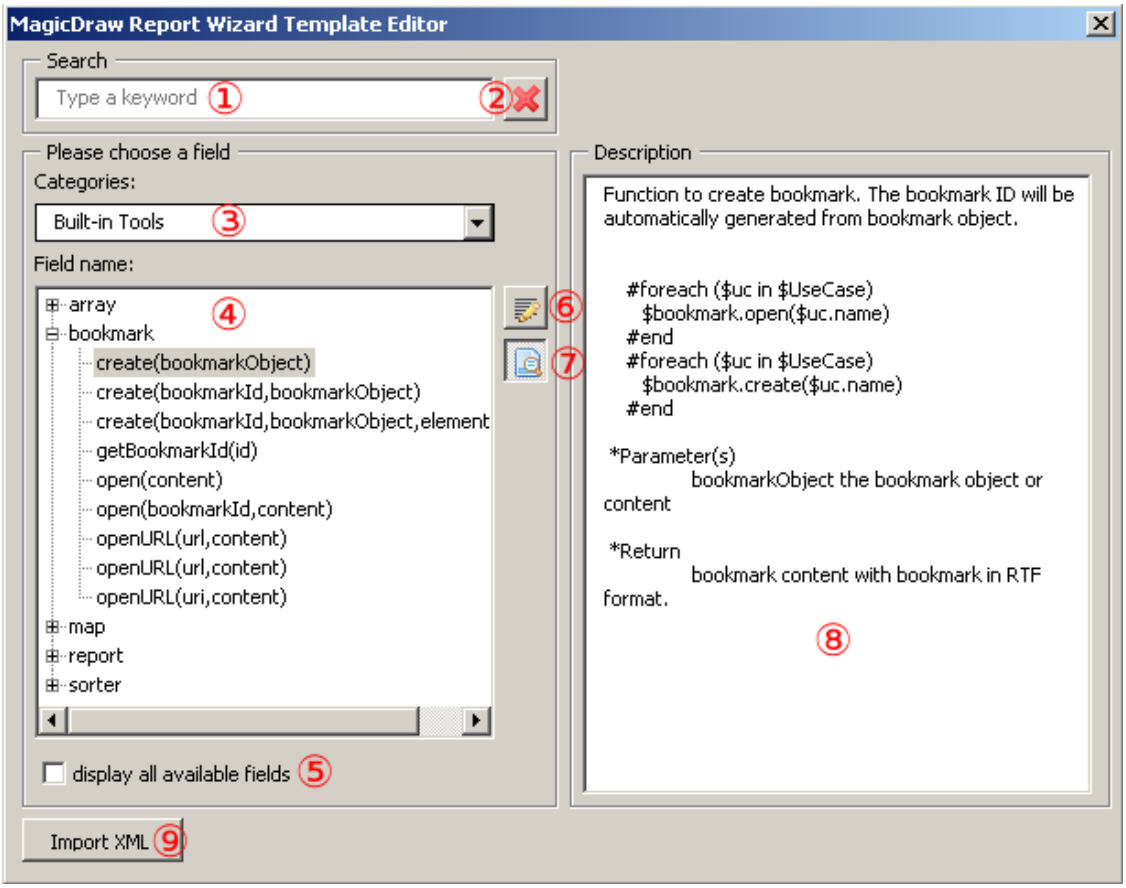


Figure 84 -- Report Wizard Template Editor Dialog

Table 15 -- Report Wizard Template Editor Options

Name	Function
Search box	Filter a list of fields. Only fields that contain a keyword of search as part of their names can be shown in the *(4) List of fields.*
Clear search results	Clear the current search result.
Categories combo box	Select categories of fields. Fields are shown in *(4) List of fields* according to their categories.
List of fields	Show a list of fields. Double-click a field name to insert the code.
Display all available fields check box	Show all fields, otherwise it will show only commonly used fields.
Insert button	Insert a code for a selected field into the document.
Show/Hide description button	Show or hide *(8) description pane*.
Description pane	Show the description of a selected field.
Import button	Import a data file.

5.3 Data File

The Template Editor allows you to create a new data file and import it to the **Report Wizard Template Editor** dialog. Click the **Import** button to import the data file. The data file is written in the XML format. The following is the example of an XML data file schema (Figure 85).

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/
XMLSchema">
  <xs:element name="data">
   <xs:complexType>
    <xs:sequence>
     <xs:element minOccurs="0" maxOccurs="1" name="elements">
      <xs:complexType>
       <xs:sequence>
        <xs:element minOccurs="0" maxOccurs="unbounded" name="element">
         <xs:complexType>
          <xs:all>
           <xs:element minOccurs="1" maxOccurs="1" name="name" type="xs:string" />
           <xs:element minOccurs="0" maxOccurs="1" name="description"
type="xs:string" />
           <xs:element minOccurs="0" maxOccurs="1" name="members">
            <xs:complexType>
             <xs:sequence>
             <xs:element minOccurs="0" maxOccurs="unbounded" name="function">
              <xs:complexType>
               <xs:sequence>
                <xs:element minOccurs="1" maxOccurs="1" name="name" type="xs:string"
/>
                 <xs:element minOccurs="0" maxOccurs="1" name="description"
type="xs:string" />
                <xs:element minOccurs="0" maxOccurs="unbounded" name="param">
                 <xs:complexType>
                  <xs:all>
                   <xs:element minOccurs="1" maxOccurs="1" name="name"
type="xs:string" />
                   <xs:element minOccurs="0" maxOccurs="1" name="description"
type="xs:string" />
                   <xs:element minOccurs="0" maxOccurs="1" name="type"
nillable="true" type="xs:string" />
                   <xs:element minOccurs="0" maxOccurs="1" name="direction">
                    <xs:simpleType>
                     <xs:restriction base="xs:string">
                      <xs:enumeration value="in" />
                      <xs:enumeration value="out" />
                     </xs:restriction>
                    </xs:simpleType>
                   </xs:element>
                  </xs:all>
                 </xs:complexType>
                </xs:element>
               </xs:sequence>
              </xs:complexType>
             </xs:element>
             <xs:element minOccurs="0" maxOccurs="unbounded" name="attribute">
              <xs:complexType>
               <xs:all>
                <xs:element minOccurs="1" maxOccurs="1" name="name" type="xs:string"
/>
                 <xs:element minOccurs="0" maxOccurs="1" name="description"
type="xs:string" />
                <xs:element minOccurs="0" maxOccurs="1" name="type" nillable="true"
type="xs:string" />
                </xs:all>
               </xs:complexType>
              </xs:element>
             </xs:sequence>
            </xs:complexType>
           </xs:element>
          </xs:all>
          <xs:attribute name="often" type="xs:boolean" />
         </xs:complexType>
        </xs:element>
       </xs:sequence>
      </xs:complexType>
     </xs:element>
    </xs:sequence>
    <xs:attribute name="name" type="xs:string" />
   </xs:complexType>
  </xs:element>
</xs:schema>
```

Figure 85 -- XML Data File Schema

Table 16 -- XML Data File Schema Elements and Their Descriptions

Element	Attribute / Element	Description
data		A root element.
	name : string	A data name. This value will be used as a category name in *(3) Category.*
	elements : complexType	A group of <element> elements.
elements		A group of <element> elements.
element		An element display on *(4) List of fields.*
	name : string	An element's name.
	description : string	An element description.
	often : boolean	If an attribute is true, the element will be managed as a suggested element.
	members : complexType	A group of <function> or <attribute>.
function		A function member.
	name : string	A function's name.
	description : string	A function description.
	param : complexType	A group of function parameters.
param		A function parameter.
	name : string	A parameter's name.
	description : string	A parameter description.
	type : string	A parameter type.
	direction : simpleType	The direction of a parameter: • in - indicates this parameter is an input. • out - indicates this parameter is an output.
attribute		An attribute member.
	name : string	An attribute's name.
	description : string	An attribute description.
	type : string	An attribute type.

The following is the example of an XML data file (Figure 86).

```
<?xml version="1.0" encoding="UTF-8"?>
<data name="Built-in Tools" xmlns:xsi="http://www.w3.org/2001/
XMLSchemainstance"
xsi:noNamespaceSchemaLocation="fields.xsd">
  <elements>
    <element often="true">
      <name>array</name>
      <description>Use for creating the Array or HashSet instance.</
description>
      <members>
        <function>
          <name>subList</name>
          <description>Create ArrayList of the portion of list in given size.</
description>
          <param>
            <name>list</name>
            <direction>in</direction>
            <type>List</type>
            <description>a original list.</description>
          </param>
          <param>
            <name>size</name>
            <direction>in</direction>
            <type>int</type>
            <description>view size of given list</description>
          </param>
          <param>
            <name>list</name>
            <direction>out</direction>
            <type/>
            <description>a of view of the specified size within given list.</
description>
          </param>
        </function>
      </members>
    </element>
  </elements>
</data>
```

Figure 86 -- Example of XML Data File

6. Generating Reports from Report Wizard

In addition to default document templates, Report Wizard allows you to create customized specification document templates. Templates may contain your own custom fields not related to model elements, as well as fields that correspond to model elements. Once customized, a Report Wizard template can be used with data from any project.

You can also format your template to create the style you want including tables of contents, headers and footers, and page numbers. You can apply most character and paragraph formatting available from your rtf editor for the rtf template or specify with html tags in the HTML template, including keywords. Once the template has been completed, you can run Report Wizard to create a report in a format that corresponds to the template.

Report Wizard templates can be in txt, rtf, html, odt, odf, odp, docx, xlsx, pptx, and xml for DocBook or FO files. If you prefer, you can work in Report Wizard Template Editor until you have finished the template file and use the Report Wizard template windows to save it in the template folder. The default templates are located in the *<MagicDraw home>/plugins/com.nomagic.magicdraw.reportwizard/data* folder.

Note	All built-in rtf report templates are combined into the RTF (depreciated) report template category.

6.1 Concepts

Report Wizard includes the following concepts:

- **Template**: specifies the document layout, format, corresponding model elements, and custom defined fields.
- **Report Data**: specifies a set of custom fields and data in the selected template. A template can have a number of different custom defined fields for a project or different projects organized in a report.
- **Report**: a generated user document with data from the project displayed in the selected template style.

6.2 Default Templates

There are 13 default templates that come with the report engine.

(i) Class Specification Report: describes the specification of class, interface, and enumeration type of the project.

(ii) Data Dictionary Report: enables you to print elements of MagicDraw data dictionary.

(iii) IEEE 1233: the standard template based on the IEEE 1233 recommendation.

(iv) Model Extension: describes common UML model extension mechanisms (stereotypes, tagged values, and constraints). It is useful for reporting custom UML profiles.

(v) Use Case (Simple): describes system functionalities and actors in a simple format.

(vi) Use Case (Modern): describes system functionalities and actors that are useful in support of use-case driven analysis.

(vii) Web Publisher (Simple HTML): enables you to publish MagicDraw models (including diagrams) in simple HTML. The report is viewable using a standard browser such as Internet Explorer or Firefox.

(viii) Web Publisher 2.0: enables you to publish MagicDraw models (including diagrams) in HTML with rich features. The report is viewable using a standard browser such as Internet Explorer or Firefox.

(ix) Activity Diagram: provides a standard report for activity diagrams. The content of the report is a list of all the nodes (ordered by node hierarchy in each activity diagram).

(x) Activity Diagram Specification: provides a standard report for activities. The content of the report is a list of all the nodes in each activity.

(xi) Sequence Diagram: provides a report that shows sequence diagrams and a list of all the messages in the diagrams.

(xii) Sequence Diagram Specification: provides a report that shows sequence diagrams, and a list of all the messages and lifelines in the diagrams.

(xiii) Web Publisher Collaboration: is implemented based on the Web Publisher 2.0 template. It improves features for text editing, element review, and XML messages. The J2EE compliance server is required to run the generated report.

6.3 Architecture Templates

There are five architecture report templates that come with the report engine: (i) Behavioral, (ii) Environment, (iii) Implementation, (iv) Structural, and (v) Use Case report templates.

6.3.1 Behavioral Report

A Behavioral report is a standard report for the Behavioral view. This report will be generated by a selected package that consists of Sequence, Communication, State Machine, and Activity diagrams. The report lists all packages in a project and arranges them hierarchically. Each package consists of the specification of messages in the Sequence diagram, the specification of lifelines in the Communication diagram, the specification of states in the State Machine diagram, and the actions in the Activity diagram. All elements in the report are ordered by their names.

6.3.2 Environment Report

An Environment report is a standard report for the Environment view. The report will be generated by a selected package that consists of an Implementation diagram (Deployment diagram). The report lists all packages in a project and arranges them hierarchically. Each package describes the specification of nodes, interfaces, components, and artifacts which are ordered by the element’s name.

6.3.3 Implementation Report

An Implementation report is a standard report for the Implementation view. The report will be generated by a selected package that consists of an Implementation diagram (Component diagram). The report lists all packages in a project and arranges them hierarchically. Each package consists of a list of interfaces, components, and artifacts. All elements in the report are ordered by their names.

6.3.4 Structural Report

A Structural report is a standard report for the Structural view. This report will be generated by a selected package that consists of a Class diagram. The report lists all packages in a project and arranges them hierarchically. Each package describes the specification of interfaces, classes, and enumerations which are ordered by the element’s name.

6.3.5 Use Case Report

A Use Case report is a standard report for the Use Case view. This report will be generated by a selected package that consists of Use Case diagrams. The report lists all packages in a project and arranges them hierarchically. Each package describes the specification of actors and use case. All elements in the report are ordered by their names.

6.4 Generating Use Case Description Reports

Report Wizard provides a **Use Case Description** document template, which is designed to capture all Use Case-related artifacts, for example, UseCases, actors, Use Case descriptions, and so on, in a report. This template includes all of the Use Case diagram-related keywords. Therefore, when you select the highest level of the packages (the highest level of the packages in MagicDraw is **Data**) as the scope of the report, only Use Case diagrams and their related elements will be added to the document.

To generate a Use Case description document:

1. Open the **Magic Library.mdzip** sample project from the **<MagicDraw_home>/samples/case studies** directory (Figure 87).

NOTE	This step is only necessary for illustration purposes (as well as other steps within this scenario).

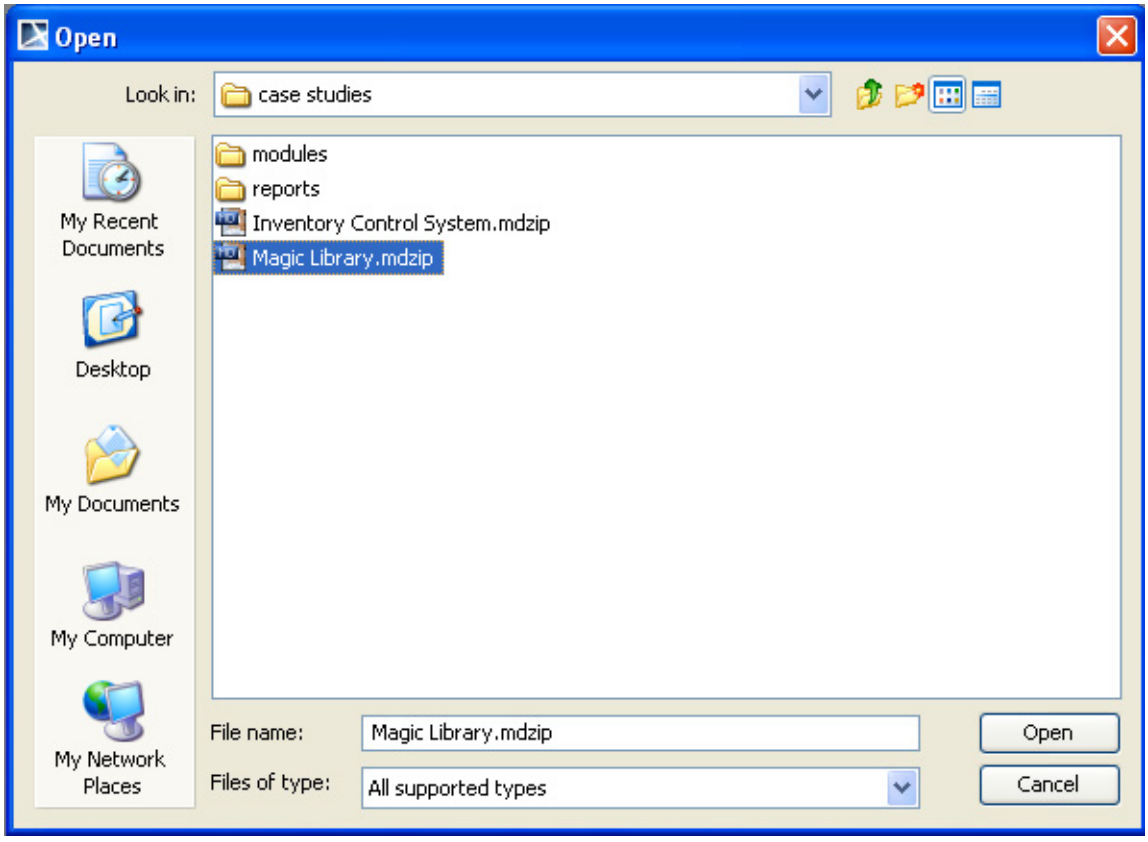


Figure 87 -- The Magic Library.mdzip Project File

2. On the **Tools** menu, select the **Report Wizard** command. The **Report Wizard** dialog will open.
3. Select a template, for example, **Default Template** > **UseCase (Simple)** and click **Next** (Figure 88).

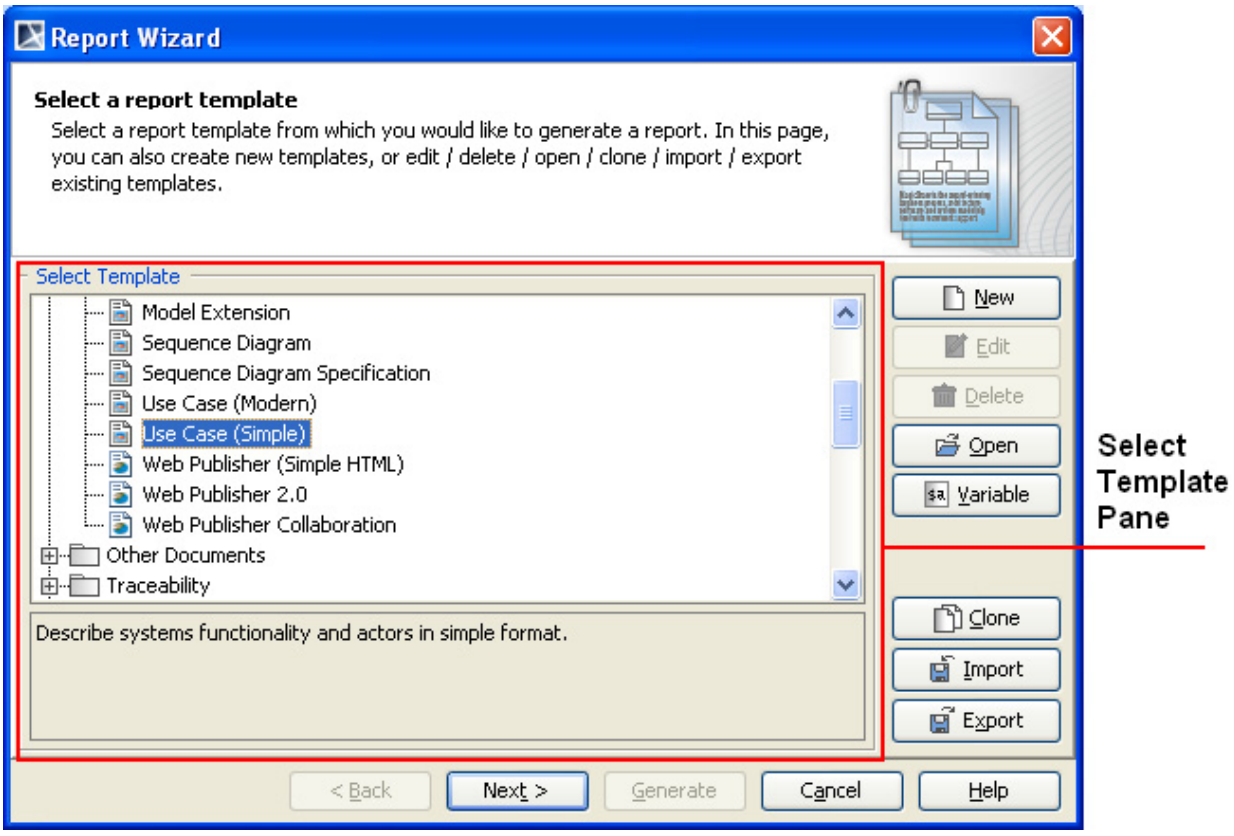


Figure 88 -- Report Wizard Dialog

4. Either

    4.1. select the **built-in** Report Data (Figure 89). You can modify or delete some variables of the **Built-in** Report Data in the **Report Variable** dialog (Figure 91) by clicking the **Variable** button.

    Or

    4.2 click the **New** button to create a new one. Once you create a new Report Data, for example, MyReportData, you will see it in the Select Report Data pane in the **Report Wizard** dialog (Figure 90). You can select the new Report Data and click the **Variable** button to create its report variables.

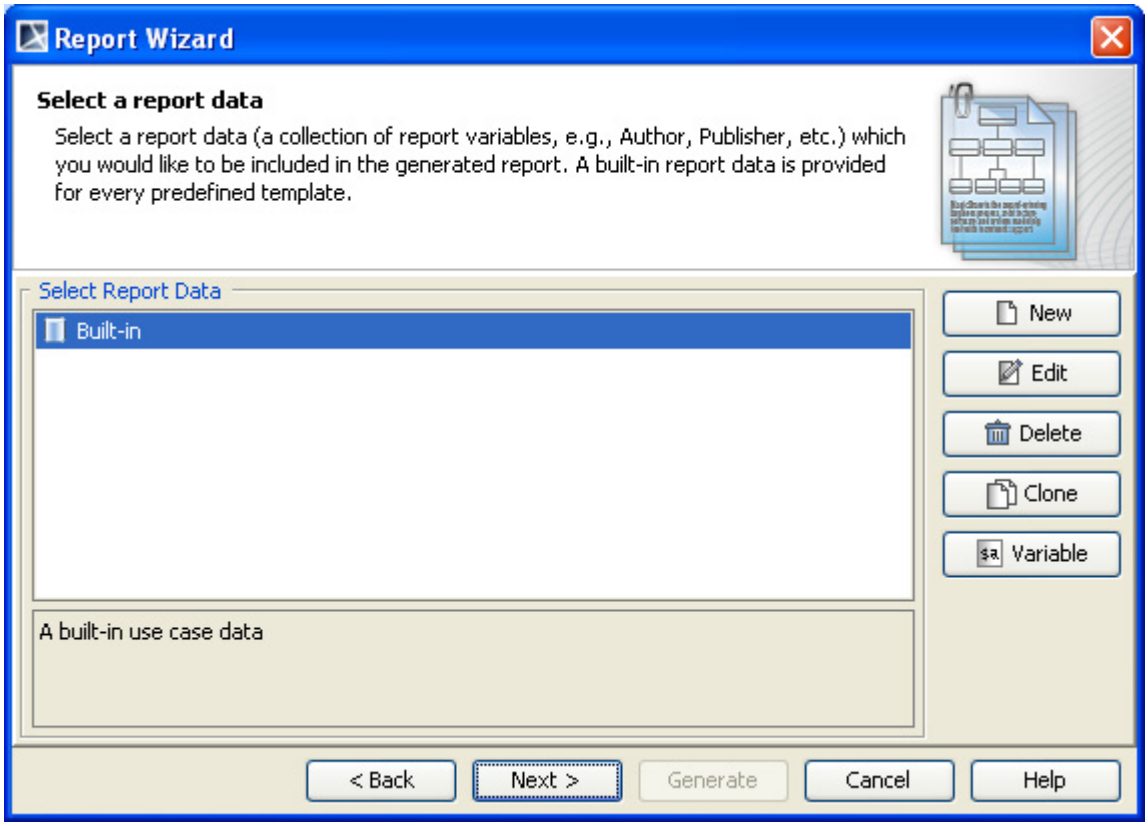


Figure 89 -- Selecting the Built-in Report Data

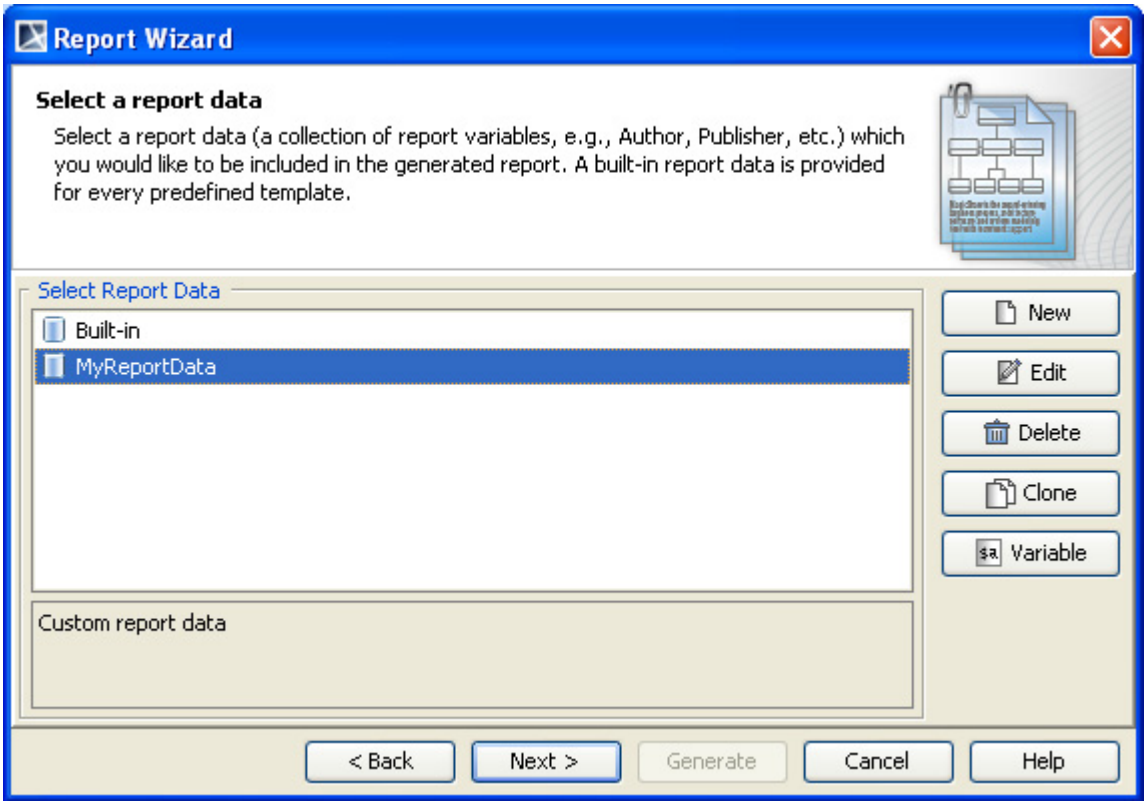


Figure 90 -- Selecting a Custom Report Data

NOTE	You can create a new report variable and modify or delete an existing one through the **Report Variable** dialog.

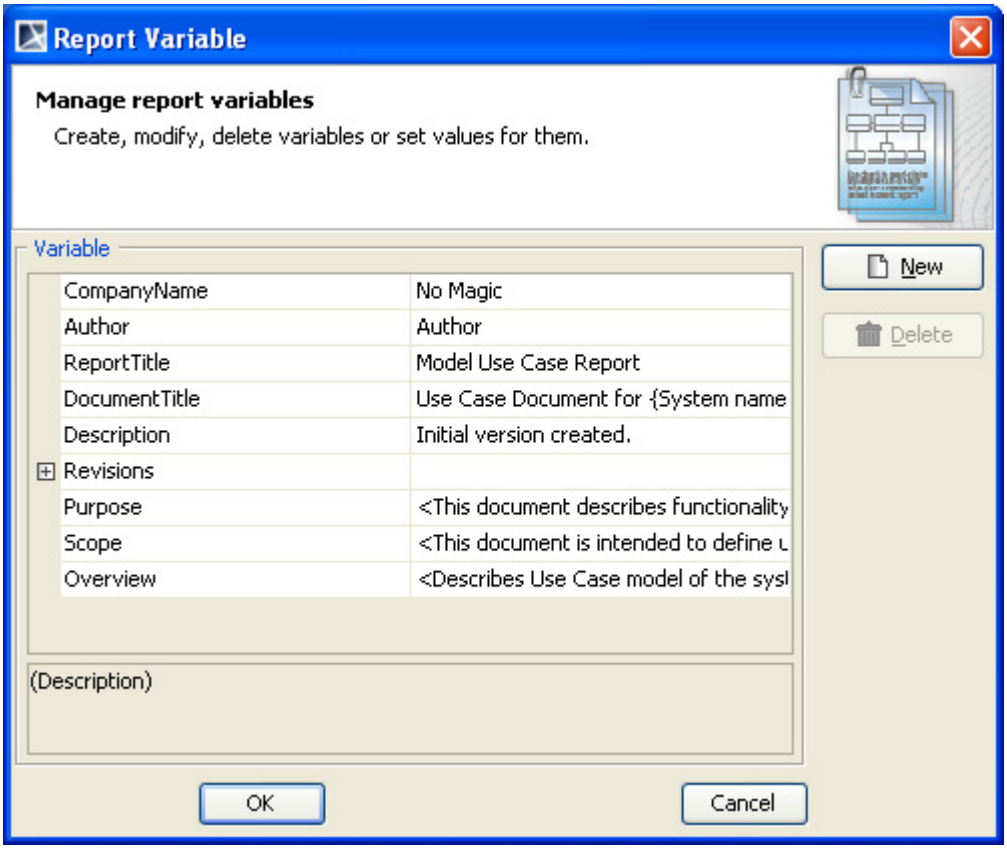


Figure 91 -- The Report Variable Dialog

5. Once you have completed modifying or creating the report variables, click **Next**. The **Select Element Scope** option will open in the **Report Wizard** dialog.
6. Select the scope of the report from the package tree on the left-hand side. In this case, it will be the **MagicLibrary Requirements[MagicLibrary Requirements.mdzip]** model package because all use case requirements are stored in this package.
7. Click the **Add** button. The model package will be moved to the **Selected objects** tree on the right-hand side (Figure 92).
8. Click **Next** (Figure 92).

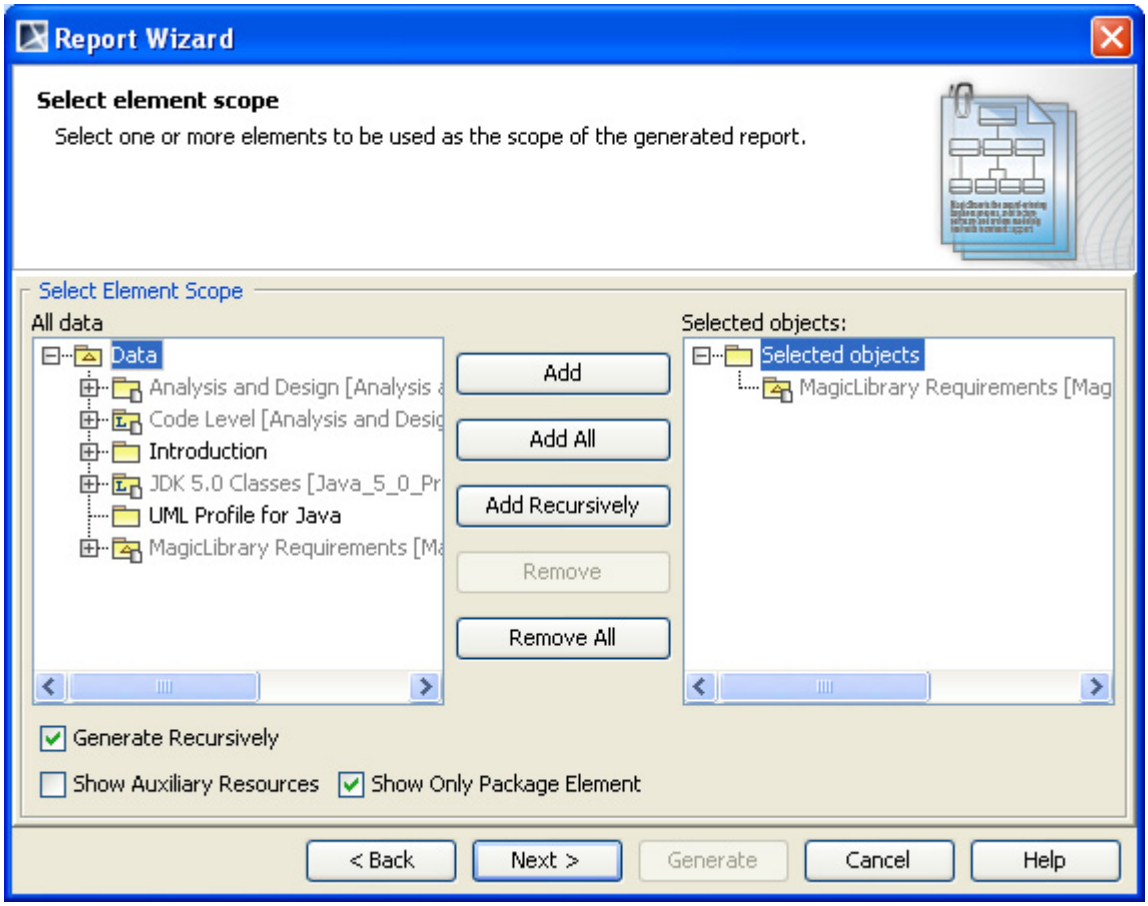


Figure 92 -- Selecting the Scope of the Report

9. Click the "**...**" button next to the **Report file** text box to specify the location where you want to save the report (Figure 93). The **Save as** dialog will open.
10. Select the file location, enter the filename, and click **Save**. The report file format varies depending on the template file format. For example, if the template file format is **.rtf,* the report file format will be **.rtf* as well.

Figure 93 -- Selecting the Report File Location

11. Select the report image format, **.png*, **.jpg, *.emf,* or **.wmf* and select an image size option (Figure 94).

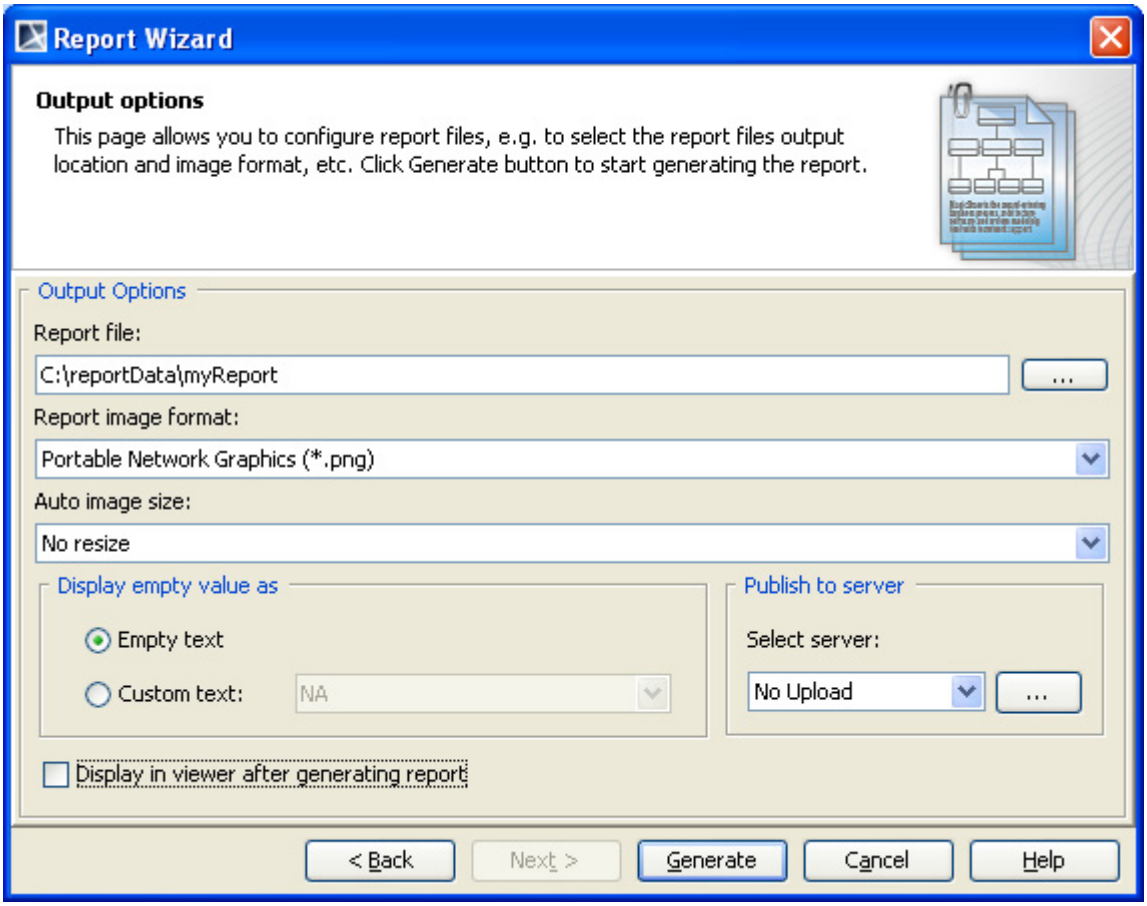


Figure 94 -- Selecting an Image Format

12. Select an option to display empty value information, either **Empty text** or **Custom text** (Figure 95).

NOTE	In some cases, a query may return an empty value that causes blank fields in the report. The **Display empty value as** option is useful when you have a standard representation for blank fields.

Figure 95 -- Selecting a Display Empty Value Option

13. Select the **Display in viewer after generating report** check box to open the report document with a default editor (Figure 96).

Figure 96 -- Selecting the Display in Viewer After Generating Report Option

14. Click **Generate**.

6.5 Web Publisher 2.0 Reports

6.5.1 Generating Reports

Web Publisher is a Java-Doc-like report with a clickable navigation and an image map for all diagrams and elements.

To generate a Web Publisher 2.0 report:

1. Open the **Magic Library.mdzip** sample project from the **<MagicDraw_home>/samples/case studies** directory (see Figure 87 on page 141).
2. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open (Figure 97).
3. In the **Select Template** pane, select **Default Template** > **Web Publisher 2.0**, and click **Next** (Figure 97).

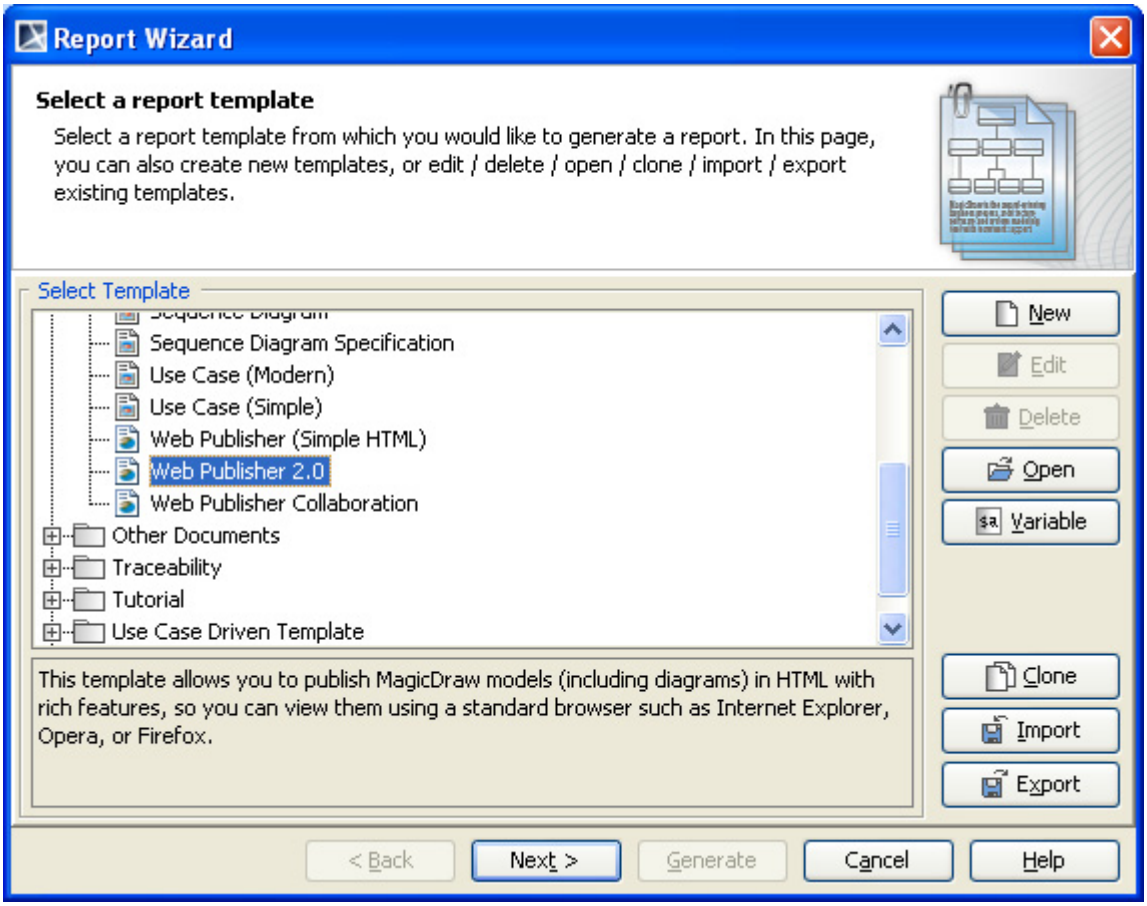


Figure 97 -- Selecting Web Publisher 2.0 Template

4. Click **New**. The **New Template** dialog will open. Type the report name and description and select the location of the template file. Click **Next**.
5. In the **Select Report Data** pane, select the built-in Report Data and click **Next**.

NOTE	In the **Select Report Data** pane, you can create a new set of Report Data for the Web Publisher template. The Report Data is a container for a set of custom-defined fields in the template. It can be used to group different report versions.

6. In the **Variable** pane, enter information for predefined custom fields or create a new one (Figure 98). Click **OK**.

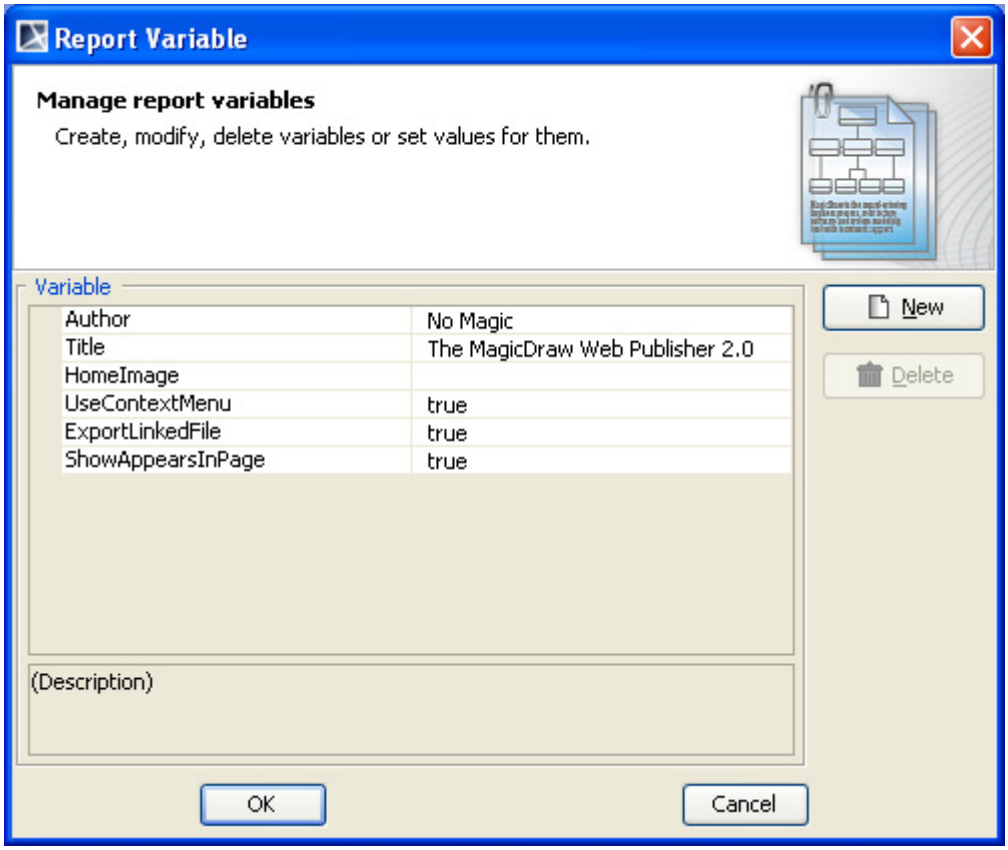


Figure 98 -- The Variable Pane

7. Select the scope of the report in the open package tree. In this case it will be the **Data** model package if you want to have a web-based report of your entire project. Click **Next** (Figure 99).

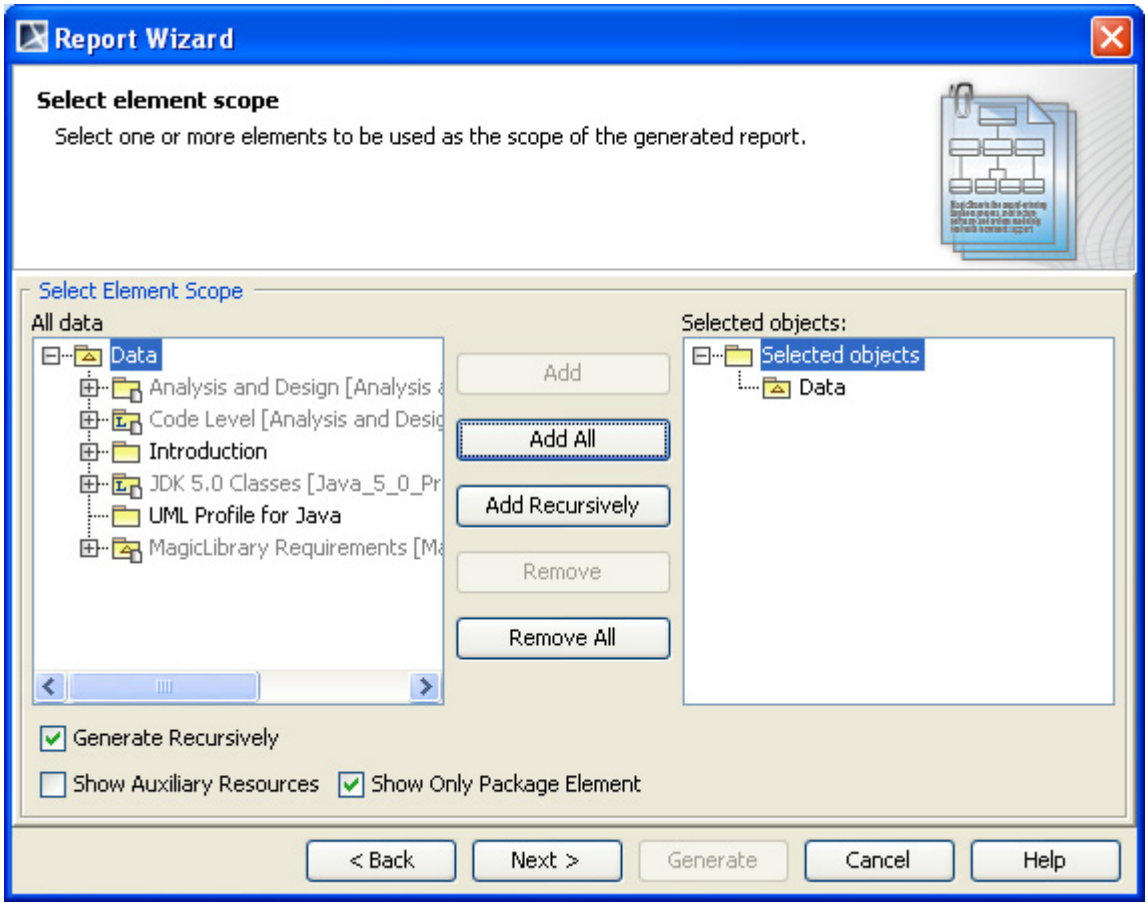


Figure 99 -- Selecting the Scope of the Web Publisher 2.0 Report

8. Click the "**...**" button to locate the report file location (see Figure 93). The **Save as** dialog will open.
9. Select the file location, type the report name, and click **Save**. A generated web report will include a number of folders and files.
10. Select the report image format: **.png*, **.jpg* or **.svg* (see Figure 94).
11. Select an option to display empty value information, either **Empty text** or **Custom text**.

NOTE	In some cases, the query may return an empty value that creates blank fields in the report. The **Display empty value as** option is useful when you have a standard representation for blank fields (see Figure 95).

12. Select the **Display in viewer after generating report** check box to open the report document with the default editor (see Figure 96).
13. After all options have been selected, click **Generate**.

6.5.2 Web Publisher 2.0 Features

This section describes the look of Web Publisher 2.0 and gives examples on how to work with each feature.

6.5.2.1 Report Layout

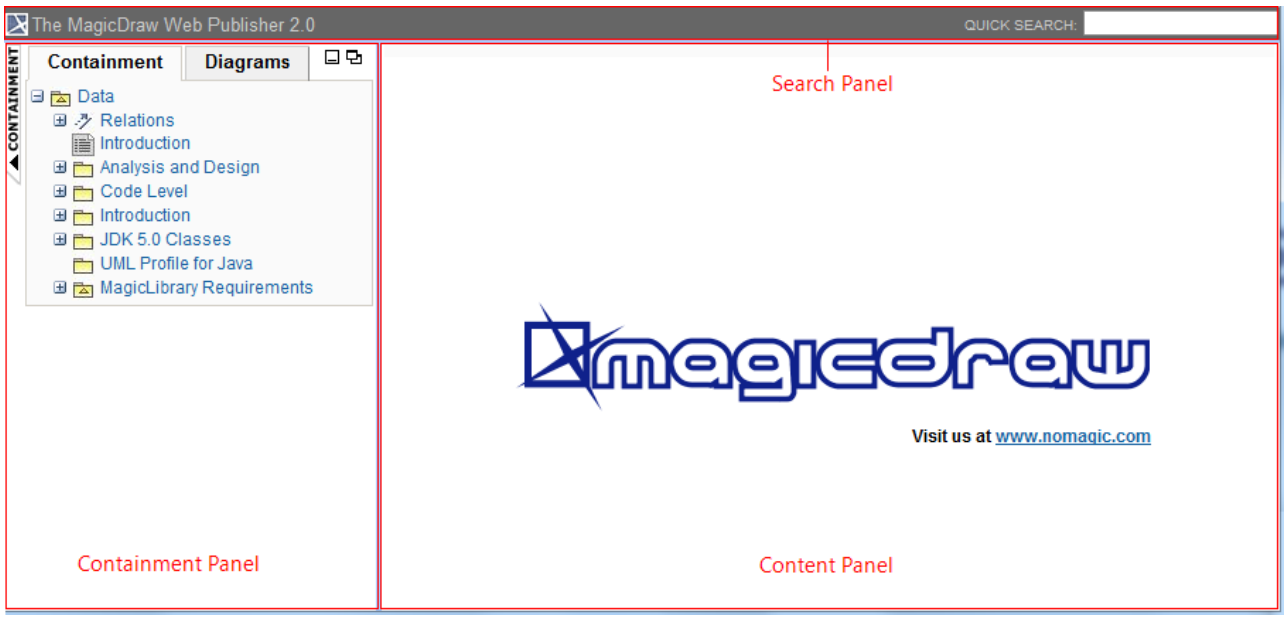


Figure 100 -- Web Publisher 2.0 Report Layout

The Web Publisher report consists of three panels (Figure 100):

(i) Containment panel: This panel contains two tabs: (a) **Containment** tab and (b) **Diagrams** tab. The **Containment** tab shows data of a project in a tree structure (Figure 100) and the **Diagrams** tab shows all diagrams in a project, which are grouped by type (Figure 100).

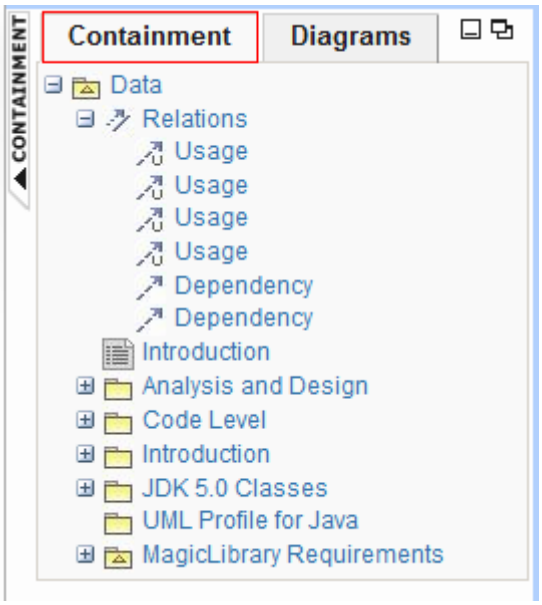


Figure 101 -- The Containment Tab

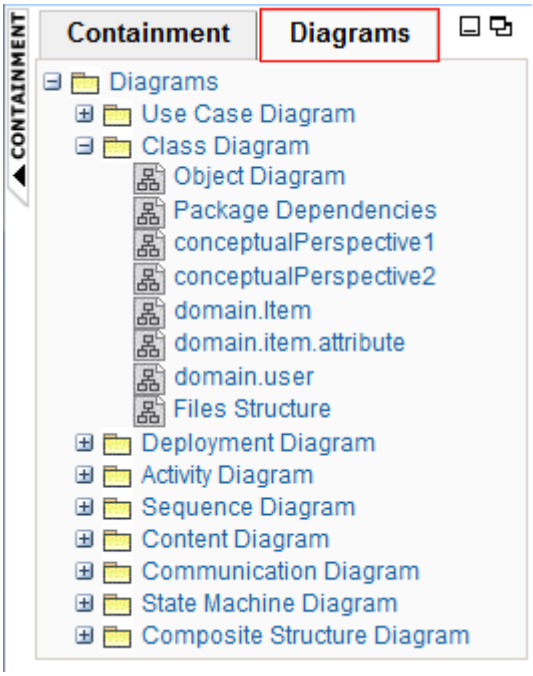


Figure 102 -- The Diagram Tab

(ii) Content panel: This panel shows an element's content.

(iii) Search panel: This panel contains a quick search box.

6.5.2.2 Containment Menu

To hide or show the Containment menu:

- Click the **CONTAINMENT** menu to hide it and click it again to show it (see Figure 103).

Figure 103 -- Hiding the Containment Menu

To expand or collapse the Containment tree:

- Click the "**+**" button in the Containment tree to expand it or click the "**-**" button to collapse it (see Figure 104).

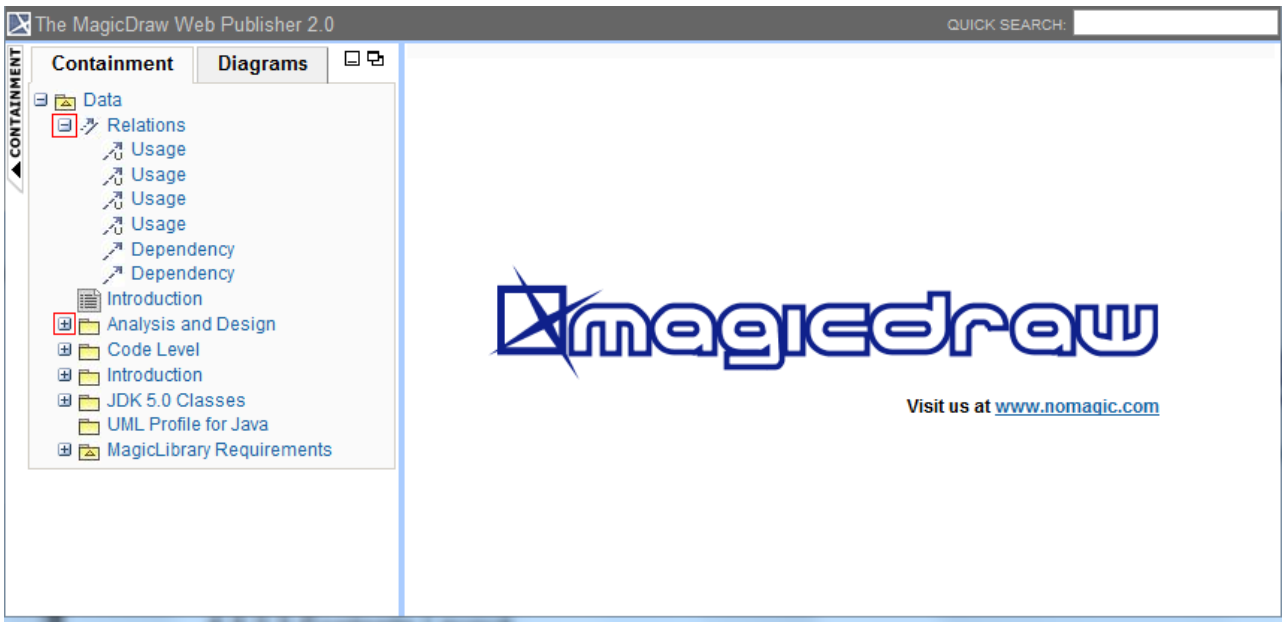


Figure 104 -- Expanding and Collapsing the Containment Tree

6.5.2.3 Contents Layout

The Contents panel of Web Publisher contains three tabs: (i) Diagram, (ii) Specification, and (iii) Appears in. You can click any element in the Containment tree of Web Publisher to open three tabs.

(i) The Diagram tab shows diagram images (see Figure 105).

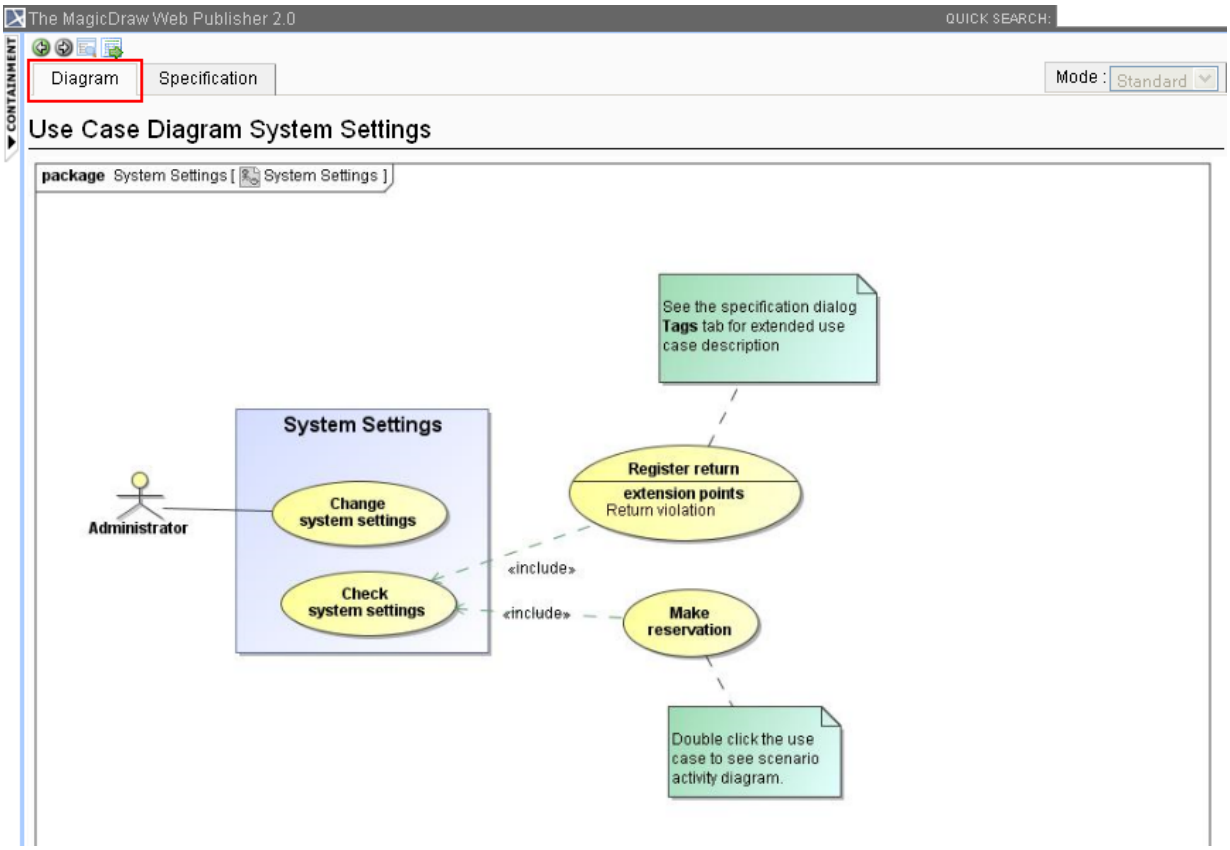


Figure 105 -- The Diagram Tab of Contents Panel

(ii) The Specification tab shows elements specification (see Figure 106).

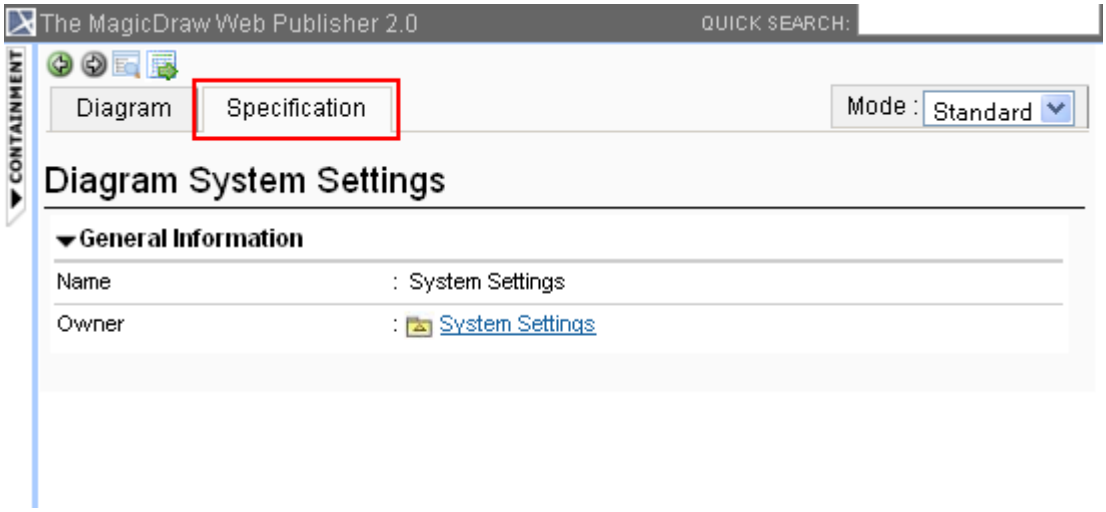


Figure 106 -- The Specification Tab of Contents Panel

To show or hide element contents:

- Click and re-click the arrow button to show and hide the contents (see Figure 107).

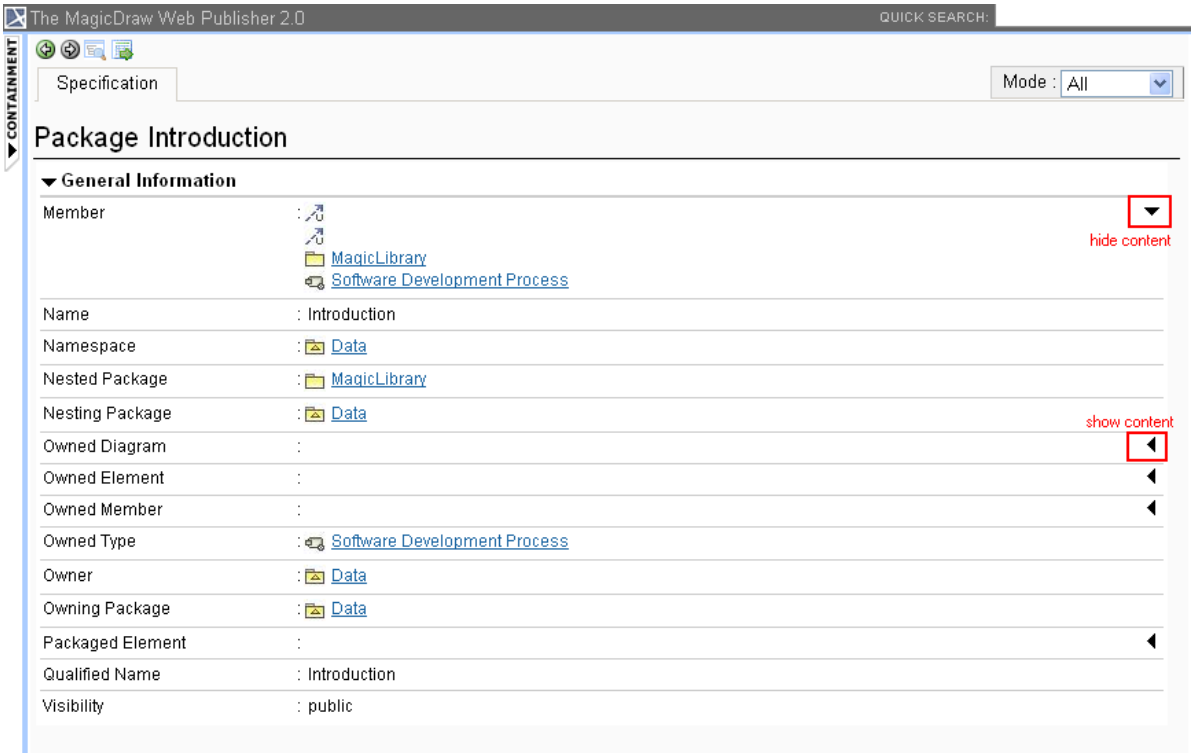


Figure 107 -- Showing and Hiding Element Contents

To show an element specification, Active Hyperlink, Hyperlink, submachine of state, or behavior of the call behavior action:

- Click a diagram's element to show the context menu for opening its specification, Active Hyperlink, Hyperlink, submachine of state, or behavior of the call behavior action (see Figure 108).

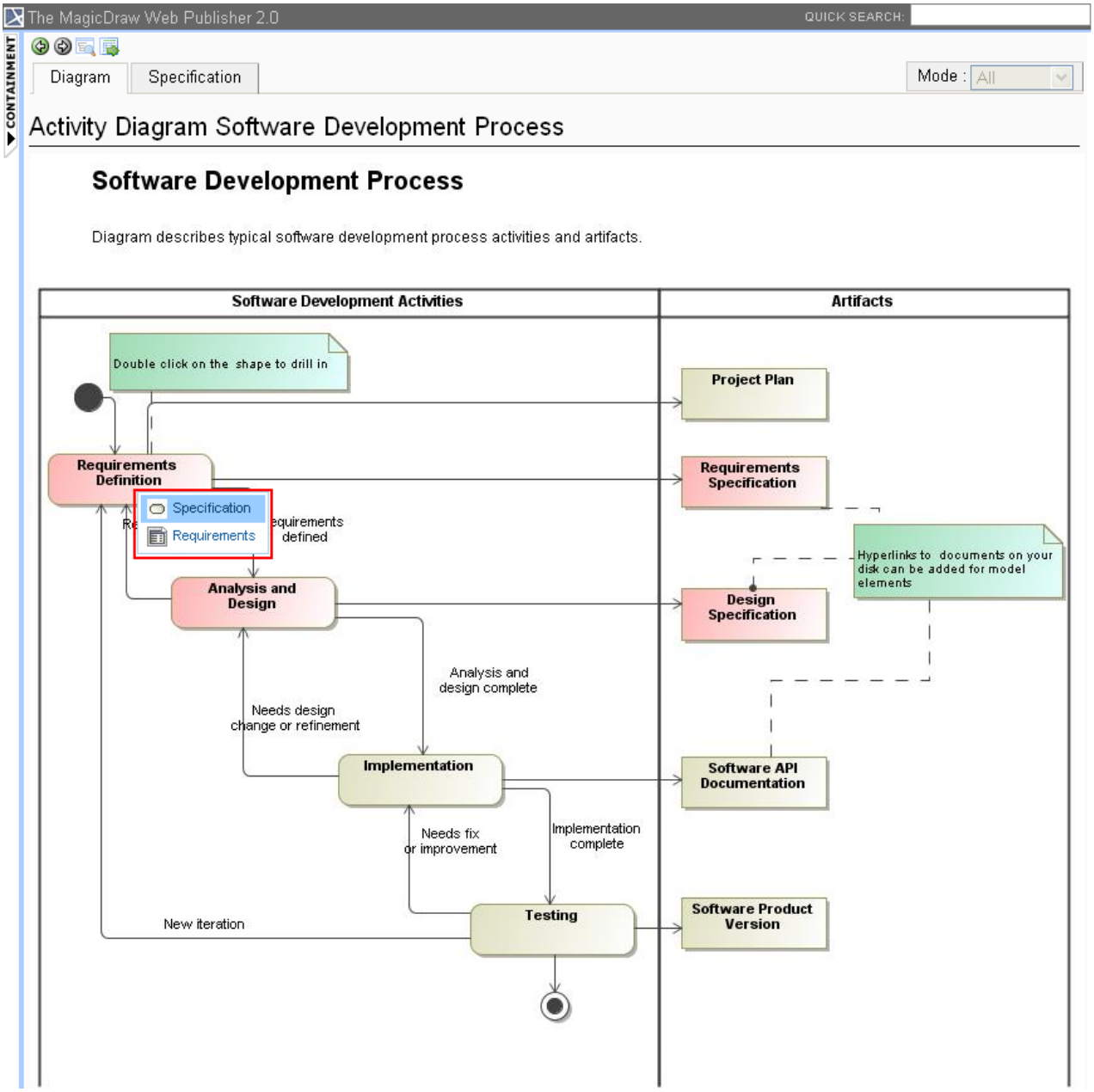


Figure 108 -- Web Publisher 2.0 Context Menu

To add an Active Hyperlink to a model:

- Double-click a diagram's element to open the Active Hyperlink and add it to a model element (see Figure 109).

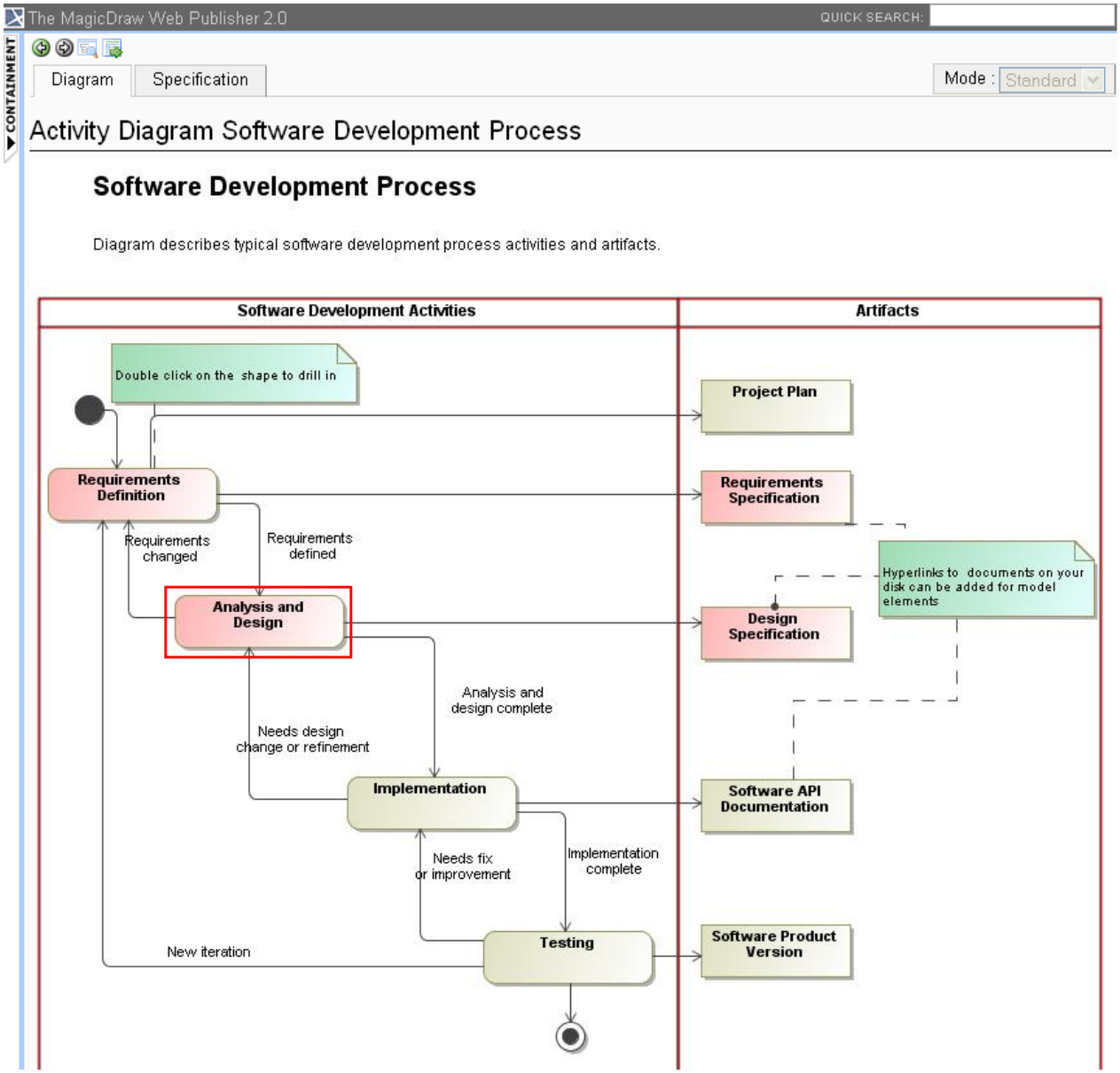


Figure 109 -- Adding Active Hyperlink

(ii) The Appears in tab shows you all diagrams in which a particular element is present (see Figure 106). You need to select the element in the Containment tree to open the **Appears** in tab.

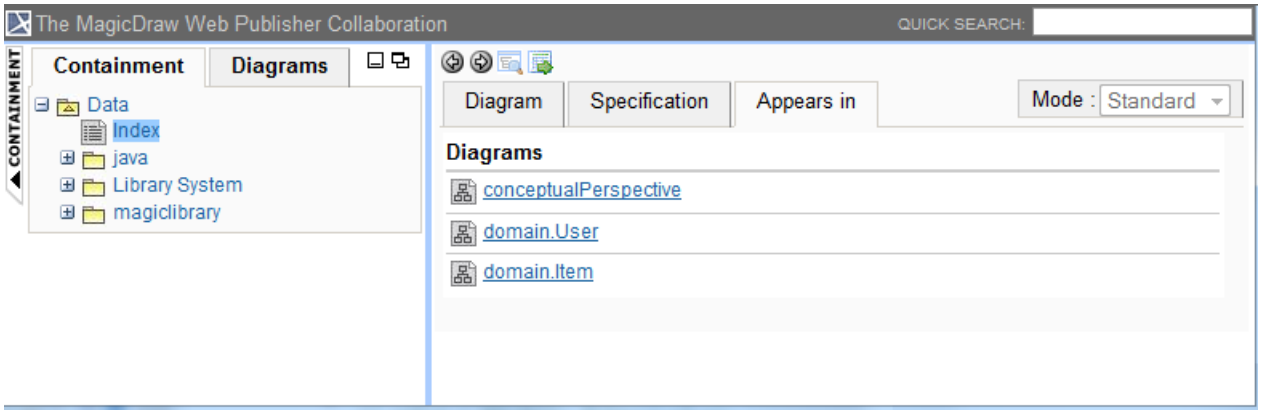


Figure 110 -- The Appears in Tab of Contents Panel

6.5.2.4 Quick Search Box

You can search for an element in a project by typing a specific keyword in the **Quick Search** box. You can also use a regular expression as a keyword (see Figure 111).

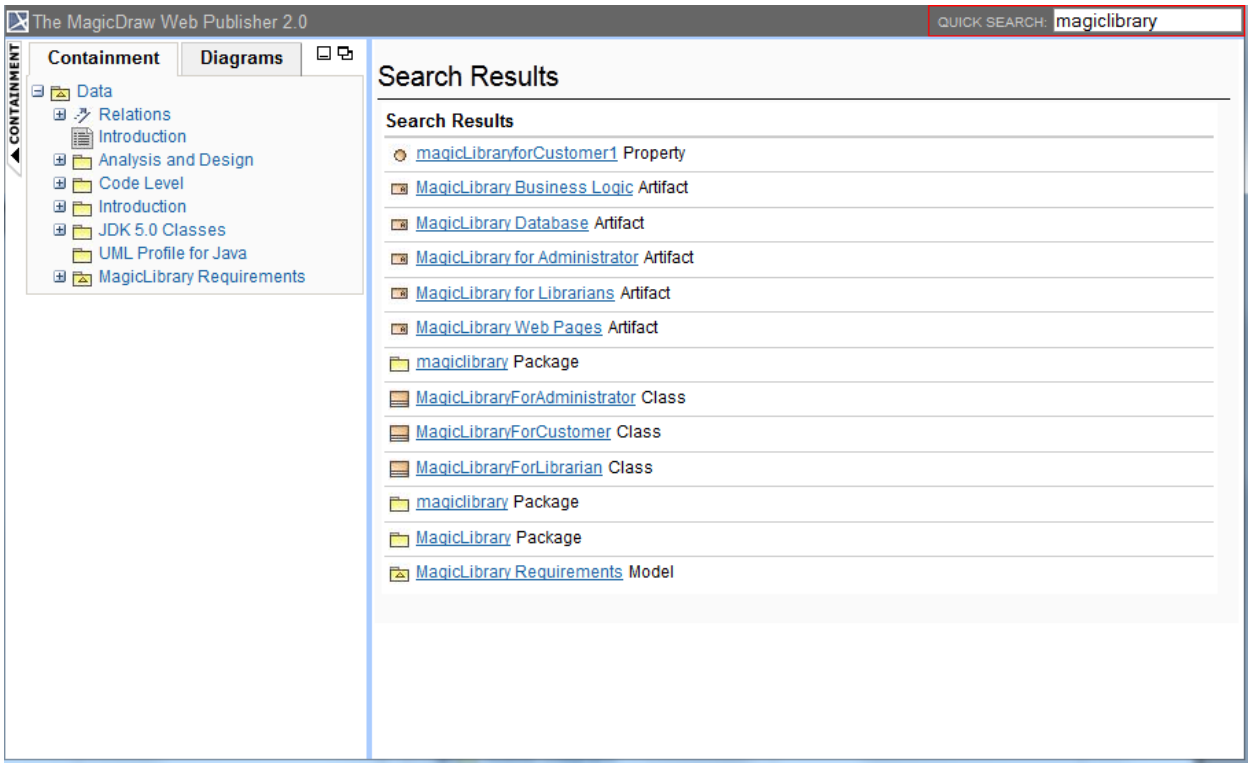


Figure 111 -- Searching for an Element

6.5.2.5 NEW! Displaying Requirement ID Properties in the Containment Tree

Report Wizard can display requirement property IDs of a SysML Requirement diagram (Figure 112 and Figure 113) in the Containment tree in the Web Publisher 2.0 report output (Figure 114). You can select the option to display the requirement property IDs in the **Report Variable** dialog (Figure 115).

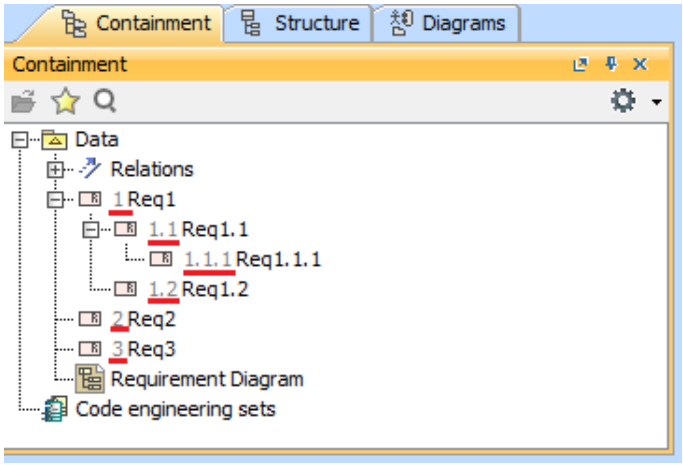


Figure 112 -- The Requirement Property IDs in the Containment Tree in MagicDraw

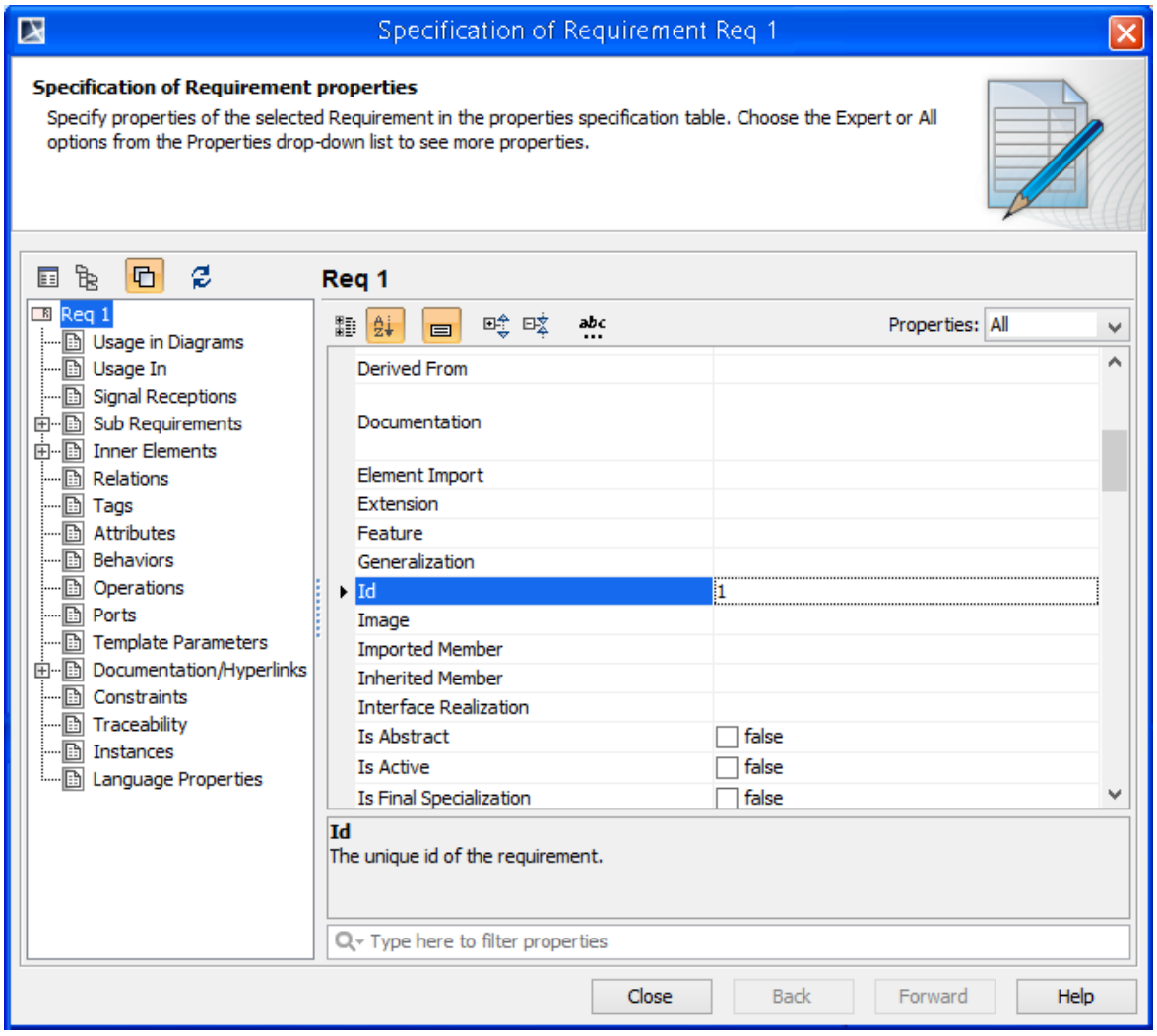


Figure 113 -- The Requirement Property ID in the Specification Dialog

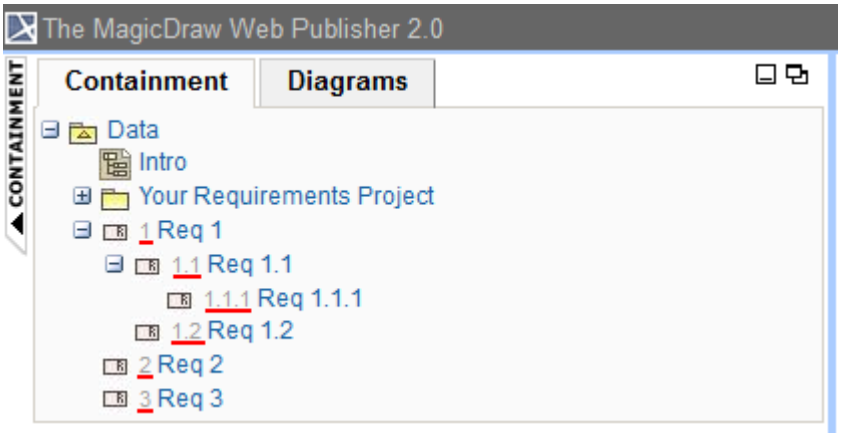


Figure 114 -- The Requirement Property ID in the Containment Tree in Web Publisher 2.0

To display requirement property IDs of a SysML Requirement diagram in the Web Publisher 2.0 report Containment tree:

1. Open the **Report Variable** dialog.
2. Select the **DisplayTreeElementId** variable and enter the value **true**.
3. Click **OK**.

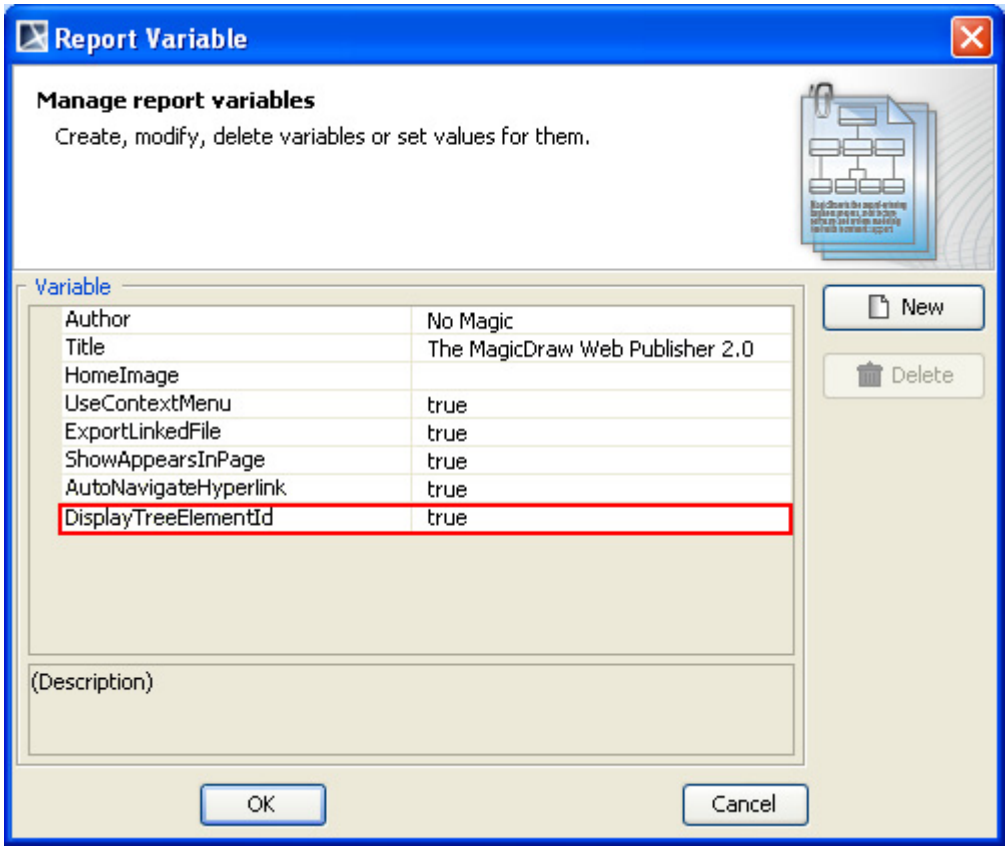


Figure 115 -- Selecting the Requirement Property ID Display Option in the Report Variable Dialog

6.5.2.6 Changing a Homepage Image

Report Wizard enables you to change a homepage image. To change the homepage image, enter a specific image value in the **HomeImage** user-defined variable in the **Report Variable** dialog (see Figure 116).

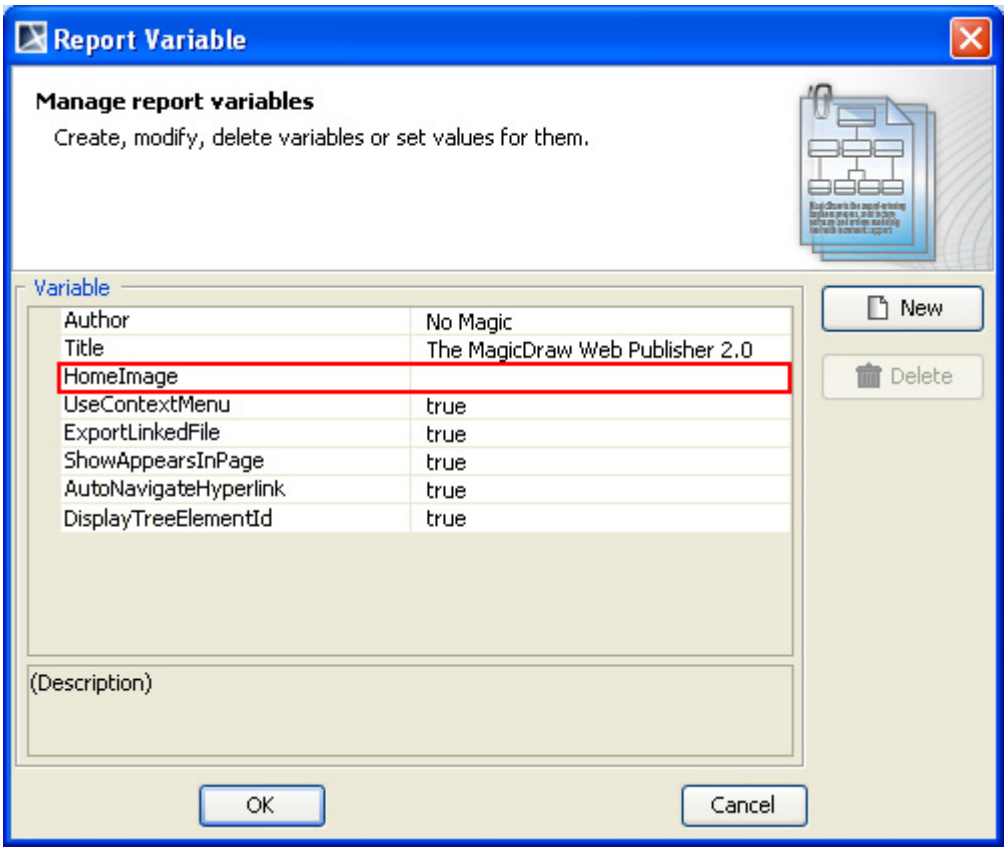


Figure 116 -- The Variable Pane in the Report Variable Dialog

See Table 17 below for the possible values of the HomeImage variable.

Table 17 -- HomeImage User-Defined Variable

Possible Value	Result
(not specified)	A MagicDraw logo image will be displayed as the homepage image.
Diagram Name (plain text)	Enter a diagram name (in plain text) to display the diagram as the homepage image.
Element ID (mdel://)	Enter “mdel://” followed by a model element ID to display the element as the homepage image. For example, “mdel://_10_0EAPbeta2_8740266_1126593738250_35764_172”.
Local Image (file://)	Enter the location of an image file on your computer to display the image as the homepage image. For example, “file://d://picture//image.jpg”.
Web Image (http://)	Enter the location of an image on the Web to display the image as the homepage image. For example, “http://www.photobucket.com/image.jpg”.

Figure 117 demonstrates an example of specifying a diagram name (in plain text), in this case “Software Development Process”, in the “HomeImage” variable.

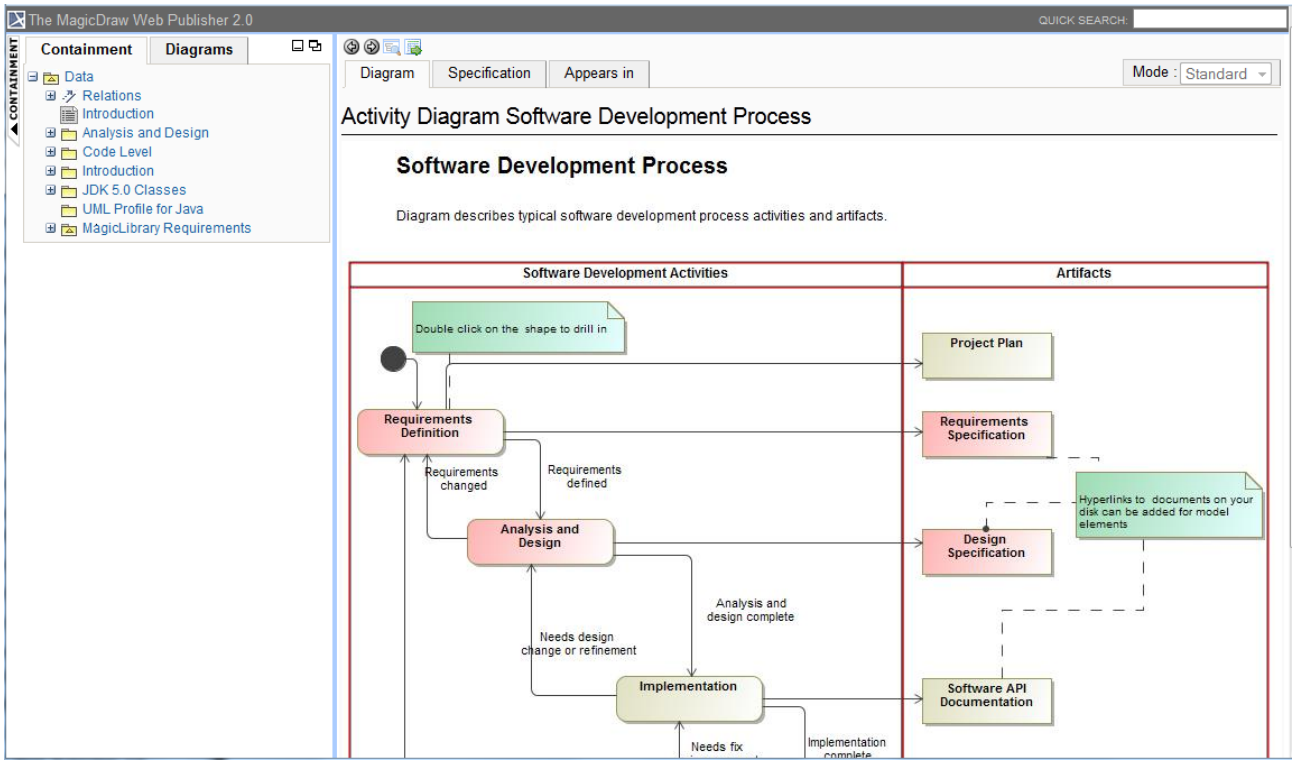


Figure 117 -- Example of Specifying Diagram Name (Plain Text) in the HomeImage Variable

6.5.2.7 Element Description

The **Specification** tab shows a brief description of elements in a tooltip. Move your mouse over an element to see the description (see Figure 118).

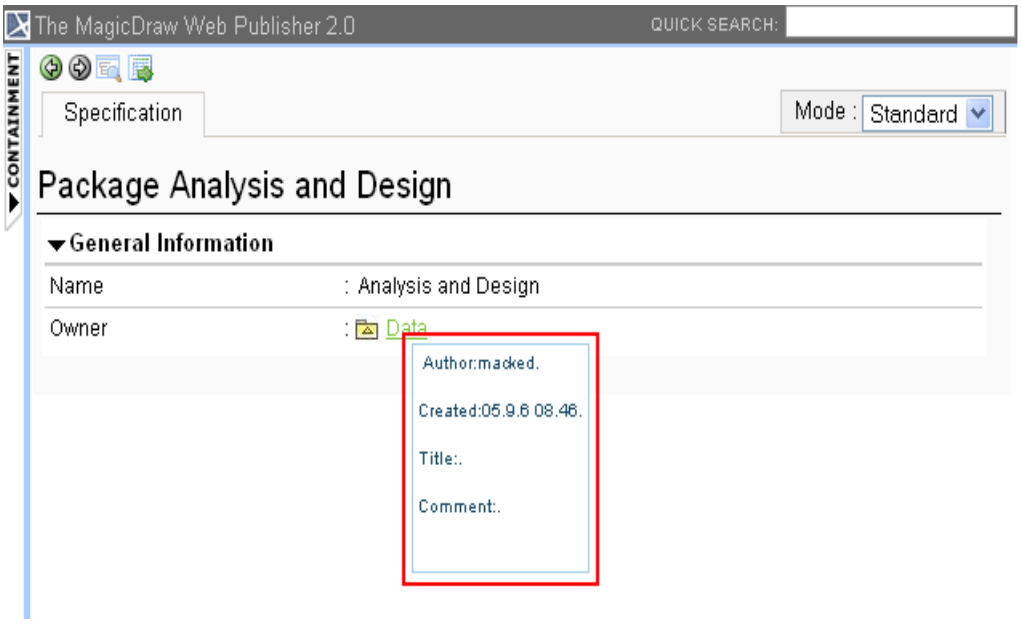


Figure 118 -- Showing Element Description

6.5.2.8 Shortcut to Homepage

You can click **The MagicDraw Web Publisher 2.0** at the top-left corner to go to the index page (see Figure 119).

Figure 119 -- Shortcut to Homepage

6.5.2.9 Property Visibility

The property visibility in the **Specification** tab has three mode types: (i) Standard, (ii) Expert, and (iii) All. The mode that will be shown in the property visibility depends on the mode that you have selected in MagicDraw (see Figure 120).

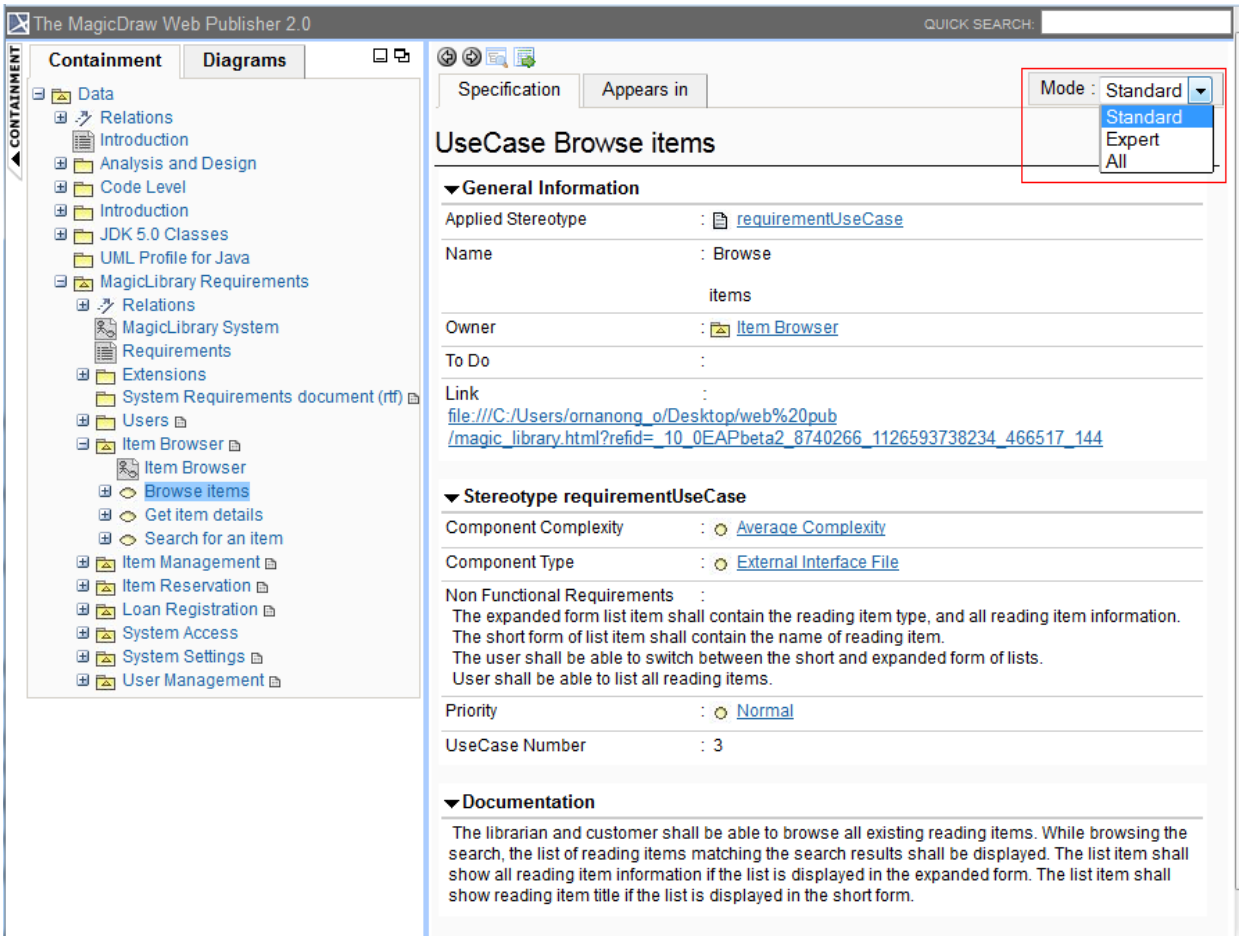


Figure 120 -- Property Visibility Mode Types

6.5.2.10 Showing or Hiding Context Menu

To show or hide a context menu:

1. Open the **Report Variable** dialog (Figure 121).
2. Either set the value of the **UseContextMenu** user-defined variable to “true” to show a context menu or “false” to hide it.

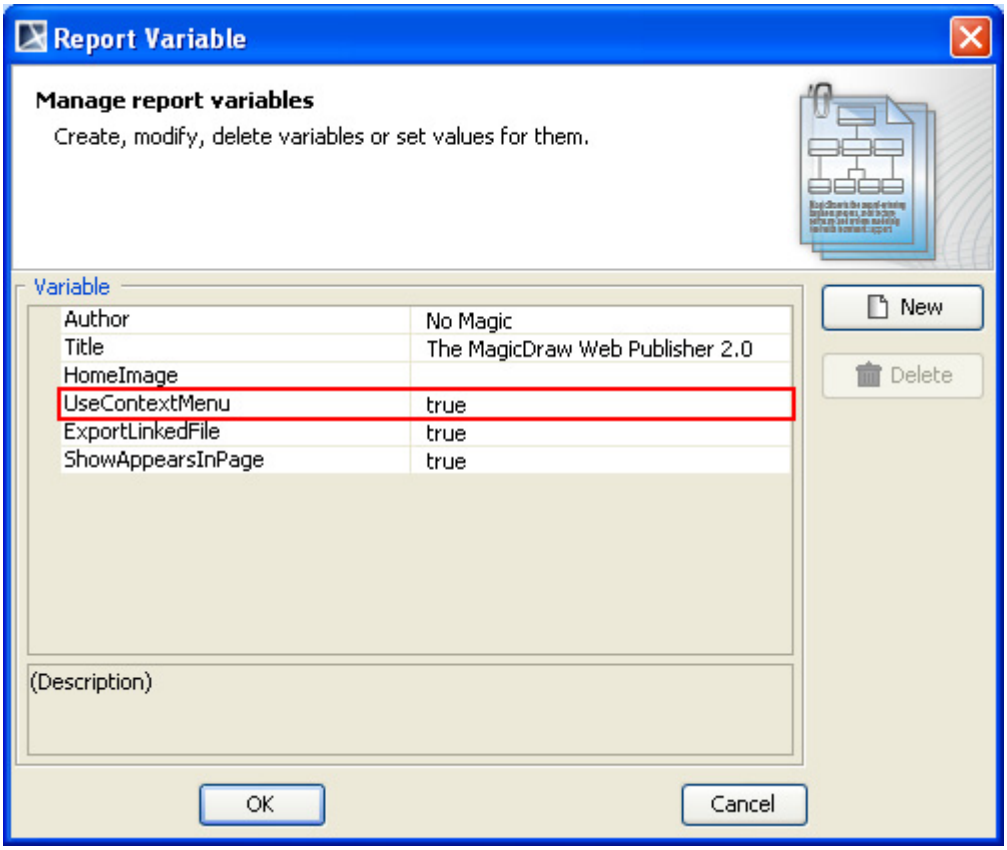


Figure 121 -- The UseContextMenu User-Defined Variable

UseContextMenu Value	Function
true	To show the context menu on a right mouse clicking of a diagram element.
false	To show an element specification or open an element, diagram, or page specified in any existing active hyperlink on a right mouse clicking of a diagram element.

6.5.2.11 Exporting a Linked File into an Output Folder

To export a linked file into an output folder:

1. Open the **Report Variable** dialog (Figure 122).
2. Set the value of the ExportLinkedFile user-defined variable to “true”.

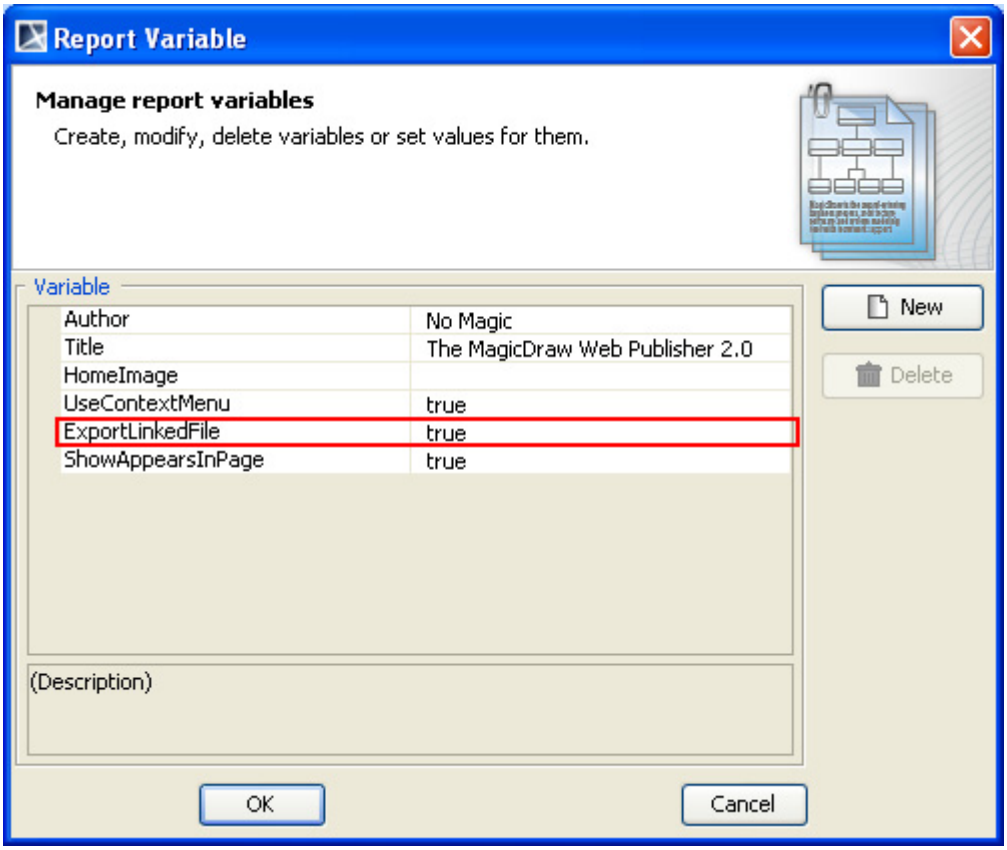


Figure 122 -- The ExportLinkedFile User-Defined Variable

ExportLinkedFile Value	Function
true	To allow the template to copy a linked file from a model hyperlink into an output report folder.
false	To keep the link to an absolute path only.

6.5.2.12 Enabling the Appears in Tab in an Output Report

You can show or hide the **Appears in** tab in your web output report.

To show the Appears in tab in an output report:

1. Open the **Report Variable** dialog (Figure 123).
2. Set the value of the user-defined variable **ShowAppearsInPage** to “true” (“true” is the default value).

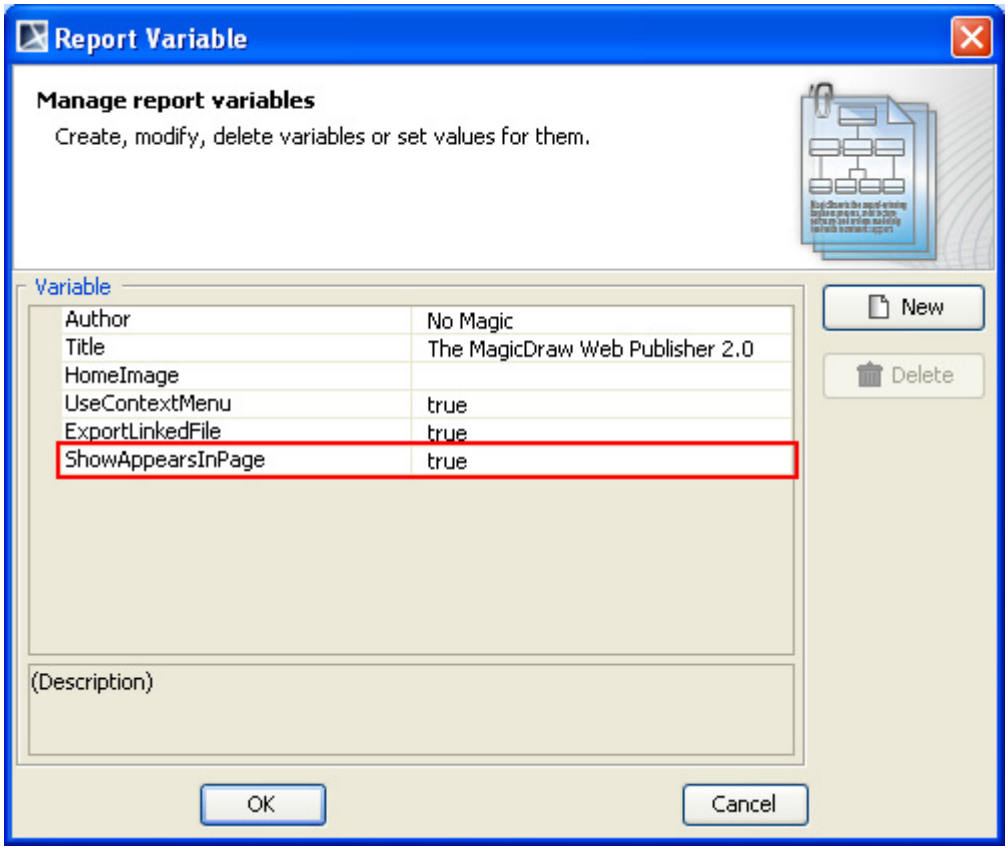


Figure 123 -- The ShowAppearsInPage User-Defined Variable

ExportLinkedFile Value	Function
true	To show data in a report and to open the **Appears in** tab once you click an element in the Containment tree or a diagram pane.
false	To hide the **Appears in** tab in a generated report.

6.5.2.13 Navigating to Element Active Hyperlinks

To navigate to an active hyperlink of an element in an output report.

1. Open the **Report Variable** dialog (Figure 124).
2. Set the value of the "AutoNavigateHyperlink" user-defined variable as "true" or "false". The default value is "true".

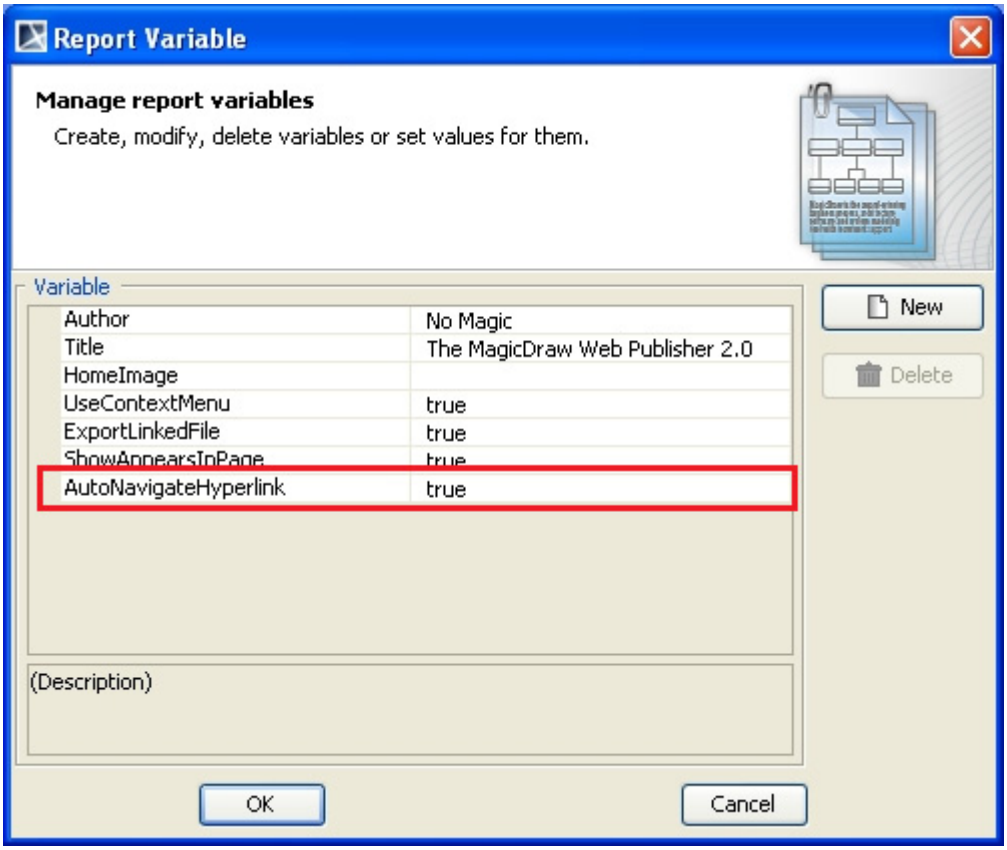


Figure 124 -- AutoNavigateHyperlink User Defined Variable

Table 18 -- AutoNavigateHyperlink User Defined Variable Value

AutoNavigateHyperlink Value	Function
true	Automatically navigate the active hyperlink of each element. For example, if A has an active hyperlink to B and B has an active hyperlink to C, then C will be shown when you click A.
false	The behavior of navigation to active hyperlink is the same as that of Magic-Draw. For example, if A has an active hyperlink to B and B has an active hyperlink to C, then B will be shown when you click A.

6.5.2.14 Opening an Activity, State Machine, Collaboration, or Interaction Diagram

Click an Activity, State Machine, Collaboration, or Interaction diagram to open a sub-diagram associated with an element.

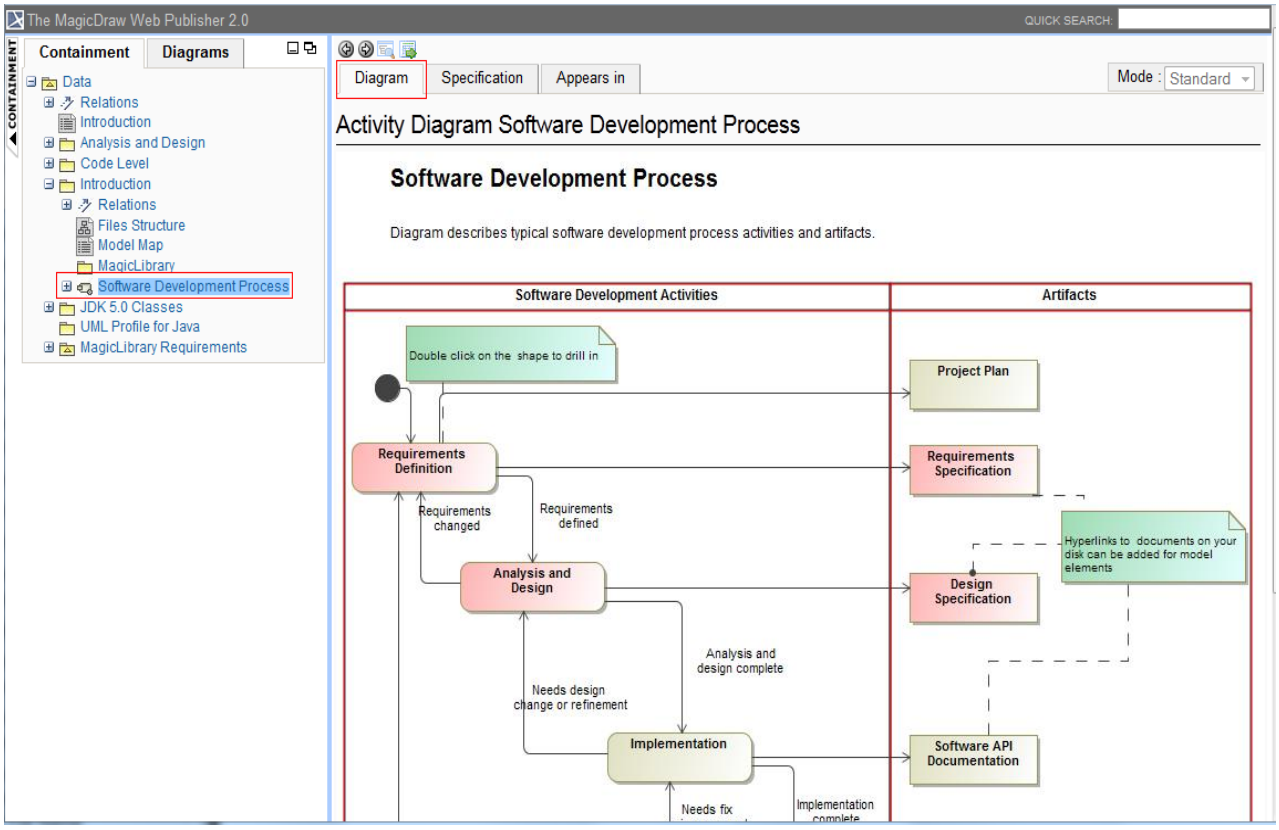


Figure 125 -- Opening Activity, State Machine, Collaboration, or Interaction Diagram

6.5.2.15 Opening the Sub-diagrams of a State with Submachine

To open the sub-diagrams, double-click either a state with a Submachine or a call behavior action of which behavior is specified. For example, double-clicking the state “a1” (Figure 126) with the submachine “sub1” will show a diagram of the state machine “sub1” (Figure 127).

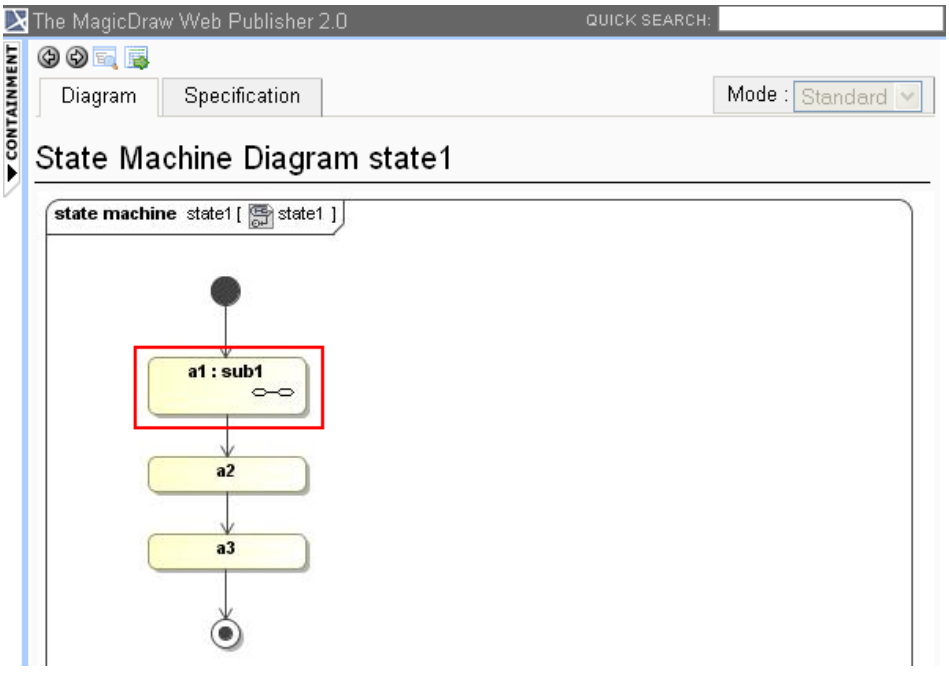


Figure 126 -- Double-clicking a State with Submachine

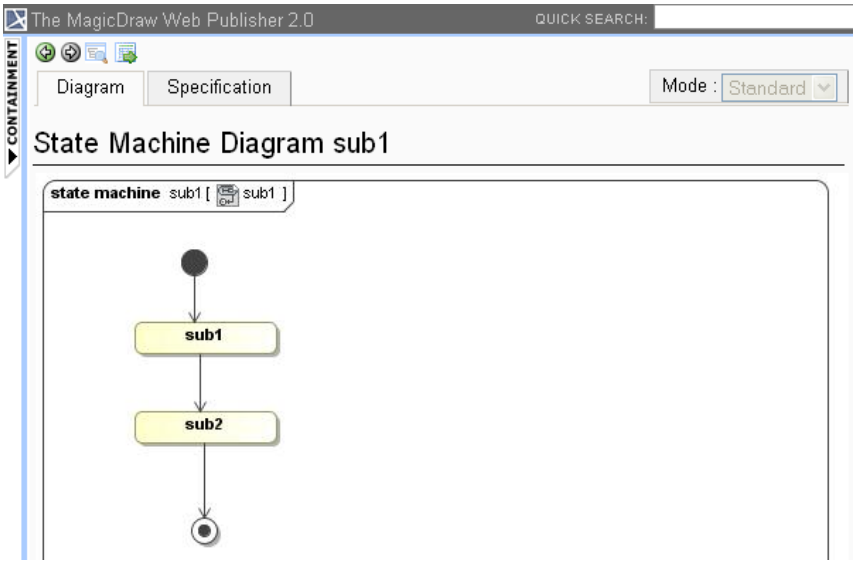


Figure 127 -- Diagram of State Machine "sub1"

NOTE	• Web Publisher does not support SVG (Scalable Vector Graphics) images. You can view all diagram images created in SVG but they are not linkable. • Element icons in SVG will not be exported into a web page.

6.6 Web Publisher Collaboration Reports

The Web Publisher Collaboration report is implemented based on the Web Publisher 2.0 report. The Web Publisher Collaboration report improves text editing, model review, and XML message features. The J2EE compliance server requires a running generated report.

6.6.1 Generating Reports

The Web Publisher Collaboration template is located under the Default Template category.

To generate a Web Publisher Collaboration template report:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select **Web Publisher Collaboration** (Figure 128).

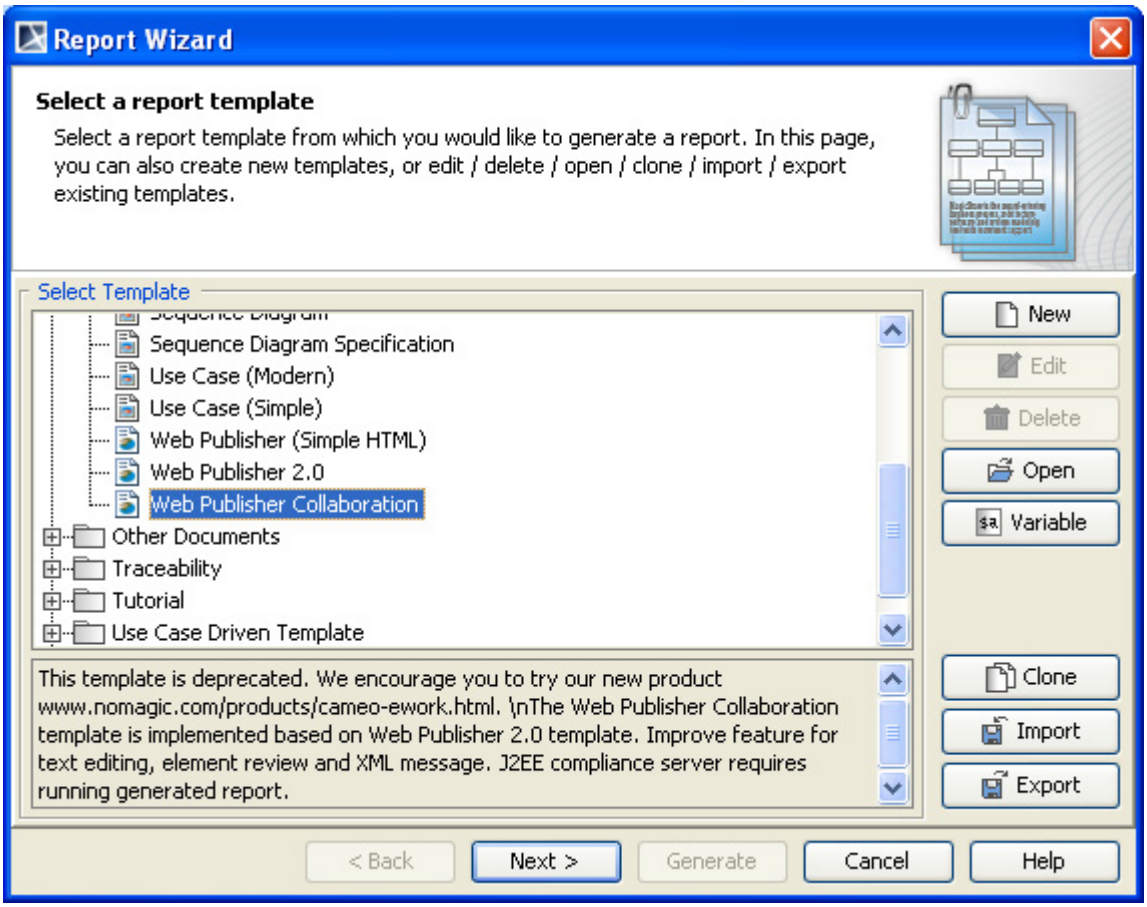


Figure 128 -- Selecting the Web Publisher Collaboration Template

- There are three user-defined variables available for the default Report Data.

  (i) **Author**: The author of the report.

  (ii) **Title**: The title of the web page.

  (iii) **UseElementLink**: If “true”, it will allow the element hyperlink to work with diagrams. If “false”, the element specification will be shown on the web page.

3. Before generating a report, choose the option to upload the generated report to the server (Figure 129). See **6.8 Uploading Reports to Remote Locations** for more detail.

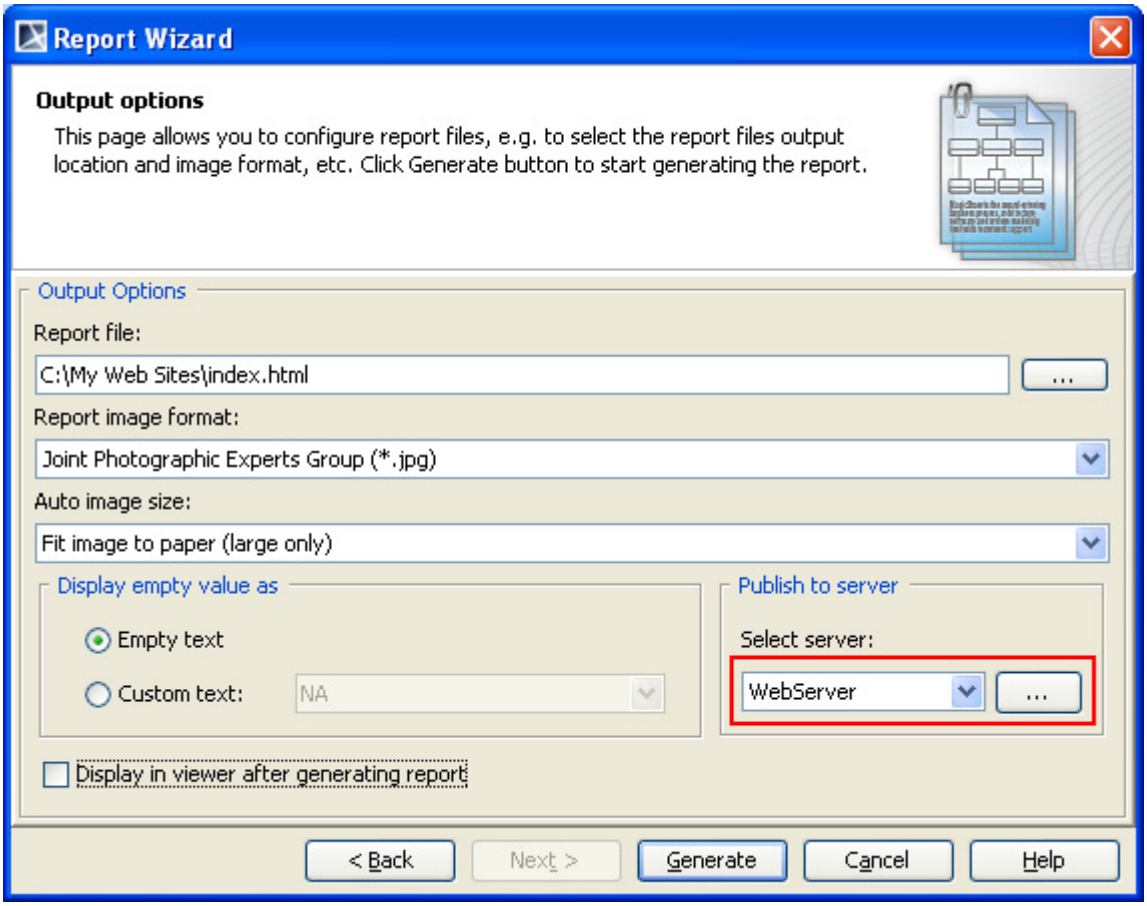


Figure 129 -- Selecting the Server to Upload the Report

6.6.2 Web Publisher Collaboration Feature

The main feature of the **Web Publisher Collaboration** report is for reviewing tasks. The generated report will allow you to (6.6.2.1) add comments and (6.6.2.2) alter model contents including documentation.

6.6.2.1 Adding Comments

To add comments:

- Click **Add Review** to add review text (Figure 130). Review text can be in a rich text format, for example, bold, italic, text color, etc. You cannot modify text in the review pane, but you can remove it by clicking the **Remove** option.

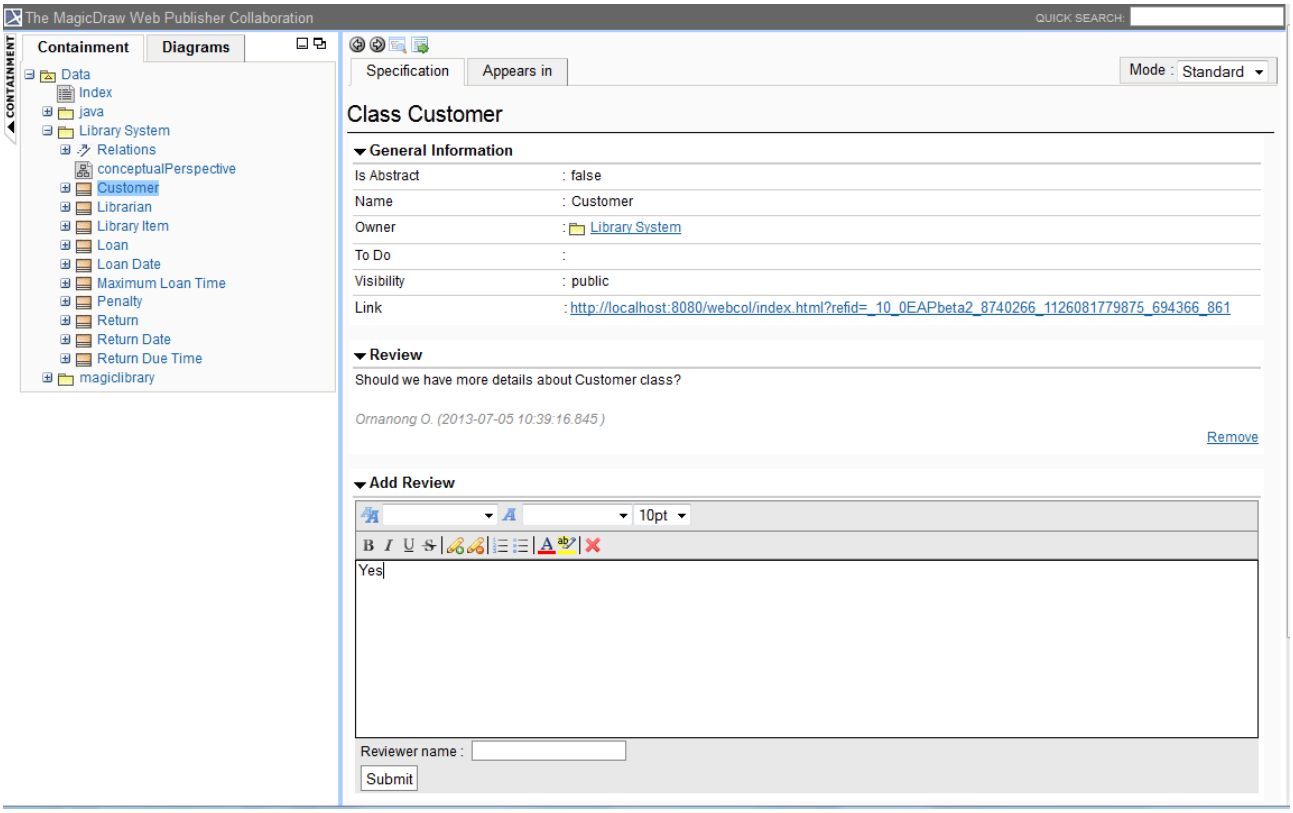


Figure 130 -- Adding Comments on the Web Publisher Collaboration Page

6.6.2.2 Altering Model Contents

To alter model contents:

- Click the field to open an input box (Figure 131). You can modify only the fields with text value. Field editing completes once you have pressed enter or text input is out of focus. Press **ESC** to cancel the editing process.

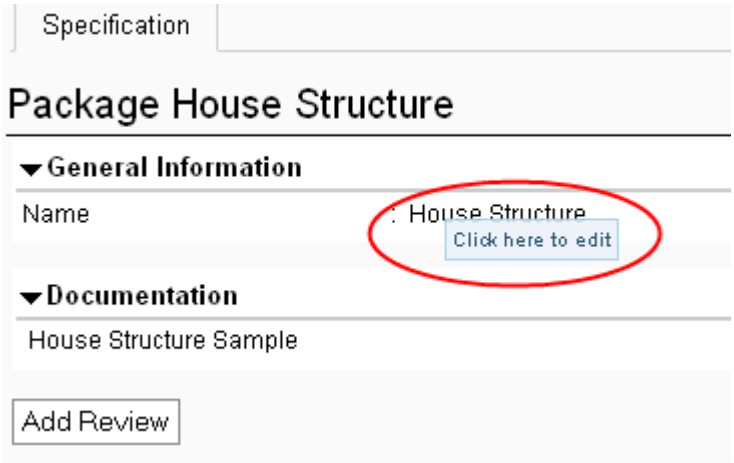


Figure 131 -- Editing Field

NOTE	• Web Publisher does not support SVG (Scalable Vector Graphics) images. You can view all diagram images created in SVG but they are not linkable. • Element icons in SVG will not be exported into a web page.

6.6.3 XML Integration

Web Publisher Collaboration opens an interface for retrieving model contents through XML or web services (Figure 132).

```
XML?refid=elementID
```

The endpoint service is “XML” with a query string for “refid”, for example:

```
http://127.0.0.1:8080/house/
XML?refid=_16_5beta1_2104050f_1233137219765_123064_4025
```

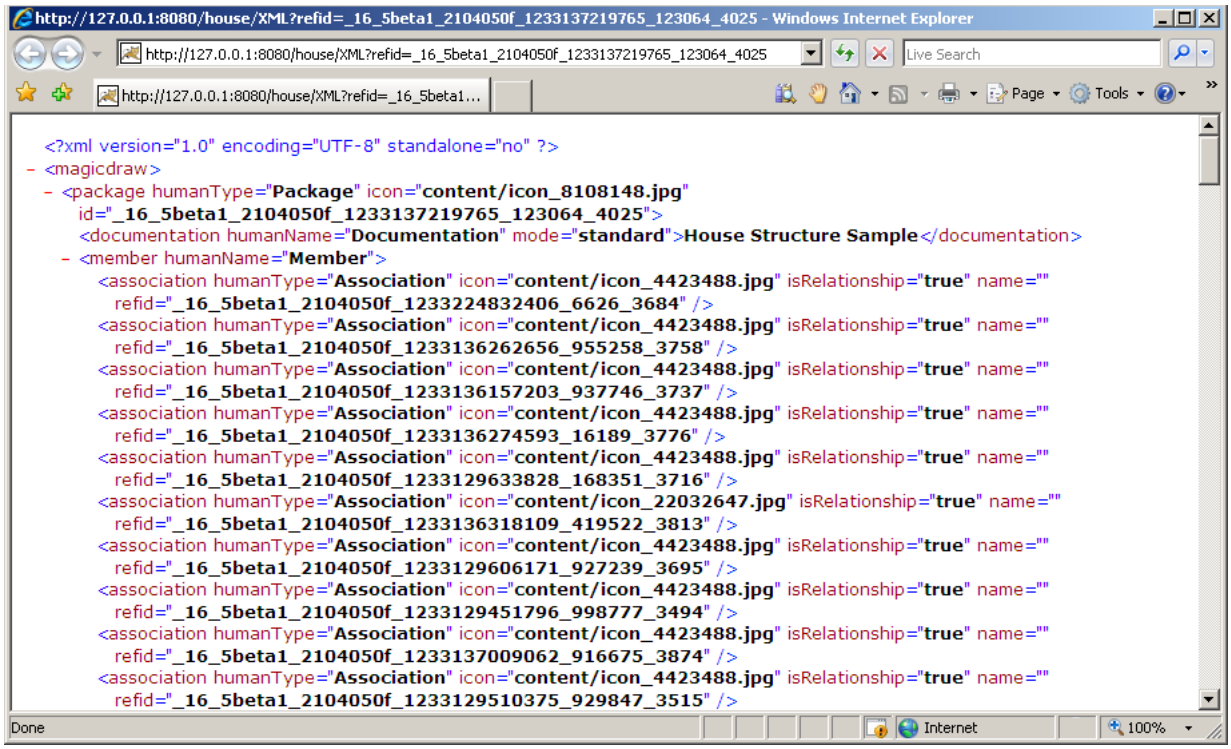


Figure 132 -- Example of Data Return from XML Service

6.7 NEW! Web Portal Reports

Report Wizard provides a report template that you can use to generate a web portal report. A web portal report is a report published in HTML format so it can be viewed in a web browser. With the web portal report, you can share your project and virtually make your models readable to the other stakeholders, including those who do not understand MagicDraw models. The web portal report allows the readers to provide feedback on any element or diagram in the model by commenting on it. This web portal report template is only available in MagicDraw Enterprise edition. In other editions, MagicDraw provides a demo version of the web report template, which can contain, at most, 10 symbols per view.

A web portal report simplifies the complexity of a model by reducing less needed elements from the model tree and displays the most relevant views of your project. For example, a MagicDraw project report includes views such as Glossary, Requirements, Architecture, Implementation, and so forth, and a SysML Plugin project report includes views such as Requirements, Structure, Interfaces, Constraints, and so forth. It helps you generate your project in a user-friendly and easy-to-browse environment.

The web portal report features a quick search to help you find elements and diagrams for faster content viewing.

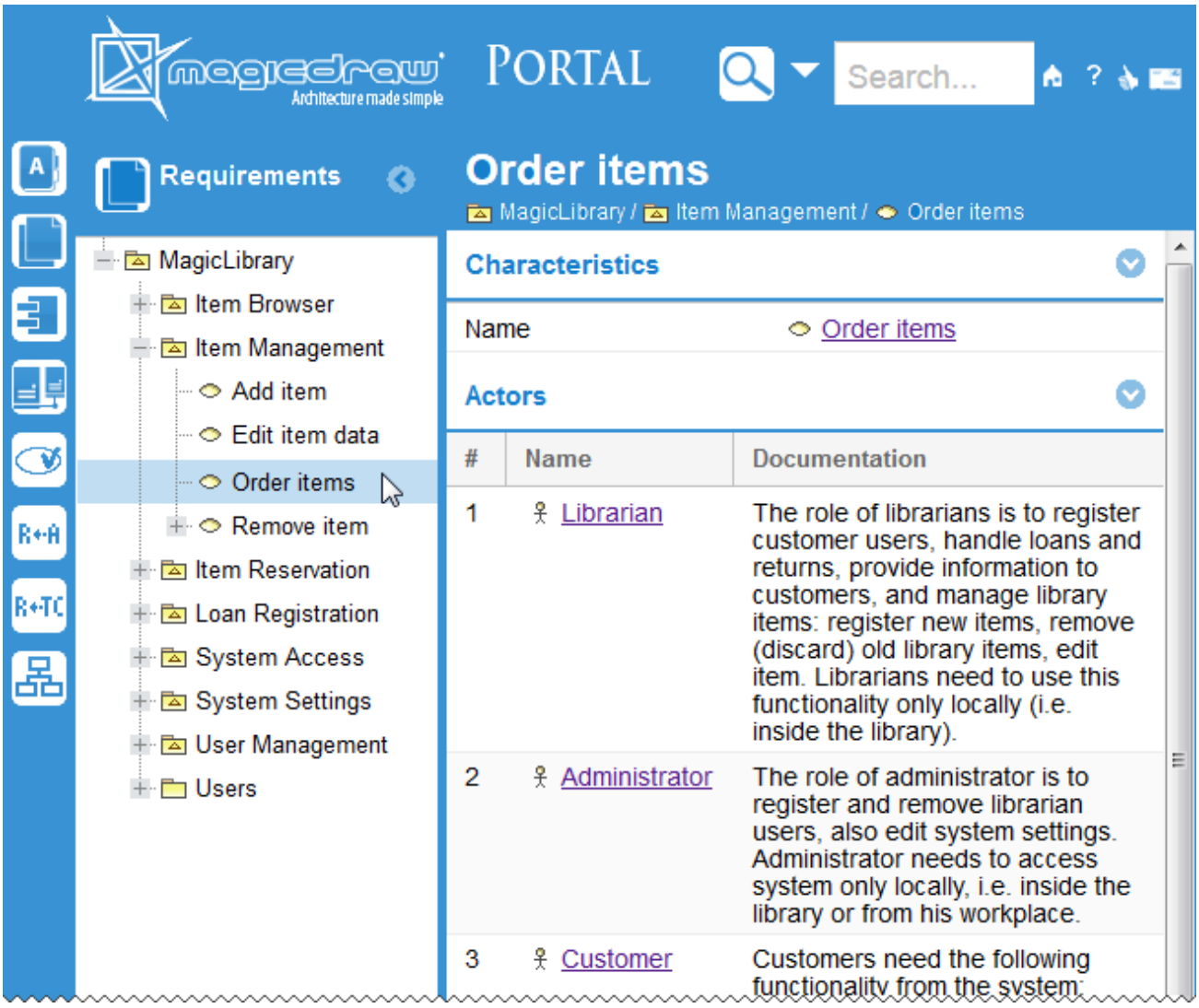


Figure 133 -- An Example of Web Portal Report - Software Engineering Portal

6.7.1 Generating Reports

Generating a web portal report is as easy as generating any other reports with Report Wizard.

To generate a web portal report from a MagicDraw project:

1. Press **Ctrl**+**Shift**+**G** to open the **Report Wizard** dialog.
2. In the **Select Template** pane, expand the **Web Reports** package and select **Software Engineering Portal**.

NOTE	If your MagicDraw has a plugin that provides another template for generating a web portal report, you can find this template in a separate package. For example, if you have installed SysML Plugin, you should expand the **SysML - Web Reports** package and select **SysML - Web Reports**.

3. Click **Next**.
4. If you need to allow comments on the report, do the following:
    4.1. Click the **Variable** button. The **Report Variable** dialog will open.
    4.2. In the value cell of the **WebComment** variable, type the global address for comments delivery, for example, *example.com/jiraExample.php* (Figure 134).
    4.3. Click **OK**.

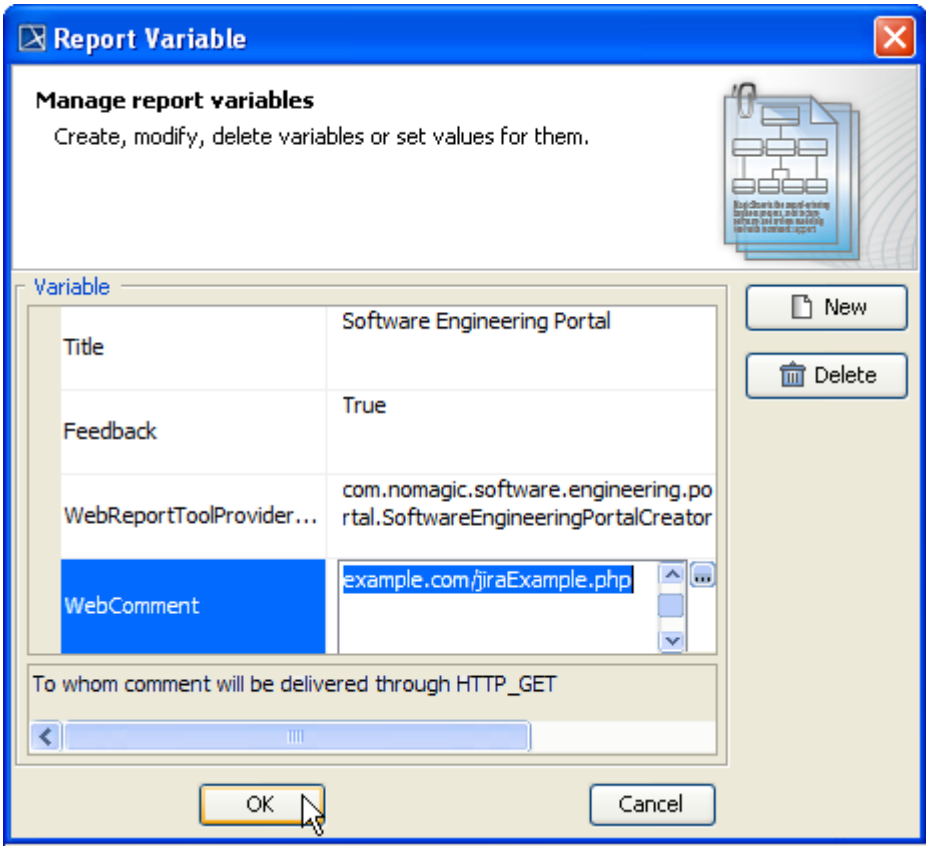


Figure 134 -- Enabling Feedback on a Web Portal Report

5. If you want ScreenTips to appear on the report when it opens for the first time, do the following:

5.1. Click the **Variable** button. The **Report Variable** dialog will open.

5.2. In the value cell of the **ShowTip** variable, type either *True* or *true*.

5.3. Click **OK**.

6. Click **Next**.
7. Select the elements you need to include in the report and click **Next**.
   For more information, refer to 1.1.2.3 Select Element Scope Pane on page 46.
8. Save your report in a specific location, type the report name (for example, *report.html*), and specify other output options if desired.
9. Click **Generate**. The web portal report will be generated and ready for review.

NOTE	As a web portal report includes *a number of files and folders*, it is strongly recommended that you save the report in a separate folder.

   For more information, refer to 1.1.2.4 Generate Output Pane on page 47.
10. You can open the report by double-clicking the HTML/HTM file in the location specified in step 6 (in this example, *report.html*).
11. You can place the report in a shared directory or on a web server to make it available for the other stakeholders.

6.7.2 Commenting on a Report

If a web portal report enables feedback or comments, you can write something about a model element or a diagram in the report. See step 4 in 6.7.1 Generating Reports on page 178 for more information on how to enable feedback or comments in a web portal report.

To write a comment on a web portal report:

1. Select an element or diagram you need to comment in the model tree view on the left-hand side of the web portal report.
2. Click the comment icon in the upper-right corner of the report. The **Comment** dialog opens.

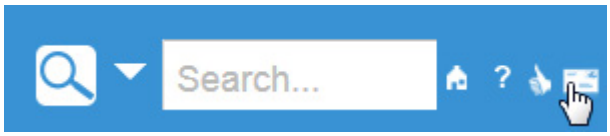


Figure 135 -- The Comment Icon

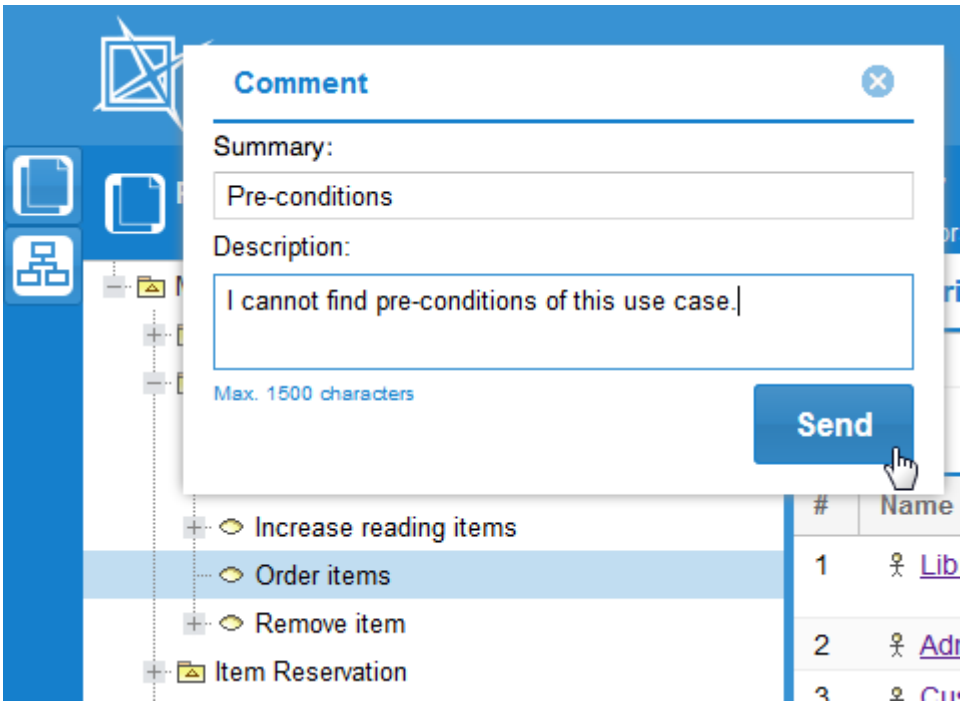


Figure 136 -- Commenting on a Web Portal Report

3. Type a short statement that describes your comment or feedback in the **Summary** box.
4. Type your comment in details in the **Description** box

IMPORTANT!	Your comments in the **Description** box should not exceed 1500 characters. Comments exceeding the limit will not be included.

5. Click **Send**. The global address of the selected element or diagram, the name of that element or diagram, and the contents in both the **Summary** and **Description** boxes will be sent to the web server.

6.7.3 Reading Comments

There are several ways to deliver comments on elements and diagrams in a web portal report and allow others to read them. You can choose to deliver them through an issue tracking system, such as JIRA, or an e-mail platform, such as Gmail or Outlook.

The following example shows how to deliver comments, if you need to get the comments to a certain account on JIRA as issues of the type 'Bug':

1. Copy the following script:

```
<?php

$contentUrl = $_GET['url'];                 // Global address of the commented
                                            // element or diagram.
$contentTitle = $_GET['contentTitle'];      // Name of the commented element
                                            // or diagram.
$contentSummary = $_GET['commentSummary'];// Summary text of the comment.
$contentCommentArray = $_GET['comment'];  // Text of the comment.

$contentComment = implode(" ", $contentCommentArray);
```

```
$description = $contentTitle . " \\\\ " . $contentComment . " \\\\ " . "Link to the
content: \\\\" . $contentUrl;

$issue = array(
    'type'=>'1',        // Type of JIRA issue
                        // that stores the comment.
                        // '1' means 'Bug'.
    'project'=>'TEST', // Name of JIRA project
                        // that stores the comments (3.1).
    'description'=> $description,   // Description contents
                                    // of JIRA issue that
                                    // stores the comment.
    'summary'=> $contentSummary,    // Summary text of JIRA issue
                                    // that stores the comment.
    'priority'=>'2',                // '2' means 'Critical'.
    'assignee'=>'username',         // Username of JIRA account,
                                    // to which the comment is sent (3.2).
    'reporter'=>'username',         // Username of JIRA account,
                                    // which sends the comment (3.3).
);
$soapClient = new SoapClient("https://example.com/rpc/soap/jirasoapservice-
v2?wsdl");                                          // (3.4)

$token = $soapClient->login('username', 'password');  // (3.5)

$soapClient->createIssue($token, $issue);

?>
```

2. Create a new file and paste the script onto the file.
3. Change the following values (the red ones in the script):
    3.1. The name of a JIRA project.
    3.2. The assignee's username.
    3.3. The reporter's username.
    3.4. The global address of a web service, which provides JIRA.
    3.5. The username and password of the JIRA account wherein a new issue is created from the comment data.
4. Save the file as *jiraExample.php*.
5. Upload the file to your web server, for example, Apache Tomcat.
6. When enabling comments in your web portal report (step 4 in 6.7.1 Generating Reports on page 178), specify *<web server address>/jiraExample.php* (for example, *example.com/jiraExample.php*) as the value of the **WebComment** variable.

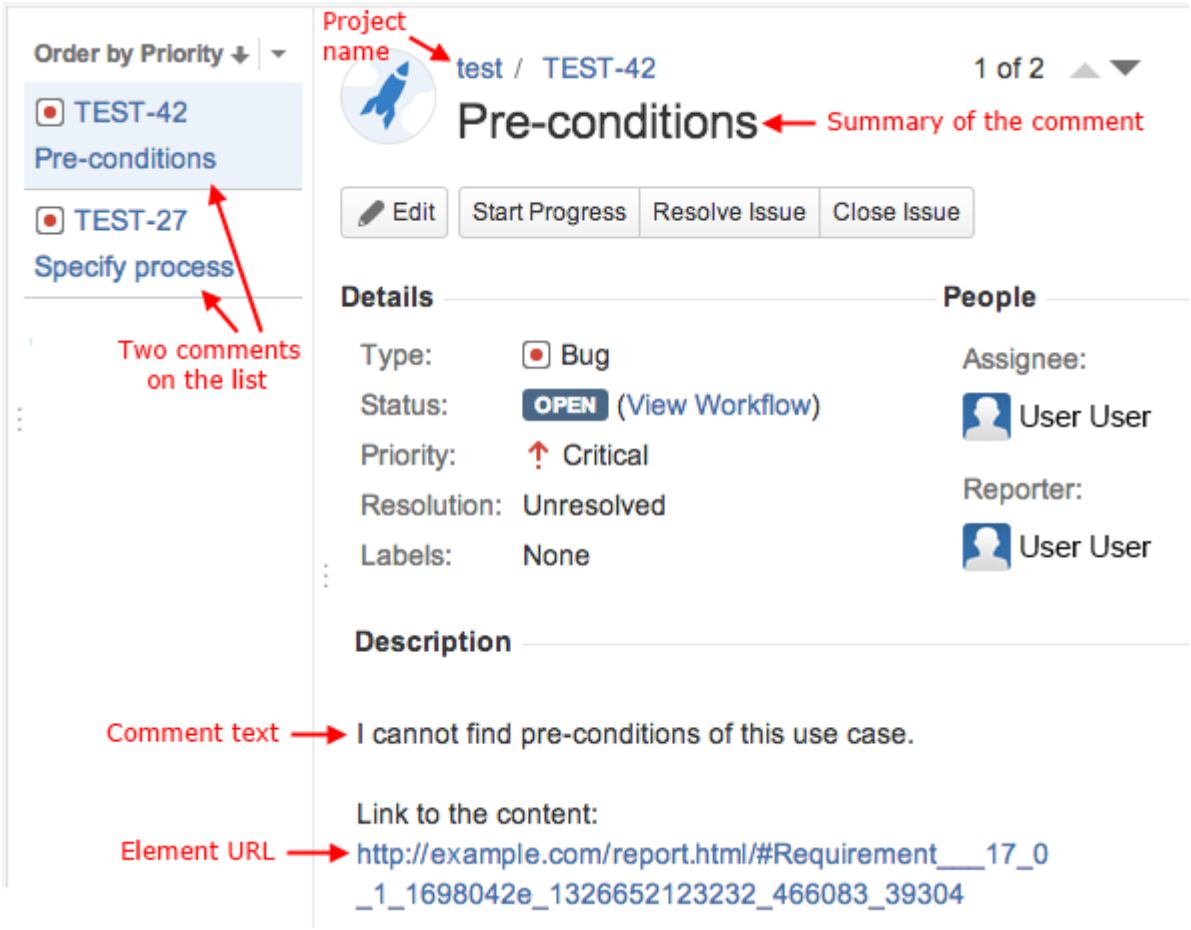


Figure 137 -- The Representation of Web Portal Report Comments on JIRA (a Fragment of JIRA Window)

6.8 Uploading Reports to Remote Locations

This feature allows you to upload a generated report to a predefined remote location. Each remote location is described in a “Profile” that holds all necessary information. You can use the **Profile Management** dialog to add, edit, or delete a profile.

This section contains (6.8.1) Quick Guide and (6.8.2) Detailed Explanations. In the Quick Guide section, you will learn how to create a profile step-by-step and how to use the created profile to upload a report to a remote server. The Detailed Explanations section describes what a valid Profile is and some of the common mistakes or errors when uploading a report.

6.8.1 Quick Guide

To create a profile:

1. In the **Report Wizard** dialog, click the "**...**" button (Figure 138). The **Profile Management** dialog will open (Figure 139).

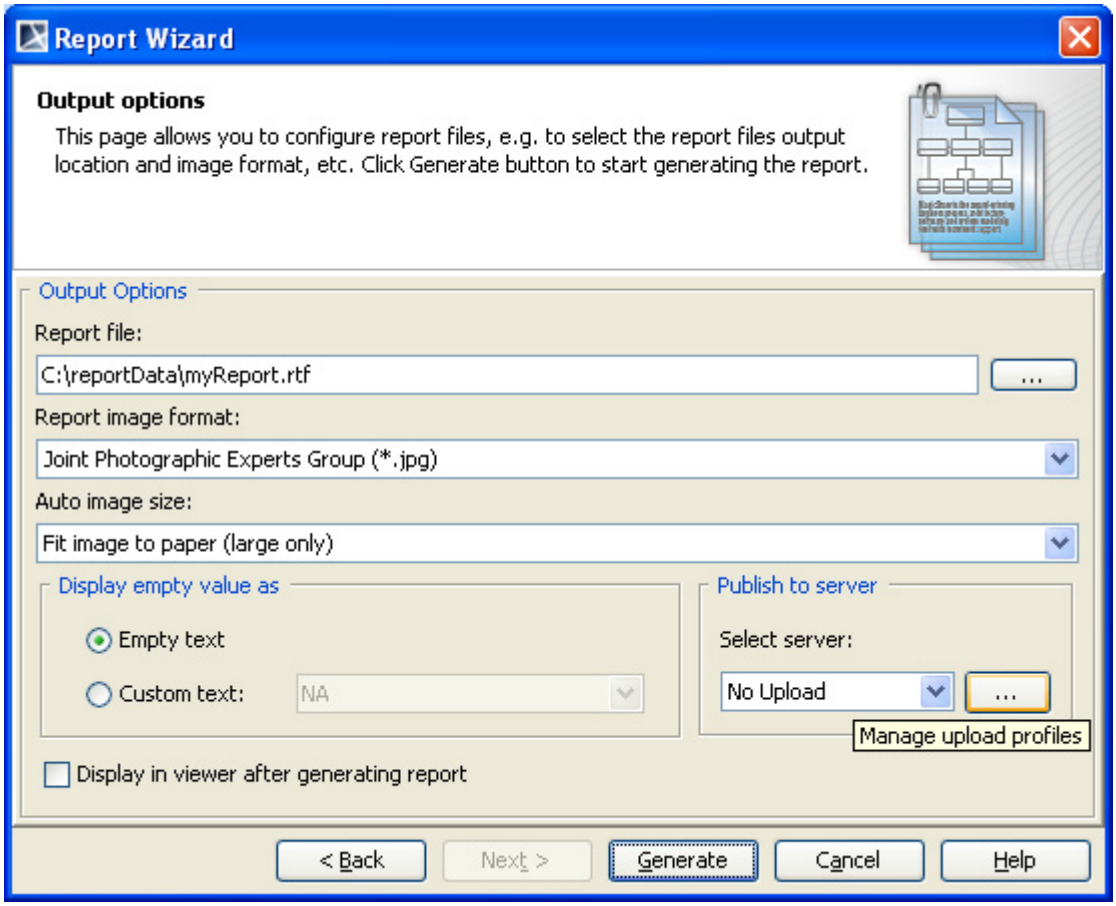


Figure 138 -- Dialog for Uploading Report to Remote Server

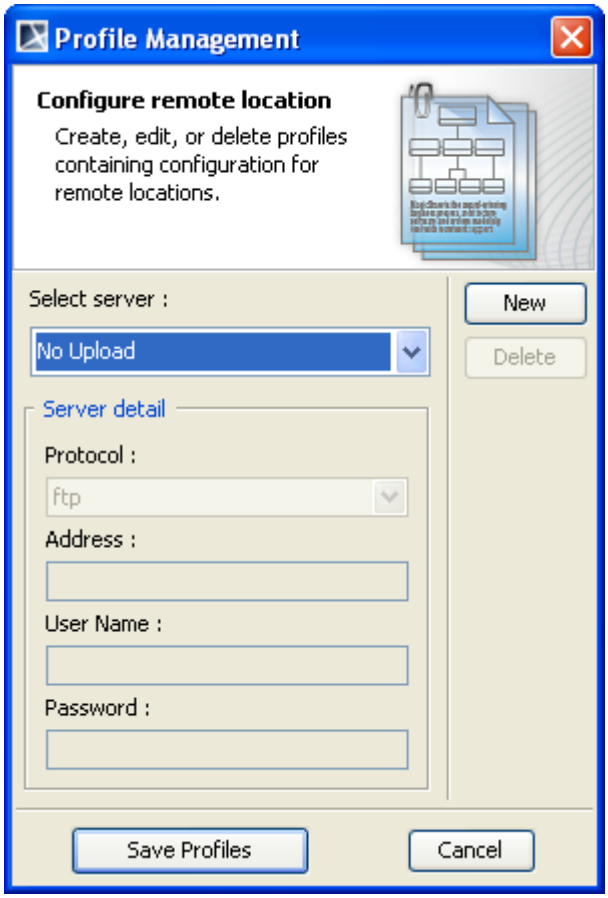


Figure 139 -- Profile Management Dialog

2. Click the **New** button to create a new Profile. The **New server profile** dialog will open (Figure 140).
3. Enter the name of the profile to be created. You cannot leave the **Name** field empty nor can you assign a name already been used in an existing set of Profiles.
4. Click **OK**.

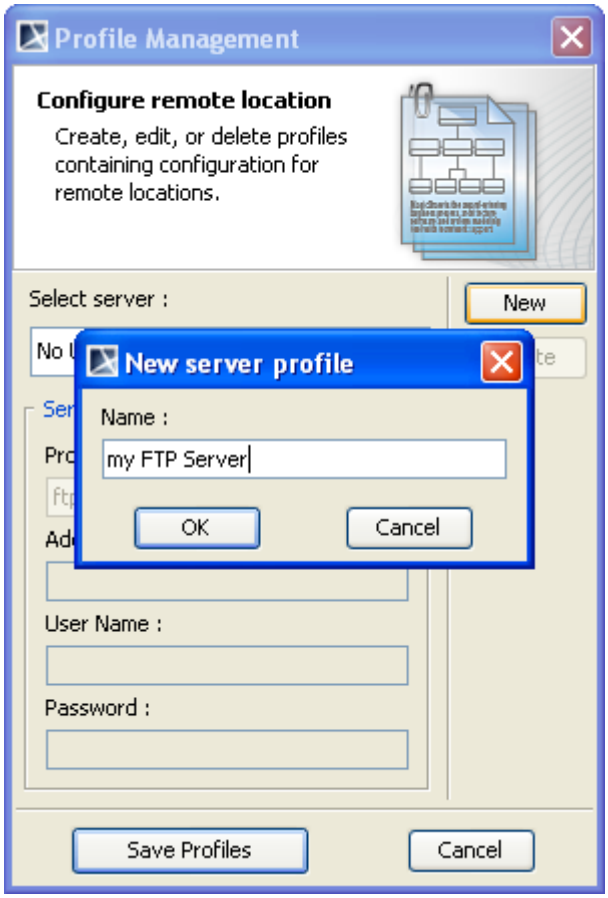


Figure 140 -- New Server Profile Dialog

5. To fill in the details of the profile, choose a Protocol and fill in a URL address. You can leave the **User Name** and **Password** fields empty if desired.
6. Click the **Save Profiles** button to save the newly-added Profile and close the **Profile Management** dialog (Figure 141).

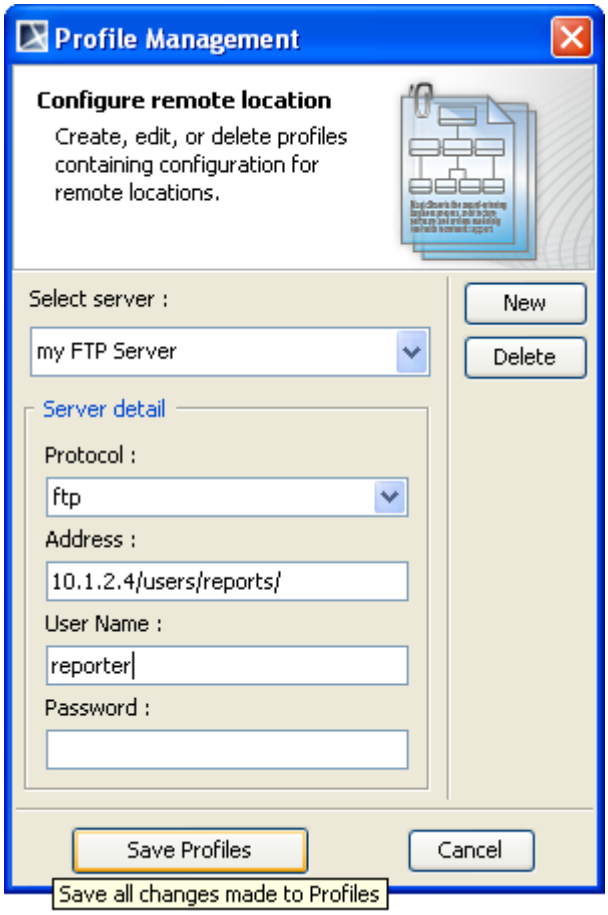


Figure 141 -- Enter Server Details

7. You are now back to the **Report Wizard** dialog and are ready to select the newly-created Profile (Figure 142). Once the report has been generated, it will be uploaded to the location specified in the Profile created earlier.

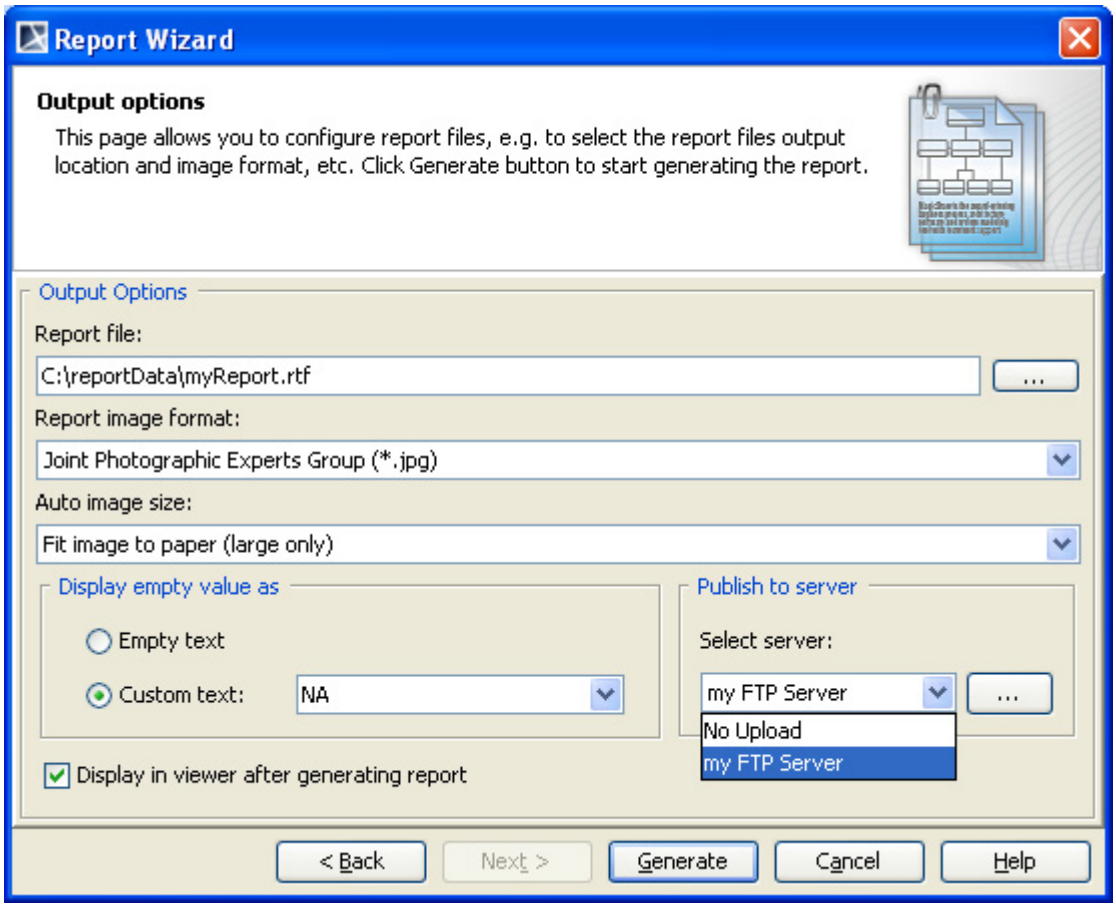


Figure 142 -- Selecting Server Profile

8. Enter authentication information in the **Authentication** dialog and click **OK** (Figure 143).

Figure 143 -- Authentication Dialog

9. If the report has been successfully uploaded, a message dialog will open showing the following message (Figure 144).

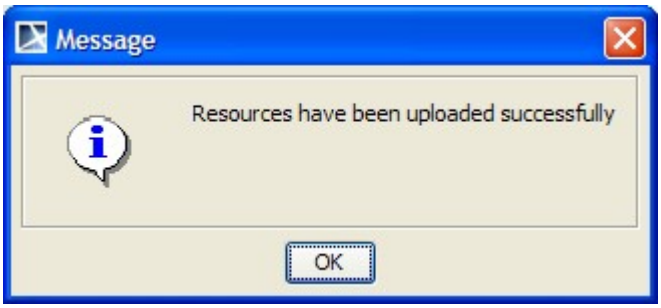


Figure 144 -- Successful Report Upload

10. Click **OK**.

6.8.2 Detailed Explanations

This section contains two parts: (6.8.2.1) Using the **Profile Management** dialog (Figure 139) and (6.8.2.2) Upload Problems illustrating problems that may arise when uploading a report to a remote location.

6.8.2.1 Using Profile Management Dialog

This section contains explanation about (i) Profile Management dialog buttons and (ii) Profile Management dialog fields, describing the dialog in Figure 139.

(i) Profile Management Dialog Buttons

The Profile Management dialog contains five buttons:

(a) New: to add a new profile to the list of existing Profiles. You cannot create a profile with blank name or with a name already been used. You can add and edit multiple Profiles. However, these profiles will not be saved until you click the **Save Profiles** button.

(b) Remove: to remove the currently selected profile. Note that you cannot remove the "No Upload" profile.

(c) Save Profiles: to save all profiles. If new profiles have been added or existing Profiles have been modified, then these changes will be saved. All profiles will be checked for consistency or information correctness. You will be asked to fix issues, if any. It is not possible to save profiles as long as invalid information is detected. See Section **(ii) Profile Management Dialog Fields** below for the description of "valid profile".

(d) Cancel: to abandon all newly-added profiles and all changes made to existing profiles. If you do not make any changes to any profiles, clicking this button will bring you back to the **Output Options** pane of the Report Wizard dialog. Otherwise, the **Confirm Cancel** dialog (Figure 145) will open. In this dialog, you will see the names of the profiles whose content you have changed. You can choose to either abandon all changes or return to the **Profile Management** dialog and save the changes.

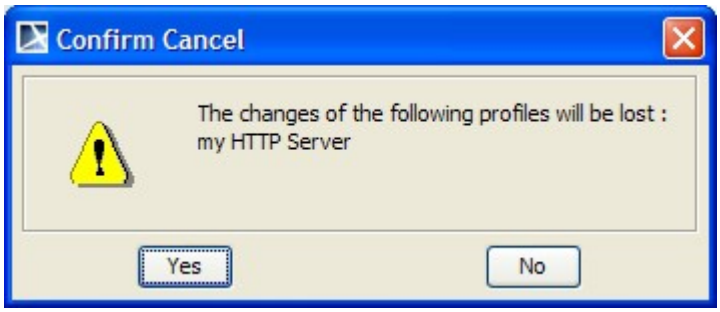


Figure 145 -- Cancel Confirmation Dialog

(e) Exit: this button  is located in the upper-right corner of the Profile Management pane. It works in a manner similar to the **Cancel** button.

(ii) Profile Management Dialog Fields

Profiles describe information necessary for sending a report to a remote location. The report will be saved remotely with the same name as the locally-generated report and will overwrite any file with the same name on the remote location.

The Address field is URL sensitive, and can hold protocol as well as username information. If the protocol or username information is found in the Address field, the corresponding fields, namely the Protocol and Username fields, will be updated with the values from the Address field. At the very least, a profile must have a hostname in the Address field.

You cannot save a profile unless this condition is met. The Username and Password fields contain sensitive data and therefore are optional. If these fields are empty in a profile, you will be prompted for the username and password when the server asks for your authentication.

- **Profile name**: This drop-down list holds all the existing Profiles. They are alphabetically sorted. The "No upload" profile is always available and you can neither modify nor remove it. Select the "No Upload" profile if you do not want to upload a report.
- **Protocol**: Five different protocols are supported: FTP, FTP over SSL (Secure Socket Layer), Webdav, Webdav over SSL, and SSH (Secure Shell). You can either choose to select a protocol from the protocol drop-down list or fill in the scheme in the address part of the profile. Certificates that are sent by servers using secure traffic (FTP over SSL, Webdav over SSL, and SSH) are silently accepted. The scheme identifiers and default port numbers of the five supported protocols are listed in Table 19.

Table 19 -- Scheme Identifier and Default Port Numbers of Five Supported Protocols

	Protocol Name	Scheme	Default Port Number	Traffic Mode
1	ftp	ftp://	21	Plain text
2	webdav	http://	80	Plain text
3	ftp + ssl	ftps://	990	Encrypted & Secure
4	webdav + ssl	https://	443	Encrypted & Secure
5	ssh	ssh:// or sftp://	22	Encrypted & Secure

- **Address**: The Address field is the central part of a profile. Other fields, except the Password field, can be set by it. An Address contains five different parts: scheme, username, hostname, port (number), and (remote) path. Except hostname, every part is optional. Depending on the circumstances, you

might need to add a special port number and/or the remote path where you have write access. Even though an address is valid without the path part, most servers will require a path and will not let you write to the root directory. In every case, scheme and username parts will take precedence over the selection in the Protocol Field or the content in the Username field. The following is the basic pattern for the address field.

[scheme://][username@]hostname[:port][path]

- **scheme**: The supported schemes are ftp, ftps, http, https, ssh, or sftp. A scheme must be followed by "://".
- **username**: A username is needed for user authentication. It must be followed by "**@**".
- **hostname**: Must be either an IP address (for example, 10.1.1.195) or a human readable URL (for example, www.ftpserver.com), and a valid address.
- **port**: A port number where the server is listed. It is only necessary if the port number is different from the default port for well-known services. It must be preceded by "**:**".
- **path**: A remote location where the report will be saved. Paths are Unix style paths and therefore use "*/*" (forward-slash) as a delimiter. This is optional.

Examples of valid addresses:

- 10.1.1.195 (hostname only)
- 10.1.1.195/companyDav (hostname and path)
- 10.1.1.195:80/companyDav (hostname, port number, and path)
- ftp://www.ftpserver.com (scheme and hostname)
- john@10.1.1.195 (username and hostname)
- john@www.ftpserver.com/users/john/reports (username, hostname, and path)
- ssh://john@10.1.2.35:22/reports (all parts)

- **User Name**: This field specifies a username that will be used for authentication. If the address contains a username part, the content of the Username field will be ignored. It will be either filled in or overwritten with the username from the Address. A Profile with an empty username field is valid, but you will be prompted for a username and password every time you upload to the server using this profile.
- **Password**: A profile with a password must always be accompanied by a username. A Profile with a password but without a username is invalid and therefore cannot be saved. The password field uses an '*' to represent a character in a password. Saving a profile with a password will save the password in an encrypted form. For example, if the password is 'test', it will be encrypted to '0013BCA5590DE'. A Profile with an empty password field is valid, but you will be prompted for a password every time you upload a report to the server in this profile.

6.8.2.2 Upload Problems

There are three main problems that can arise when uploading a report to a remote location.

(i) The server that you are trying to connect is not responding, or the valid address you have entered in the Profile is not the address of the server that responds to your request (Figure 146).

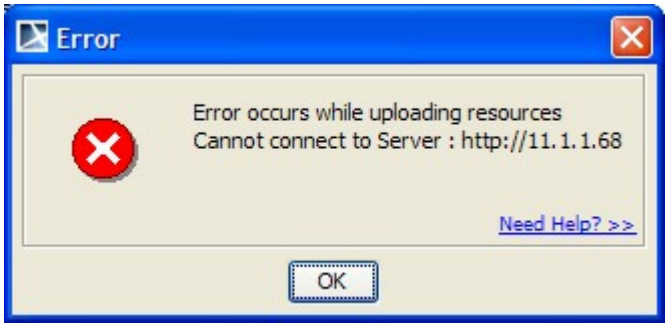


Figure 146 -- Connection Error Message Dialog

(ii) Your username and/or password are incorrect, and the server does not allow you to proceed (Figure 147).

Figure 147 -- Authentication Error Message Box Dialog

(iii) Various causes can lead to an unsuccessful attempt to upload a report. For example, the server runs out of space and thus cannot save the report, or the connection could have been interrupted. Whatever the cause might be, the report HAS NOT BEEN transmitted successfully (Figure 148). For more details on error messages, see MagicDraw logs.

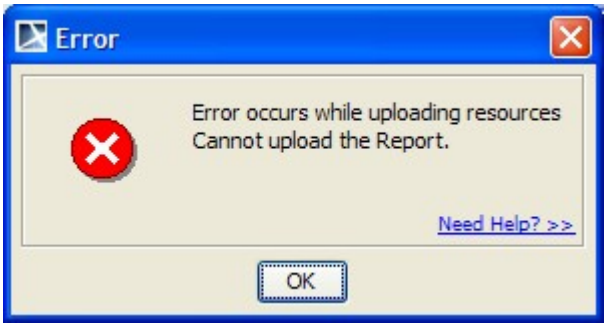


Figure 148 -- Unsuccessful Upload Error Message Dialog

6.9 Adding Variables into an Output Report Filename

You can use the following variables and include them in an output report filename.

- Date variable
- Template variable
- Random number
- Project attribute

6.9.1 Date Variable

A date variable is a variable for the current date and time. (See section 4.12 $date above).

The date variable consists of:

- A date variable with the default format.
- A date variable with a customized date format.

6.9.1.1 Date Variables with Default Format

Using a date variable without an attribute causes it to format the current date and time into a default format.

The syntax: `${date}`

For example:

```
C:\OutputReport\index_${date}.html
```

The output report filename would be “index_2011-12-21 11.55.44.html”.

6.9.1.2 Date Variable with Custom Format

Using a date variable with an attribute causes it to format the current date and time into a specific format.

The syntax: `${date.get('format')} or ${date.get("format")}`

For example:

```
C:\OutputReport\index_${date.get('yyyyMMdd-hhmmss')}.html
```

The output filename would be “index_20111221-115544.html”.

6.9.2 Template Variable

A template variable is a variable for a template that is created in Report Wizard. It allows you to add all template variables into an output report filename (see 1.1.2.2.4 Including Variables in a Template).

6.9.2.1 Including Template Variables in an Output Report Filename

When you include template variables created in an output report filename, the output filename which consists of the variables will be converted into value. This section uses the following template variables as examples (Figure 149).

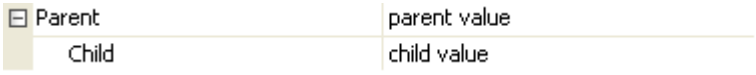


Figure 149 -- Sample of Report Variables

6.9.2.2 Adding a Value of a Top-level Variable

You can retrieve a top-level variable in an output report filename by using the following syntax.

The syntax: `${Parent}`

For example:

```
C:\OutputReport\index_${Parent}.html
```

The report output filename would be “index_parent value.html”.

6.9.2.3 Adding a Value of a Child Variable

You can retrieve any of the following child variable values in an output report filename.

1. Getting a child variable at an index position:

   The syntax: `${Parent.get(0)}`
2. Getting a child variable by child names:

   The syntax: `${Parent.get('Child')} or ${Parent.get("Child")}`
3. Getting a child value by referencing its name (in this case “Child”):

   The syntax: `${Parent.Child}`

For example:

```
C:\OutputReport\index_${Parent.get('Child')}.html
```

The output report filename would be “index_child value.html”.

6.9.3 Random Number

Report Wizard supports only pseudorandom numbers in an output report filename.

The random number consists of:

- A random number with the default distributed int value.
- A random number with a distributed int value between 0 (inclusive) and specified value (exclusive).

6.9.3.1 Random Number with the Default Distributed Integer Value

You can use Report Wizard to generate pseudorandom numbers with the default distributed integer value.

The syntax: `${random}`

For example:

```
C:\OutputReport\index_${random}.html
```

The output report filename would be “index_21547.html”.

6.9.3.2 Random number with a distributed integer value between 0 (inclusive) and specified value (exclusive)

You can use Report Wizard to generate pseudorandom numbers with the default distributed integer value between 0 and a specific value.

The syntax: `${random.nextInt(n)}`

The Parameters:

“n” - the bound on the random number to be returned. The “n” value must be a positive integer.

For example:

```
C:\OutputReport\index_${random.nextInt(1000)}.html
```

The output report filename would be “index_457.html”.

6.9.4 Project Attribute

You can add a project attribute or information about a project into an output report filename.

The project attribute consists of:

- Project name
- Teamwork version

6.9.4.1 Project Name

You can retrieve the name of a project by using the following syntax.

The syntax: `${project.name}`

For example:

```
C:\OutputReport\index_${project.name}.html
```

The output report filename would be “index_myProject.html”.

6.9.4.2 Teamwork version

You can retrieve a teamwork version of a project by using the following syntax.

The syntax: `${project.version}`

For example:

```
C:\OutputReport\index_${project.version}.html
```

The output report filename would be “index_1234.html”.

6.9.5 Exception Flow

You may accidentally specify an invalid output report filename such as:

- An invalid syntax variable.
- A variable that does not exist in a template variable.
- An invalid parameter.

If this happens, Report Wizard will use this variable as a filename and a warning message will open in a Magic-Draw log file (\.magicdraw\version\md.log).

For example:

```
C:\OutputReport\index_${date.get('yyyyMMdd-hhmmss)}.html
```

A single quote after “yyyyMMdd-hhmmss” was missing. Therefore, the output filename would be “index_${date.get('yyyyMMdd-hhmmss)}.html” and a warning message would open in MagicDraw (Figure 150).

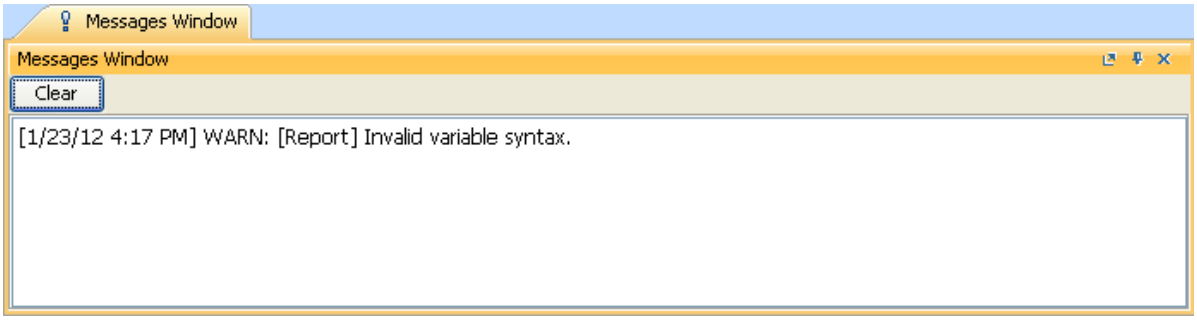


Figure 150 -- A Warning Message of an Invalid Variable Syntax

For example:

```
C:\OutputReport\index_${Parent}.html
```

"`${Parent}`" was not in the report template variable. Therefore, the output filename would be "`index_${Parent}.html`" and a warning message would open in MagicDraw (Figure 151).

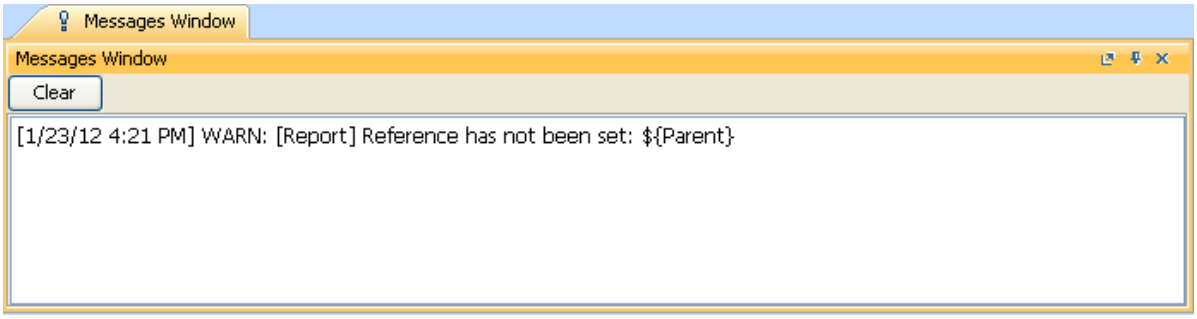


Figure 151 -- A Warning Message of a Variable that Does not Exist in a Template Variable

For example:

```
C:\OutputReport\index_${date.get('yyyy-MM-dd qq')}.html
```

In this example, '`yyyy-MM-dd qq`' is an invalid parameter. Therefore, output filename would be "`index_${date.get('yyyy-MM-dd qq').html`" and a warning message would open in MagicDraw (Figure 152).

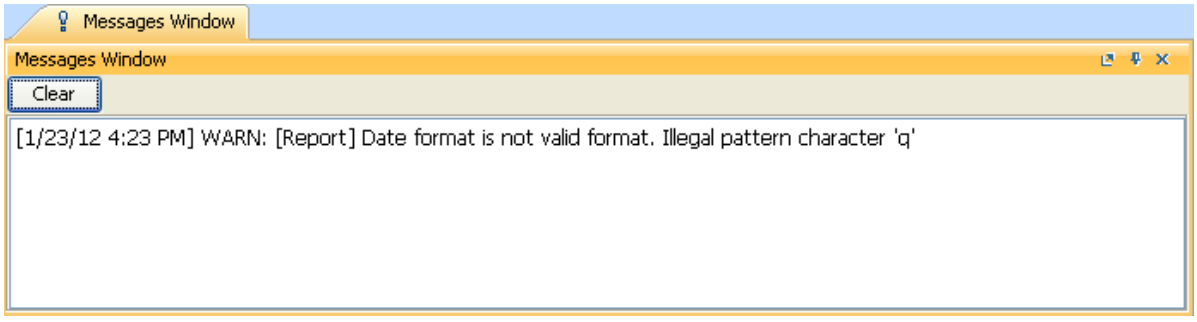
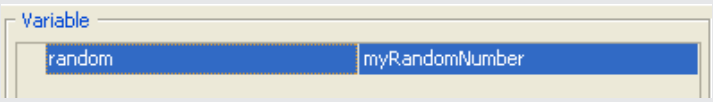


Figure 152 -- A Warning Message of an Invalid Parameter

NOTE	• All variables should be able to be combined together. For example:
	`C:\OutputReport\index_${project.name}_${date}.html`
	
	The output filename would be "`index_myProject_2011-12-21 11.55.44.html`".
	
	• The template variable is the highest priority of all other variables. For example:
	`C:\OutputReport\index_${random}.html`
	
	If you specify a template variable whose name is at random in the Report Data, the variable value will be used as the filename.
	
	 
	Figure 153 -- Template Variable Name at Random
	
	The output filename would be "`index_myRandomNumber.html`".
	If you do not specify a template variable whose name is at random in the Report Data, the random number with the default distributed integer value will be used as the filename.
	The output filename would be "`index_12345.html`".

6.10 FAQs

To generate an output report document from Report Wizard:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select the template or create a new one. Click **Next**.
3. Specify **Report Data** and add information for the variables. Click **Next**.
4. Select the document scope from the corresponding packages. Click **Next**.
5. Select the output location, images format, and text for blank fields.
6. Click **Generate**.

To add a new report template:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Click **New**. The **New** dialog will open.
3. Enter the template name and description. Click the "**...**" button to specify the template file location.
4. Click **Create**.

NOTE	Once a new template has been created, **Report Wizard** will add a folder with the entered template name and save the selected template in this folder.

To remove a template:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template from the list and click **Delete**.

NOTE	Once removed, the selected template with its folder and reports cannot be recovered.

To modify a template file:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template from the list and click **Open**. The default editor and a template file for editing will open.
3. Modify the template and perform the save command in the editor.

NOTE	A different editor will be used for each template format. For example, MS Word could be used for **.rtf* template modification, or Macromedia Dreamweaver could be used for **.html* template editing.

To add a Report Data into the template:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template or create a new one. Click **Next**. The **Select Report Data** pane will appear.
3. Click **New**. The **New** dialog will appear.
4. Enter the Report Data name and description. Click **Create**. A new Report Data will be created. In the next step, you may add new fields or delete the existing ones.

To remove Report Data from the template:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template or create a new one. Click **Next**. The **Select Report Data** pane will appear.
3. Select the Report Data from the list and click **Delete**.

To set the default viewer option for the report file:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template and Report Data and specify the variables and package scope. Click the **Next** button to proceed.
3. At the last wizard step, select the **Display in viewer after generating report** check box. The report output will be displayed in the default editor or browser.

To change an output image format:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template and Report Data and specify the variables and package scope. Click the **Next** button to proceed.
3. At the last wizard step, select the output image format from the **Report Image Format** box.

NOTE	The supported image formats include: • ***.PNG** and ***.JPG**: for all supported report templates. • ***.SVG**: for HTML, XML and Text report templates. • ***.EMF** and ***.WMF**: for RTF, OOXML and Text report templates.

To change an empty value configuration:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template and Report Data and specify the variables and package scope each time.Click the **Next** button to proceed.
3. At the last wizard step, select an option for output on blank fields:
   - Select **Display empty value** or **Display value as**, and select **NA** or
   - Enter the text to represent other than null value when the template query fields return empty.

To add a new variable:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template and Report Data. Click the **Next** button to proceed.
3. Click the **New** button when the **Variable** pane opens. The **Variables** dialog will open.
4. Enter the name of a new variable and its value (the value can be modified later after the variable has been created).
5. Click **Create**.

To delete a variable:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template and Report Data. Click the **Next** button to proceed.
3. Select a field and click **Delete** when the **Variable** step opens.

NOTE	You cannot recover any deleted Report Data.

To modify a variable:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template and Report Data. Click the **Next** button to proceed with the steps.
3. Select a field and modify its value when the **Variable** step opens. The value can be modified in the properties list or in the **Field Value** box below the properties list.

To select a package for report generation:

1. On the **Tools** menu, click **Report Wizard**. The **Report Wizard** dialog will open.
2. Select a template and Report Data and specify the variables. Click the **Next** button to proceed.
3. The package tree will open. Select the package of the project and click the **Add** button to add the elements from the package to the report.

NOTE	Clicking the **Add** button will add only the selected element, not its children, to the report scope. In order to include all children, click the **Add Recursively** button instead.

To generate a normal text output format:

1. Create the MagicDraw query in the text file using the text editor (Figure 154).

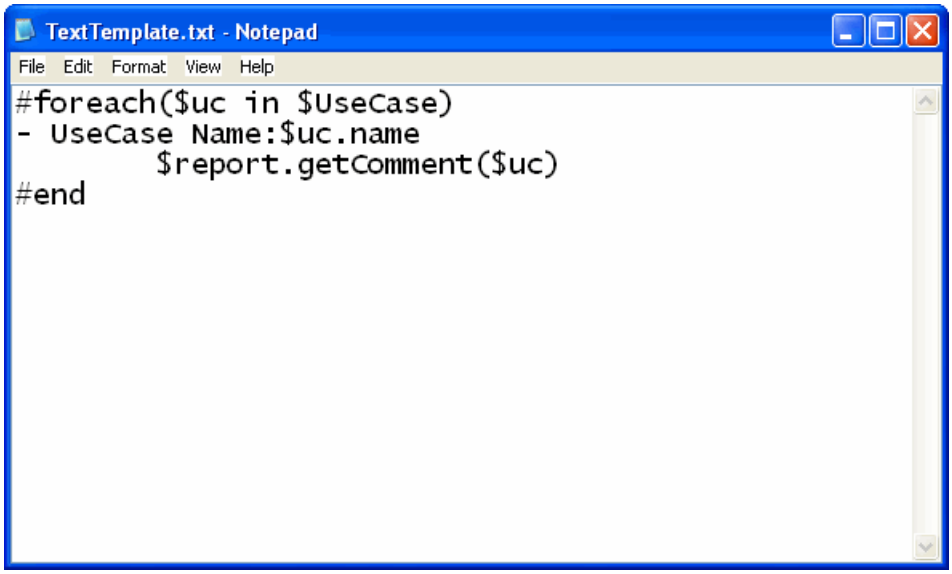


Figure 154 -- Entering Query in the Normal Text Template

2. Create a new template in the **Report Wizard** dialog through the **New Template** dialog (Figure 155).

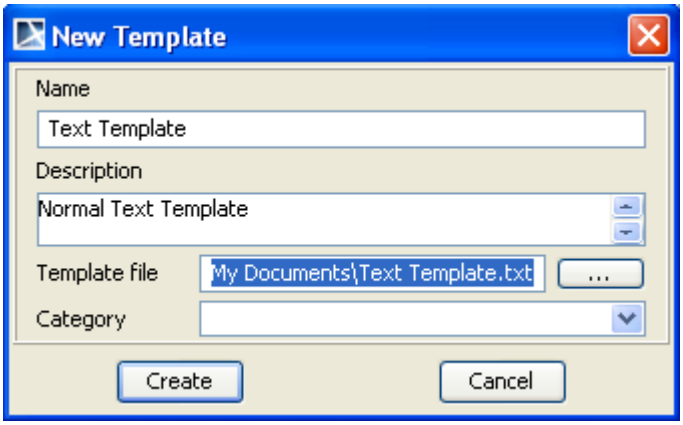


Figure 155 -- Creating New Text Template

3. Select **Text Template** (Figure 156) and generate the output report (Figure 157).

.

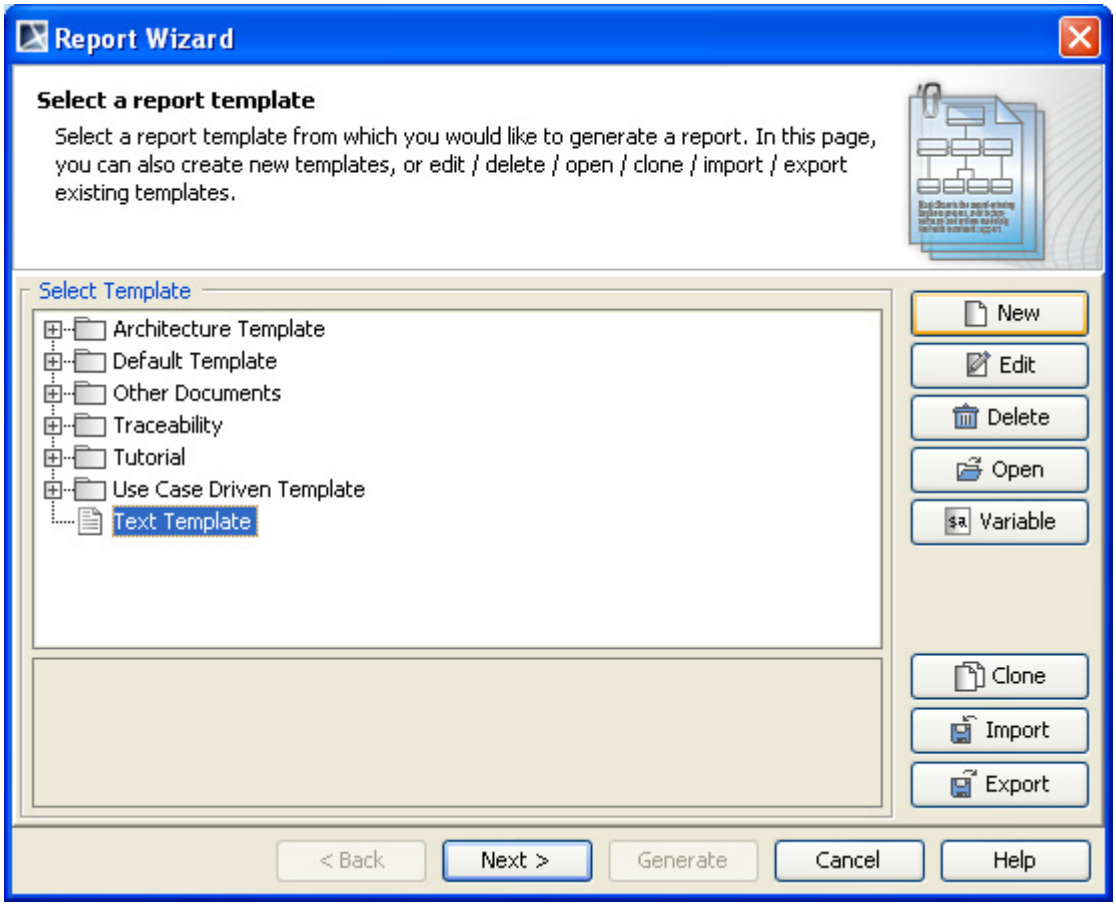


Figure 156 -- Selecting Text Template to Generate Report Output

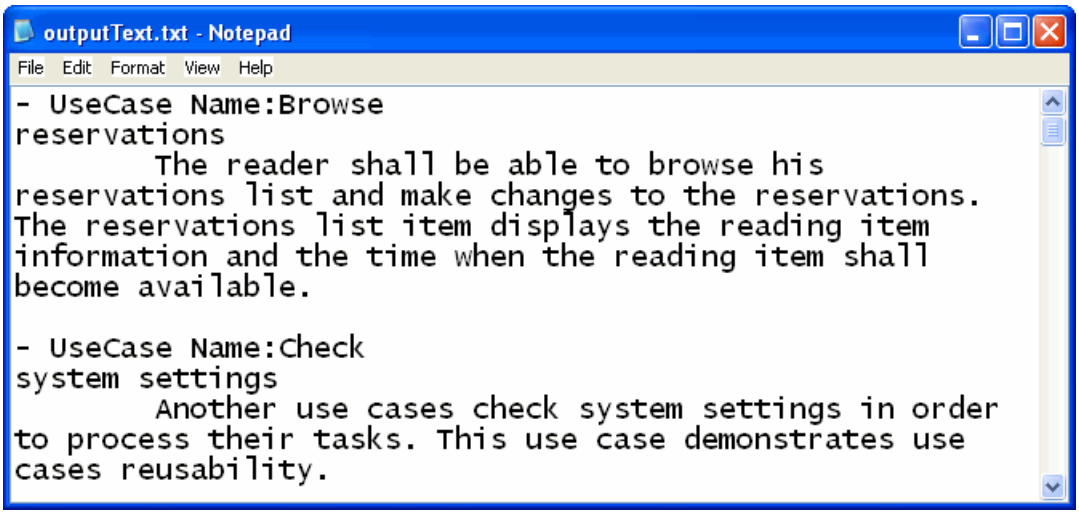


Figure 157 -- Text Output Report

7. Generating Reports from the Containment Tree

You can generate reports directly from the Containment tree in MagicDraw.

To generate reports from the Containment tree:

1. Either:

   Right-click a package in the Containment tree to open the shortcut menu, as displayed in Figure 158. Select **Generate Report...**, and then select a template from the category list or template item.

   or

   Right-click a Report Data in the Containment tree to open the shortcut menu, as displayed in Figure 159. Select **Quick Generate Report...**.

NOTE	You must specify the template and data in the Report Data before using the **Quick Generate Report...** shortcut menu.

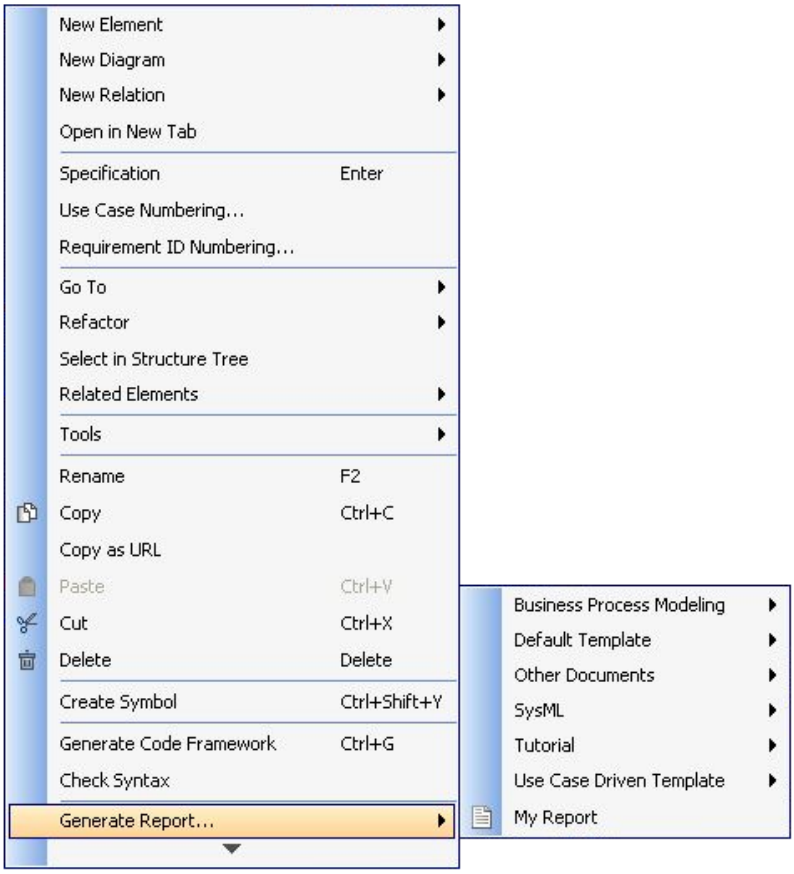


Figure 158 -- Containment Tree Shortcut Menu - Generate Report

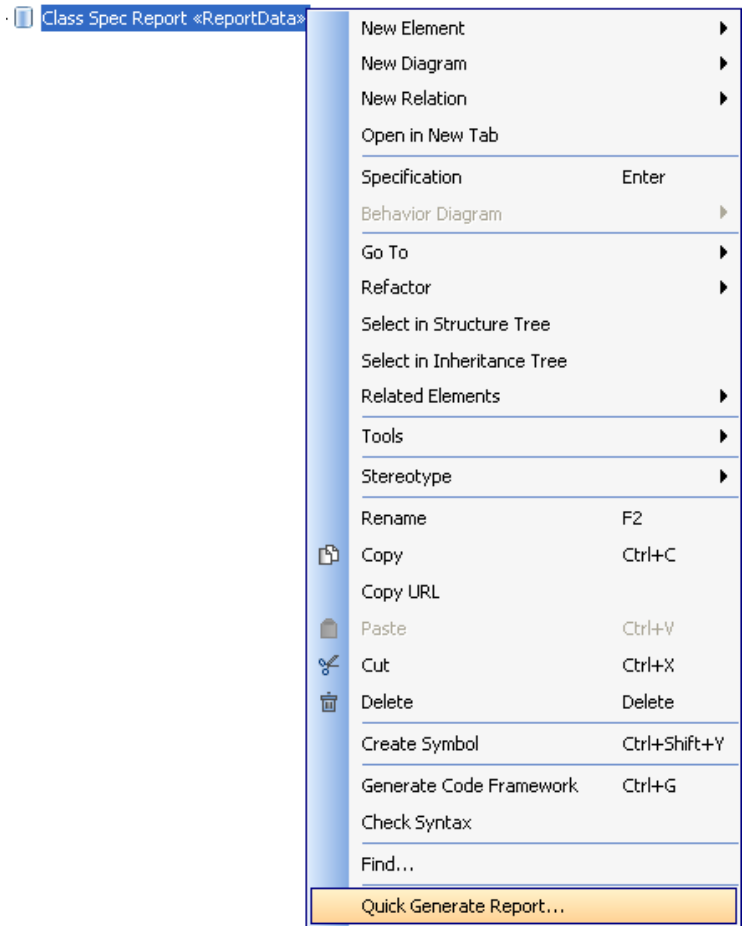


Figure 159 -- Containment Tree Shortcut Menu - Quick Generate Report

2. Select the save location and type the filename.
3. A dialog will open, asking if you want to open the report in the default viewer after the report generating process is complete (Figure 160).

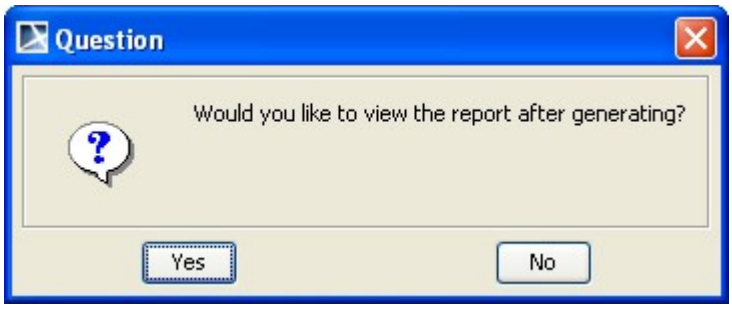


Figure 160 -- Question Dialog - View Generated Report

NOTE	• To open the **Report Wizard** dialog and modify the data or output properties, click the **Report Wizard...** on the shortcut menu. • By default, the quick generate report command will select the default settings from the last changes saved to the Report Data.

8. Generating Reports from the Command Line

To generate reports and schedule report printing, type the command in the terminal. This feature allows you to generate reports without opening the MagicDraw application and using Report Wizard.

8.1 Generate - the Command to Generate Reports

To generate a report from the package scope:

- **generate** - `project` *`projectFileName`* `-output` *`outputFileName`* `-template` *`templateName`* `-package` *`packageNameList`*

To generate a report from the element scope:

- **generate** `-project` *`projectFileName`* `-output` *`outputFileName`* `-template` *`templateName`* `-element` *`elementNameList`*

To generate a report from the option specified in the properties file:

- **generate** `-properties` *`propertiesFileName`*

To generate a Teamwork password for a properties file:

- **generate** `-generatepassword` *`password`*

Description

The Generate command creates a report document with a received set of information from arguments and parameters. The information will then be generated as a report document to the specified output file. By default, an argument is the specified data of the parameters that are invoked. If the `-properties` option is specified, the argument is the name of a properties file. A properties file contains other parameters with the specified data of each parameter.

Synopsis

- `-project` *`projectFileName`*

  This command specifies a filename with the MagicDraw project path.

- `-output` *`outputFileName`*

  This command specifies a filename with the output file path.

- `-template` *`templateName`*

  This command specifies a template name to be used for generating a report document. The template must exist in MagicDraw prior to using this command, otherwise an error will occur. If the template name is not specified, the template specified in the Report Data (specified in **-report** `reportName`) will be used instead.

- `-package` *`packageNameList`*

  This command specifies the name of one or more packages from a MagicDraw project that will be included in the report. Package entries must be separated by a semicolon (;).

- `-element` *`elementNameList`*

  This command specifies the name of one or more elements from a MagicDraw project that will be included in the report. Element entries must be separated by a semicolon (;).

- `[options]`

  The command-line options.

- `-properties` *`propertiesFileName`*

  This command specifies the name of a properties file to utilize. Use only with `-properties`.

- `-generatepassword` *`password`*

  This command generates an encrypted password to be used with a properties file.

Options

The command line feature supports a set of options that are useful in adding more configuration possibilities.

- **`-report`** `reportName`

  This command specifies the name of a Report Data file or Report Data element. The Report Data file must exist in MagicDraw prior to using this command, otherwise an error will occur. If the `reportName` is not specified, the previous Report Data will be set and used instead.

- **`-autoImage`** `0|1|2|3`

  This command specifies how an image will be shown in a report document. The default value for this argument is 1.

  0 – No resize.

  1 – Fit image to paper (large only).

  2 – Fit and rotate image (clockwise) to paper (large only).

  3 – Fit and rotate image (counter-clockwise) to paper (large only)

- **`-imageFormat`** `jpg|png|svg|emf|wmf`

  This command specifies an image format in a report document. The default value for this argument is jpg.

  jpg – Joint Photographic Expert Group

  png – Portable Network Graphics

  svg – Scaling Vector Image

  emf – Microsoft Windows Enhanced Metafile

  wmf – Windows Metafile

- **`-recursive`** `true|false`

  This command specifies how to select a package in a MagicDraw project. The default value for this argument is true.

  true – select the specified package and its recursive package.

  false – select only the specified package.

- **`-includeAuxiliary`** `true|false`

  This command is used to select packages including auxiliary packages. The default value is false.

- **`-outputOnBlankField`** `stringValue`

  This command will show a string value in a blank field in a report document. The default value for this argument is “”.

- **`-category`** `categoryName`

  This command specifies a template category.

- **`-fields`**`[name=value]`

  This command specifies a variable.

- **`-server`** `serverName|IPAddress`

  This command specifies the name or IP Address of a Teamwork Server project.

- **-login** loginName

  This command specifies a login name to log onto Teamwork Server.

- **-password** password

  This command specifies a password to log on to Teamwork Server.

- **-spassword** encryptedPassword

  This command specifies an encrypted password (Teamwork password) to log onto Teamwork Server. This option is available only in a properties file.

- **-upload** serverAddress

  This command specifies serverAddress consisting of a scheme, userInfo, host, port, and path to connect and upload a generated report to a server (see 8.1.2.3 Upload generated report to server).

- **-overwrite** true|false

  This command overwrites any previously generated files. The default value for this argument is true.

  true – overwrites all files automatically (removes any existing file before generating a report.)

  false – If the file exists, the following prompt message will open:

```
Output file already exists.
Would you like to replace the existing file? [y][n]:
```

  If you type 'y' or 'yes', Report Wizard will generate a new report and use it to replace the previous one. If you type 'n' or 'no', Report Wizard will generate no report and terminate the process.

- **-pversion** projectVersion

  This command specifies a Teamwork project version.

Using Command Line

You can use the command line on Windows, Linux, or Unix.

To use the command line on Windows:

1. Run a command line console. In the Console window, go to the local installation of the MagicDraw application.
2. Go to the **plugins\com.nomagic.magicdraw.reportwizard** folder and type the command line there.

To use the command line on Linux or Unix:

1. Run a terminal (command line console). In the Console window, go to the local installation of the MagicDraw application.
2. Go to the **plugins\com.nomagic.magicdraw.reportwizard** folder and type the command line there.

See the following examples of command line on Windows and Linux or Unix respectively.

```
generate -properties "C:\\output\\prop.properties"
```

```
generate -project "C:\\MagicDraw\\samples\\diagrams\\class
diagram.mdzip" -output "C:\\output\\output.rtf" -template "Class
Specification Report" -package "Data" -report "Built-in" -
autoImage 1 -imageFormat png -recursive false -
outputOnBlankField "#NA"
```

Figure 161 -- Samples of Command Line

```
./generate.sh -project "/home/project/project.mdzip" -output
"/home/output/output.rtf" -template "Class Specification Report"
-package "Data" -report "Built-in" -autoImage 1 -imageFormat png
-recursive false -outputOnBlankField "#NA"
```

Figure 162 -- Samples of Command Line on Linux or Unix

8.2 Generating a Report from Teamwork Server

The available command arguments include:

- `-server`, `-login`, and `-password` are key arguments to log on to Teamwork Server. You will be prompted for a password when trying to enter `-server` and `-login` without `-password`.
- If `-spassword` is used with a properties file, an encrypted password must be used for this property.
- `-pversion` is a key argument to specify a Teamwork project version. You can specify a project version after `-pversion`. If either you do not specify any version or the version you specify does not match any version in Teamwork Server, Report Wizard will generate the latest project version.
- You can specify a project name and its branch after `-project`. For example:

```
"MyProject"                    --> This means generating MyProject
                                   without specifying its branch.

"MyProject##release"           --> This means generating MyProject
                                   from the branch ["release"].

"MyProject##release##sp1"      --> This means generating MyProject
                                   from the branch and sub-branch
                                   ["release", "sp1"].
```

See the following for more examples of how to generate a project from a specific branch and/or a specific version.

Example 1: Generating a project without specifying its branch.

```
generate -project "MyProject" -template "Web Publisher
2.0" -output "D:\output\output.html"  -package "Data" -
server "localhost" -login "Administrator" -password
"Administrator"
```

Example 2: Generating a project from the branch release.

```
generate -project "MyProject##release" -template "Web
Publisher 2.0" -output "D:\output\output.html"  -package
"Data" -server "localhost" -login "Administrator" -
password "Administrator"
```

Example 3: Generating a specific version of a project without specifying its branch.

```
generate -project "MyProject" -pversion "2" -template
"Web Publisher 2.0" -output "D:\output\output.html"  -
package "Data" -server "localhost" -login
"Administrator" -password "Administrator"
```

Example 4: Generating a specific version of a project from the branch release.

```
generate -project "MyProject##release" -pversion "2" -
template "Web Publisher 2.0" -output
"D:\output\output.html"  -package "Data" -server
"localhost" -login "Administrator" -password
"Administrator"
```

8.3 Properties Filename

When you use `-properties`, the other command actions are not necessary anymore because the configuration information is contained in the properties file. The information in the properties file is the same as used in the command line.

There are four parameters needed to specify data for a report: (i) project, (ii) output, (iii) template, and (iv) package. There are also other five parameters called options, which are additional configuration information such as report, autoImage, imageFormat, recursive, and outputOnBlankField. These nine parameters are described in the previous sections **8.1 Generate - the Command to Generate Reports**.

A properties file is a simple text file. You can create and maintain a properties file with any text editors. See Figure 163 for an example.

```
#---- main argument ----#
project = C:\\MagicDraw\\samples\\diagrams\\class diagram.mdzip
output = C:\\output\\output.rtf
template = Class Specification Report
package = java;Library System;magiclibrary;objects

#---- optional ----#
report = Built-in
autoImage = 1
imageFormat = png
recursive = false
outputOnBlankField = #NA
```

Figure 163 -- Sample of Properties File

In Figure 163, the command lines begin with a pound sign (`#`). The other lines contain key-value pairs. The key is on the left side of the equal sign, and the value is on the right. For instance, `template` is the key that corresponds to the value of `Class Specification Report`.

The string that represents the key and value in the properties file has a special character. The special character is an escape character and needs to be used to prevent interpretation errors. Each escape character starts with a backslash.

Table 20 -- Available Character Sequences

Escape Sequence	Character
\n	new line
\t	tab
\b	backspace
\f	form feed
\r	return
\"	" (double quote)
\'	' (single quote)
\\	\ (backslash)
\uDDDD	character from the Unicode character set (DDDD is four hex digits)

8.3.1 XML Properties File

J2SE version 1.5 and Report Wizard version 15.5 allow you to use XML files to load and save key-value pairs.

Properties DTD:

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- DTD for properties -->
<!ELEMENT properties ( comment?, entry* ) >
<!ATTLIST properties version CDATA #FIXED "1.0">
<!ELEMENT comment (#PCDATA) >
<!ELEMENT entry (#PCDATA) >
<!ATTLIST entry key CDATA #REQUIRED>
```

For example:

```
<?xml  version = "1.0" encoding = "UTF-8"?>
<!DOCTYPE properties SYSTEM
"http://java.sun.com/dtd/properties.dtd">
<properties>
     <entry key = "project">C:\MagicDraw\samples\diagrams\class
diagram.mdzip</entry>
     <entry key = "output">C:\\output\\output.rtf</entry>
     <entry key = "template">Class Specification Report</entry>
     <entry key = "package">java;Library
System;magiclibrary;objects</entry>
</properties>
```

Figure 164 -- Sample of XML Property

8.4 Uploading Generated Reports to Servers

The available command arguments include:

- `-upload` is the key argument to upload a generated report to a server.

The following code (Figure 165) is the uploaded command syntax of the `-upload` value.

```
-upload
"{scheme}://[{userInfo}@]{host}[:{port}][/{path}][?{query}][#{fragment}]"
```

Figure 165 -- The Uploaded Command Syntax

where square brackets [...] are delineated as optional.

- **{scheme}**

  The {scheme} defines the namespace, purpose, and the syntax of the remaining part of a URL. This field is mandatory. A scheme must be followed by "://". The supported schemes are:

  - ftp
  - ftps
  - sftp
  - http
  - https

- **{userInfo}**

  The {userInfo} defines the username and password for authentication. The syntax is displayed in Figure 166.

```
{username}[:{password}]
```

Figure 166 -- The UserInfo Syntax

This optional password must be predicated by ":", and it can be an empty string. If the password is omitted, the command line will prompt for the password.

UserInfo must be followed by "@", and this field is optional.

NOTE	{username} and {password} should not contain special characters such as ":", "/", and "@" for they may cause an invalid result or error when the uploaded command is parsed.

- **{host}**

  The {host} defines a host name or an IP address that gives the destination location of a URL. This field is mandatory.

- **{port}**

  The {port} defines a port number where the server is listed. The port value has to be a value from 1 to 65535. It is necessary when the port number is different from the default port for well-known services. If the port is omitted, the default port will be used to connect to the server. Table 21 shows a port number for each scheme.

Table 21 -- Default Port Numbers for Schemes

Scheme	Port Number
ftp	21
ftps	990
sftp	22
http	80
https	443

The port must be preceded by ":". This field is optional.

- **{path}**

  The {path} defines a remote location where the report will be saved. Paths are Unix-style paths; therefore use “/” (forward-slash) as delimiters. This field is optional.

- **{query}**

  The {query} defines a query string that contains data to be passed to software running on the server. It may contain name or value pairs separated by ampersands.

- **{fragment}**

  The {fragment} defines a fragment identifier that, if present, specifies a part or a position within the overall resource or document.

NOTE	For this feature, the parser ignores query and fragment. Both fields are included in {path}.

The following are some examples of valid server addresses.

- ftp://magicreport:1234@10.1.2.4:25/report

Scheme	ftp
User name	magicreport
Password	1234
Host	10.1.2.4
Port	25
Path	report

- ftp://10.1.2.4:25/report

Scheme	ftp
Host	10.1.2.4
Port	25
Path	report

- ftp://10.1.2.4

Scheme	ftp
Host	10.1.2.4
Port	21 (Default port for ftp)

- ftp://magicreport@10.1.2.4:25/report

Scheme	ftp
User name	magicreport
Host	10.1.2.4
Port	25

Path	report

NOTE	The command line prompts for password.

- ftp://magicreport:@10.1.2.4:25/report

Scheme	ftp
User name	magicreport
Password	
Host	10.1.2.4
Port	25
Path	report

NOTE	The command line uses an empty password.

The following are some examples of invalid server addresses.

Invalid Server Address	Cause
10.1.2.4:25	The scheme is required.
Xx://10.1.2.4:25	The scheme is invalid.
ftp://magicreport@	The host is required.
ftp://@10.1.2.4:25	The username is required.

8.5 Syntax Rules

- Command parameters containing spaces must be enclosed in quotes, for example, "UML Standard Profile".
- Command parameters are case sensitive, except `project`, `imageFormat` and `recursive` which are not case-sensitive.
- Blank spaces (“ “) separate commands and parameters.
- To specify a package name that contains a semicolon (;), you can use a backslash (\). For example, the package name “com;nomagic” can be typed by using “`com\;nomagic`”. The backslash followed by a semicolon (\;) is not considered to be a character separator.
- For a parameter that contains unicode characters such as Thai, you can use the xml properties file to generate a report. The properties file does not support the unicode encoding.
- A field entry consists of a name-value pair. The name and value formats are specified by [name=value] pattern strings. A valid name must start with a letter (a-z or A-Z) and can be followed by any letter, digit, or underscore.
- You can specify a field name that consists of brackets ([ ]) by using backslashes (\ ). For example, "[author=NoMagic][Revision=[1.0]]" will be typed as "`[author=NoMagic][Revision=\[1.0\]]`".
- Either `-package` or `-element` can be used with the Generate command. For example, you can use `-package` without `-element`.
- `If -upload` is specified to the command line. Its value is validated and executed after a report has been generated.

9. Report Wizard Quick Print

Report Wizard provides 5 keyboard shortcuts to create a report, with last used options, from a recently-used template.

Table 22 -- The predefined keyboard shortcuts

Keyboard Shortcut	Quick Print Template
Alt + 1	Template name A
Alt + 2	Template name B
Alt + 3	Template name C
Alt + 4	Template name D
Alt + 5	Template name E

To change a keyboard shortcut:

1. On the main menu, click **Options** > **Environment** to open the **Environment Options** dialog.
2. Select **Category: Tools** in the **Keyboard** pane.
3. Press the **New** key and click **Assign**.
4. For more details, see the MagicDraw User Manual, Setting Environment Options.

To use Report Wizard Quick Print:

1. After a report has been generated, a new menu will appear below the **Report Wizard...** menu (Figure 167). The name of the new menu is the name of the recently generated template.

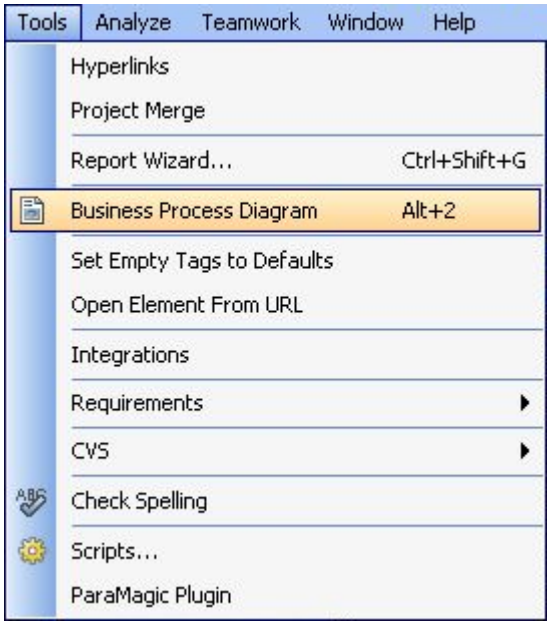


Figure 167 -- Newly-generated Report as a Quick Option in Main Menu

2. Either click this menu or press **Alt+1**, **Alt+2**, **Alt+3**, **Alt+4** or **Alt+5** to generate this template with the last used options.
3. Select the saved location and filename (Figure 168).

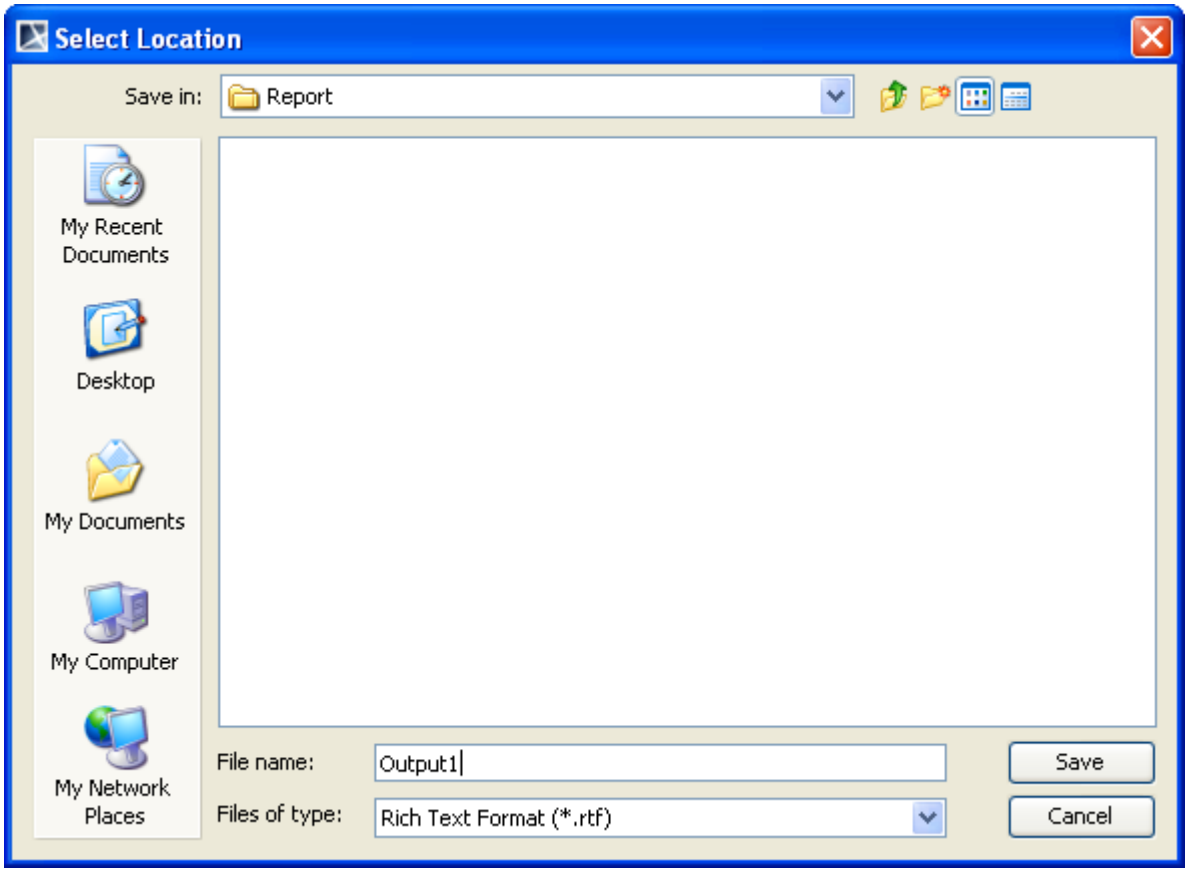


Figure 168 -- Select the Location to Save the Report

4. A message box will open, asking if you want to open the report in the default viewer once the generating process has completed (Figure 169).

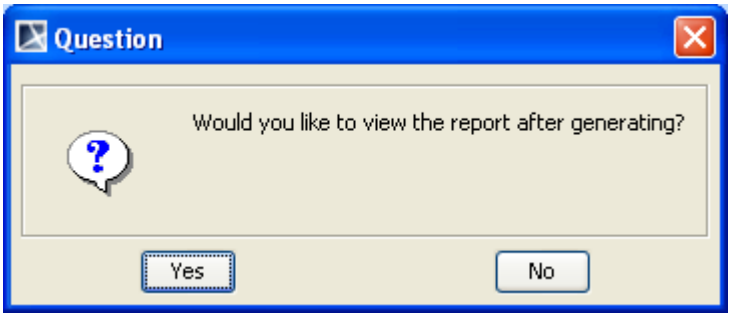


Figure 169 -- Question Dialog - View Report

5. The next time you generate a report, a new menu will create and map the keyboard shortcuts until the keyboard shortcuts list is fully filled. The number of keyboard shortcuts is limited to five.
6. If the keyboard shortcuts list is full and the new template has been generated, the keyboard shortcuts will be reused.

For example, Report Wizard Quick Print provides the following keyboard shortcuts:

Table 23 -- Sample of Report Wizard Quick Print Keyboard Shortcuts

Shortcut Key	Template Name
Alt + 1	Tutorial 01 – Print Element
Alt + 2	Tutorial 02 – Print Diagram
Alt + 3	Tutorial 03 – Print Project
Alt + 4	Tutorial 04 – Print Report Data
Alt + 5	Tutorial 05 – Macro

Table 23 shows that the **Tutorial 01 – Print Element** keyboard shortcut is the most outdated template and the following report has been completed using the *Business Process Diagram* template. Report Wizard Quick Print will reuse the keyboard shortcut of the most outdated template.

Table 24 -- Reusing Keyboard Shortcuts

Shortcut Key	Template Name
Alt + 1	Business Process Diagram
Alt + 2	Tutorial 02 – Print Diagram
Alt + 3	Tutorial 03 – Print Project
Alt + 4	Tutorial 04 – Print Report Data
Alt + 5	Tutorial 05 – Macro

If the next template to be generated has already been in the Quick Print list, the list will not change.

10. Report Wizard Environment Options

The Report Wizard environment options in the MagicDraw Environment Options dialog allow you to configure the report engine. There are three things that you can configure: (i) Report engine properties, (ii) Template mappings, and (iii) Template folder.

(i) Report Engine Properties

Report Engine Properties can be configured as follows:

a. Template process size (int). This value defines the size of allocated memory for processing a template. If the template is larger than the allocated size, the engine will create temporary files on a local disk and process the template from these files.

b. Template pool size (int). This value defines the number of processing threads for evaluating a template. An increase in the number of threads may improve the performance of the engine, which will also depend on your hardware and JVM.

c. Velocity properties. These properties are a key-value pair. You can add any number for these properties. You will need a basic knowledge of Velocity to enter the value. (See http://velocity.apache.org/engine/devel/apidocs/org/apache/velocity/runtime/RuntimeConstants.html)

d. Debug report template. You can configure this value to enable or disable any invalid properties, references, or exception messages on the message window of MagicDraw. See 11 Debug Report Template for more details.

(ii) Template Mapping

Template mappings associate a template type with the template engine. The Report engine allows you to determine how to handle different types of files, such as JS or DOCBOOK files. All you have to do is specify a filename extension and select an engine name. The Report engine also allows developers to add a user custom engine to this option.

(iii) Template Folder

You can either select or clear the **Monitor template folder** check box (Figure 170) in the Report Wizard environment options in the MagicDraw Environments Options dialog to enable or disable the option to deploy an MRZIP template file. If you select the check box, Report Wizard will automatically deploy the MRZIP template file to the Report Wizard dialog whenever the file is added to your folder.

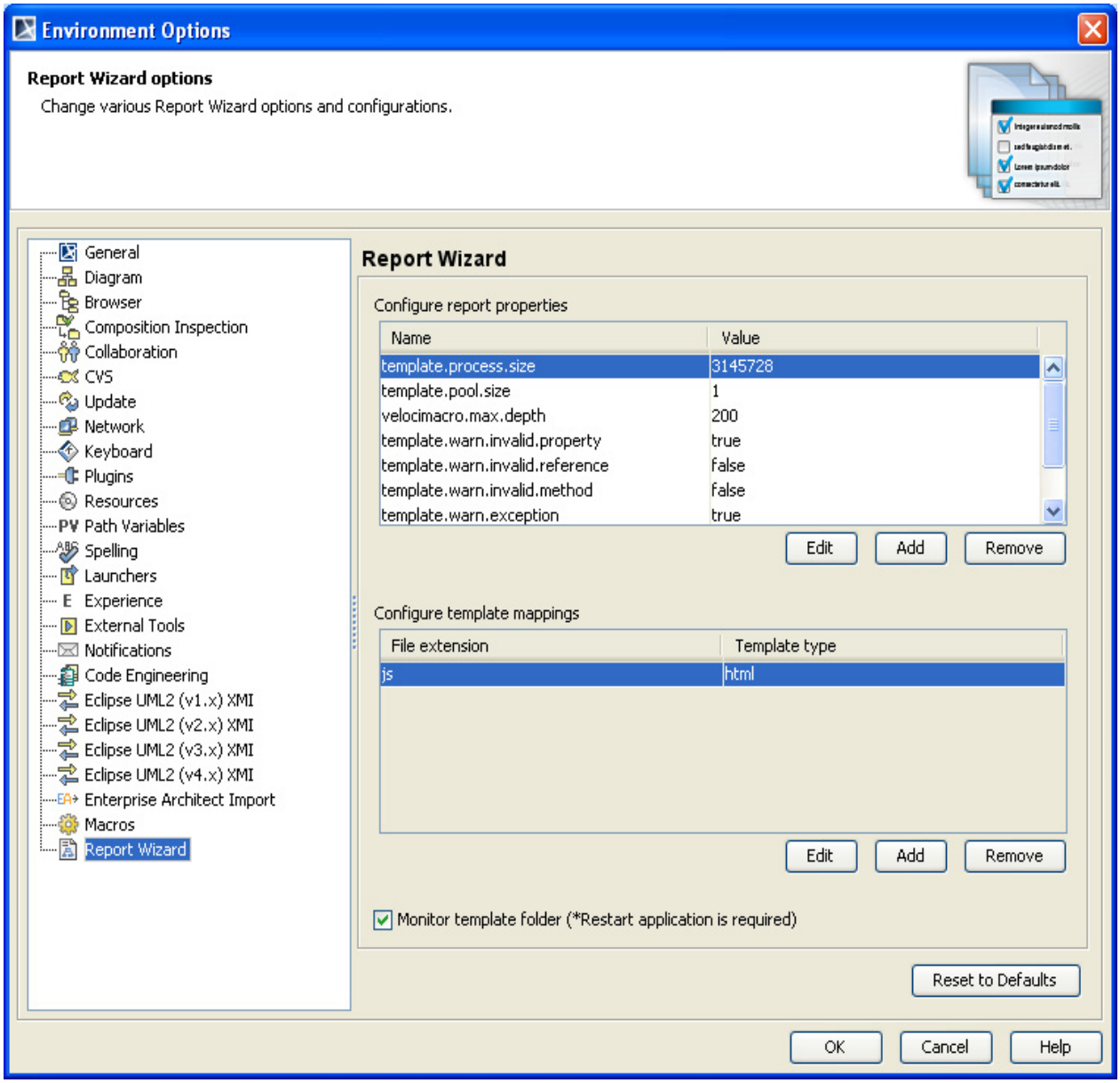


Figure 170 -- Report Wizard GUI Configuration in MagicDraw Environment Options Dialog

10.1 Configuring Report Engine Properties

Figure 171 shows the **Configure report properties** pane.

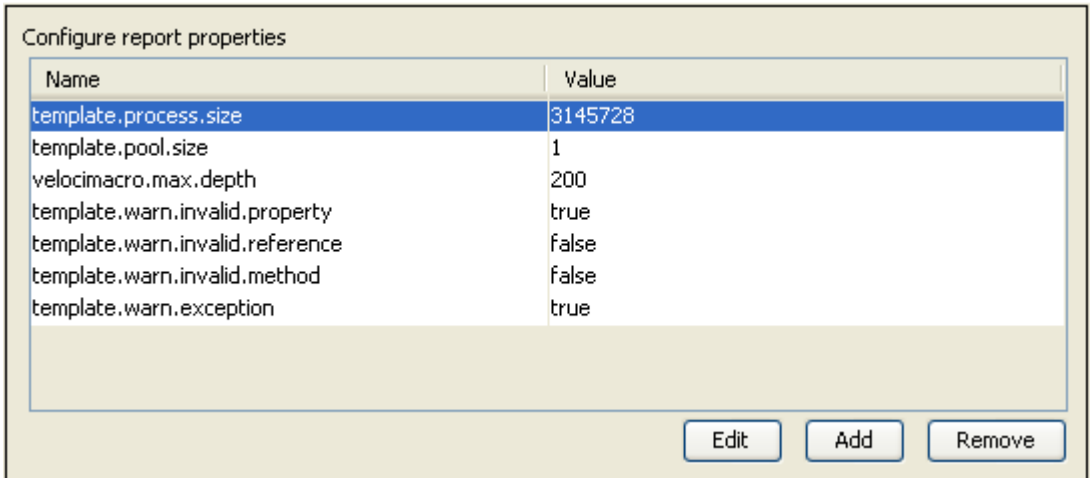


Figure 171 -- Configure Report Properties Pane

This pane contains 3 buttons: (i) Add, (ii) Edit, and (iii) Remove.

(i) Add

To create a new report property:

1. Click the **Add** button in the **Configure Report Properties** pane. The **Report properties** dialog will open (Figure 172).

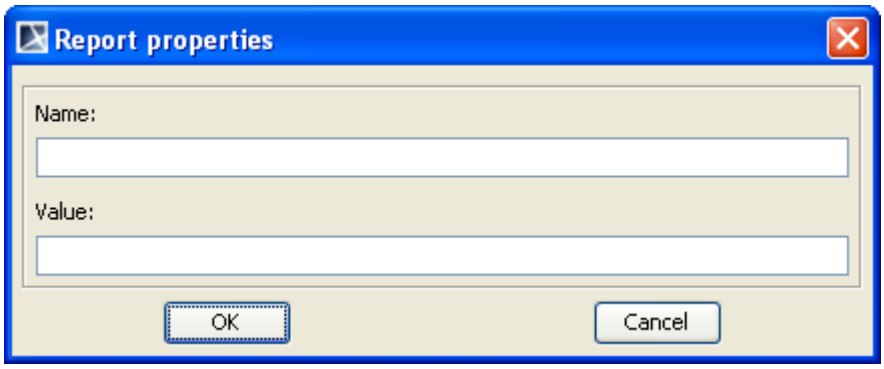


Figure 172 -- Creating a New Report Property in the Report Properties Dialog

2. Enter the property name and value.

Table 25 -- Report Engine Properties Dialog Fields

Field Name	Function	Default Value	Possible Value	Required
Name	To enter the property name	Blank	Text	Yes
Value	To enter the property value	Blank	Text	No

(ii) Edit

To edit a report engine property:

1. Select a property in the **Configure Report Properties** pane and click the **Edit** button. The **Report properties** dialog will appear (Figure 173).

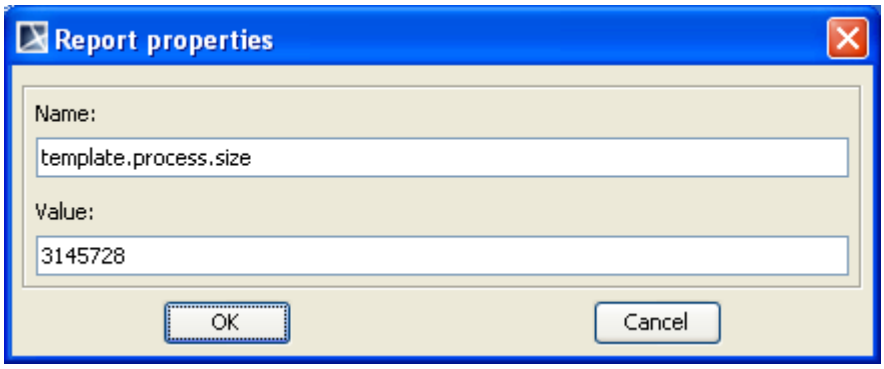


Figure 173 -- Editing a Report Property in the Report Properties Dialog

2. Edit the property name and value. (See Table 25 Report Engine Properties Dialog Fields.)

(iii) Remove

To delete a report property:

1. Select a property in the **Configure Report Properties** pane and click the **Remove** button.

10.2 Configuring Template Mappings

Figure 174 shows the **Configure Template Mappings** pane.

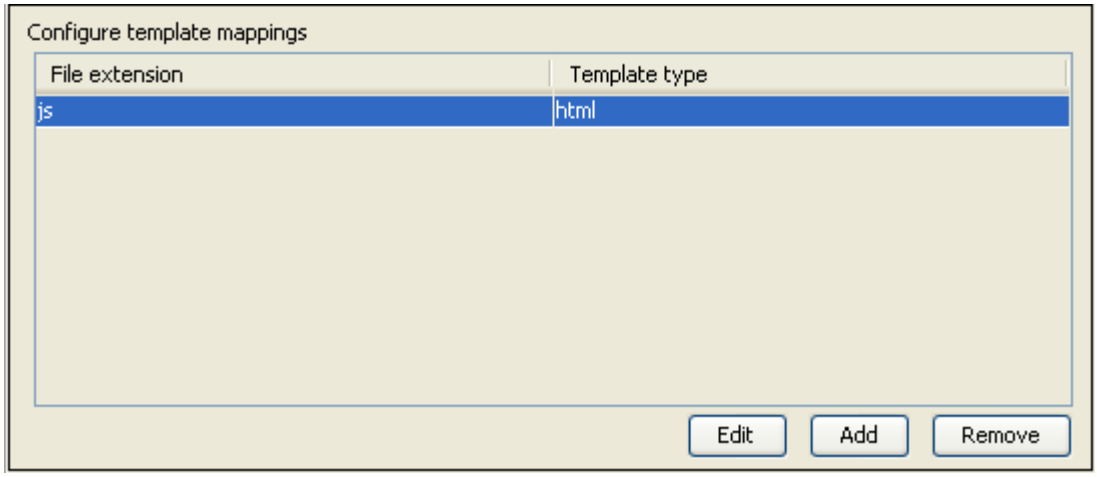


Figure 174 -- The Configure Template Mappings Pane

This pane contains 3 buttons: (i) Add, (ii) Edit, and (iii) Remove.

(i) Add button

To create a new template mapping:

1. Click the **Add** button in the **Configure Template Mappings** pane. The **Template mappings** dialog will open (Figure 175).

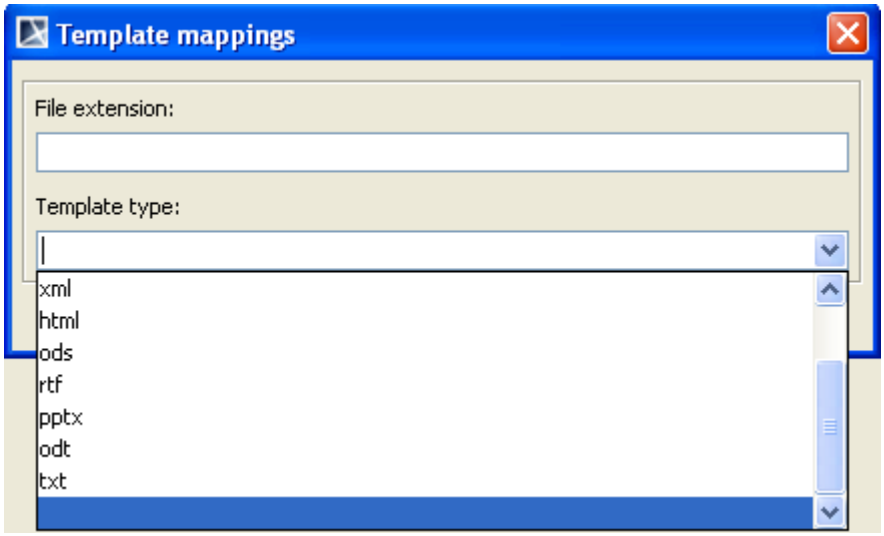


Figure 175 -- Adding Template Mapping in the Template Mappings Dialog

2. Enter a filename extension and template type.

Table 26 -- Template Mappings Dialog Fields

Field Name	Function	Default Value	Possible Value	Required
File extension	To enter a filename extension. The filename extension is not case-sensitive	Blank	Text	Yes
Template type	To enter a template type. The template type is case-sensitive	Blank	Text	Yes

(ii) Edit button

To edit a template mapping:

1. Select a template mapping in the **Configure Template Mappings** pane and click the **Edit** button. The **Template mappings** dialog will open (Figure 176).

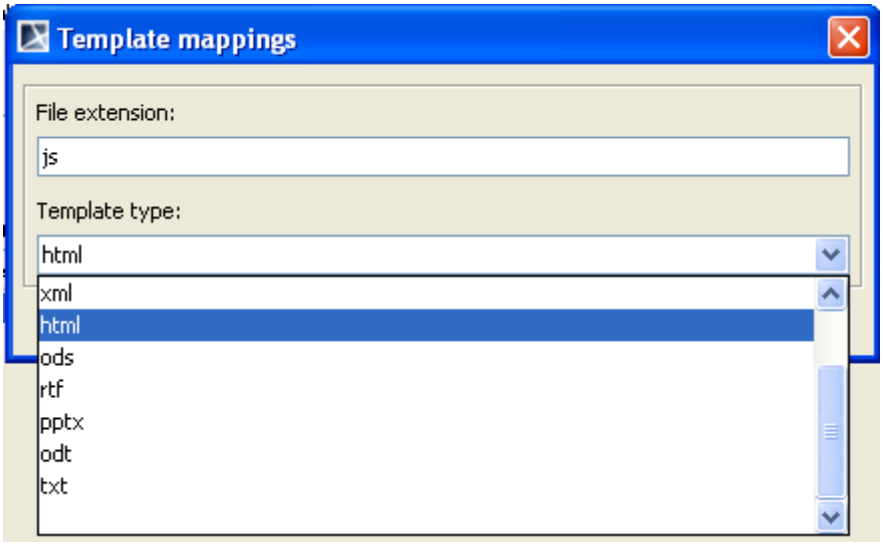


Figure 176 -- Editing Template Mapping in the Template Mappings Dialog

2. Edit the filename extension and template type. (See Table 26 Template Mappings Dialog Fields.)

(iii) Remove button

To delete a template mapping:

1. Select a template mapping in the **Configure Template Mappings** pane and click the **Remove** button.

NOTE	When template mapping is removed from environment option, the file extension mapping will be removed from MagicDraw. To restore default setting, you have to restart MagicDraw.

10.3 Monitor Template Folder Option

You can either enable or disable the MRZIP template file automatic deployment option in the Report Wizard environment options by selecting or clearing the **Monitor template folder** check box (Figure 177).

Figure 177 -- Monitor Template Folder Pane.

10.4 Reset to Defaults Option

Click the **Reset to Defaults** button to reset data to the default settings (Figure 178).

Figure 178 -- Reset to Defaults Button

NOTE	• MagicDraw allows you to configure the report engine settings in three levels: (i) Environment option, (ii) global config.xml, and (iii) template config.xml. • The template config.xml configuration settings will override the environment option configuration settings, which will override the global config.xml configuration settings.

11. Debug Report Template

The Debug Report template features warning messages that describe template errors. A warning message will appear in a **Messages Window** while the report template is being processed. Warning messages have no effect on the output report, thus can be ignored. They are intended for informative purposes only.

There are 5 warning message types:

11.1 Invalid Property

The warning (Figure 179) will open when an invalid property is encountered during the report generation. For example, getting a text property from the `$package` variable, when the text property is not a valid property for `$package`, is a variable with an invalid property that will trigger a warning.

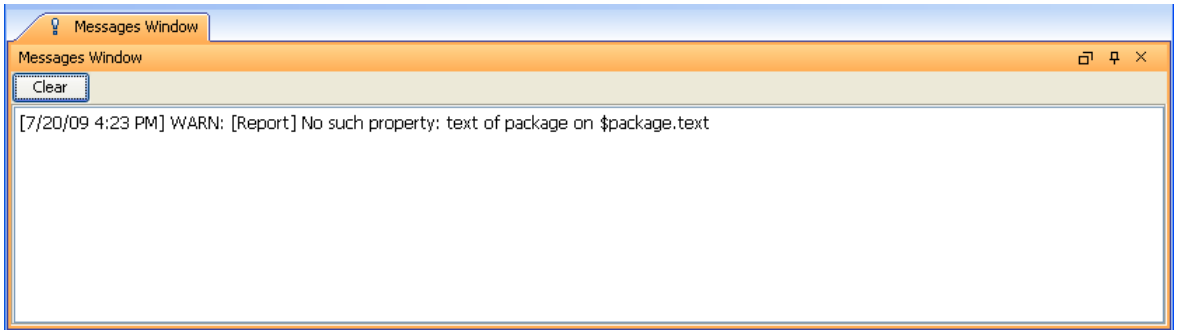


Figure 179 -- Invalid Property Warning Message

11.2 Invalid Reference

The warning will open (Figure 180) whenever using a variable, for example, `$empty` that has not been specified.

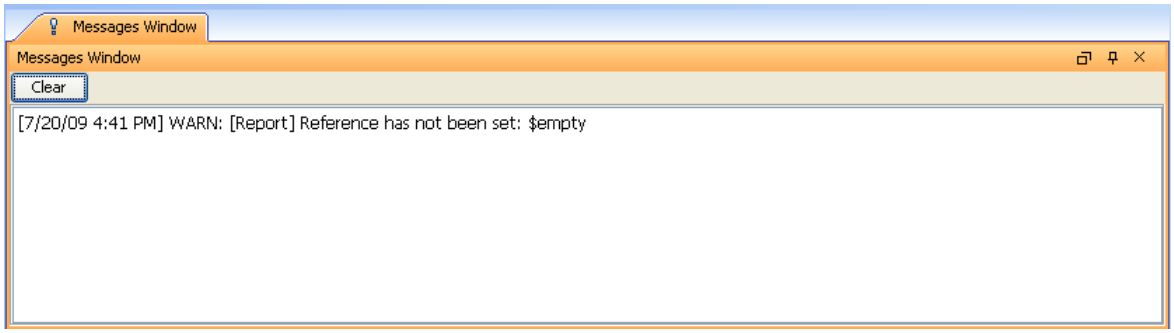


Figure 180 -- Invalid Reference Warning Message

11.3 Invalid Method Reference

The warning message will open (see Figure 181) when the use of an invalid method from a variable is encountered during the report generation. In this example, the “getStereotypeProperty” method is not a valid method of the `$report` variable.

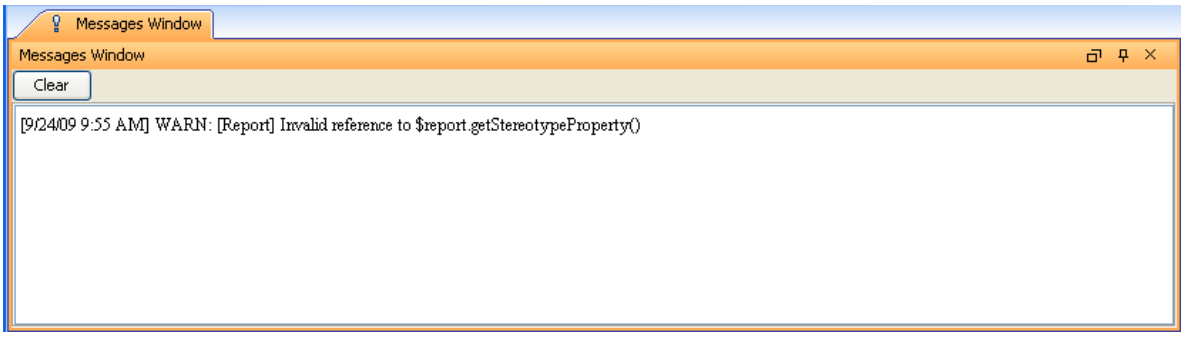


Figure 181 -- Invalid Method Reference Warning Message

11.4 Exception

The warning message (Figure 182) will open whenever an exception, such as IndexOutOfBoundException, occurs during the report generation.

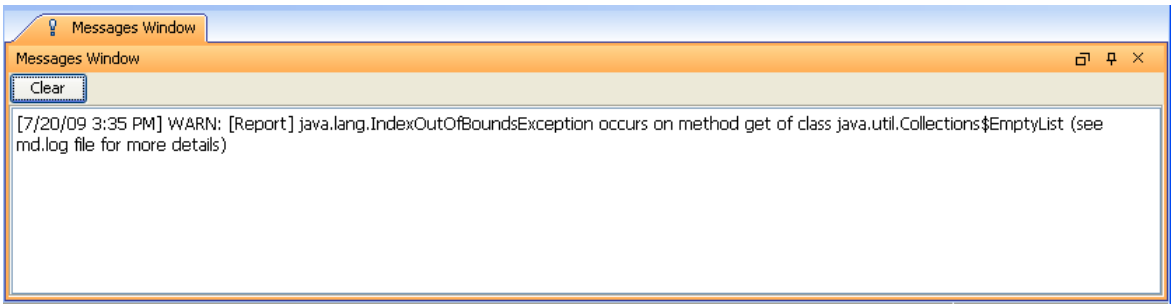


Figure 182 -- Exception Warning Message

11.5 Invalid Syntax

The warning message (Figure 183) will open whenever a template contains any invalid syntax, such as using `#forrow` without `#endrow`.

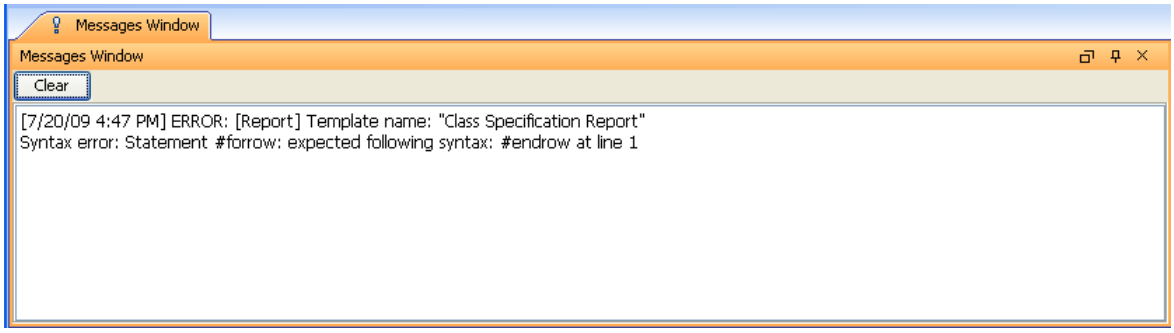


Figure 183 -- Invalid Syntax Warning Message

11.5.1 Enabling or Disabling Warning Messages

You can enable or disable any invalid properties, references, and exception messages except invalid syntax messages by editing the config.xml file and tags and values. Invalid syntax messages are always enabled.

11.5.1.1 Modifying config.xml

To modify the config.xml file:

- Either (i) edit the config.xml file in the **...\plugins\com.nomagic.magicdraw.reportwizard\data** folder to enable or disable all templates' warning messages or (ii) edit the config.xml file or create a file in the **...\plugins\com.nomagic.magicdraw.reportwizard\data\templatefolder** folder for each template.

For example, to enable or disable a warning message of Class Specification Report you need to edit the config.xml file in the **...\plugins\com.nomagic.magicdraw.reportwizard\data\Class Specification Report** folder.

11.5.1.2 Adding Tags and Values

```
<tag>value</tag>
```

Figure 184 -- A Tag for a Warning Message Type

Table 27 -- Warning Message Types

Warning Message Type	Tag
Invalid Property	<template.warn.invalid.property>
Invalid Reference	<template.warn.invalid.reference>
Invalid Method Reference	<template.warn.invalid.method>
Exception	<template.warn.exception>

Set this boolean value to:

- "true" to enable warning messages, or
- "false" to disable warning messages.

An example of how an Invalid Reference warning message of Class Specification Report can be enabled is shown in Figure 185.

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<configuration>
<template.warn.invalid.reference>true</template.warn.invalid.reference>
</configuration>
```

Figure 185 -- The Invalid Reference Warning Message Enabled through File config.xml

12. Use Case Driven

Report Wizard provides a set of templates to support the Use Case Driven approach methodology. A MagicDraw project that creates the Use Case Driven approach development steps can generate a report to capture elements.

Report Wizard provides 3 templates for the Use Case Driven approach:

12.1 Use Case Specification Report

12.2 Method Specification Report

12.3 Use Case Project Estimation Report

You can create a new MagicDraw project using the Use Case Driven approach either as:

(i) A blank project with the **UseCase_Profile.xml** module or

(ii) A Use Case project

(i) To create a new project as a blank project using **UseCase_Profile.xml**:

1. On the main menu, click **File**.
2. Click **Use Module…** . The **Use Module** dialog will open.
3. Select the **UseCase_Profile.xml** module.
4. Click **Finish**. The MagicDraw project will apply the Use Case Description profile.

(ii) To create a new project as a Use Case Project:

- A MagicDraw project will apply the Use Case Description profile automatically.

12.1 Use Case Specification Report

The Use Case Specification report shows the details of actors and use cases in the project. The first part, which is the actor summary, shows the list of all actors and their associated use cases. The second part presents the use case specification in general information of relations and scenarios. The report supports use case and SysML use case diagrams.

12.2 Method Specification Report

The purpose of the Method Specification report is to show the method design and its related use cases in detail to developers.

The report shows a class diagram and a list of all classes in the diagram. The list contains attributes and methods for each class. The report also shows the method specification, parameters, and algorithms.

12.3 Use Case Project Estimation Report

The use case project estimation or 'Use Case Points' is a method for sizing and estimating projects developed with the object-oriented method, developed by Gustav Karner of Objectory (now Rational Software). The method is an extension of Function Point Analysis and Mk II Function Point Analysis (an adaption of FPA mainly used in the UK).

The Use Case Project Estimation report is intended to estimate the project size and duration of hourly manpower required based on the use case model. The report supports use case and SysML use case diagrams.

The use case point technique is applied to reestimate the project size. All the use cases used in the example below are based on the use case diagram. The following weight criteria are used:

12.3.1 Classifying Actors

Table 28 -- Actors Classification

Actor complexity	Litmus Test to recognize classifications	Weight
Low complexity	An external system with a well-defined API.	1
Average complexity	Either a human with a command line interface or an external system via some protocols or a database.	2
High complexity	A human with a GUI or a web page.	3

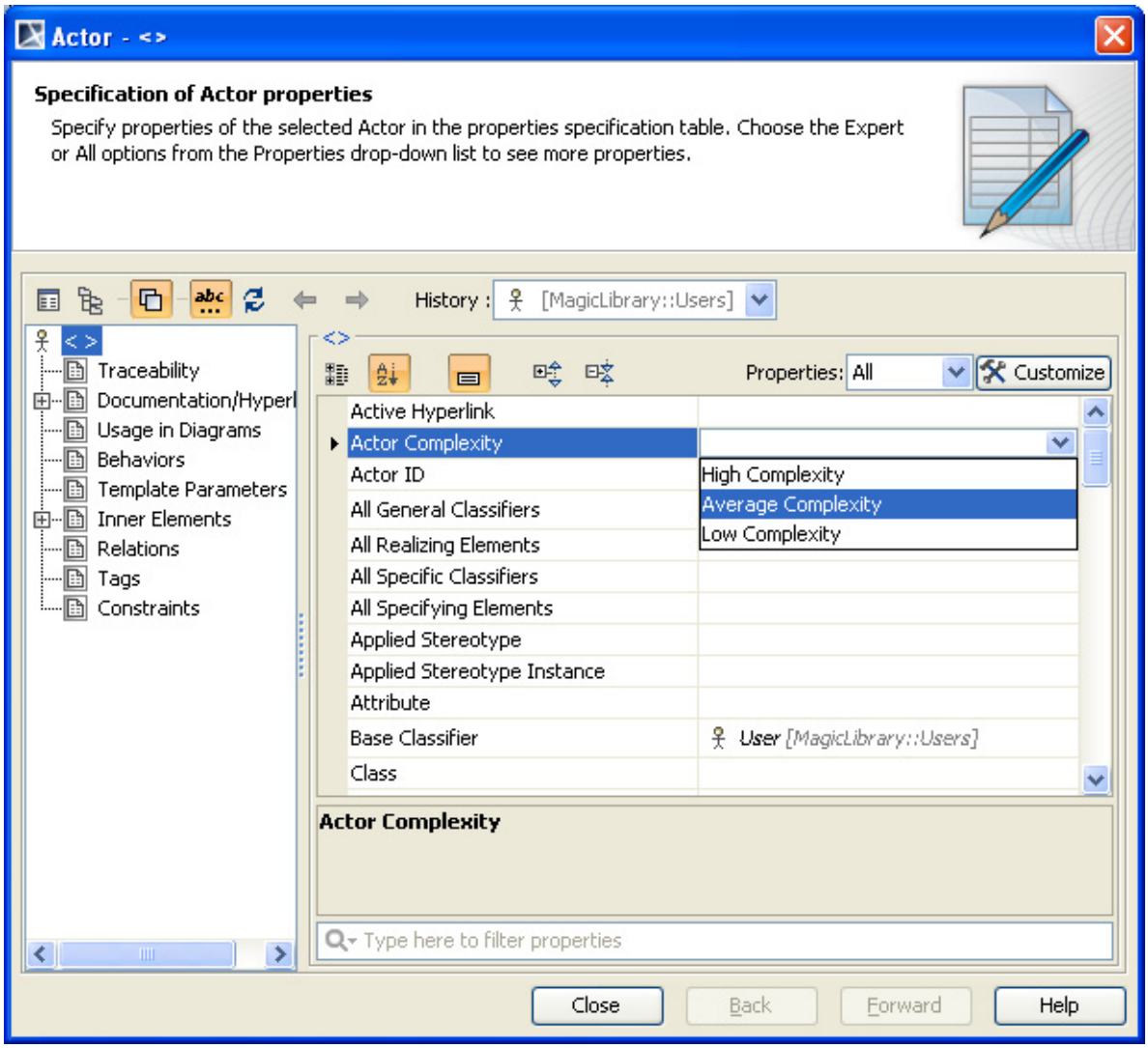


Figure 186 -- Use Case Driven - Actor Classification

12.3.2 Unadjusted Actor Weights

Unadjusted Actor Weights (UAW) is obtained by counting how many actors there are in each category, multiplying each total by its weight, and adding up the products.

12.3.3 Determining Scenarios and Transactions of Use Cases

Table 29 -- Use Case Complexity

Use Case Complexity	Litmus Test To Decide Classifications	Weight
Low complexity	1 - 3 transactions	5
Average complexity	4 - 7 transactions	10
High complexity	> 7 transactions	15

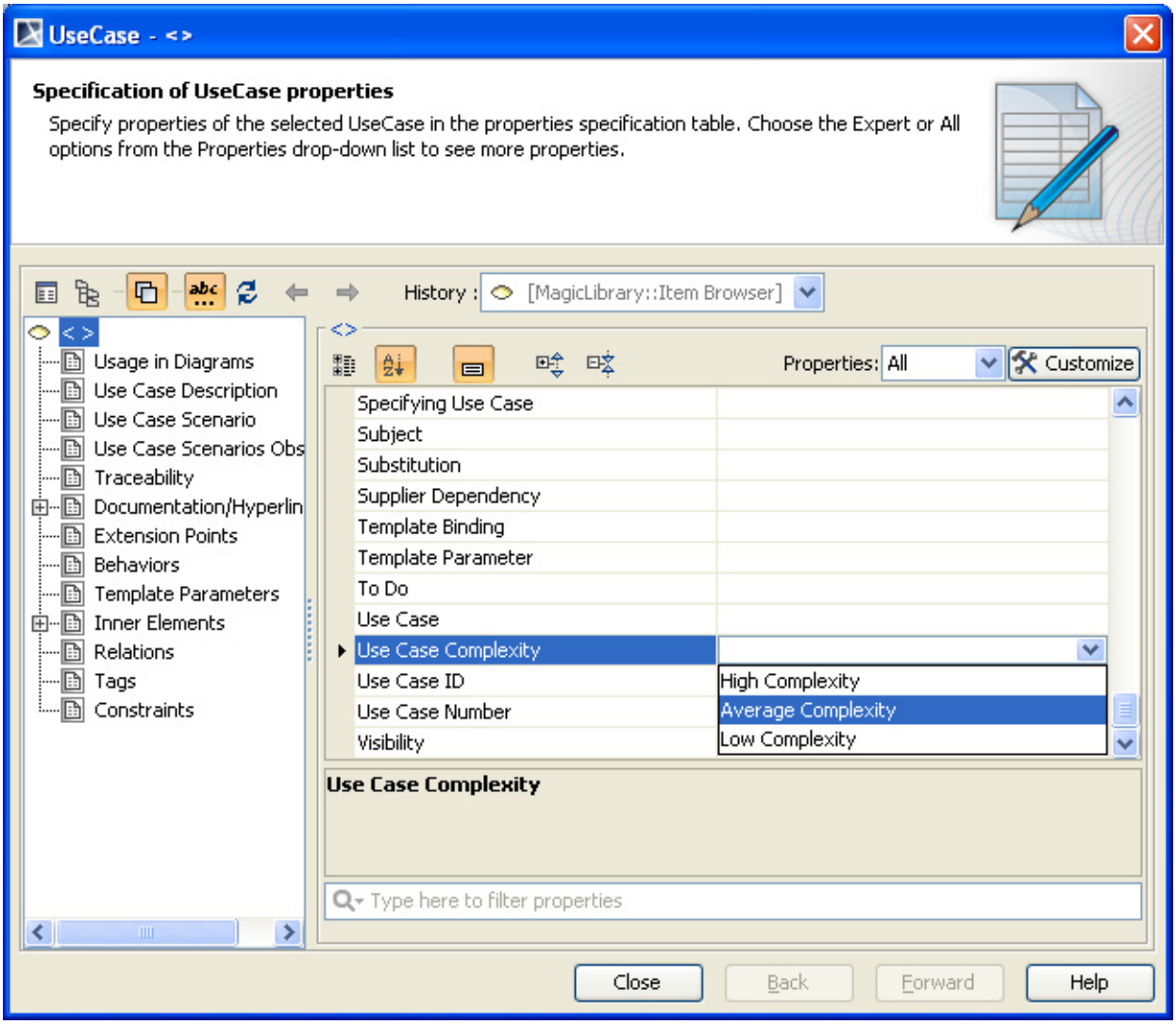


Figure 187 -- Use Case Driven - Use Case Complexity

12.3.4 Unadjusted Use Case Weights

A transaction is a set of activities, which is either performed entirely or not at all. To determine the number of transactions, you need to count the use case steps. Next, multiply each use case type by the weighting factor and add up the products to get **Unadjusted Use Case Weights (UUCW)**.

12.3.5 Unadjusted Use Case Point

Add UAW and UUCW to get **Unadjusted Use Case Point (UUCP)**: *UUCP = UAW + UUCW.*

Reference Documents

- The Estimation of Effort Based on Use Cases, published by Rational software

  ftp://ftp.software.ibm.com/software/rational/web/whitepapers/2003/finalTP171.pdf
- COCOMO II

  http://sunset.usc.edu/csse/research/COCOMOII/cocomo_main.html

12.4 Project Characteristics

The Technical and Environmental factors are associated with the weight of the project. You have to assign a value to each factor. The value assigned to a particular factor depends on the degree of influence a factor has. The relevance values range from 0 to 5, where 0 means no influence, 3 is the average level of influence, and 5 means a strong influence.

12.4.1 Technical Factors

Table 30 -- Technical Factors

Factor	Technical Factors	Weight	Description
T1	Distributed system	2.0	The system distributed architecture or centralized architecture.
T2	Response adjectives	1.0	The response time is one of the important criteria.
T3	End-user efficiency	1.0	The end-user efficiency.
T4	Complex processing	1.0	The business process is very complex.
T5	Reusable code	1.0	The project maintains high reusability. The design is complex.
T6	Easy to install	0.5	The project requires simple installation.
T7	Easy to use	0.5	User-friendly is one of the important criteria.
T8	Portable	2.0	The project requires cross-platform implementation.
T9	Easy to change	1.0	The project is highly customizable in the future. The architectural design is complex.
T10	Concurrent	1.0	The project has a large numbers of users working with locking support. The architecture increases the project complexity.
T11	Security features	1.0	The project has heavy security.
T12	Access for third parties	1.0	The project is dependent on the third party's control. Studying and understanding the third party is required.
T13	Special training required	1.0	The application is so complex for the user that training must be provided.

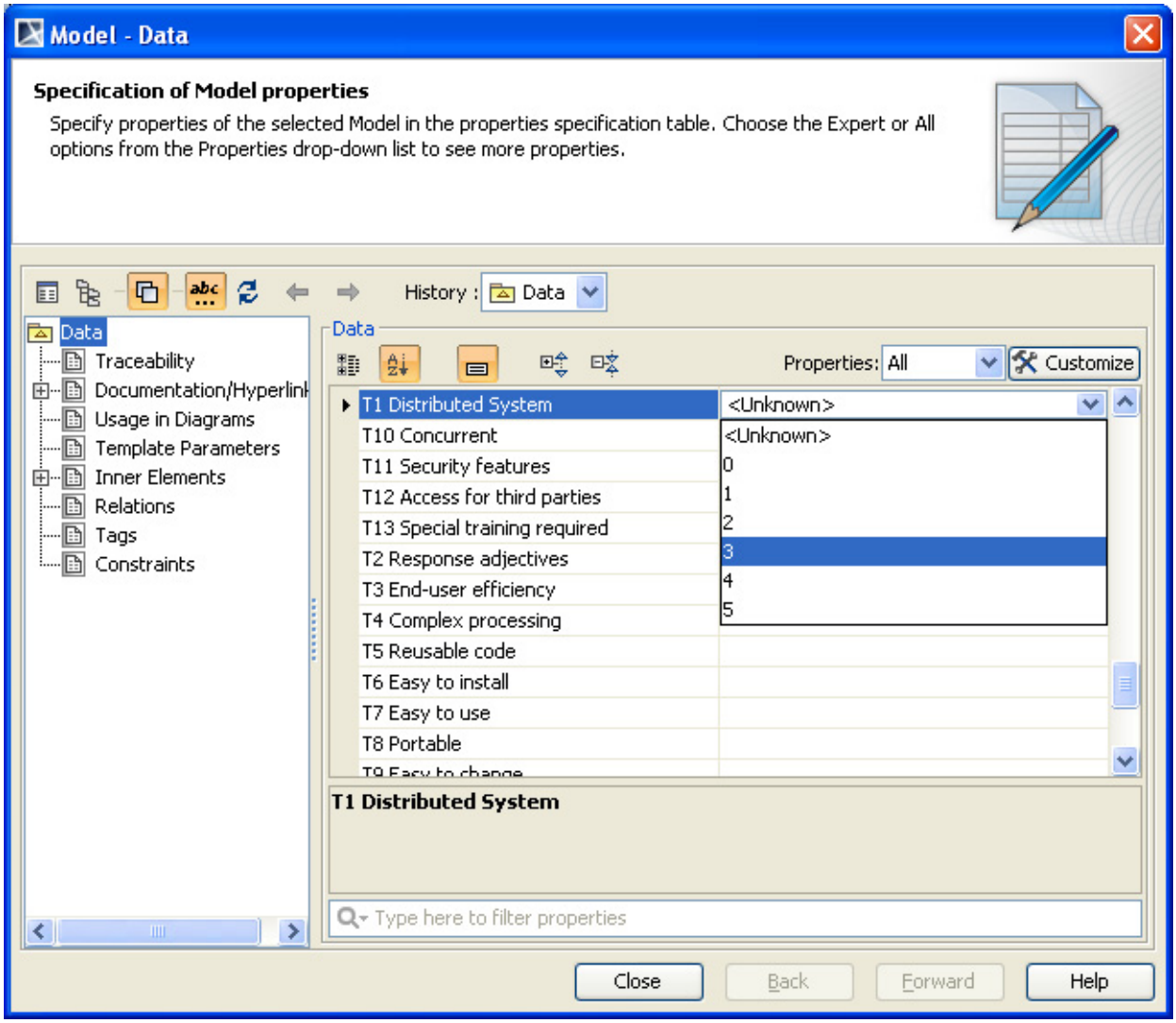


Figure 188 -- Use Case Driven Model Data T1

12.4.1.1 Technical Factor Value

Technical Factor Value (TFactor) is obtained with the multiplication of the value of each Technical factor by its weight.

TFactor = *value* x *weight*

12.4.1.2 Technical Complexity Factor

Technical Complexity Factor (TCF) is obtained with the addition of *0.6* to the sum of **TFactor** multiplied by *0.01*.

*TCF = 0.6 + (0.01 * TFactor)*

12.4.2 Environmental Factors

Table 31 -- Environmental Factors

Factor	Environmental Factors	Weight	Description
E1	Familiar with RUP	1.5	Staff in the project are familiar with domain and technical details of the project.
E2	Application experience	0.5	The application experience level.
E3	Object-oriented experience	1.0	Staff in the project have basic knowledge of the OOP concept. The project is implemented on the object oriented design.
E4	Lead analyst capability	0.5	The analyst who is leading the project has enough domain knowledge.
E5	Motivation	1.0	The project motivates staff to work including how the software industry is going on
E6	Stable requirements	2.0	The requirements are clear, stable, and unlikely to change in the future.
E7	Part-time workers	-1.0	Part-time staff are working on the project.
E8	Difficult programming language	-1.0	Complexity of a programming language.

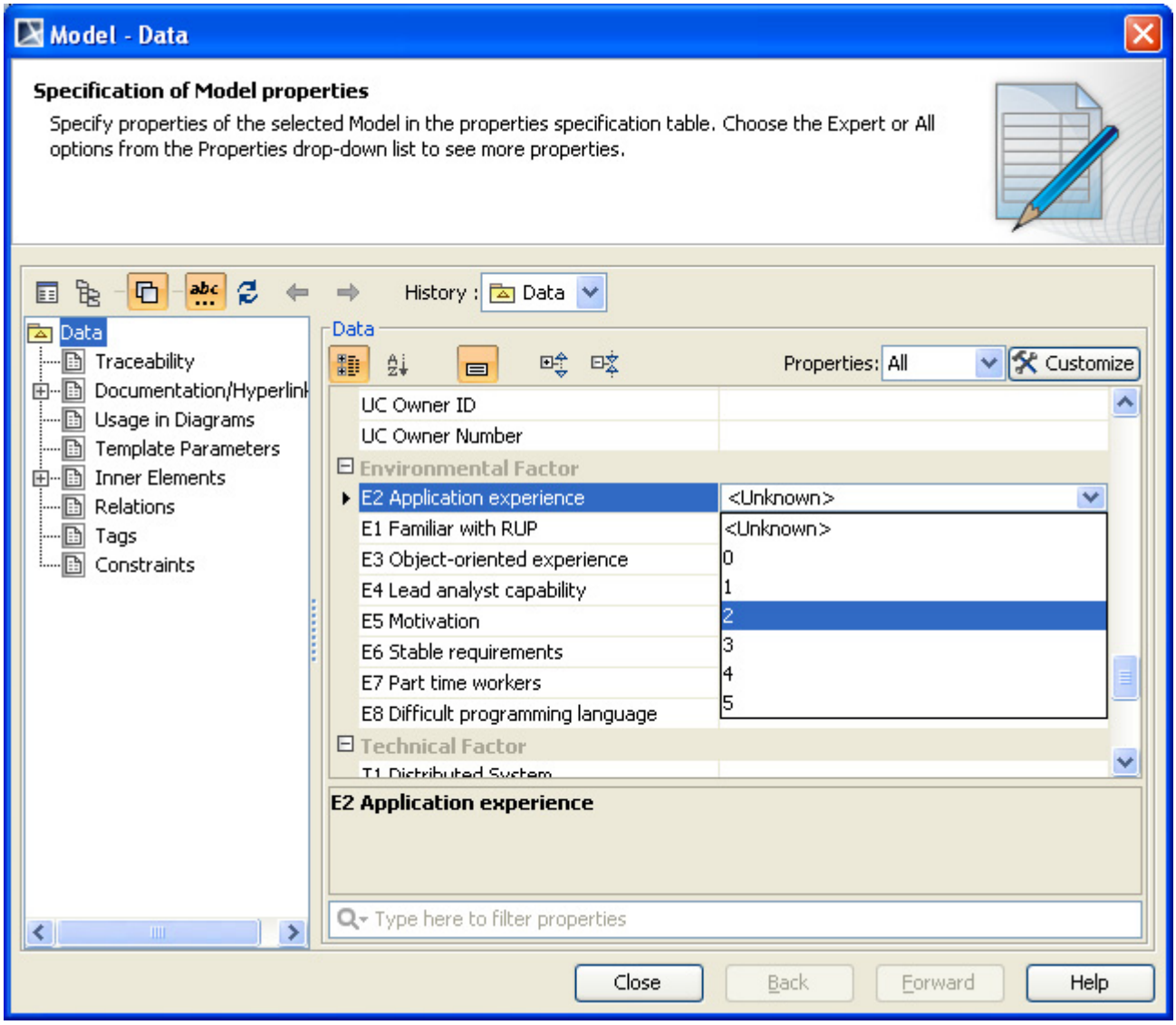


Figure 189 -- Use Case Driven Model Data E2

12.4.2.1 Environmental Factor Value

Environmental Factor Value (EFactor) is obtained with the multiplication of the value of each Environmental factor by its weight.

12.4.2.2 Environmental Factor

Environmental Factor (EF) is obtained with the addition of *1.4* to the sum of **EFactor** multiplied by *-0.03*.

*EF = 1.4 + (-0.03 * EFactor)*

12.4.3 Project Estimation

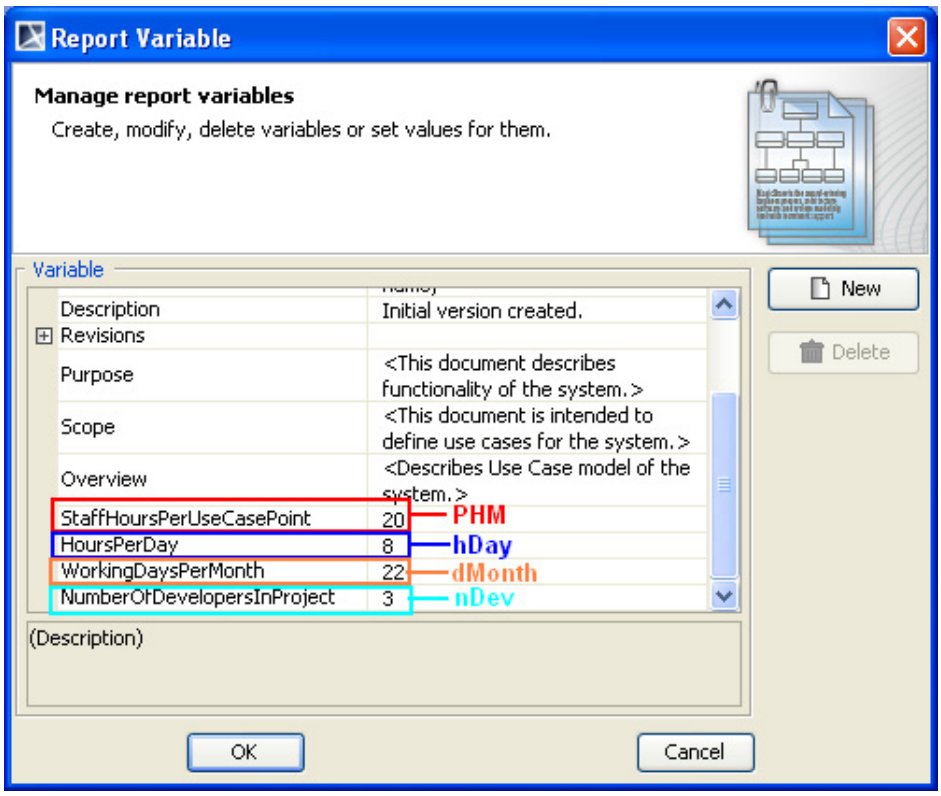


Figure 190 -- Variables of Use Case Project Estimation

12.4.3.1 Adjusted Use Case Points

The Adjusted Use Case Point (UCP) is determined with the multiplication of Unadjusted Use Case Point (UUCP) by Technical Complexity Factor (TCF) and Environmental Factor (EF).

*UCP = UUCP * TCF * EF*

12.4.3.2 Estimated Effort in Person Hours

The person hours multiplier or *X* hours is a ratio of the number of man hours (PHM) per Use Case Point based on past projects. If no historical data has been collected, industry experts suggest using a figure between 15 and 30. A typical value is 20.

X hours = *UCP * PHM*

12.4.3.3 Estimated Effort in Scheduled Time

Divide *X* hours by the number of developers working on the project and working hours per day to determine Estimated Effort in Scheduled Time or *Y* days. This means that with *n*Dev developers, it would take *Y* days to complete the project.

Y days = *X* / *n*Dev / *h*ay

12.4.3.4 Estimated Effort in Working Days

Divide *Y* days by working days per month to get the estimated effort in working days or *Z* months. This means that with *n*Dev developers, it would take *Z* month to complete the project.

Z months = *Y* / *d* Month

13. Javadoc Syntax Tool

Javadoc is the industry standard for documenting Java classes. Javadoc can be documented inside the documentation field (Figure 191).

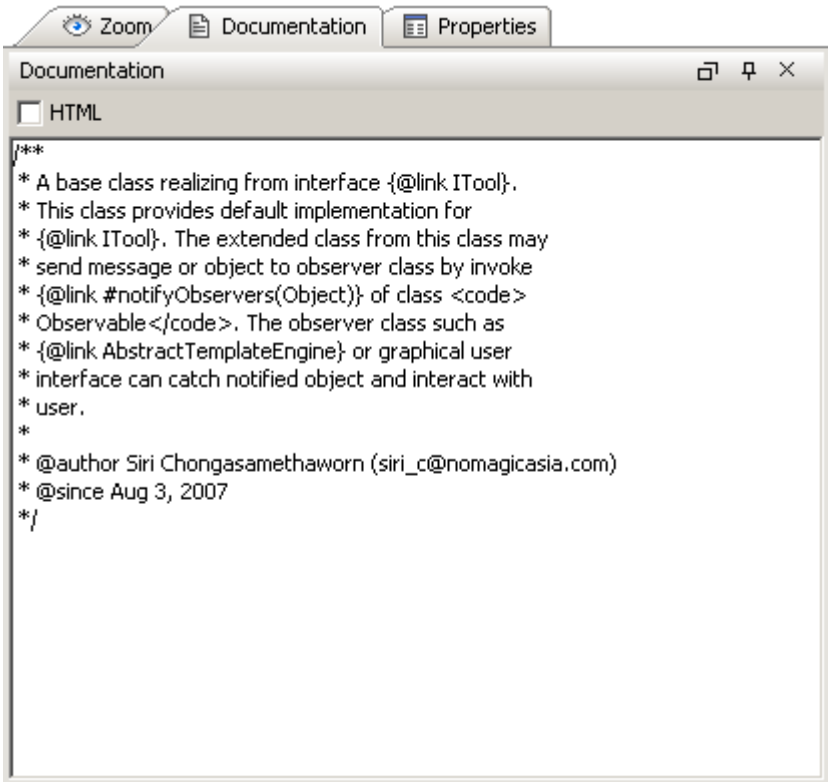


Figure 191 -- Documentation Field

Report Wizard provides a template tool for translating Javadoc text into Javadoc properties. Javadoc Tool will be loaded and used inside the template upon the user's request.

An example of Javadoc text is shown below:

```
/**
* A base class realizing from interface {@link ITool}.
* This class provides default implementation for
* {@link ITool}. The extended class from this class may
* send message or object to observer class by invoking
* {@link #notifyObservers(Object)} of class <code>
* Observable</code>. The observer class such as
* {@link AbstractTemplateEngine} or graphical user
* interface can catch notified object and interact with
* user.
*
* @author Siri Chongasamethaworn (siri_c@nomagicasia.com)
* @since Aug 3, 2007
*/
```

To print the Javadoc comment and author inside the template:

```
#import ("javadoc",
"com.nomagic.reportwizard.tools.doc.JavaDocTool")
#set ($doc = $javadoc.create($class.documentation))
Comment:
    $doc.comment
Author:
    $doc.author
```

The output from this example will be:

```
Comment:
        A base class realizing from interface ITool. This class
        provides default implementation for ITool. The extended
        class from this class may send message or object to
        observer class by invoke #notifyObservers(Object) of class
        Observable. The observer class such as
        AbstractTemplateEngine or graphical user interface can
        catch notified object and interact with user.
Author:
  Siri Chongasamethaworn (siri_c@nomagicasia.com)
```

The Javadoc Syntax Tool is implemented based on Custom Tool (See Appendix A: Report Extensions).

13.1 Javadoc Syntax

A doc comment consists of characters between the characters /** that begin the comment and the characters */ that end it. Leading asterisks are allowed on each line and are described below. Text in a comment can continue to multiple lines.

- **Leading asterisks**

  When Javadoc Tool parses a doc comment, leading asterisk (*) characters on each line are discarded.

- **First sentence**

  The first sentence of each doc comment is a summary sentence. This sentence can be retrieved from `$doc.firstSentenceTags`. The first sentence tags are a collection of inline tags until full stops `(.)`.

- **Comment and tag sections**

  A comment is the main description which begins after the starting delimiters /** and continues until the tag section. A tag section starts with the first block tag. The comment can be retrieved by $doc.comment

- **Comments written in HTML**

  Text is written in HTML and will be rendered as HTML support before being printed to a report. (See Appendix D: HTML Tag Support)

- **Block and in-line tags**

  A tag is a special keyword within a doc comment that Javadoc Tool can process. There are two kinds of tags:

  (i) Block tags

  They can be placed only in the tag section. The block tag form is @tag. The block tag can be accessed directly from the root document such as $doc.param and $doc.author.

  The $doc.tags will provide a collection of all the tags appearing in this Javadoc.

  (ii) Inline tags

  They can be placed anywhere in the main description or in the block tags. The inline tag form is {@tag}.

Table 32 -- Current Supported Tags

Tag	JDK	Report Wizard Support
@author	1.0	Yes
{@code}	1.5	Render as <code>text</code>
{@docRoot}	1.3	Not supported
@deprecated	1.0	Yes
@exception	1.0	Yes
{@inheritDoc}	1.4	Not Supported
{@link}	1.2	Yes, with conditions (External link, model support, and class/ method link will be ignored)
{@linkplain}	1.4	Yes, see {@link link}
{@literal}	1.5	Yes
@param	1.0	Yes
@return	1.0	Yes
@see	1.0	Yes, with conditions (External link, model support, and class/ method link will be return as plain text)
@serial	1.2	Yes
@serialData	1.2	Yes
@serialField	1.2	Yes
@since	1.1	Yes
@throws	1.2	Yes
{@value}	1.4	Not Supported
@version	1.0	Yes

13.2 Javadoc Tool API

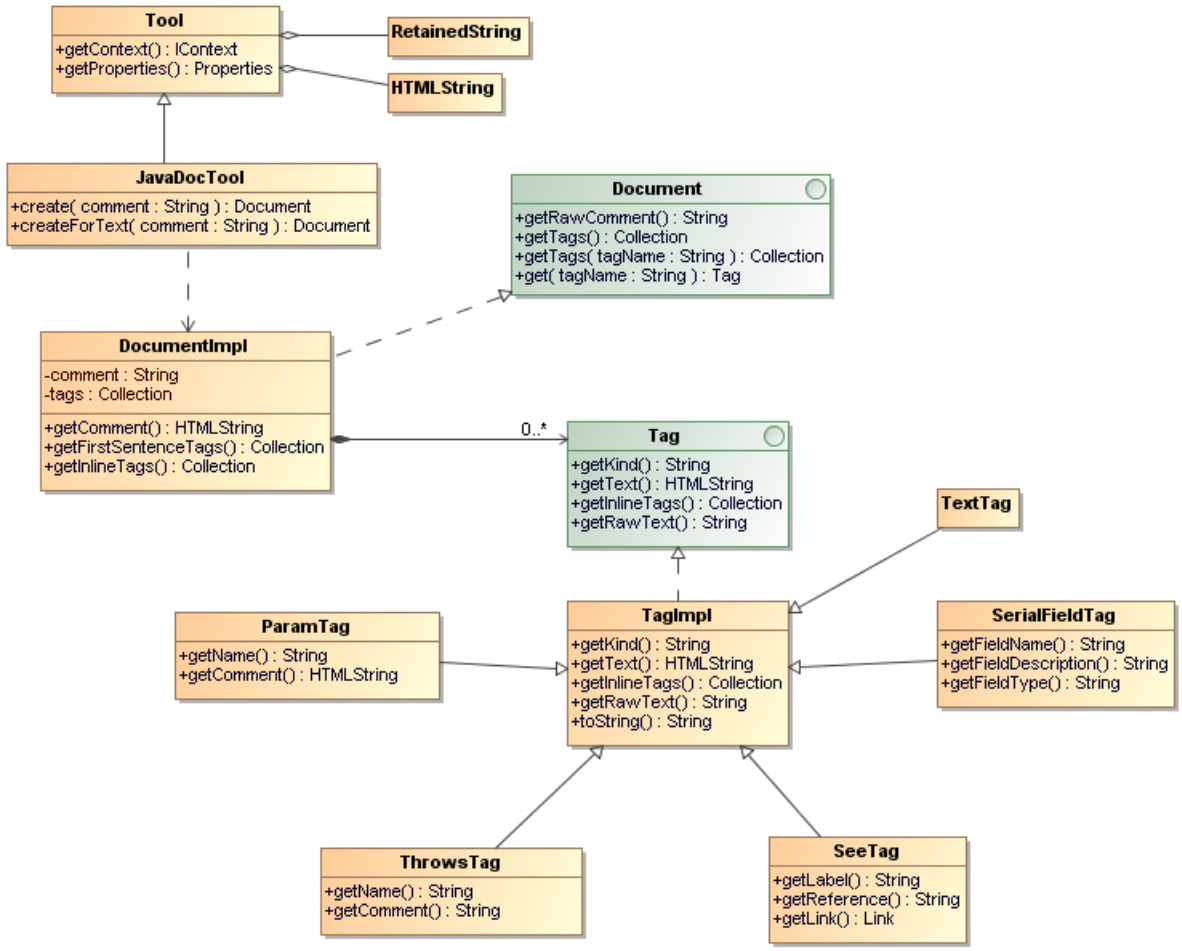


Figure 192 -- Javadoc Tool API

13.2.1 JavaDocTool

JavaDoc Tool is a custom tool class used for creating a Document node.

- create() - Return a new instance of a Document node. Each JavaDoc comment must start with /** and ended with */.
- createForText() - Return a new instance of a Document node. This method allows in-complete JavaDoc (comments without /** and */) to be loaded with JavaDocTool.

13.2.1.1 Document

Document is an interface representing a Comment Document.

- getRawComment() - Return the full unprocessed text of the comment.
- getTags() - Return all tags in this document item.
- getTags(tagName : String) - Return a tag of the specified kind of this document item.
- get(tagName : String) - Return a tag of the specified kind of this document item. If any tags with the same kind are found, the first tag of that kind will be returned.

13.2.1.2 DocumentImpl

DocumentImpl is a default JavaDoc document implementation.

- getComment() - Return formatted text for this document.
- getInlineTags() - Return comment as a collection of tags.
- getFirstSentenceTags() - Return the first sentence of the comment as a collection of tags.

13.2.1.3 Tag

Tag is an interface representing a simple documentation tag, such as @since, @author, and @version

- getKind() - Return the kind of this tag.
- getText() - Return the text of this tag.
- getInlineTags() - Return a collection of tags for a documentation comment with embedded {@link} tags.

13.2.1.4 TagImpl

TagImpl is a default tag implementation.

- getRawText() - Return the full unprocessed text of this tag.
- toString() - Return the text of this tag. Usually calls getText().

13.2.1.5 ParamTag

ParamTag represents a @param documentation tag.

- getName() - Return the name of the parameter associated with this tag.
- getComment() - Return the parameter's comment.

13.2.1.6 ThrowsTag

ThrowsTag represents a @throws or @exception documentation tag.

- getName() - Return the name of the exception associated with this tag.
- getComment() - Return the exception's comment.

13.2.1.7 SeeTag

SeeTag represents a user-defined cross-reference to related documentation. The reference can be either inline with the comment using {@link} or a separate block comment using @see.

- getLabel() - Return the label of the @see tag.
- getReference() - Return the MODEL or URL of the @see reference.
- getLink() - Return the Link object representing this tag.

13.2.1.8 SerialFieldTag

SerialFieldTag represents a @serialField tag.

- getFieldName() - return the serial field name.
- getFieldDescription() - return the field comment.
- getFieldType() - return the field type string.

For examples:

- Import the Javadoc tool and create an instance of Javadoc document:

```
#import ("javadoc",
"com.nomagic.reportwizard.tools.doc.JavaDocTool")
#set ($doc = $javadoc.create($comment))
```

- Print a Javadoc comment:

```
$doc.comment
```

- Print the first encountered author:

```
$doc.author
```

- Print all authors:

```
#foreach ($author in $doc.getTags("author"))
$author.text
#end
```

- Print the first sentence:

```
#foreach ($tag in $doc.firstSentenceTags)
$tag.text
#end
```

- Print the inline tags:

```
#foreach ($tag in $doc.inlineTags)
$tag.kind
$tag.text
#end
```

- Print a raw comment (plain text without a document parser or HTML renderer):

```
$doc.rawComment
```

- Print all block tags:

```
#foreach ($tag in $doc.tags)
$tag.kind : $tag.text
#end
```

- Print all param tags:

```
#foreach ($tag in $doc.getTags("param"))
$tag.name - $tag.comment
#end
```

- Print all throws tags:

```
#foreach ($tag in $doc.getTags("throws"))
$tag.name - $tag.comment
#end
```

- Print all see tags:

```
#foreach ($tag in $doc.getTags("see"))
$tag.label - $tag.reference
#end
```

Reference Documents

- Javadoc specification

  http://java.sun.com/j2se/1.5.0/docs/tooldocs/windows/javadoc.html#javadoctags
- Writing Javadoc

  http://java.sun.com/j2se/javadoc/writingdoccomments/index.html
- Javadoc Tool API

  <install.dir>/plugins/com.nomagic.magicdraw.reportwizard/api/javadoc.zip

14. Import Tool

Import Tool enables you to dynamically import documents or parts of them into reports, giving you greater flexibility when generating reports that require dynamic resources. You can now include documents whose location is only known at the actual translation time.

Import Tool allows you to:

- parse and import RTF, HTML, and text templates from any location in the file system;
- reuse the **#sectionBegin** and **#sectionEnd** syntax to import any part of a document. ImportTool makes use of the predefined syntaxes: **#sectionBegin** and **#sectionEnd**, which were introduced with the **#includeSection** directive. (See #includeSection Directive in the Report Wizard Custom Language section for **#sectionBegin** and **#sectionEnd** usage)

14.1 Import Syntax

To use the Import tool syntax:

1. To declare Import Tool in the template, type: **#import ('import', 'com.nomagic.reportwizard.tools.ImportTool')**. The directive **#import** will load Import Tool so that it can be accessed inside the template.
   - The first parameter **'import'** is for identifying the alias of Import Tool (in this case, **'import'**, but it can be named anything).
   - The second parameter **'com.nomagic.reportwizard.tools.ImportTool'** has to be copied as it is (do not rename it). Otherwise, Import Tool will not be loaded. For further details, see Ruby Script Tool.
2. To import any content from a child template, type:
   - **$import.include('child.rtf')** to import a complete document at the current position of the template, and/or
   - **$import.includeSection('child.rtf', 'Section A')** to include only the text contained in the named section of the document.

$import

This part names the alias assigned to Import Tool when declaring it to the template.

$import.include(FileName)

A 'FileName' specifies the location of a file in the file system. This filename can be either an absolute or a relative path. The 'FileName' parameter can be set either statically or dynamically. See the Import Usage section for an illustration on how to use it.

$import.includeSection(FileName, SectionName)

A ‘FileName' functions the same as in the sub-section above. A 'SectionName' denotes a paragraph in the document named 'FileName', which is delimited by the **#sectionBegin(SectionName)** and **#sectionEnd** identifiers. The SectionName variable can also be set either statically or dynamically. See the Import Usage section for an illustration on how to use it.

14.2 Import Usage

14.2.1 Preparatory Step

Define a child template that you will use as in examples 1, 2, and 3. This child template contains the following header line and named sections ('Section A' and 'Section B'):

```
This is the child template.

#sectionBegin(Section A)
This is Section A.
#sectionEnd

#sectionBegin(Section B)
This is Section B.
#sectionEnd
```

14.2.2 Usage in Example 1

This example shows how to statically include the complete child template as shown in the Preparatory Step. To include it, call the **$import.include('child.rtf')** method. Note that there is no specified path, this path to the child template tells you that the master and child templates reside in the same directory.

```
#import ('import', 'com.nomagic.reportwizard.tools.ImportTool')

This is the 1st master template
Include child template
$import.include('child.rtf')
```

The output right below will include the entire text from the master template (right above) and from the child template (see the Preparatory Step) minus the template directives. The included content will be then parsed and stripped of all velocity directives. The output is as follows:

```
This is the 1st master template
Include child template
This is the child template.

This is Section A.

This is Section B.
```

14.2.3 Usage in Example 2

This example shows how to statically include a section of the child template as shown in the Preparatory Step. To include the section, named 'Section A' from the child template, call the **$import.includeSection('templates/child.rtf', 'Section A')** method. In this example, the master and child templates reside in different directories, which means that the child template will reside in a subdirectory called 'templates'. This 'templates' directory will thus reside in the same directory as the master template.

```
#import ('import', 'com.nomagic.reportwizard.tools.ImportTool')

This is the 2nd master template
Include Section A
$import.includeSection('templates/child.rtf', 'Section A')
```

The output will be:

```
This is the 2nd  master template
Include Section A
This is Section A.
```

14.2.4 Usage in Example 3

This example shows how to dynamically include the section of a child template as shown in the Preparatory Step. Before dynamically including the section of the child template named 'Section B', set a variable for the file location of the child template [**#set ($child = "C:/ImportTool/child.rtf")**] and another one for the section name to be included [**#set ($section = "Section B")**]. To include the 'Section B' section from the child template, call the **$import.includeSection($child, $section)** method. In this example, the child's template location is provided by an absolute path. Note that dynamic values must not be specified in a pair of quote marks, otherwise the section will not be included.

```
#import ('import', 'com.nomagic.reportwizard.tools.ImportTool')

This is the 3rd master template
Include Section B
#set ($child = "C:/ImportTool/child.rtf")
#set ($section = "Section B")
$import.includeSection($child, $section)
```

The output will be:

```
This is the 3rd master template
Include Section B
This is Section B.
```

NOTE	The Import Tool supports RTF, HTML, XML, and text files only.

15. JavaScript Tool

JavaScript Tool enables report templates to evaluate or run JavaScript codes from templates and external JavaScript files (Figure 193).

The general concept behind this JavaScript feature is to separate complex business logic from presentation logic. Complex logic should be executed by JavaScript, and presentation logic should be executed by Velocity code.

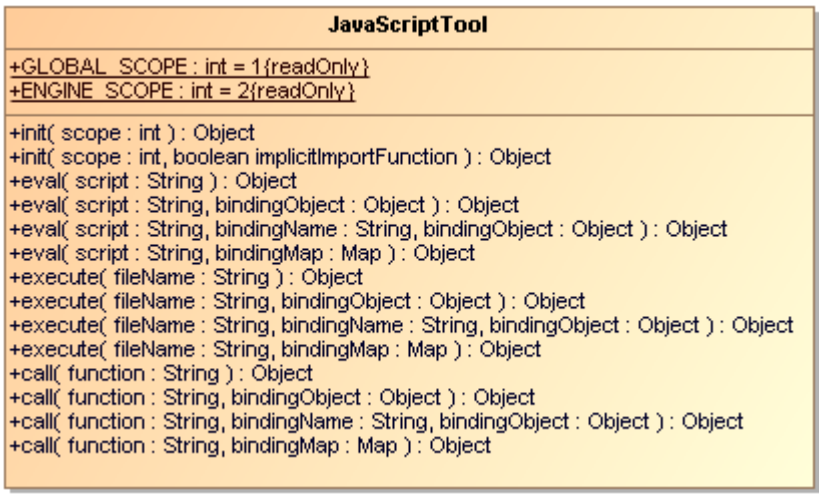


Figure 193 -- Class Diagram: JavaScript Tool

JavaScript Tool includes 3 methods:

(i) 'eval' Method: this method will evaluate JavaScript text, and then return the result.

(ii) 'execute' Method: this method will execute a JavaScript file, and then return the result.

(iii) 'call' Method: this method will call a JavaScript function, and then return the result.

Like other Custom Tools, the JavaScript Tool 'scripttool.jar' must be installed in the 'extensions' folder of the Report Wizard plugin, and 'js.jar' must be included in any class path or the 'extensions' folder. For further information about Custom Tools and the installation, see **1 Custom Tool**.

To import JavaScript Tool to a template type, for example:

```
#import('js', 'com.nomagic.reportwizard.tools.script.JavaScriptTool')
```

15.1 JavaScript Tool API

15.1.1 'eval' Method

eval(String script)

This method will evaluate a JavaScript code from a string and return the result.

```
$js.eval('script')
```

eval(String script, Object bindingObject)

This method will evaluate a JavaScript code with a single binding object. The code will be evaluated from a string. The "importer" name will be used as a binding name for this object.

```
#foreach ($class in $Class)
   $js.eval('importer.getName()', $class)
#end
```

eval(String script, String bindingName, Object bindingObject)

This method will evaluate a JavaScript code with a single binding object and specified binding name. The code will be evaluated from a string. The binding name will be used as the name for this object.

```
#foreach ($class in $Class)
   $js.eval('cls.getName()', 'cls', $class)
#end
```

eval(String script, Map bindingMap)

This method will evaluate a JavaScript code with a set of binding arguments (a name and an object). The code will be evaluated from a string. The binding map consists of key-value pairs for this binding name and binding object.

```
#set ($dict = $map.createHashMap())
#set ($void = $dict.put("first", "foo"))
#set ($void = $dict.put("last", "bar"))
$js.eval("first + ' ' + last", $dict)
```

15.1.2 'execute' Method

execute(String filename)

This method will execute a JavaScript file. The filename parameter is a file path to the JavaScript file.

```
$js.execute('filename.js')
```

execute(String filename, Object bindingObject)

This method will execute a JavaScript file with a single binding object. The filename parameter is a file path to the JavaScript file. The "importer" name will be used as the binding name for this object.

```
#foreach ($class in $Class)
   $js.execute('filename.js', $class)
#end
```

```
// filename.js
importer.getName();
```

execute(String filename, String bindingName, Object bindingObject)

This method will execute a JavaScript file with a single binding object and specified binding name. The filename parameter is a file path to the JavaScript file. The binding name will be used as the name for this object.

```
#foreach ($class in $Class)
   $js.execute('filename.js', 'cls', $class)
#end
```

```
// filename.js
cls.getName();
```

execute(String filename, Map bindingMap)

This method will execute a JavaScript file with a set of binding arguments (a name and an object). The filename parameter is a file path to the JavaScript file. The binding map consists of key-value pairs for this binding name and binding object.

```
#set ($map = $map.createHashMap())
#set ($void = $map.put("first", "foo"))
#set ($void = $map.put("last", "bar"))
$js.execute('filename.js', $map)
```

```
// filename.js
first + ' ' + last;
```

NOTE	• *Absolute Path:* If a 'filename' is provided with an absolute path, JavaScript Tool will read the JavaScript file from an absolute location such as $js.execute('c:/mycode/readclass.js'). • *Relative Path*: If a 'filename' is provided with a relative path, JavaScript Tool will read the template from a relative location. This relative location starts from the current directory in which the template is located such as $js.execute('readclass.js').

15.1.3 'call' Method

call(String function)

This method will provide a short and reusable method to call a JavaScript function. This function must be defined before calling this method. This function can be defined by 'eval' or 'execute'.

```
$js.execute('javascript.js')
$js.call('calc(1, 3)')
```

```
// javascript.js
function calc(var1, var2)
{
   return var1 + var2;
}
```

call(String function, Object bindingObject)

This method will provide a short and reusable method to call a JavaScript function with a single binding object. The "importer" name will be used as the binding name for this object. This function must be defined before calling this method. This function can be defined by 'eval' or 'execute'.

```
$js.execute('javascript.js')
$js.call('calc(1, 3)', 10)
```

```
// javascript.js
function calc(var1, var2)
{
   var f = Number(importer ? importer : 0);
   return f + var1 + var2;
}
```

call(String function, String bindingName, Object bindingObject)

This method will provide a short and reusable method to call a JavaScript function with a single binding object and specified binding name. This binding name will be used as the name for this object. This function must be defined before calling this method. This function can be defined by 'eval' or 'execute'.

```
$js.execute('javascript.js')
$js.call('calc(1, 3)', 'factor', 10)
```

```
// javascript.js
function calc(var1, var2)
{
   var f = Number(factor ? factor : 0);
   return f + var1 + var2;
}
```

call(String function, Map bindingMap)

This method will provide a short and reusable method to call a JavaScript function with a set of binding arguments (a name and an object). The binding map consists of key-value pairs for this binding name and binding object.

```
#set ($map = $map.createHashMap())
#set ($void = $map.put("first", "foo"))
#set ($void = $map.put("last", "bar"))
$js.call('hello()', $map)
```

```
// filename.js
function hello()
{
   return 'hello ' + first + ' ' + last;
}
```

15.2 References to Elements

References to elements are implicitly inserted into the JavaScript context when calling **eval()**, **execute()**, or **call()**. Examples of implicit variables include, for instance, **$Class**, **$UseCase**, **$sorter**, etc.

For example:

A "functions.js"

```
importPackage(java.util)

// variable $Dependency and $sorter can be accessed directly inside
function getSupplier()
{
   var supplierList = new ArrayList();
     var sortedDependencyList = $sorter.sort($Dependency);
   for (var i=0; i<sortedDependencyList.size(); i++)
   {
      var dependency = sortedDependencyList.get(i);
      supplierList.addAll(dependency.getSupplier());
   }
   return supplierList;
}
```

A template code

```
#import ('js', 'com.nomagic.reportwizard.tools.script.JavaScriptTool')

$js.execute("functions.js")
#set ($supplierList = $js.eval("getSupplier()"))
#foreach ($supplier in $supplierList)
  $supplier.name
#end
```

Example:

A "functions.js"

```
var qualifiedName = "";
function packageQualifiedName(element)
{
   qualifiedName = "";
    packageName(element);
    return qualifiedName==""?"Default":qualifiedName;
}

function packageName(element)
{
    var parent = element.owner;
   if (parent.classType.simpleName == 'Package') {
       if (qualifiedName == "")
             qualifiedName = parent.name;
          else
          qualifiedName = parent.name + '.' + qualifiedName;
          packageName(parent);
    }
}
```

A template code

```
#import ('js', 'com.nomagic.reportwizard.tools.script.JavaScriptTool')

$js.execute("functions.js")
#foreach ($c in $Class)
   Package: $js.eval('packageQualifiedName($c)')
    Name: $c.name
#end
```

Reference Documents

- Mozilla JavaScript Tool

  http://developer.mozilla.org/en/Rhino_documentation
- Sun JavaScript programming guide

  http://java.sun.com/javase/6/docs/technotes/guides/scripting/programmer_guide/index.html

16. Groovy Script Tool

Groovy Script Tool enables report templates to evaluate or run Groovy codes from templates and external Groovy files.

The Groovy Tool includes two methods:

(i) 'eval' method: This method will evaluate Groovy text, and then return the result.

(ii) 'execute' method: This method will execute a Groovy file, and then return the result.

Like other Script Tools, the Groovy Script Tool 'scripttool.jar' must be installed in the 'extensions' folder of the Report Wizard plugin, and 'groovy-all-1.7.9.jar' must be included in any class path or the 'extensions' folder. For further information about Custom Tools and the installation, see **1 Custom Tool**.

To import Groovy Script Tool to a template, type the following code:

```
#import ('groovy', 'com.nomagic.reportwizard.tools.script.GroovyTool')
```

16.1 Groovy Script Tool API

16.1.1 'eval' Method

eval(String script)

This method will evaluate a Groovy code from a string and return the result.

```
$groovy.eval("println 'Hello World!'")
```

eval(String script, String bindingName, Object bindingObject)

This method will evaluate a Groovy code with a single binding object and specified binding name. The code will be evaluated from a string. The binding name will be used as the name for this object.

```
#foreach ($c in $Class)
 $groovy.eval("println classname", "classname", $c.name)
#end
```

eval(String script, Map bindingMap)

This method will evaluate a Groovy code with a set of binding arguments (a name and an object). The code will be evaluated from a string. The binding map consists of key-value pairs for the binding name and the binding object.

```
#set ($dict = $map.createHashMap())
#set ($void = $dict.put("first", "foo"))
#set ($void = $dict.put("last", "bar"))
$groovy.eval("println first + last", $dict)
```

Or

```
$groovy.eval("println first + ' '+ last", {"first":"foo", "last":"bar"})
```

NOTE	The second code contains curly brackets; '{' and '}' characters, which are not allowed to be used in any RTF template. For the RTF template, use the first code instead.

16.1.2 'execute' method

execute(String filename)

This method will execute a Groovy file. The 'filename' parameter refers to a name of the Groovy file or an absolute path to the Groovy file.

```
$groovy.execute("filename.groovy")
```

execute(String filename, String bindingName, Object bindingObject)

This method will execute a Groovy file with a single binding object and specified binding name. The 'filename' parameter is a file path to the Groovy file. The binding name will be used as the name for this object.

File filename.groovy

```
"Class name is $c.name"
```

The template code

```
#foreach ($c in $Class)
  $groovy.execute("filename.groovy", 'c', $c)
#end
```

execute(String filename, Map bindingMap)

This method will execute a Groovy file with a set of binding arguments (a name and an object). The 'filename' parameter is a file path to the Groovy file. The binding map consists of key-value pairs for the binding name and the binding object.

File filename.groovy

```
first + " " + last
```

The template code

```
#set ($dict = $map.createHashMap())
#set ($void = $dict.put("first", "foo"))
#set ($void = $dict.put("last", "bar"))
$groovy.execute("filename.groovy", $dict)
```

NOTE	• *Absolute Path*: If the 'filename' is provided with an absolute path, Groovy Tool will read the Groovy file from an absolute location such as $groovy.execute('c:/mycode/readclass.groovy'). • *Relative Path*: If the 'filename' is provided with a relative path, Groovy Tool will read the template from a relative location. This relative location starts from the current directory in which the template is located such as $groovy.execute('readclass.groovy').

16.2 References to Elements

References to elements are similar to ones in JavaScript Tool. The elements are implicitly inserted into the Groovy context when calling “eval()”, or “execute()”. Examples of implicit variables include $Class, $UseCase, $sorter, etc.

File 'AllAbstractClass.groovy'

```
// variable $Class can be accessed directly inside Groovy script

def list = []
for (c in $Class) {
    if (c.isAbstract()) {
        list.add(c)
    }
}
return list
```

The report template code is:

```
#import ('groovy', 'com.nomagic.reportwizard.tools.script.GroovyTool')
#set ($abstractClassList = $groovy.execute('AllAbstractClass.groovy'))
#foreach ($cls in $abstractClassList)
  $cls.name
#end
```

17. Ruby Script Tool

Ruby Script Tool enables report templates to evaluate or run Ruby codes from templates and external Ruby files.

The Ruby Tool includes 2 methods:

(i) 'eval' method: This method will evaluate Ruby text, and then return the result.

(ii) 'execute' method: This method will execute a Ruby file, and then return the result.

Like other Script Tools, the Ruby Script Tool 'scripttool.jar' must be installed in the 'extensions' folder of the Report Wizard plugin, and 'jruby-complete-1.6.3.jar' must be included in any class path or the 'extensions' folder. For further information about Custom Tools and the installation, see **1 Custom Tool**.

To import Ruby Script Tool to a template, type the following code:

```
#import ('ruby',
'com.nomagic.reportwizard.tools.script.RubyScriptTool')
```

17.1 Ruby Script Tool API

17.1.1 'eval' Method

17.1.1.1 eval(String script)

This method will evaluate a Ruby code from a string and return the result.

```
$ruby.eval("puts 'Hello World!'")
```

17.1.1.2 eval(String script, String bindingName, Object bindingObject)

This method will evaluate a Ruby code with a single binding object and specified binding name. The code will be evaluated from a string. The binding name will be used as the name for this object.

```
#foreach ($class in $Class)
  $ruby.eval('"Class name is " + c.name', 'c', $class)
#end
```

17.1.1.3 eval(String script, Map bindingMap)

This method will evaluate a Ruby code with a set of binding arguments (a name and an object). The code will be evaluated from a string. The binding map consists of key-value pairs for the binding name and binding object.

```
#set ($dict = $map.createHashMap())
#set ($void = $dict.put("first", "foo"))
#set ($void = $dict.put("last", "bar"))
$ruby.eval("puts first + last", $dict)
```

Another alternative is as follows:

```
$ruby.eval("puts first + last", {"first":"foo", "last":"bar"})
```

The second code contains curly brackets; "{" and "}" characters, which are not allowed to be used in any RTF template. For the RTF template, use the first code instead.

17.1.2 'execute' Method

17.1.2.1 execute(String filename)

This method will execute a Ruby file. The 'filename' parameter is a name of the Ruby file or an absolute path to the Ruby file.

```
$ruby.execute("filename.rb")
```

After executing the Ruby file, the result of the execution will be stored in the single context for each report generation. If the Ruby file contains Ruby functions, you can recall the functions with the use of 'eval()' methods.

For example, File 'String.rb':

```
def deCamelCase(str)
  return str.gsub!(/(.)([A-Z])/,'\1 \2')
end
```

Indicated below is the template code.

```
$ruby.execute("String.rb")
#foreach ($c in $Class)
  $ruby.eval('deCamelCase($c.name)')
#end
```

17.1.2.2 execute(String filename, String bindingName, Object bindingObject)

This method will execute a Ruby file with a single binding object and specified binding name. The 'filename' parameter is a file path to the Ruby file. The binding name will be used as the name for this object.

File 'filename.rb'

```
puts c.name
```

The template code

```
#foreach ($c in $Class)
  $ruby.execute("filename.rb", 'c', $c)
#end
```

17.1.2.3 execute(String filename, Map bindingMap)

This method will execute a Ruby file with a set of binding arguments (a name and an object). The 'filename' parameter is a file path to the Ruby file. The binding map consists of key-value pairs for the binding name and binding object.

File 'filename.rb'

```
puts first+' '+last
```

The template code

```
#set ($dict = $map.createHashMap())
#set ($void = $dict.put("first", "foo"))
#set ($void = $dict.put("last", "bar"))
$ruby.execute("filename.rb", $dict)
```

NOTE	• *Absolute Path*: If the 'filename' is provided with an absolute path, Ruby Tool will read the Ruby file from an absolute location such as $ruby.execute('c:/mycode/readclass.rb'). • *Relative Path*: If the 'filename' is provided with a relative path, Ruby Tool will read the template from a relative location. This relative location starts from the current directory location of the template, such as $ruby.execute('readclass.rb').

17.2 References to Elements

References to elements are similar to JavaScript Tool and Groovy Tool. The elements are implicitly inserted into the Ruby context when "eval()" or "execute()" is called. Examples of implicit variables include $Class, $UseCase, $sorter, etc.

For example, File 'Functions.rb':

```
def supplierList
   result = [];
   $Dependency.each do |item|
      item.supplier.each do |supplier|
         result << supplier;
      end
   end
   return result;
end
```

Indicated below is the template code.

```
#import ('ruby',
'com.nomagic.reportwizard.tools.script.RubyScriptTool')
$ruby.execute('Functions.rb')
#set ($supplierList = $ruby.eval('supplierList'))
#foreach ($e in $supplierList)
  $e.name
#end
```

18. Dialog Tool

The purpose of a Dialog Tool is to enable report templates to call functions for creating dialogs to interact with users during the report generation process. To modify the report templates, you can use the **Dialog Tool**.

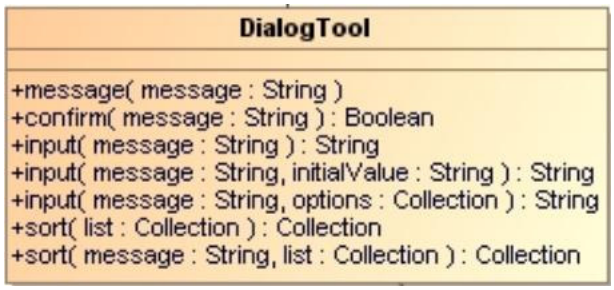


Figure 194 -- Class Diagram: Dialog Tool

The Dialog Tool uses 4 methods:

(i) **message**: This method will create message dialogs.

(ii) **confirm**: This method will create confirmation dialogs and return the Boolean value 'true' when you click the **OK** button or return 'false' when you click the **Cancel** button.

(iii) **input**: This method will create input dialogs and return the input value as a string.

(iv) **sort**: This method will create Sort and Enable dialogs and return a collection of newly-sorted results.

Like other Custom Tools, the Dialog Tool (dialogtool.jar) must be installed in the 'extensions' folder of the Report Wizard plugin.

To import a Dialog Tool to a template, type the following:

```
#import('dialog','com.nomagic.reportwizard.tools.DialogTool')
```

18.1 Dialog Tool API

18.1.1 'message' Method

`message(String message) : void`. This method will create messages into message dialogs. For example:

```
$dialog.message("Click OK to close dialog")
```

The output will be:

Figure 195 -- Message Dialog

18.1.2 'confirm' Method

`confirm(String message) : boolean`. This method will create messages into confirmation dialogs and return the Boolean value 'true' when you click the **OK** button or 'false' when you click the **Cancel** button in the dialog. For example:

```
#if($dialog.confirm("Do you want to geanerate section A?"))
#end
```

The output will be:

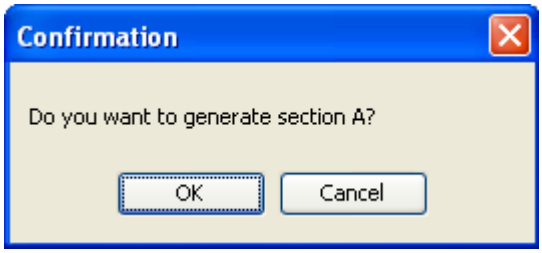


Figure 196 -- Confirmation Dialog

18.1.3 'input' Method

18.1.3.1 Input Dialogs with Text

`input(String message) : String`. This method will create input dialogs from messages, and then return the input values as strings when you click the **OK** button or 'null' when you click the **Cancel** button in the dialog. For example:

```
#set ($userText = $dialog.input("Enter your name"))
#if ($userText)
Your name is $userText
#else
Please specify your name
#end
```

The output will be:

Figure 197 -- Input Dialog with Text

18.1.3.2 Input Dialogs with Text and Initial Value

`input(String message, String initialValue) : String`. This method will create messages and add initial values in input dialogs. It will return the input values as strings when you click the **OK** button or 'null' when you click the **Cancel** button. For example:

```
#set ($userText = $dialog.input("Enter a date", "July10,2009"))
Date is $userText
```

The output will be:

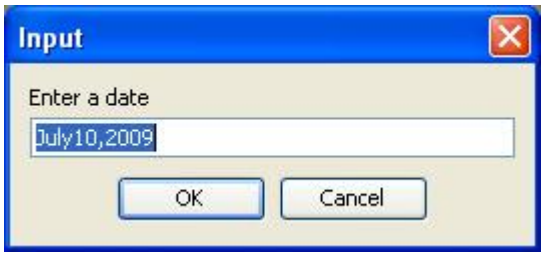


Figure 198 -- The Input Dialog with Text and an Initial Value

18.1.3.3 Input Dialog with Text and Initial Value Array

`input(String message, Collection options) : String`. This method will create messages and add initial value arrays in input dialogs. It will return the input values as strings when you click the **OK** button or 'null' when you click the **Cancel** button. For example:

```
#set ($selectedOption = $dialog.input("Choose your favorite
fruit", ["Apple", "Orange", "Banana"]))
Your favorite fruit is $selectedOption
```

The output will be:

Figure 199 -- Input Dialog with Text and Initial Value Array

18.1.4 'sort' Method

18.1.4.1 Sort and Enable Dialogs

`sort(Collection list) : Collection`. This method will create Sort and Enable dialogs from collections and return a collection of the newly-sorted results when you click the **OK** button or return the original collection when you click the **Cancel** button in the dialog. For example:

```
#foreach ($diagram in $dialog.sort($Diagram))
$diagram.name
#end
```

The output will be:

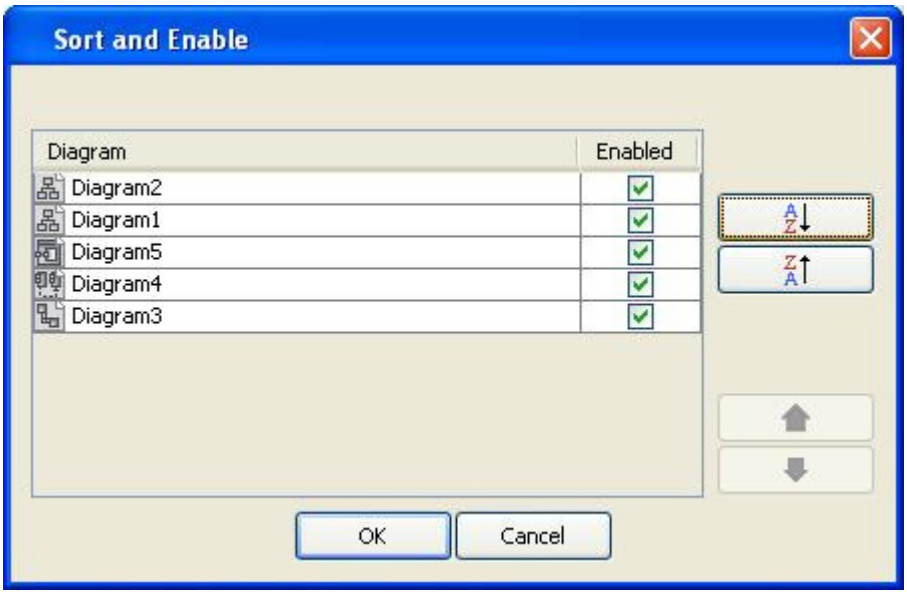


Figure 200 -- Sort and Enable Dialog

18.1.4.2 Sort and Enable Dialogs with Text

`sort(String message, Collection list)`. This method will create the Sort and Enable dialogs from text and collections and return a collection of the newly-sorted results when you click the **OK** button or return the original collection when you click the **Cancel** button in the dialog. For example:

```
#foreach ($diagram in $dialog.sort("Rearrange diagram for presen-
tation report",$Diagram))
$diagram.name
#end
```

The output will be:

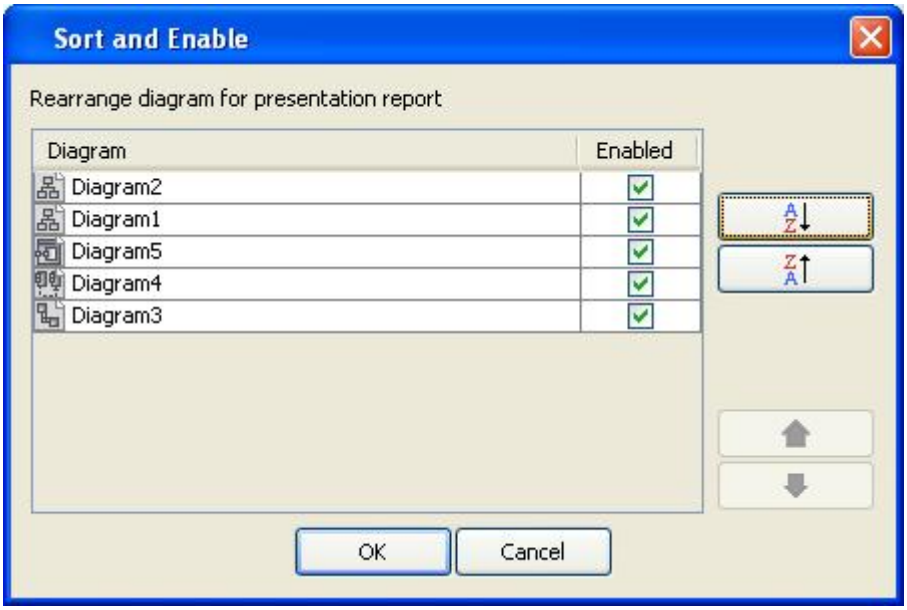


Figure 201 -- Sort and Enable Dialog with Text

19. Text Tool

A Text tool provides extra functions to convert or format text.

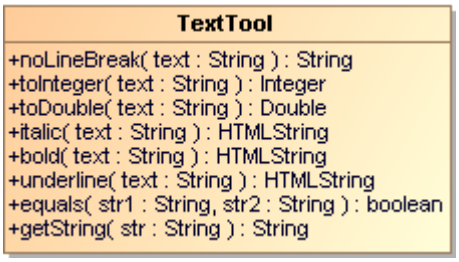


Figure 202 -- Class Diagram: Text Tool

Like other Custom Tools, the Text Tool (text.jar) must be installed in the 'extensions' folder of the Report Wizard plugin. For further information on Custom Tools and installation, see 1 Custom Tool.

To import a Text Tool to a template, type the following:

```
#import('text', 'com.nomagic.reportwizard.tools.TextTool')
```

19.1 Text Tool API

noLineBreak(String text)

This method will remove all control characters such as U+0009 (Tab), U+000A (Line Feed), and U+000D (Carriage Return) from a given text. This method will also filter text under the category "Cc" in the Unicode specification. An example of a use case that contains multiple lines has the code as shown below.

```
$usecase.name
```

The output will be:

```
Line 1
Line 2
Line 3
```

With the **$text.noLineBreak()** method, the code will be:

```
$text.noLineBreak($usecase.name)
```

The output will be:

```
Line 1 Line 2 Line 3
```

toInteger(String text)

Converts a string argument to a signed decimal integer. For example:

```
#set ($int = $text.toInteger('2'))
#set ($result = $int + 1)
Result is $result
```

toDouble(String text)

Converts a string argument to a signed decimal double. For example:

```
#set ($d = $text.toDouble('10.1'))
#set ($result = $d + 2)
Result is $result
```

italic(String text)

Forces a report to render a given text in the italic style. For example:

```
The $text.italic($class.name) must provide interface for web ser-
vices.
```

The output will be:

```
The BusinessServices must provide interface for web services.
```

bold(String text)

Forces a report to render a given text in the bold style. For example:

```
Method $text.bold($operator.name) must be implemented by implemen-
tation class.
```

The output will be:

```
Method doService must be implemented by implementation class.
```

underline(String text)

Forces a report to render a given text in the underlined style. For example:

```
Attribute $text.underline($attribute.name) contains a service
name.
```

The output will be:

```
Attribute serverName contains a service name.
```

html(String text)

Forces a report to render a given text as HTML. For example:

```
$text.html('<ul><li>A</li><li>B</li></ul>')
```

The output will be:

```
·A
·B
```

For more information on supported HTML tags, see Appendix D: HTML Tag Support.

getString(String text)

Converts text from RTF to a Java String. For example:

```
#set ($str = $text.getString("Übersetzer"))
$str
```

The output will be:

```
Übersetzer
```

equals(String str1, String str2)

Compares two strings. The result will be true if and only if **str1** represents the same sequence of characters as **str2** does. This method supports RTF text comparison. For example:

```
#set ($str = $text.getString("Übersetzer"))
#if ($text.equals($str, "Übersetzer"))
   true
#end
```

20. Model Validation Tool

The Model Validation Tool allows templates to:

- Invoke the Validation menu and validate the models from suite names.
- Set the severity.
- Retrieve validation results.

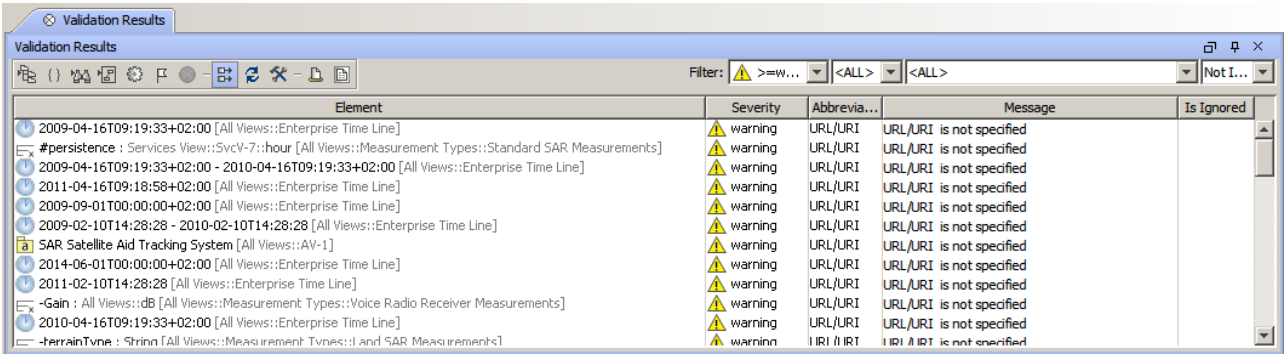


Figure 203 -- Model Validation Dialog

Like other Custom Tools, the Model Validation Tool 'validationtool.jar' must be presented in the 'extensions' folder of the Report Wizard plugin. For further information on Custom Tools and the installation, see 1 Custom Tool.

To import a Model Validation Tool to a template, type this code in the template.

```
#import('validator', 'com.nomagic.reportwizard.tools.ModelValidationTool')
```

20.1 Model Validation Tool API

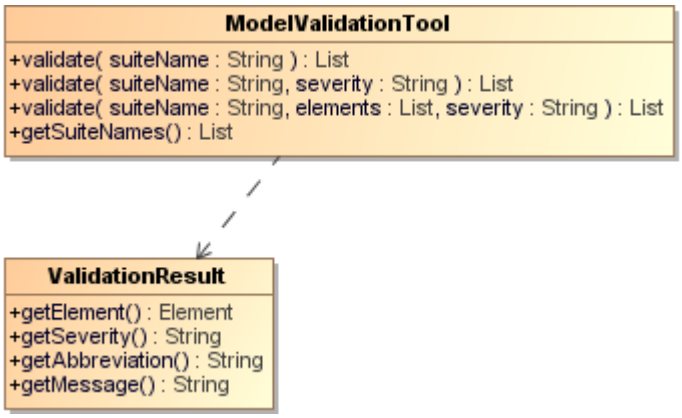


Figure 204 -- Class Diagram of a Model Validation Tool

Class MetricsTool

Methods:

- +validate(suiteName : String) : List<ValidationResult>
- +validate(suiteName : String, severity: String) : List<ValidationResult>
- +validate(suiteName : String, element : List, severity : String) : List<ValidationResult>
- +getSuiteNames() : List<String>

Class ValidationResult

Methods:

- +getElement( ) : Element
- +getSeverity( ) : String
- +getAbbreviation() : String
- +getMessage( ) : String

20.1.1 Validate Methods

validate(suiteName : String) : List<ValidationResult>

Uses only a suite name to validate a model from the whole project with default “debug” as severity.

```
#set ($results = $validator.validate("suitename"))
```

validate(suiteName : String, severity : String) : List<ValidationResult>

Uses a suite name and a severity type to validate a model from the whole project. The severity types are “debug”, “info”, “warning”, “error” and “fatal”.

```
#set ($results = $validator.validate("suitename", "severity"))
```

validate(suiteName : String, elementList : List<Element>, severity : String) : List<ValidationResult>

Uses a suite name and a severity type to validate a model from an element list. The severity types are “debug”, “info”, “warning”, “error”, and “fatal”.

```
#set ($results = $validator.validate("suitename", $elementList, "severity"))
```

To validate all classes by using ‘UML completeness constraints’ suite and the severity type is warning, for example, type the following code:

```
#set ($results = $validator.validate("UML completeness constraints", $Class,
"warning"))
```

20.1.2 Getting the Suite Name List

The template author can list the entire available Model Validation suite names from ‘suiteNames’ methods. The ‘suiteNames’ is available in the ModelValidationTool class.

getSuiteNames() : List<String>

```
#set ($nameList = $validator.suiteNames)
```

`$validator` represents the ModelValidationTool class.

Prints all Metrics names and their values of all Classes, for example, type the following code:

```
#foreach ($name in $validator.suiteNames)
    $name
#end
```

20.1.3 Getting the Validation Data from Validation Results

The object returned from validate methods in the previous section is the list of validation results. The validation results contain columns of validation result with each row of validated models.

getElement() : Element

Gets a validated element.

```
#set ($element = $results.getElement())
```

To print all validated elements' names, for example, type the following code:

```
#set ($results = $validator.validate("UML completeness constraints"))
#foreach ($result in $results)
    $result.element.name
#end
```

getSeverity() : String

Gets a severity type.

```
#set ($severity = $results.getSeverity())
```

getAbbreviation() : String

Gets an abbreviation.

```
#set ($abbr = $results.getAbbreviation())
```

getMessage() : String

Gets a message.

```
#set ($message = $results.getMessage())
```

20.2 Code Examples for Model Validation Tool

The code in this section demonstrates some scenarios with Model Validation Tool.

To print all validation results from a project by using the “UML completeness constraints” suite, for example, type the following code:

```
#import('validator', 'com.nomagic.reportwizard.tools.ModelValidationTool')

#set ($results = $validator.validate("UML completeness constraints"))
#foreach ($result in $results)
    Element: $result.element.name
    Severity: $result.severity
    Abbreviation: $result.abbreviation
    Message: $result.message
#end
```

To print only the validation results from the Class by using the “UML Correctness” suite and the "warning" severity, for example, type the following code:

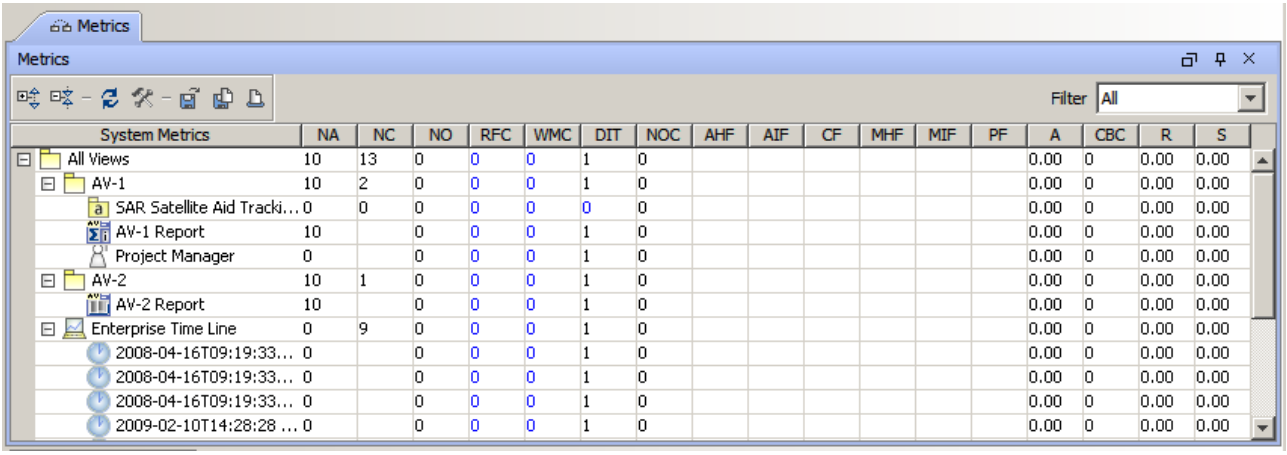
```
#import('validator', 'com.nomagic.reportwizard.tools.ModelValidationTool')

#set ($results = $validator.validate("UML Correctness", $Class, "warning"))
#foreach ($result in $results)
    Element: $result.element.name
    Abbreviation: $result.abbreviation
    Message: $result.message
#end
```

21. Metrics Tool

The Metrics Tool allows templates to:

- Invoke the Metrics menu and calculate the Metric from its suite names.
- Set a filter.
- Retrieve row elements and the Metric value.



System Metrics	NA	NC	NO	RFC	WMC	DIT	NOC	AHF	AIF	CF	MHF	MIF	PF	A	CBC	R	S
All Views	10	13	0	0	0	1	0							0.00	0	0.00	0.00
AV-1	10	2	0	0	0	1	0							0.00	0	0.00	0.00
SAR Satellite Aid Tracki...	0	0	0	0	0	0	0							0.00	0	0.00	0.00
AV-1 Report	10		0	0	0	1	0							0.00	0	0.00	0.00
Project Manager	0		0	0	0	1	0							0.00	0	0.00	0.00
AV-2	10	1	0	0	0	1	0							0.00	0	0.00	0.00
AV-2 Report	10		0	0	0	1	0							0.00	0	0.00	0.00
Enterprise Time Line	0	9	0	0	0	1	0							0.00	0	0.00	0.00
2008-04-16T09:19:33...	0		0	0	0	1	0							0.00	0	0.00	0.00
2008-04-16T09:19:33...	0		0	0	0	1	0							0.00	0	0.00	0.00
2008-04-16T09:19:33...	0		0	0	0	1	0							0.00	0	0.00	0.00
2009-02-10T14:28:28 ...	0		0	0	0	1	0							0.00	0	0.00	0.00

Figure 205 -- Metrics Dialog

Like other Custom Tools, the Metrics Tool 'metrictool.jar' must be presented in the 'extensions' folder of the Report Wizard plugin. For further information on Custom Tools and the installation, see 1 Custom Tool.

To import the Metrics Tool to a template, type this following code in the template:

```
#import('metrics', 'com.nomagic.reportwizard.tools.MetricsTool')
```

21.1 Metrics Tool API

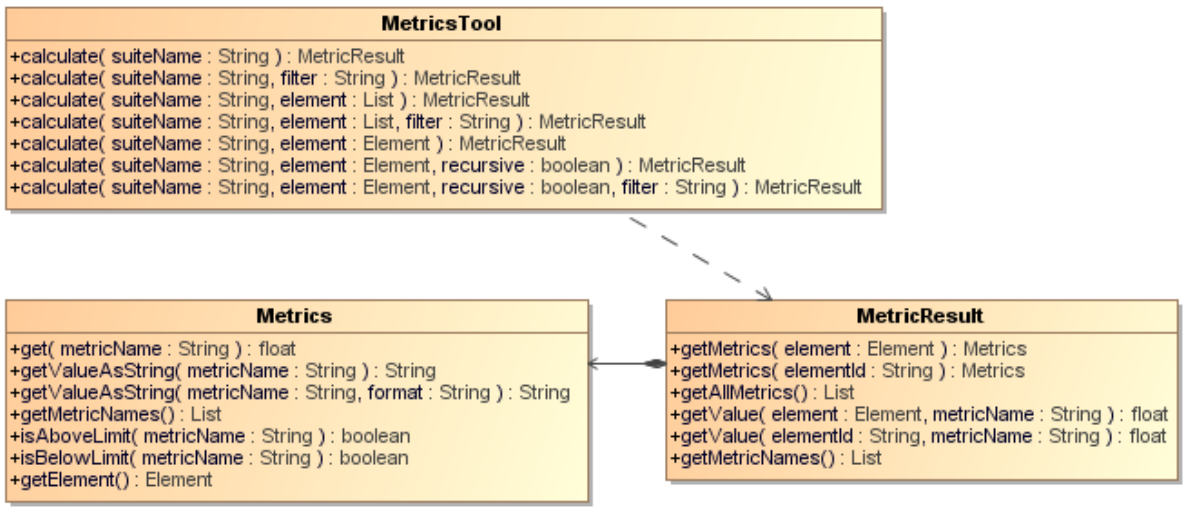


Figure 206 -- Class Diagram of the Metrics Tool

Class of MetricsTool

Methods:

- +calculate(suiteName : String) : MetricsResult
- +calculate(suiteName : String, filter : String) : MetricsResult
- +calculate(suiteName : String, element : java::util::List) : MetricsResult
- +calculate(suiteName : String, element : java::util::List, filter : String) : MetricsResult
- +calculate(suiteName : String, element : Element) : MetricsResult
- +calculate(suiteName : String, element : Element, recursive : boolean) : MetricsResult
- +calculate(suiteName : String, element : Element, filter : String) : MetricsResult

Class of MetricsResult

Methods:

- +getMetrics(element : Element) : Metrics
- +getMetrics(elementId : String) : Metrics
- +getAllMetrics() : List<Metrics>
- +getValue(element : Element, metricName : String) : float
- +getValue(elementId : String, metricName : String) : float
- +getMetricNames() : List<String>

Class of Metric

Methods:

- +get(metricName : String) : float
- +getValueAsString(metricName : String) : String
- +getValueAsString(metricName : String, format : String) : String
- +getMetricNames() : List
- +isAboveLimit(metricName : String) : boolean
- +isBelowLimit(metricName : String) : boolean

21.1.1 Calculation Methods

calculate(suiteName : String) : MetricResult

Uses only the suite name to calculate the Metric from an entire project.

```
#set ($metricsResults = $metrics.calculate('suitename'))
```

Example code:

Calculates the Metric from the Actor name “Template Author”.

```
#set ($metricsResults = $metrics.calculate('System Metrics'))
```

calculate(suiteName : String, filter : String) : MetricResult

Uses a suite name and filter to calculate the Metric from an entire project. `"filter"` is a filter name displayed in the Metric dialog.

```
#set ($metricsResults = $metrics.calculate('suitename', "filter"))
```

NOTE	If the language used in the MagicDraw interface changes, the filter name needs to be replaced with a target language, for example: French will be "Violations de Paquetage" for "Package Violations".

calculate(suiteName : String, elementList : List<Element>) : MetricResult

Specifies a suite name and Element list to calculate the Metrics.

```
#set ($metricsResults = $metrics.calculate('suitename', $elementList))
```

To calculate the Metrics from all classes by using the ‘System Metrics’ suite, for example, type the following code:

```
#set ($metricsResults = $metrics.calculate('System Metrics', $Class))
```

calculate(suiteName : String, elementList : List<Element>) : MetricResult

Specifies a suite name and Element list to calculate the Metric with a specific filter name.

```
#set ($metricsResults = $metrics.calculate('suitename', $elementList, "filter"))
```

To calculate the Metric from all classes by using the ‘System Metrics’ suite with the package violations filter, for example, type the following code:

```
#set ($metricsResults = $metrics.calculate('System Metrics', $Class, "Package
Violations"))
```

calculate(suiteName : String, element : Element) : MetricResult

Calculates the Metric from a single element.

```
#set ($metricsResults = $metrics.calculate('suitename', $element))
```

To calculate the Metric from the Actor name “Template Author”, for example, type the following code:

```
#set ($actor = $report.findElementInCollection($Actor, "Template Author"))
#set ($metricsResults = $metrics.calculate('System Metrics', $actor))
```

calculate(suiteName : String, element : Element, recursive : boolean) : MetricResult

Calculates the Metric from a single element with the recursive option. If the recursive option is true, it will calculate the result from a given root element and recursive to all children; otherwise (false), calculates the result from the single element.

```
#set ($metricsResults = $metrics.calculate('suitename', $element, $recursive))
```

To calculate the Metric from a root element and recursive to all children. The result is similar to the calculated result from all elements in a project, for example, type the following code:

```
#set ($root = $project.model)
#set ($metricsResults = $metrics.calculate('System Metrics', $root, true))
```

calculate(suiteName : String, element : Element, recursive : Boolean, filter : String) : MetricResult

Calculates the Metric from a single element with the recursive option and a filter name. If the recursive option is true, it will calculate the result from a given root element and recursive to all children; otherwise (false), calculate the result from the single element.

```
#set ($metricsResults = $metrics.calculate('suitename', $element, $recursive,
"filter"))
```

21.1.2 Getting Metric Data from Metric Results

The object returned from calculating methods in the previous section is the Metrics results. The Metrics results represent the Metrics Table as shown in MagicDraw. It consists of Element and the Metrics. To get the Metrics and value, we need to pass the element (row) as parameter and get the Metrics (column).

getMetrics(element : Element) : Metrics

Gets the Metric of a specified element.

```
#set ($elementMetric = $metricsResults.getMetrics($element))
```

getMetrics(elementId : String) : Metrics

Gets the Metric of a specific element ID.

```
#set ($elementMetric = $metricsResults.getMetrics("element id"))
```

getAllMetrics() : List<Metrics>

Gets all Metrics at once.

To print all numbers of attribute (NA) value of all elements, for example, type the following code:

```
#set ($metricsResults = $metrics.calculate('System Metrics')
#foreach ($elementMetric in $metricsResults.allMetrics)
    $elementMetric.element.name has $elementMetric.NA
#end
```

getValue(element : Element, metricName : String) : float

This is the shortcut method to get a specific Metric value of a target element. The Metric name is the abbreviation of Metric, for example, NA, NC, NO, RFC, etc. This value is case-sensitive. See 21.1.3 Getting Metric Values.

```
#set ($value = $metricsResults.getValue($element, "Metric name"))
```

getValue(elementId : String, metricName : String) : float

This is the shortcut method to get the specified Metrics value of a target element. The Metric name is the abbreviation of Metric, for example, NA, NC, NO, RFC, etc. This value is case-sensitive. See 21.1.3 Getting Metric Values.

```
#set ($value = $metricsResults.getValue("element id", "Metric name"))
```

21.1.3 Getting Metric Values

The method in Section 21.1.2 Getting Metric Data from Metric Results will return a Metric object. The Metric object represents all Metric values of a single element. If the Metric contains no value, the returned value will be zero.

get(metricName : String) : float

The Metric name is the abbreviation of Metric, for example, NA, NC, NO, and RFC. This value is case-sensitive.

To return the number of attributes (NA) from Class SwingUtilities, for example, type the following code:

```
#set ($class = $report.findElementInCollection($Class, "SwingUtilities"))
#set ($metricsResults = $metrics.calculate('System Metrics', $class))
#set ($elementMetric = $metricsResults.getMetrics($class))
#set ($value = $elementMetric.get("NA"))
```

NOTE	The user can use the Velocity technique for a shortcut when retrieving value from a Metrics name. The Metrics name is case-sensitive.

To return the number of an attribute (NA), for example, type the following code:

```
#set ($value = $elementMetric.NA)
```

getValueAsString(metricName : String) : String

You can format an output value as string. The Metric name is the abbreviation of Metric, for example, NA, NC, NO, and RFC. This value is case-sensitive. If the Metric contains no value, the returned string will be an empty string.

```
#set ($value = $elementMetric.getValueAsString('metricName'))
```

The characters in the table below are used in the patterns.

Symbol	Meaning
0	Digit
#	Digit, zero shows as absent
.	Decimal separator or monetary decimal separator
,	Grouping separator
E	Separates mantissa and exponent in scientific notation.
%	Multiply by 100 and show as percentage

The following are some examples of patterns.

Value	Pattern	Result
23.456	###.00	23.46
23.456	000.00	023.46
23.456	###.###	23.456
12345678	###,###.##	12,345,678.00
12345678	#.##	12345678

NOTE	

	• Since the symbol contains # (hash character), which is a special character for Velocity Template Language, you needs to use a pair of single quotes instead of double quotes to pass the hash character into the parameter.
	• The following code is not in the correct format:
	`$elementMetric.getValueAsString("NA", "#.##")`
	The code written above will return an unexpected result. Use the following code to get the formatted text.
	`$elementMetric.getValueAsString("NA", '#.##')`
	However, this method cannot use a single quote character in formatted text.

The following is the sample code:

Return the number of an attribute (NA) from Class SwingUtilities.

```
#set ($class = $report.findElementInCollection($Class, "SwingUtilities"))
#set ($metricsResults = $metrics.calculate('System Metrics', $class))
#set ($elementMetric = $metricsResults.getMetrics($class))
#set ($value = $elementMetric.getValueAsString("NA", '#.##'))
```

21.1.4 Getting the Metric Name List

A template author can list an entire available Metric names from ‘metricNames’ methods. The ‘metricNames’ is available in both Metric results and Metric class.

getMetricNames() : List<String>

```
#set ($nameList = $elementMetric.metricNames)
```

Or

```
#set ($nameList = $metricsResults.metricNames)
```

$elementMetric represents a Metric class and $metricsResults represents a MetricsResults class.

To print all Metric names and all of their classes’ values, for example, type the following code:

```
#set ($metricsResults = $metrics.calculate('System Metrics', $Class))
#foreach ($class in $Class)
    $class.humanName
    #foreach ($metricName in $metricsResults.metricNames)
      $metricName value $metricsResults.getValue($class, $metricName)
    #end
#end
```

To print all Metric names and their values of all Classes, for example, type the following code:

```
#set ($metricsResults = $metrics.calculate('System Metrics', $Class))
#foreach ($class in $Class)
    #foreach ($elementMetric in $metricsResults.getMetrics($class))
       #foreach ($metricName in $elementMetric.metricNames)
           $metricName value $elementMetric.get($metricName)
       #end
    #end
#end
```

21.1.5 Getting the Result Attribute “is above limit” from a Metrics Name

The “is above limit” is a Boolean value that indicates that a value is larger than the value configured in the Metrics menu. The $elementMetric represents a Metric class and $metricsResults represents a MetricsResults class.

```
#set ($isAbove = $metricsResults.isAboveLimit('metricName'))
```

To change the HTML text color to red if the number of classes in a project is larger than the limit, for example, type the following code:

```
#set ($metricsResults = $metrics.calculate('System Metrics', $project.model,
true))
#set ($elementMetrics = $metricsResults.getMetrics($project.model))
#if ($elementMetrics.isAboveLimit('NC'))
    Total classes is <font color="red">$elementMetrics.get('NC')</font>
#end
#end
```

21.1.6 Getting the Result Attribute “is below limit” from a Metric Name

The “is below limit” is a Boolean value that indicates that a value is less than the value configured in the Metric menu.

The $elementMetric represents a Metric class.

```
#set ($isAbove = $elementMetric.isBelowLimit('metricName'))
```

Example code:

Change the text color to red if the number of responses for the class “Customer” is less than the limit.

```
#set ($class = $report.findElementInCollection($Class, "Customer"))
#set ($metricsResults = $metrics.calculate('System Metrics', $class))
#set ($elementMetrics = $metricsResults.getMetrics($class))
#if ($elementMetrics.isBelowLimit('RFC'))
$class.name is too complex. The total number of methods access to this class is
<font color="blue">$elementMetrics.get('RFC')</font>
#end
```

21.2 Code Examples for Metric Tool

The code in this section demonstrates some scenarios with Metric Tool.

(i) Printing all Metric names and their values of all elements under the package “Design” by using the “System Metrics” suite.

```
#import('metrics', 'com.nomagic.reportwizard.tools.MetricsTool')

#set ($package = $report.findElementInCollection($Package, "Design"))
#set ($metricsResults = $metrics.calculate('System Metrics', $package))
Package $package.name contains the following metrics
#foreach ($metricName in $metricsResults.metricNames)
    $metricName value $metricsResults.getValue($package, $metricName)
#end
```

(ii) Creating a hierarchy of elements of a project and printing all Metric names and their values by using the “System Metrics” suite.

```
#import('metrics', 'com.nomagic.reportwizard.tools.MetricsTool')

#macro (next $e)
#set ($metricsResults = $metrics.calculate('System Metrics', $e))
Element $e.name
#foreach ($metricName in $metricsResults.metricNames)
    $metricName value $metricsResults.getValue($e, $metricName)
#end
#foreach ($child in $e.ownedElement)
#next($child)
#end
#end

#next ($project.model)
```

(iii) Creating a Metric table for Classes by using the “System Metrics” suite and formatting the result by using two-decimal digits.

```
#import('metrics', 'com.nomagic.reportwizard.tools.MetricsTool')

#set ($metricsResults = $metrics.calculate('System Metrics', $Class))
#foreach ($cls in $Class)
Class $cls.name
#set ($elementMetric = $metricsResults.getMetrics($cls))
    #foreach ($name in $elementMetric.metricNames)
        $name : $elementMetric.getValueAsString($name, '##.00')
    #end
#end
```

22. Dependency Matrix Tool

The Dependency Matrix Tool allows templates to:

- Access data from Dependency Matrix.
- Use diagrams to get data from Dependency Matrix.
- Get row elements.
- Get column names.
- Get relations between row and column elements.

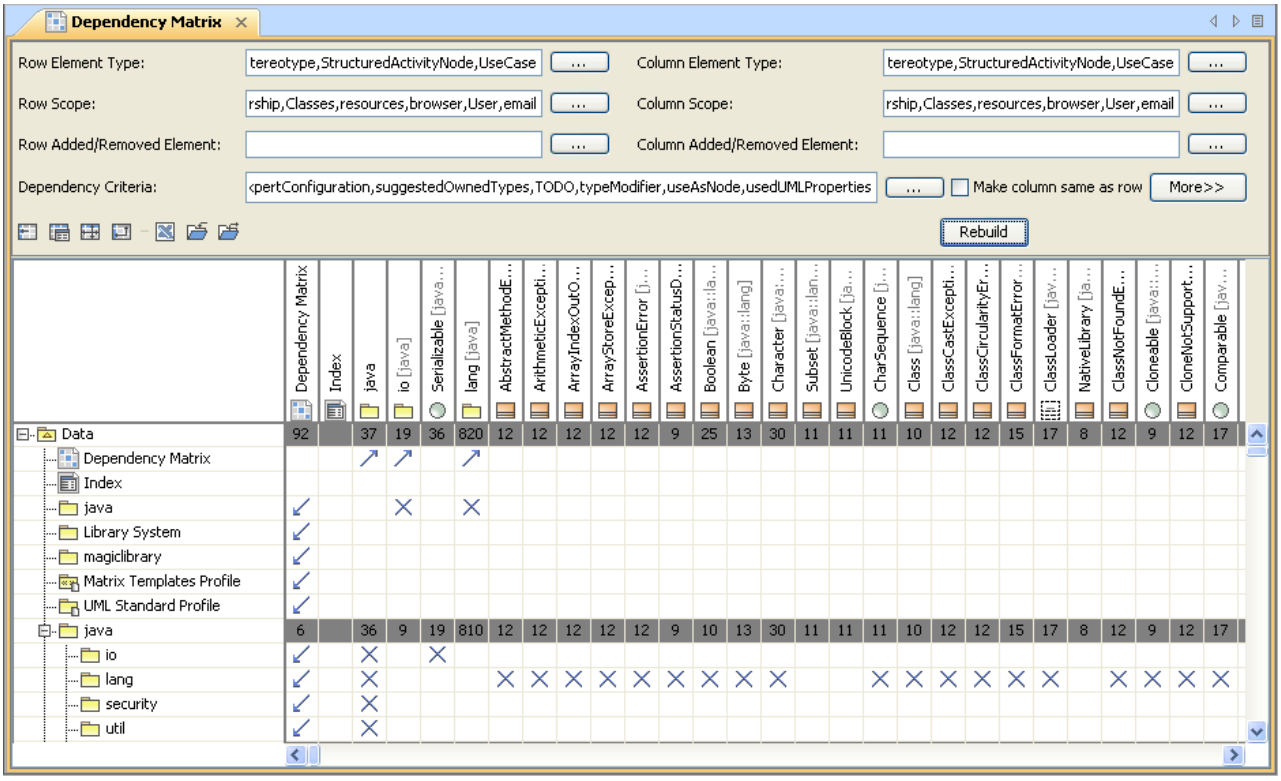


Figure 207 -- Dependency Matrix Diagram

Like other Custom Tools, the Generic Table Tool 'dependencymatrixtool.jar' must be presented in the 'extensions' folder of the Report Wizard plugin. For further information on Custom Tools and the installation, see 1 Custom Tool.

To import the Dependency Matrix tool to a template, type the following code in the template:

```
#import ('depmatrix', 'com.nomagic.reportwizard.tools.DependencyMatrixTool')
```

22.1 Dependency Matrix Tool API

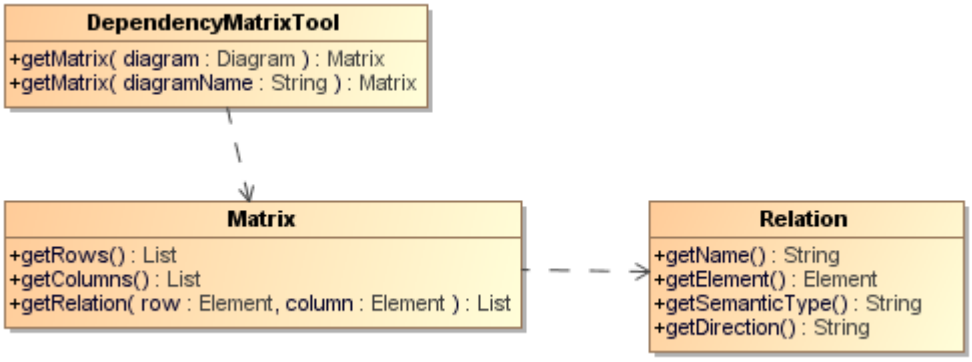


Figure 208 -- Class Diagram of the Dependency Matrix Tool

Class DependencyMatrixTool

Methods:

- +getMatrix(diagram : Diagram) : Matrix
- +getMatrix(diagramName : String) : Matrix

Class Matrix

Methods:

- +getRows() : List<Element>
- +getRows() : List<Element>
- +getColumns() : List<Element>
- +getColumns() : List<Element>
- +getRelation(row: Element, column : Element) : List<Relation>

Class Relation

Methods:

- +getName() : String
- +getElement() : Element
- +getSemanticType() : String
- +getDirection() : String

22.1.1 Using Diagrams to Get Data from Dependency Matrix

A Dependency Matrix is a special diagram. You can retrieve it using the **$Diagram** variable. Thus, every method must accept a diagram instance or a diagram's name.

Use the following methods to return a Dependency Matrix instance. You can retrieve rows and columns from the Dependency Matrix instances.

22.1.1.1 Getting Dependency Matrix Instances from Diagram Elements

getMatrix(diagram : Diagram) : Matrix

To get a Dependency Matrix instance from a specified diagram element, use the following code.

```
#set($matrix = $depmatrix.getMatrix($diagram))
```

Where the parameter is:

- diagram – a diagram element

Return an instance of Dependency Matrix.

For example:

```
#foreach($diagram in $project.getDiagrams("Dependency Matrix"))
    #set($matrix = $depmatrix.getMatrix($diagram))
#end
```

22.1.1.2 Getting Dependency Matrix Instances from Diagram Names

getMatrix(diagramName : String) : Matrix

To get a Dependency Matrix instance from a specified diagram's name.

```
#set($matrix = $depmatrix.getMatrix($diagram))
```

Where the parameter is:

- diagram – a diagram's name

Return a Dependency Matrix instance.

Example code:

```
#set($diagram = "diagram name")
#set($matrix = $depmatrix.getMatrix($diagram))
```

22.1.2 Getting Row Elements

The Matrix consists of rows and columns.

22.1.2.1 Getting All Row Elements

getRows() : List<Element>

Use this method to retrieve a list of row elements.

```
$matrix.getRows()
```

The returned value is a list of Elements.

To print all row elements' names, for example, type the following code:

```
#foreach($row in $matrix.rows)
     $row.name
#end
```

22.1.3 Getting Column Elements

The matrix consists of rows and columns.

22.1.3.1 Getting all column elements

getColumns() : List<Element>

Use this method to retrieve a list of column elements.

```
$matrix.getCloumns()
```

The returned value is a list of Elements.

To print all column elements' names, for example, type the following code:

```
#foreach($col in $matrix.columns)
     $col.name
#end
```

22.1.4 Getting Relations between Row and Column Elements

getRelation(row : Element, column : Element) : List<Relation>

Use this method to retrieve the relations between row and column elements.

```
$matrix.getRelation($row, $column)
```

Where the parameter is:

- row – a row element
- column – a column element

The returned value is a list of Relations.

The Relation class contains the following methods:

- **getSemanticType** : String

  Return the semantic type
- **getElement** : Element

  Return a relationship element or null if the relationship is not an element, for example, tag name.
- **getName** : String

Return a relationship name. If the relationship is a tag name, it will return the tag name. If the relationship is NamedElement, it will return the element name; otherwise, return a human name.

- **getDirection** : String

  Return the direction.

To print the row, column, and its relationship name, for example, type the following code:

```
#foreach($row in $matrix.rows)
  #foreach($col in $matrix.cols)
    #foreach($rel in $matrix.getRelation($row, $col))
      $row.name has $rel.name with $col.name
    #end
  #end
#end
```

22.2 Example of Dependency Matrix Tool

The code in this section demonstrates some scenarios with Dependency Matrix Tool. The code may not be executable or may not return a correct result. The purpose is to show you how to use Generic Table Tool and how it works.

Prints the row, column and its relationship name.

```
#foreach ($diagram in $project.getDiagrams("Dependency Matrix"))
  #set ($matrix = $depmatrix.getMatrix($diagram))
  #foreach ($row in $matrix.getRows())
     #foreach ($col in $matrix.getColumns())
       #foreach ($rel in $matrix.getRelation($row, $col))
         $row.name has $rel.name with $col.name
       #end
     #end
  #end
#end
```

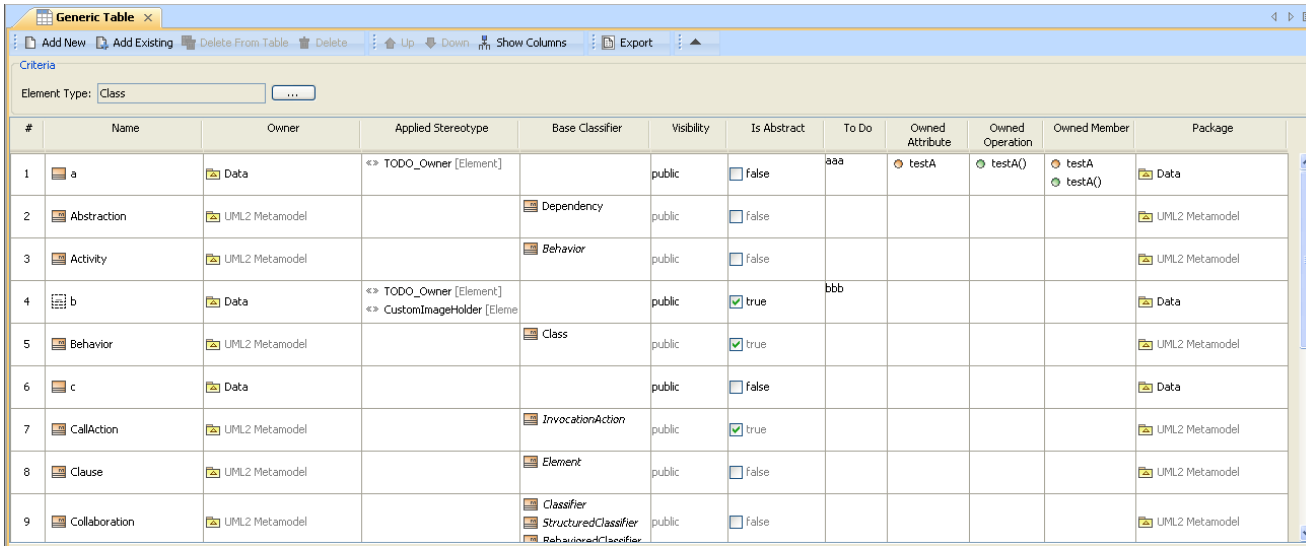
Counts the number of relations of column elements.

```
#foreach ($diagram in $project.getDiagrams("Dependency Matrix"))
    #set ($matrix = $depmatrix.getMatrix($diagram))
    #foreach ($col in $matrix.getColumns())
        #set ($count = 0)
        #foreach ($row in $matrix.getRows())
          #set ($numberOfrelation = $matrix.getRelation($row, $col).size())
          #set ($count = $count + $numberOfrelation)
        #end
        $col.name has $count relations
     #end
#end
```

23. Generic Table Tool

The Generic Table tool allows templates to:

- Access data of the Generic Table.
- Use diagrams to get data from the Generic Table.
- Get the row elements.
- Get the column names.
- Get the cell values.



#	Name	Owner	Applied Stereotype	Base Classifier	Visibility	Is Abstract	To Do	Owned Attribute	Owned Operation	Owned Member	Package
1	a	Data	TODO_Owner [Element]		public	false	aaa	testA	testA()	testA testA()	Data
2	Abstraction	UML2 Metamodel		Dependency	public	false					UML2 Metamodel
3	Activity	UML2 Metamodel		Behavior	public	false					UML2 Metamodel
4	b	Data	TODO_Owner [Element] CustomImageHolder [Eleme		public	true	bbb				Data
5	Behavior	UML2 Metamodel		Class	public	true					UML2 Metamodel
6	c	Data			public	false					Data
7	CallAction	UML2 Metamodel		InvocationAction	public	true					UML2 Metamodel
8	Clause	UML2 Metamodel		Element	public	false					UML2 Metamodel
9	Collaboration	UML2 Metamodel		Classifier StructuredClassifier	public	false					UML2 Metamodel

Figure 209 -- Generic Table Dialog

Like other Custom Tools, the Generic Table tool 'genericatabletool.jar' must be presented in the 'extensions' folder of the Report Wizard plugin. For further information on Custom Tools and the installation, see 1 Custom Tool.

To import the Generic Table tool to a template, for example, type the following code in the template.

```
#import('generic', 'com.nomagic.reportwizard.tools.GenericTableTool')
```

23.1 Generic Table Tool API

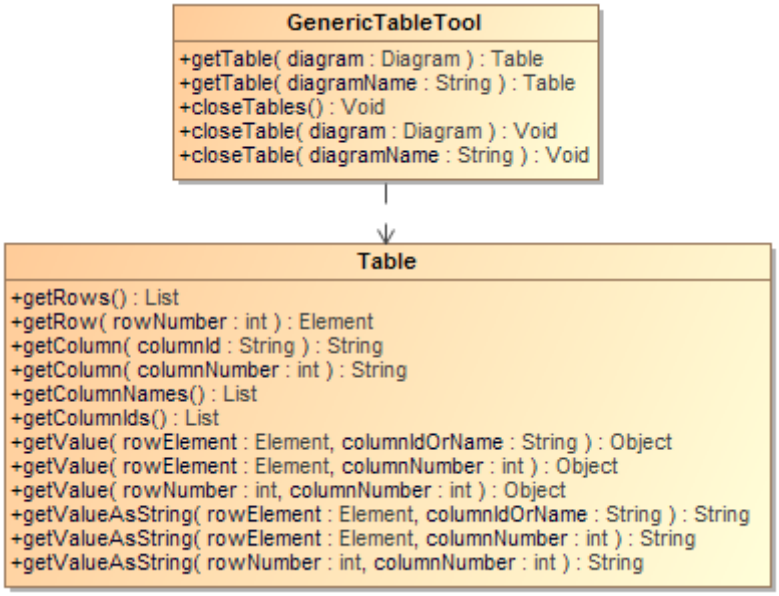


Figure 210 -- Generic Table Tool Diagram

Class GenericTableTool:

Methods:

- +getTable(diagram : Diagram) : Table
- +getTable(diagramName : String) : Table
- +closeTables() : Void
- +closeTable(diagram : Diagram) : Void
- +closeTable(diagramName : String) : Void

Class Table:

Methods:

- +getRows() : List<Element>
- +getRow(rowNumber : int) : Element
- +getColumn(columnId : String) : String
- +getColumn(columnNumber : int) : String
- +getColumnNames() : List<String>
- +getColumnIds() : List<String>
- +getValue(rowElement : Element, columnIdOrName : String) : Object
- +getValue(rowElement : Element, columnNumber : int) : Object
- +getValue(rowNumber : int, columnNumber : int) : Object
- +getValueAsString(rowElement : Element, columnIdOrName : String) : String
- +getValueAsString(rowElement : Element, columnNumber : int) : String
- +getValueAsString(rowNumber : int, columnNumber : int) : String
- +getVisibleColumnIds() : List<String>

- +getVisibleColumn(columnNumber : int) : String
- +getVisibleValue(rowElement : Element, columnNumber : int) : Object
- +getVisibleValue(rowNumber : int, columnNumber : int) : Object
- +getVisibleValueAsString(rowElement : Element, columnNumber : int) : String
- +getVisibleValueAsString(rowNumber : int, columnNumber : int) : String

23.1.1 Getting Generic Table Data

A Generic Table is a special diagram. You can retrieve it by using the variable $Diagram. Thus, every method must accept the diagram instance or diagram name.

Use the following method to get the Generic Table instance. We use Generic Table instances to retrieve table information such as row elements and column names.

23.1.1.1 Getting Generic Table Instances from Diagram Elements

To get a Generic Table instance from a specified diagram element, use the following code.

getTable(diagram : Diagram) : Table

```
#set($table = $generic.getTable($diagram))
```

Where the parameter is:

- `diagram` – the diagram element.

Return the instance of a Generic Table.

Example code:

```
#foreach($diagram in $project.getDiagrams("Generic Table"))
    #set($table = $generic.getTable($diagram))
#end
```

23.1.1.2 Getting Generic Table Instances from Diagram Names

To get a Generic Table instance from a specific diagram name, use the following code.

getTable(diagramName : String) : Table

```
#set($table = $generic.getTable($diagram))
```

Where the parameter is:

- `diagram` – the diagram name.

Return the instance of a Generic Table.

Example code:

```
#set($diagram = "diagram name")
#set($table = $generic.getTable($diagram))
```

23.1.2 Closing Tables

Use the following method to close a table diagram.

23.1.2.1 Closing All Diagram Tables

CloseTables() : Void

```
$generic.closeTables()
```

23.1.2.2 Closing a Specific Table Diagram

closeTable(diagram: Diagram) : Void

```
$generic.closeTable($diagram)
```

Where the parameter is:

- `diagram` – a table diagram you want to close.

23.1.2.3 Closing a Table Diagram with a Specific diagramName

closeTable(diagramName: String) : Void

```
$generic.closeTable($diagramName)
```

Where the parameter is:

- `diagramName` – the name of a table diagram you want to close.

23.1.3 Getting Row Elements

The Generic Table consists of a series of row elements and column names. Use the following methods to retrieve a list of row elements.

23.1.3.1 Getting All Row Elements

getRows() : List<Element>

```
$table.getRows()
```

The returned value is a list of Elements. The following shows an example of how to print all row element names.

```
#foreach($row in $table.rows)
    $row.name
#end
```

23.1.3.2 Getting Row Elements in Specific Row Numbers

getRow(rowNumber : int) : Element

```
$table.getRow($rowNumber)
```

Where the parameter is:

- `rowNumber` – the row number starts with 0.

The returned value is an Element.

23.1.4 Getting Column Names

Column names are referred by column IDs. A column is a MagicDraw QProperty ID that is not readable or accessible by the user. We need to create other methods that provide better usability than using QProperty ID. Use the following methods to retrieve column names.

23.1.4.1 Getting Column Names from Column ID

getColumn(columnId : String) : String

```
$table.getColumn($columnId)
```

Where the parameter is:

- `columnId` – the ID of a column. Using column IDs has a benefit of consistency between different languages, for example, French and English. The column ID can be retrieved by the method `getColumnIds()`.

The returned value is the name of a column.

23.1.4.2 Getting Column Names from Column Numbers

getColumn(columnNumber : int) : String

```
$table.getColumn($columnNumber)
```

Where the parameter is:

- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the name of a column.

23.1.4.3 Getting All Column Names

getColumnNames() : List<String>

```
$table.getColumnNames()
```

The returned value is a list of column names.

Example code:

Prints all column names.

```
#foreach($colname in $table.getColumnNames())
    $colname
#end
```

23.1.4.4 Getting All Column IDs

getColumnIds() : List<String>

```
$table.getColumnIds()
```

The returned value is a list of column IDs.

Example code:

Print all columns IDs

```
#foreach($colid in $table.getColumnIds())
    $table.getColumn($colid)
#end
```

23.1.5 Getting Cell Values

A cell value is the value in a row element with a column name. To get a cell value, you need to provide both the row element and column. A cell value is an Element or row number. Use the following methods to retrieve a cell value.

23.1.5.1 Getting Values from Row Element and Column ID

getValue(rowElement : Element, columnIdOrName : String) : Object

```
$table.getValue($rowElement, $columnId)
```

Where the parameters are:

- `rowElement` – a row element.
- `columnId` – a column ID.

The returned value is the value in a cell. If the cell contains an element, the value is the Element.

Example code:

Prints the row, column, and value.

```
#foreach($diagram in $project.getDiagrams("Generic Table"))
#set($table = $generic.getTable($diagram))
     #foreach($row in $table.getRows())
     <h1>$row.name</h1>
         #foreach($col in $table.getColumnIds())
             $table.getColumn$col) : $table.getValue($row, $col)
         #end
     #end
#end
```

23.1.5.2 Getting Values from Row Element and Column Name

getValue(rowElement : Element, columnIdOrName : String) : Object

```
$table.getValue($rowElement, $columnName)
```

Where the parameters are:

- `rowElement` – a row element.
- `columnName` – a column name.

The returned value is the value in a cell. If the cell contains an element, the value is the Element.

23.1.5.3 Getting Values from Row Element and Column Number

getValue(rowElement : Element, columnNumber : int) : Object

```
$table.getValue($rowElement, $columnNumber)
```

Where the parameters are:

- `rowElement` – a row element.
- `columnName` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a cell. If the cell contains an element, the value is the Element.

23.1.5.4 Getting Values from Row and Column Numbers

getValue(rowNumber : int, columnNumber : int) : Object

```
$table.getValue($rowNumber, $columnNumber)
```

Where the parameters are:

- `rowNumber` – a row number starts with 0.
- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a cell. If the cell contains an element, the value is the Element.

23.1.5.5 Getting Values from Row Element and Column IDs as String

getValueAsString(rowElement : Element, columnIdOrName : String) : String

```
$table.getValueAsString($rowElement, $columnId)
```

Where the parameters are:

- `rowElement` – a row element.
- `columnId` – a column ID.

The returned value is the value in a cell and is converted into String. The String value is created by MagicDraw text representation API.

23.1.5.6 Getting Values from Row Element and Column Name as String

getValueAsString(rowElement : Element, columnIdOrName : String) : String

```
$table.getValueAsString($rowElement, $columnName)
```

Where the parameters are:

- `rowElement` – a row element
- `columnName` – a column name

The returned value is the value in a cell and is converted into String. The String value is created by MagicDraw text representation API.

23.1.5.7 Getting Values from Row Element and Column Number as String

getValueAsString(rowElement : Element, columnNumber : int) : String

```
$table.getValueAsString($rowElement, $columnNumber)
```

Where the parameters are:

- `rowElement` – a row element.
- `columnName` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a cell and is converted into String. The String value is created by MagicDraw text representation API.

23.1.5.8 Getting Values from Row and Column Numbers as String

getValueAsString(rowNumber : int, columnNumber : int) : String

```
$table.getValueAsString($rowNumber, $columnNumber)
```

Where the parameters are:

- `rowNumber` – a row number starts with 0.
- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a cell and is converted into String. The String value is created by MagicDraw text representation API.

23.1.6 Getting Visible Column and Cell Values

A visible cell value is the column which is visible on a diagram. Unlike the methods described in section 23.1.5 Getting Cell Values, the following methods will retrieve only the value which is visible on a diagram.

23.1.6.1 Getting All Visible Column IDs

getVisibleColumnIds() : List<String>

```
$table.getVisibleColumnIds()
```

The returned value is a list of visible column IDs.

23.1.6.2 Getting Visible Column Names from Column Numbers

getVisibleColumn(columnNumber : int) : String

```
$table.getVisibleColumn($columnNumber)
```

Where the parameter is:

- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the name of a visible column.

23.1.6.3 Getting Visible Values from Row Elements and Column Number

getVisibleValue(rowElement : Element, columnNumber : int) : Object

```
$table.getVisibleValue($rowElement, $columnNumber)
```

Where the parameters are:

- `rowElement` – a row element.
- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a visible cell. If the cell contains an element, the value is the Element.

23.1.6.4 Getting Visible Values from Row Number and Column Number

getVisibleValue(rowNumber : int, columnNumber : int) : Object

```
$table.getVisibleValue($rowNumber, $columnNumber)
```

Where the parameters are:

- `rowNumber` – a row number starts with 0.
- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a visible cell. If the cell contains an element, the value is the Element.

23.1.6.5 Getting Visible Values from Row Element and Column Number as String

getVisibleValueAsString(rowElement : Element, columnNumber : int) : String

```
$table.getVisibleValueAsString($rowElement, $columnNumber)
```

Where the parameters are:

- `rowElement` – a row element.
- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a visible cell and is converted into String. The String value is created by MagicDraw text representation API.

23.1.6.6 Getting Visible Values from Row and Column Numbers as String

getVisibleValueAsString(rowNumber : int, columnNumber : int) : String

```
$table.getVisibleValueAsString($rowNumber, $columnNumber)
```

Where the parameters are:

- `rowNumber` – a row number starts with 0.
- `columnNumber` – a column number starts with 1. The column number 0 is the row number.

The returned value is the value in a visible cell and is converted into String. The String value is created by MagicDraw text representation API.

23.2 Code Examples for Generic Table Tool

The code in this section demonstrates some scenarios with a Generic Table tool. The code may not be executable or may not return the correct result. This is only the idea of how to use the Generic Table tool and how it works.

The code shown below prints the row, column, and its value in the form of an HTML table.

```
#foreach($diagram in $project.getDiagrams("Generic Table"))
  <table>
  <tr>
        #set($table = $generic.getTable($diagram))
            <td>#</td>
        #foreach($colName in $table.columnNames)
            <td>$colName</td>
  #end
  </tr>
  #foreach($row in $table.rows)
        <tr>
            <td>$velocityCount</td>
        #foreach($col in $table.columnIds)
            <td>$table.getValueAsString($row, $col)</td>
        #end
        </tr>
    #end
    </table>
#end
```

24. Query Tool

The Query tool provides extra functions to retrieve MagicDraw elements by using a query language. Like other Custom Tools, the Query tool 'querytool.jar' must be presented in the 'extensions' folder of the Report Wizard plugin. For further information on Custom Tools and the installation, see 1 Custom Tool.

Type the following code in a template to import the Query tool.

```
#import('query', 'com.nomagic.reportwizard.tools.QueryTool')
```

24.1 Query Tool API

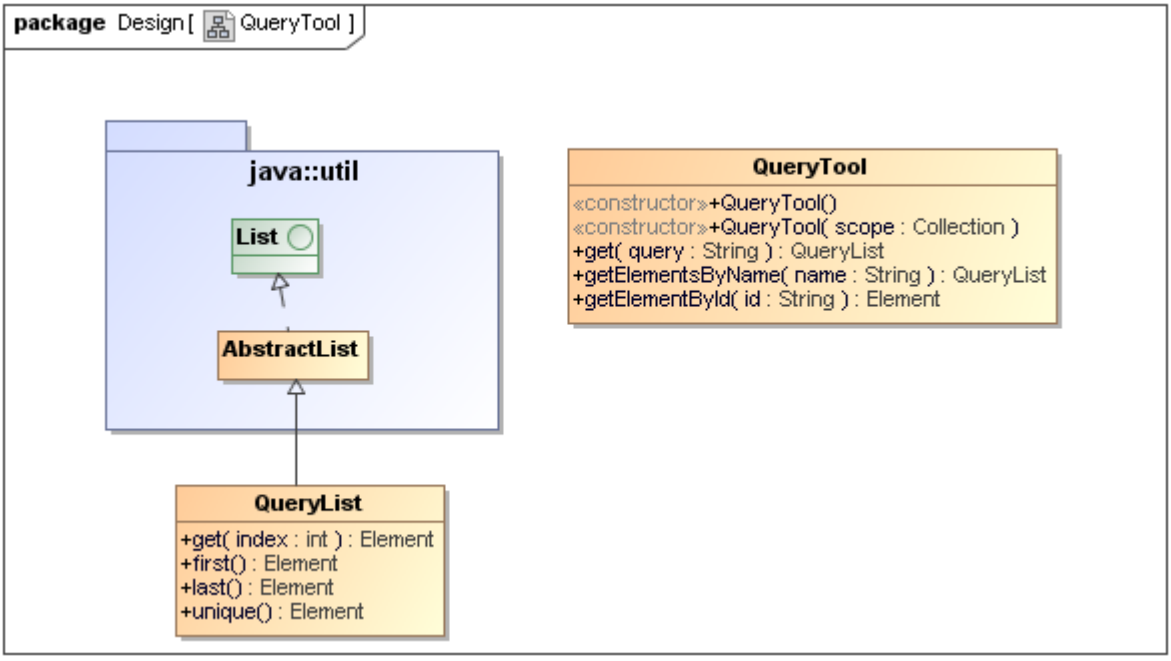


Figure 211 -- Query Tool Class Diagram

Class QueryTool

Constructor

- `QueryTool()`

  Creates the Query tool from your selected element scope. This method will use a default scope from the variable `$elements`.

- `QueryTool( scope : Collection<Element>)`

  Creates the Query tool from a specific element scope.

Methods

- +get(query :String) : QueryList
- +getElementsByName(name : String) : QueryList
- +getElementById(name : String) : Element

Class QueryList

Methods

- +get(index : int) : Element
- +first() : Element
- +last() : Element
- +unique () : Element

24.2 Recognizable Query Patterns

Query patterns are described as a CSS3 selector pattern (http://www.w3.org/TR/css3-selectors). The following table (Table 33) shows all available query patterns of the query tool.

Table 33 -- Available Query Patterns of the Query Tool

Pattern	Meaning
E	An element of type `E`.
E[foo]	An `E` element with a "`foo`" attribute.
E[foo=bar]	An `E` element whose "`foo`" attribute value exactly equals "`bar`".
E[foo^=bar]	An `E` element whose "`foo`" attribute value begins exactly with the string "`bar`".
E[foo$=bar]	An `E` element whose "`foo`" attribute value ends exactly with the string "`bar`".
E[foo*=bar]	An `E` element whose "`foo`" attribute value contains the sub-string string "`bar`".
E:empty	An `E` element that has no children.
#myid	An element with an ID equals "`myid`".
E F	An `F` element descendant of an `E` element.
E > F	An `F` element child of an `E` element.

24.2.1 Query by Type

A pattern allows a template to query elements from a given type name, for example:

```
class
```

Retrieve all `classes` from a selected package scope.

A Type name is generated from the `$element.elementType` property.

24.2.2 Query by Attribute

A pattern allows a template to query elements from given attribute name and value. When a pattern is used as an expression to match an element, the attribute pattern must be considered to match the element and that element must have an attribute that matches the attribute represented by the attribute pattern.

`[attr]`

Matches an element with an `attr` attribute regardless of the value of the attribute.

`[attr=value]`

Matches an element with an `attr` attribute whose value is exactly `val`.

The Query tool matches against case sensitivity of attribute names and values in a pattern. A VTL property syntax (Camel case without space) will be used for the attribute names. You can use spaces in writing values.

When the value of an attribute is `NamedElement`, the element's name will be used as a default value. An asterisk (*) can be used to match any element type when combined with the other patterns, for example:

```
*[name=foo]
```

Retrieve any element whose `name` attribute is exactly `foo`. Use an asterisk to match any element.

```
actor[name=foo]
```

Retrieve all actor elements whose name attribute is exactly `foo`.

```
actor[name=]
```

Retrieve all actor elements whose name attribute is empty.

```
class[owner=foo]
```

Retrieve class elements whose owner attribute name is exactly `foo`.

```
class[owner=foo][name=bar]
```

Retrieve class elements whose owner attribute name is exactly `foo` and `name` attribute is exactly `bar`.

24.2.3 Query by Substring Matching Attribute

This topic provides some additional attribute patterns for matching substrings in the value of an attribute:

`[attr^=val]`

Matches an element with an `attr` attribute whose value begins with the prefix `val`. If `val` is an empty string, the query returns nothing.

`[attr$=val]`

Matches an element with an `attr` attribute whose value ends with the suffix `val`. If `val` is an empty string, the query returns nothing.

```
[attr*=val]
```

Matches an element with an `attr` attribute whose value contains at least one instance of the substring `val`. If `val` is an empty string, the query returns nothing.

The Query tool matches against case sensitivity of attribute names and values in a pattern. A VTL property syntax (Camel case without space) will be used for attribute name. You can use spaces in writing values.

When value of attribute is `NamedElement`, the element name will be used as default value, for example:

```
*[name^=foo]
```

Retrieve any element whose `name` attributes begins with `foo`. Use an asterisk to match any element.

```
actor[name$=foo]
```

Retrieve all actor elements whose `name` attribute is ends with `foo`.

```
class[qualifiedName*=nomagic]
```

Retrieve class elements whose `qualifiedName` attribute contains string `nomagic`.

24.2.4 Query Element without Children

You can use `:empty` to query an element that has no children at all. If an element does not any children, its “Owned Element” attribute value has a zero size of items, for example:

```
package:empty
```

Retrieve any `package` whose `ownedElement` attribute is empty.

```
package[name=foo]:empty
```

Retrieve any `package` whose name attribute is exactly `foo` and `ownedElement` attribute is empty.

24.2.5 Query by Element ID

A pattern allows a template to query elements from a given element’s ID. An element’s ID is unique in a project, for example:

```
#17_0_3_8e9027a_1325220298609_477646
```

Retrieve an element whose `ID` is exactly `17_0_3_8e9027a_1325220298609_477646`.

An element’s ID is generated from the `$element.elementID` property.

24.2.6 Query by Descendent

A pattern allows a template to query an element that is the descendant of another element, for example, an Actor that is contained within a Package. A descendant query is one or more white-spaces that separate(s) two sequences of patterns.

You can use an asterisk (*) to match any element type when combined with the other patterns, for example:

```
package class
```

Retrieve all classes that are the descendants of a package element.

```
package foo
     - class bar1
     - class bar2
           - class bar3
```

The classes `bar1`, `bar2`, and `bar3` are the results.

```
package class *[name=foo]
```

Retrieve any element that (i) has a `name` value exactly `foo` and (ii) is inside a `class` that is inside a `package`.

```
package * property
```

Retrieve a property element that is the `grandchild` or a later `descendant` of a `package` element.

24.2.7 Query by Child Element

A pattern allows a template to query elements that are the children of another element (describes a parent-child relationship between two elements). An optional white-space around a greater sign can be ignored.

You can use an asterisk (*) to match any element type when combined with the other patterns, for example:

```
package > class
```

Retrieve all classes that are children of a package.

```
package foo
     - class bar1
     - class bar2
           - class bar3
```

The classes `bar1` and `bar2` are the results.

24.2.8 Additional Conditions for Query Patterns

When you are writing queries, be sure you observe the following conditions.

- A Query pattern cannot contain only spaces, for example:

```
$query.get('') or $query.get(' ')
```

An invalid query pattern.

- An element type cannot contain `[, ]`, `:`, `*`, `>`, `#`, and white space.
- Characters #, >, and white-space are the end statements except in an attribute name or value, for example:

`$query.get("class#17_0_3_8e9027a")` equivalent to
`$query.get("class #17_0_3_8e9027a")`

Retrieve an element's ID `17_0_3_8e9027a` that is a `grandchild` or a later `descendant` of a `class` element.

`$query.get("class>property")` equivalent to
`$query.get("class > property")`

Retrieve a `property` element that is the child of a `class` element.

`$query.get("class property")`

Retrieve a `property` element that is a `grandchild` or a later `descendant` of a `class` element.

An end statement is required to separate an element and its child, or grandchild, for example:

`$query.get("class[attr] property")`

Retrieve a property element that is a grandchild or a later descendant of a class element that contains an `attr` attribute.

`$query.get("class[attr]property")`

An invalid query pattern.

- Characters = , ^=, $=, and *= are keywords and all strings except] that are written next to these keywords mean the attribute values.
- Attribute names are mandatory.
- An attribute name cannot contain white-space, =, ^=, $=, *=, and], for example:

`$query.get("*[ name =bean]")` is equivalent to
`$query.get("*[name=bean]")`

Retrieve all elements whose `name` attribute is `bean`.

`$query.get("*[ element type = bean ] ")`

An invalid query pattern.

If an attribute value is not in any double quotes or single quotes, all strings, except `],` after a keyword mean an attribute value, for example:

```
$query.get("*[name=bean]")
     Retrieve all elements whose name attribute is bean
```

- Character # must contain at least one string.
- An ID cannot contain [, : , >, #, and white-space, for example:

```
$query.get("#17_0_3_8e9027a#17_0_3_8e9027b") is equivalent to
$query.get("#17_0_3_8e9027a  #17_0_3_8e9027b")
```

Retrieve an element ID `#17_0_3_8e9027b` that is a `grandchild` or a later `descendant` of an element ID `17_0_3_8e9027a`.

```
$query.get("#17_0_3_8e9027a > *")
```

Retrieve all elements that are the children of an element ID `#17_0_3_8e9027a`.

```
$query.get("#") or
$query.get("#[name=a]#17_0_3_8e9027a")
```

An invalid query pattern.

- A `:` must be followed by `empty` and "`:empty`" must be followed by `[`, `#`, `>`, or `white-space`, except in an attribute, for example:

```
$query.get("*:empty") or
$query.get("*:empty#17_0_3_8e9027a") or
$query.get("*:empty > class") or
$query.get("*:empty[name*=class]")
```

A valid query pattern but the result of some patterns will be an empty list.

```
$query.get("*[name=:emptyx]")
```

Retrieve all elements whose name attribute is `:emptyx`

```
$query.get("*:emptyx") or
$query.get("*:em")
```

An invalid query pattern.

- If an attribute value of a MagicDraw element is null, it is equivalent to an empty attribute value.

24.3 Query Methods

This section provides query methods that you can use to retrieve an array of elements by query pattern.

24.3.1 Retrieving an Array of Element by Query Pattern

```
$query.get(query)
```

- **Parameters**: query : String (the query string as described in 24.2 Recognizable Query Patterns).
- **Returns**: `java.util.List<Element>` (a list or a collection of MagicDraw Elements or an empty List if there is no matching element).
- **The sample code** to print all Use Case elements under a packagable element named `foo` is as follows:

```
#foreach ($uc in $query.get("usecase[owner=foo]"))
     $uc.name in $uc.owner.name
#end
```

24.3.2 Getting a Single Result from Query Functions

Since a MagicDraw model element does not have a unique identified attribute so all methods will be returned in a Collection. Thus we will need convenient methods to get a single result from the Collection. Additional methods for getting a single result from query methods are as follows:

- first() – returns the first element from a collection.
- last() – returns the last element from a collection.
- get(int) – returns the n^{th} element of a collection.
- unique() – returns the first element from a collection (equivalent to first).

24.3.2.1 Getting the First Element from a Collection

```
$query.get(query).first()
```

- **Returns**: Element (the first element from a query result collection or a null value if there is no matching element).
- **A Sample code** to print the first package is as follows:

```
$query.get("package").first()
```

24.3.2.2 Getting the Last Element from a Collection

```
$query.get(query).last()
```

- **Returns**: Element (the last element from a query result collection or a null value if there is no matching element).
- **A sample code** to print the last package is as follows:

```
$query.get("package").last()
```

24.3.2.3 Getting the n^{th} Element from a Collection

```
$query.get(query).get(index)
```

- **Parameters**: index : int (a zero-based integer indicating which element to retrieve).
- **Returns**: Element (an element from a specified index of a query result collection or if the index is out of bounds, it will print a warning message to console/log and returns a null value)/
- **A sample code** to print the third package is as follows:

```
$query.get("package").get(2)
```

24.3.2.4 Getting the Unique Element from a Collection

```
$query.get(query).unique()
```

This method is equivalent to the one in 24.3.2.1 Getting the First Element from a Collection.

- **Returns**: Element (a unique element from a query result collection or a null value if there is no matching element).
- **A sample code** to print a single package is as follows:

```
$query.get("package").unique()
```

24.3.3 Retrieving an Array of Elements by Name

```
$query.getElementsByName(name)
```

Retrieve an element from a selected package scope whose element name exactly equals a given parameter. This method is equivalent to query pattern `*[name=var]`.

- **Parameters**: name : String (the element name string).
- **Returns**: java.util.List<Element> (a List or a collection of MagicDraw Elements or an empty List if there is no matching element).
- **A sample code** to print the first element whose name exactly equals to `foo` is as follows:

```
$query.getElementsByName("foo").unique()
```

24.3.4 Retrieving Elements by ID

```
$query.getElementById(id)
```

Retrieve an element from a selected package scope whose element ID exactly equals a given parameter. This method is equivalent to query pattern `#id`.

- **Parameters**: id : String (an element's ID).
- **Returns**: Element (a MagicDraw Element or a null value if there is no matching element).
- **A sample code** to print an element that contains ID 17_0_3_8e9027a_1325220298609_477646 is as follows:

```
$query.getElementById("17_0_3_8e9027a_1325220298609_477646").unique()
```

24.4 Examples

This section provides three sets of sample code to demonstrate some scenarios with the query tool. The codes may not be executable or return a correct result. They are just examples to show you how to use the Query tool and how it works.

(i) Example 1

Print any `classes` whose containing in package `com.nomagic.reportwizard`.

Without QueryTool:

```
#foreach ($c in $Class)
  #if ($c.qualifiedName.startWith("com.nomagic.reportwizard"))
    $c.name
  #end
#end
```

With QueryTool:

```
#import("query", "com.nomagic.reportwizard.tools.QueryTool")

#foreach ($c in
$query.get("class[qualifiedName^=com.nomagic.reportwizard]"))
  $c.name
#end
```

(ii) Example 2

Print any `classes` whose containing in `model Design` and `name` ends with `Bean`.

Without QueryTool:

```
#set ($match = false)
#macro (recursiveCheck $e)
  #if ($e.elementType == "model" && e.name == "Design")
    #set ($match = true)
  #else
    #recursiveCheck($e.owner)
  #end
#end

#foreach ($c in $Class)
  #set ($match = false)
  #recursiveCheck($c)
  #if ($check)
    #if ($c.name.endsWith("Bean"))
      $c.name
    #end
  #end
#end
```

With QueryTool:

```
#import("query", "com.nomagic.reportwizard.tools.QueryTool")

#foreach ($c in $query.get("model[name=Design] class[name$=Bean]"))
  $c.name
#end
```

(iii) Example 3

Matches any `property` element which `owner` element is `class` whose `name` attributes value is exactly equal to `foo`.

Without QueryTool:

```
#foreach ($p in $Property)
  #set ($owner = $p.owner)
  #if ($owner.elementType == "class" && $owner.name == "foo")
      $p.name
  #end
#end
```

With QueryTool:

```
#import("query", "com.nomagic.reportwizard.tools.QueryTool")

#foreach ($p in $query.get("class[name=foo] > property"))
  $p.name
#end
```

Appendix A: Report Extensions

Report Wizard has been enhanced with an extension that provides additional functionalities (for example, a Custom Tool that encapsulates Java functions in context). The report extensions are Java class and related resources collected into JAR archives, which are merely ZIP files that contain a specially formatted “manifest” file describing the contents of the archive.

To install the extension, copy the `.jar` file into the extensions directory under the Report Wizard plugin directory or template directory. The archives stored within subdirectories will not be loaded in Report Wizard (Figure 212).

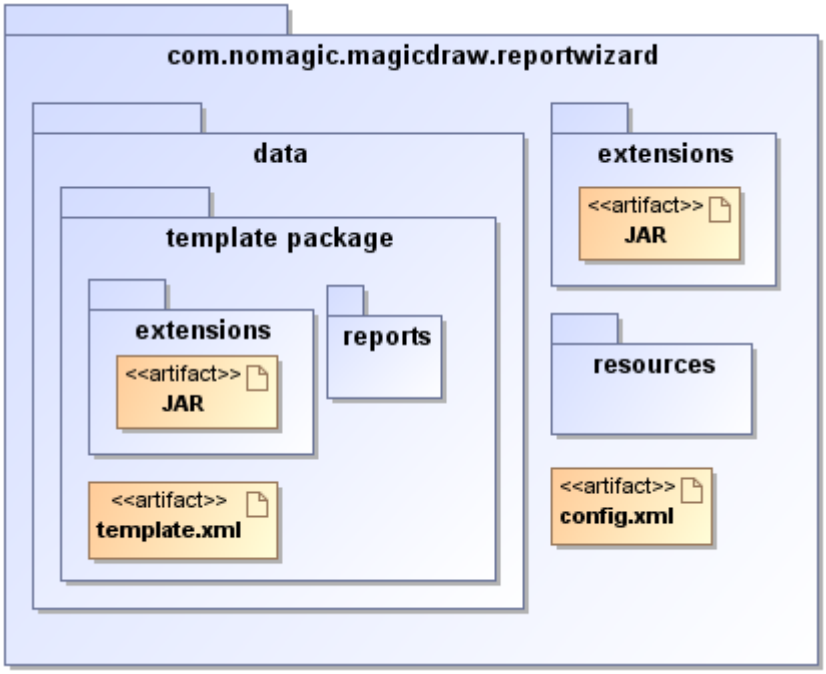


Figure 212 -- Report Wizard Plug-in Directory Structure.

The extension deployed under the global extensions directory will affect all templates, which means you can use the deployed Custom Tool in all templates. Extensions deployed under a template package will affect only the specific template.

1. Custom Tool

A Custom Tool is a template library written in Java to encapsulate functions in context. The Custom Tool (Figure 213) is extended from the report API. The tool can be used to develop custom context properties that are presentation centric or that can take advantage of the existing ‘Tool’ extensions or by document authors familiar with Java.

Report Wizard uses the word 'Tool' meaning an object encapsulating dynamic functions on the JavaBean. A Tool is a "carrier" of data between the Java and template layers. In other words, the Tool simplifies template development and maintenance.

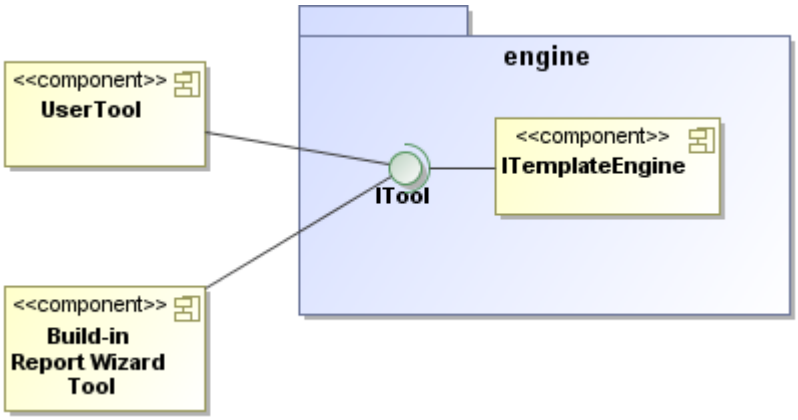


Figure 213 -- Custom Tool API Structure.

1.1 Context Name

A Context name is a name for variables or references in the template. Report Wizard uses the Velocity Template Language (VTL) as a standard syntax for the template. VTL uses "`$`" as a leading character followed by an identifier for the variable.

For example:

```
$UseCase
$foo.name
```

1.2 Context Object

A Context object is a Java Object representing a variable. A Context object is modeled on the JavaBean specifications defined by Sun Microsystems.

For example, if a String represents the variable `$foo`.name in context, the value of the String will be printed out in the output report as follows.

```
Foo Name
```

2. Tool Interface

Custom Tool is written in the Java language. The tool implements a specialized interface called `ITool`. The Report API provides both an interface and a class to support interface realization and class generalization. As mentioned earlier, a Tool is modeled on the JavaBean specifications. Functions implemented in this class must be defined in a series of setter or getter methods. The following sample shows the source code for the `ITool` interface that you must implement:

```
public interface ITool extends IBean
{
   // attributes
   Void VOID = new Void();
   // inner classes
   public class Void{}
   public class RetainedString implements CharSequence{}
   // methods
   void setContext(IContext context);
   String getContext();
   void setProperties(Properties properties);
   Properties getProperties();
}
```

All tools must implement the `ITool` interface (or one of its subclasses) as it defines the methods the template engine calls to execute. Table 34 provides a description of the methods in the `ITool` interface.

Table 34 -- Description of Methods in ITool interface.

Method	Description
setContext(Context context)	Once the class has been initialized, this method is called by the template engine runtime to set the template context. Overriding the current context will affect the code after this tool.
getContext()	Return the template context that is assigned to the current runtime.
setProperties(Properties properties)	This method is called by the template engine runtime, once the class has been initialized, to set the template properties. Overriding the current properties will not affect the engine.
getProperties()	Return the current template properties.
VOID	Represents the Void class. VOID is used to make sure that returning data from the setter method is absolutely nothing. In general, Velocity considers the return of `void` from the setter method as a 'null' value. This causes the word 'null' to be printed out in the report. To avoid this problem, the setter method may use VOID as a return object.
class Void	A void class is used as a return in the Tool when you want to be sure that nothing is returned to the context.
class RetainedString	A direct command report formatter to keep the referenced String format. The formatter and other reference insertion handlers should maintain Strings directed by this class.

The other classes that can be extended are `Tool` and `ConcurrentTool`.

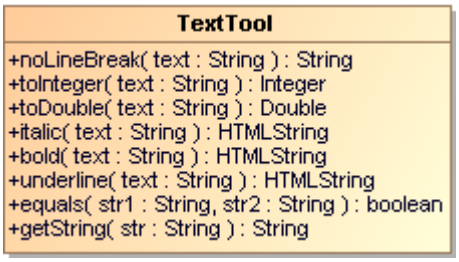


Figure 214 -- ITool Interface And Related Class.

2.1 Class Tool

A Class Tool is a base class realizing the interface `ITool`. This class provides the default implementation for `ITool`.

This class also provides methods derived from the **java.util.Observable** class, which can be used to notify the observers. An observer class, such as a template engine or a graphical user interface class, can receive the notification message from the tool and manage to display or interact with the user.

2.2 Concurrent Tool

A Concurrent Tool provides concurrent tasks running in the template engine. This class implements an unbounded thread-safe queue, which arranges the elements in a first-in-first-out (FIFO) order. New tasks are inserted at the tail of the queue, and the queue retrieval operations obtain elements at the head of the queue.

The tool extends from this class and is ideal for processing a long task that does not want other tasks to wait until the process is complete. The following code shows the sample usage of Concurrent Tool.

```
import com.nomagic.magicreport.engine.ConcurrentTool;

public class LongTaskTool extends ConcurrentTool
{
   public String longTask() {
      // enqueue object
      offer(new ConsumeObject(referent));
   }

   public void consume(ConsumeObject consumeObject) {
      Object referent = consumeObject.get();
      // process long task
   }
}
```

An example of Concurrent Tool is `FileTool`. The root template that calls the **file tool** method will create a subprocess, offer the subprocess into a queue, and continue the root template until finished. The template engine will later call the **consume** method to complete the subprocess once the consumer queue is available. The number of concurrent processes available for the execution is declared in the template engine property (See **TemplateConstants.TEMPLATE_POOL_SIZE** for detail.).

3. Creating Custom Tool

There are a few steps involved in developing a custom tool. These steps can be summarized as follows:

3.1 Developing a Tool Class

3.1 Developing a Tool Class

Developing a Tool class requires setting a class path to **magicreport.jar**. You can find **magicreport.jar** from the library folder under the Report Wizard plugin directory. The following sample shows the source code for `Hello.java`.

```
package mytool;
import com.nomagic.magicreport.engine.Tool;

public class HelloTool extends Tool
{
   public String getHello() {
      return "Hello World";
   }
   public String getHello(String name) {
      return "Hello " + name;
   }
}
```

The sample shows two methods following the getter concept defined by the JavaBean specification.

3.2 Creating an Extension Package

The extension package is delivered in a JAR file. JAR (Java ARchive) is a file format based on the popular ZIP file format and is used for aggregating many files into one. To create a JAR file, you can store `*.class` with the Java package folder structure in a ZIP file format or creating from a JAR tool.

To combine files into a JAR file (in this case), here is the sample code fragment:

```
jar cf MyTool.jar *.class
```

In this example, all the class files in the current directory are placed in the file named "`MyTool.jar`". A manifest file entry named META-INF/MANIFEST.MF is automatically generated by the JAR tool. The manifest file is the place where any meta-information about the archive is stored as named: Value pairs. Please refer to the JAR file specification for more details.

```
jar cf MyTool.jar mytool
```

The example above shows that all the class files in the directory mytool are placed in the file named "`MyTool.jar`".

A complete JAR tool tutorial can be found at:

- http://java.sun.com/docs/books/tutorial/deployment/jar/
- http://java.sun.com/javase/6/docs/technotes/tools/windows/jar.html

4. Installing Custom Tool

To install the extension, copy the JAR file containing a custom tool class into the extensions directory under the Report Wizard plugin directory or template directory. Report Wizard will automatically load a new JAR file when a new report is generated.

5. Importing Custom Tool to Template

Report Wizard uses the import directive for importing a Custom Tool to a template.

An example of a directive:

```
#import('prefix', 'name')
```

The import directive declares that the template uses the custom tool, names the tool that defines it, and specifies its tag prefix before the custom tool is used in a template page. You can use more than one import directive in a template, but the prefix defined in each template page must be unique.

5.1 Attributes

- name (type:String)

  The uniform or full qualified class name that locates the Tool class, for example, `mytool.HelloTool`

- prefix (type:String)

  The prefix that precedes the custom tool name such as a string in `$hello.getHello()`. Empty prefixes are not allowed. When developing or using custom tools, do not use tag prefixes such as bookmark, sorter, template, file, array, group, map, iterator, list, date, report, exporter, profiling, and project, as they are reserved by Report Wizard.

The code fragment indicated below declares a custom tool.

```
#import('hello', 'mytool.HelloTool')
Get Hello
$hello.getHello()
Get Hello Foo
$hello.getHello('foo')
```

The output from the above template is:

```
Get Hello
Hello World
Get Hello Foo
Hello foo
```

6. Auto Importing Template Tool

Report Wizard can automatically import a Template Tool to a template without having to declare the `#import` statement in a template code manually (see 5 Importing Custom Tool to Template).

To enable Report Wizard to automatically import a Template Tool, you have to use the existing template variable inside “template.xml” and “report.xml”.

The current template variable syntax:

```
<variable>
  <name>Variable Name</name>
  <description>Variable Description</description>
  <type/>
  <value xml:space="preserve">Variable Value</value>
</variable>
```

Add "`com.nomagic.magicreport.engine.Tool`" to a type value where the name is a variable name and the value is a full-qualified template tool class, for example:

To automatically import TextTool:

1. Edit the built-in.xml file in the ...\data\reports\Tutorial 24 - Text Tool\reports.
2. Add a variable as shown in the following example.

```
<variable>
  <name>text</name>
  <description>A text tool</description>
  <type>com.nomagic.magicreport.engine.Tool</type>
  <value
xml:space="preserve">com.nomagic.reportwizard.tools.TextTool</
value>
</variable>
```

The result is a template code that can access `com.nomagic.reportwizard.tools.Text-Tool` from `$text`.

```
$text.noLineBreak($diagram.name)
```

NOTE	Once you have edited a template variable, you have to restart Magic-Draw prior to generating a report through MagicDraw.

Appendix B: Office Open XML Format Template

Office Open XML (also referred to as OOXML or Open XML) refers to the standardized file formats of spreadsheets, charts, presentations, and word processing documents for Microsoft Office. These standardized file formats become free and open as ECMA-376 Office Open XML File Formats - 2nd edition (December 2008) and ISO/IEC 29500:2008.

The most common Open XML file formats supported by Report Wizard include:

- DOCX - for word processing (text) documents
- XLSX - for spreadsheets
- PPTX - for presentations

1. Microsoft Office Word Document (DOCX)

Report Wizard supports most DOCX features. You can place the VTL codes inside core (properties) and content of any DOCX file. **All syntax usable in RTF can also be used in DOCX**.

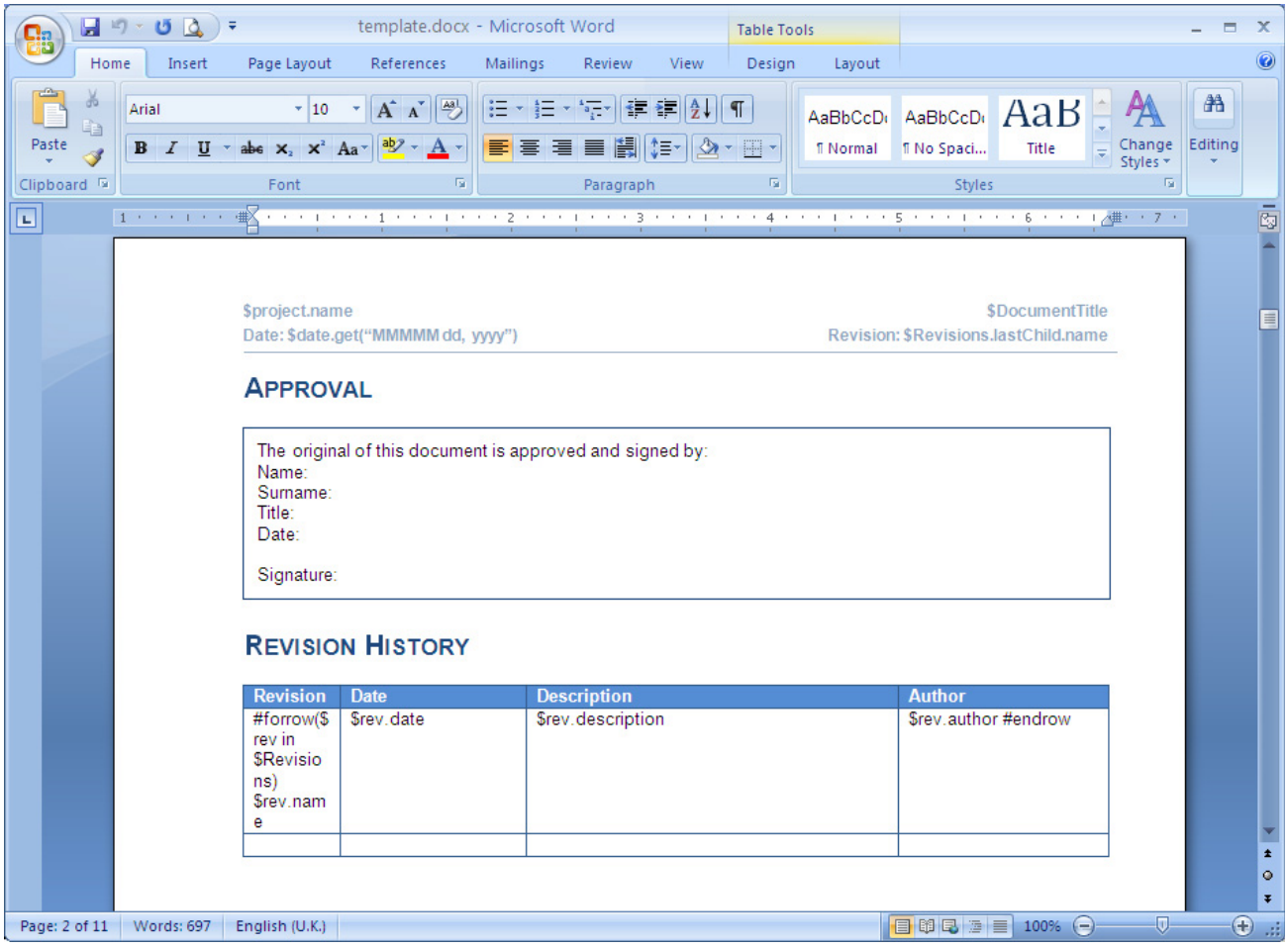


Figure 215 -- A Sample of DOCX Converted from an RTF Document

1.1. Limitations when Used in Microsoft Office Word Document

- You cannot use `#forcol` in DOCX. If you use it in a DOCX report template (Figure 216), an error message will open (Figure 217).

1 Using Forcol
2

#forcol($c in $Class)$c.name	#endcol

3

Figure 216 -- Using #forcol in DOCX

Figure 217 -- Error Message When Using #forcol in DOCX

- You cannot use multi-line statements in different objects. If you try to use them in DOCX (Figure 218), an error message will open (Figure 219).

1 **Using directive in different object**

2 #forpage($c in $Class)

$c.name #endpage

3

Figure 218 -- Invalid Usage of Multi-line Statement in DOCX

Figure 219 -- The Error Message of Invalid Usage of the Multi-line Statements in DOCX

2. Microsoft Office Excel Worksheet (XLSX)

2.1 Multi-Line Statements in XLSX

All multi-line directives such as `#if-#else-#elseif`, `#foreach`, and `#macro` must be used under the following conditions.

- The beginning and ending statements must be declared within a single cell. Figure 220 and 221 below show samples of invalid usage of the `#if` and `#foreach` statements between cells respectively.

	A	B
1	#if($e.elementType == "usecase")	
2	$e.name	
3	#end	
4		

Figure 220 -- Invalid Usage of the Multi-line #if Statement in XLSX

	A	B	C	D	E
1					
2		**Use Case**			
3		#foreach($uc in $UseCase)	$uc.name	#end	
4					

Figure 221 -- Invalid Usage of the Multi-line #foreach Statement in XLSX

In Figure 220, since the body of the `#if` statement ($e.name) resides in the A2 cell, not in the A1 cell, the body will not be generated when generating a report, regardless of the evaluation of the `#if` statement.

The code shown in Figure 221 will break the structure of a spreadsheet document.

Figure 222 and 223 demonstrate samples of valid usage of the `#if` and `#foreach` statements respectively.

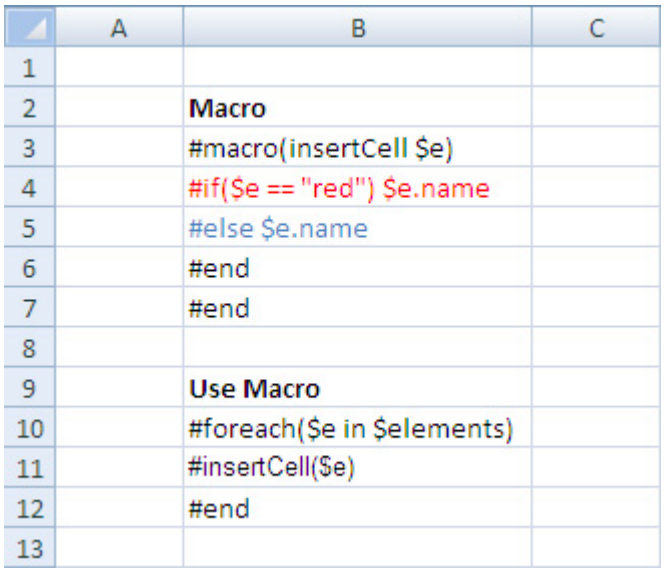
	A	B
1	#if($e.elementType == "usecase")$e.name#end	
2		

Figure 222 -- Valid Usage of the Multi-line #if Statement in XLSX

	A	B	C
1			
2		**Use Case**	
3		#foreach($uc in $UseCase) $uc.name #end	
4			

Figure 223 -- Valid Usage of Multi-line #foreach Statement in XLSX

- A VTL Macro must be declared within a single cell. Do not insert the multi-cell recorded macros in a single cell (Figure 224).

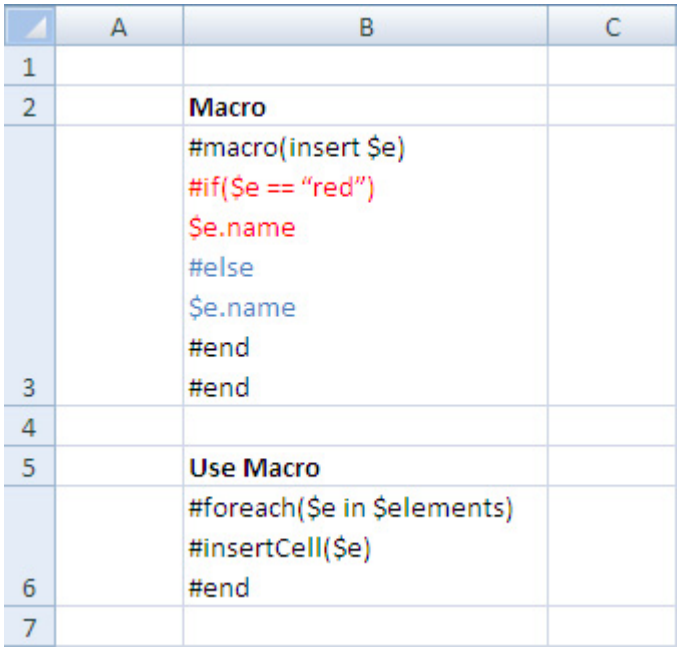


	A	B	C
1			
2		**Macro**	
3		#macro(insertCell $e)	
4		#if($e == "red") $e.name	
5		#else $e.name	
6		#end	
7		#end	
8			
9		**Use Macro**	
10		#foreach($e in $elements)	
11		#insertCell($e)	
12		#end	
13			

Figure 224 -- Invalid Usage of #macro Statement in XLSX

The macro will copy all contents between `#macro` and `#end`. Cells and rows will be included in the macro as well. Once this record has been inserted, the macro content will break the document structure.

Figure 225 demonstrates a sample of valid usage of the `#macro` statement.



	A	B	C
1			
2		**Macro**	
3		#macro(insert $e) #if($e == “red”) $e.name #else $e.name #end #end	
4			
5		**Use Macro**	
6		#foreach($e in $elements) #insertCell($e) #end	
7			

Figure 225 -- Valid Usage of #macro Statement in XLSX

2.2 Creating Data for Multiple Rows

The `#foreach` directive can only be used in a single cell record. To create data for multiple rows, use the `#forrow` directive instead (Figure 226).

	A	B	C	D
1	#forrow($uc in $UseCase)	$uc.name	#endrow	
2				

Figure 226 -- Usage of #forrow in XLSX

Figure 227 demonstrates the output of the above code.

	A	B	C
1		Use Case A	
2		Use Case B	
3		Use Case C	
4		Use Case D	
5			

Figure 227 -- Output of #forrow in XLSX

2.3 Creating Data for Multiple Columns

`#forcol` is used for creating data for multiple columns (Figure 228). This statement can be used in conjunction with the `#forrow` statement.

	A	B
1	#forcol($uc in $UseCase)$us.name#endcol	
2		

Figure 228 -- Usage of #forcol in XLSX

Figure 229 demonstrates the output of the above code.

	A	B	C	D	E
1	Use Case A	Use Case B	Use Case C	Use Case E	
2					

Figure 229 -- Output of #forcol in XLSX

2.4 Displaying Content in a Cell

Texts in any generated report are always wrapped. Also, the cells' width in the generated report depends on the cells' width in the report template used. For example, an XLSX report template in Figure 230 will generate an output report as shown in Figure 231.

	A	B	C	D
1	#forrow($uc in $UseCase)	$uc.name	#endrow	
2				

Figure 230 -- Sample of Wrapped Text (Column B) in an XLSX Report Template

	A	B	C
1		this_is_u secase1	
2		this_is_u secase2	
3		this_is_u secase3	
4			

Figure 231 -- Wrapping Text Output in XLSX

2.5 Limitation when Used in Microsoft Office Excel Worksheet

You cannot use `#sectionBegin` and `#includeSection` in XLSX. If you try to use `#sectionBegin` or `#includeSection` in an XLSX report template (Figure 232), an error message will open (Figure 233).

	A	B
1		
2		
3		
4	#sectionBegin(SectionA)	
5		
6	This is section begin	
7		
8		
9	#sectionEnd	
10		

Figure 232 -- Using #sectionBegin in XLSX

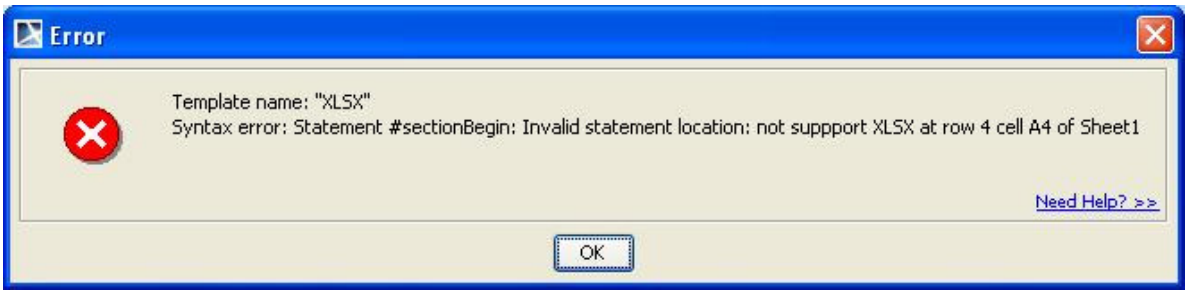


Figure 233 -- Error Message When Using #sectionBegin in XLSX

3. Microsoft Office PowerPoint Presentation (PPTX)

A presentation document requires a special document template. This template does not contain any content order, and all text content is always placed inside a text box. A text box is an image structure (an image structure keeps the position of each image in x, y coordinates). You can change a Text box position. You can also place a Text box in the same positions as others (Figure 234).

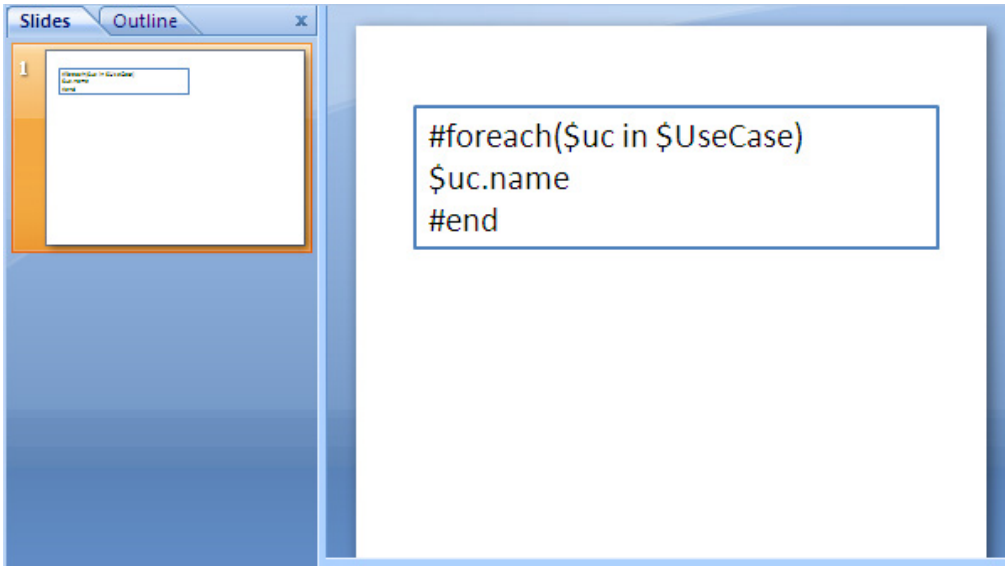


Figure 234 -- Sample of PPTX Template

3.1 Multi-line Statements in PPTX

Similar to XLSX, all multi-line directives such as `#if-#else-#elseif`, `#foreach`, and `#macro` must be used under the following conditions.

1. The beginning and ending statements must be declared within a single text box. Figure 235 below shows a sample of invalid usage of the`#foreach` statement between the text boxes.

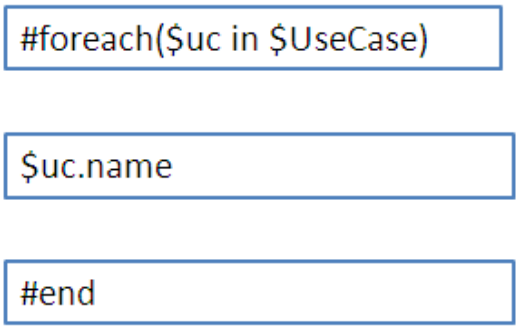


Figure 235 -- Invalid Usage of Multi-line Statement #foreach in PPTX

Since the PPTX template does not provide the statement order, the template will not be interpreted as the order of the displayed images (text boxes). For example, `$uc.name` may not be processed after `#foreach($uc in $UseCase)` has been completely processed. Figure 236 below demonstrates a sample of valid usage of the `#foreach` statement.

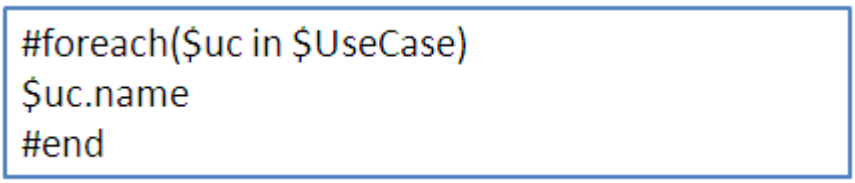


Figure 236 -- Valid Usage of Multi-line Statement #foreach in PPTX

2. A VTL Macro must be declared within a single text box. Do not insert the multi-cell recorded macros in a single text box (Figure 237).

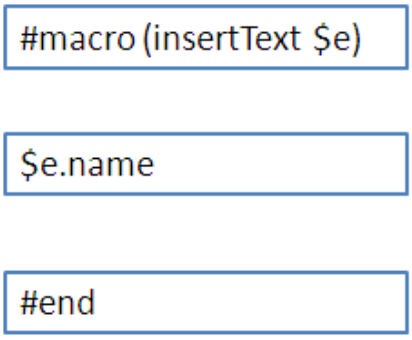


Figure 237 -- Invalid Usage of #macro Statement in PPTX

Since each text box does not have any sequence order, the macro cannot record any content between the text boxes. Figure 238 demonstrates a valid usage of the `#macro` statement.

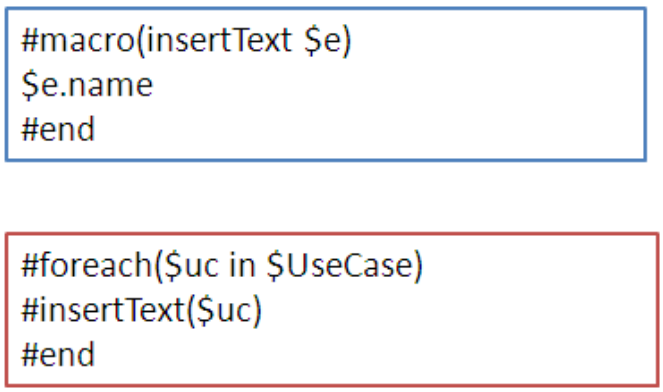


Figure 238 -- Valid Usage of #macro Statement in PPTX

3.2 Creating Data for Multiple Slides

In PPTXreport templates, you can use the `#forpage` directive to create additional slide(s) in your presentation. You can use `#forpage` and `#endpage` directives in any text box. However, the `#endpage` directive must be on same slide as the `#forpage` directive or on the following slide, but not before the slide which contains the `#forpage` directive. All directives on the slide(s) between 1) the slide the `#forpage` directive appears and 2) the slide the `#endpage` directive appears will be included within the `#forpage` statement. For example, the template in Figure 239 will produce the output in Figure 240.

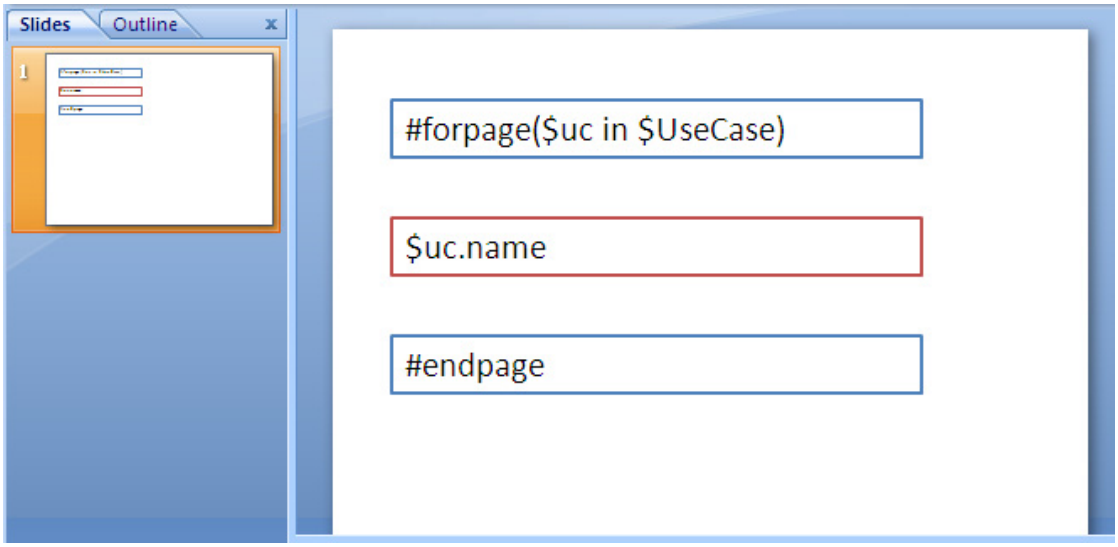


Figure 239 -- Sample of Valid Usage of #forpage in PPTX

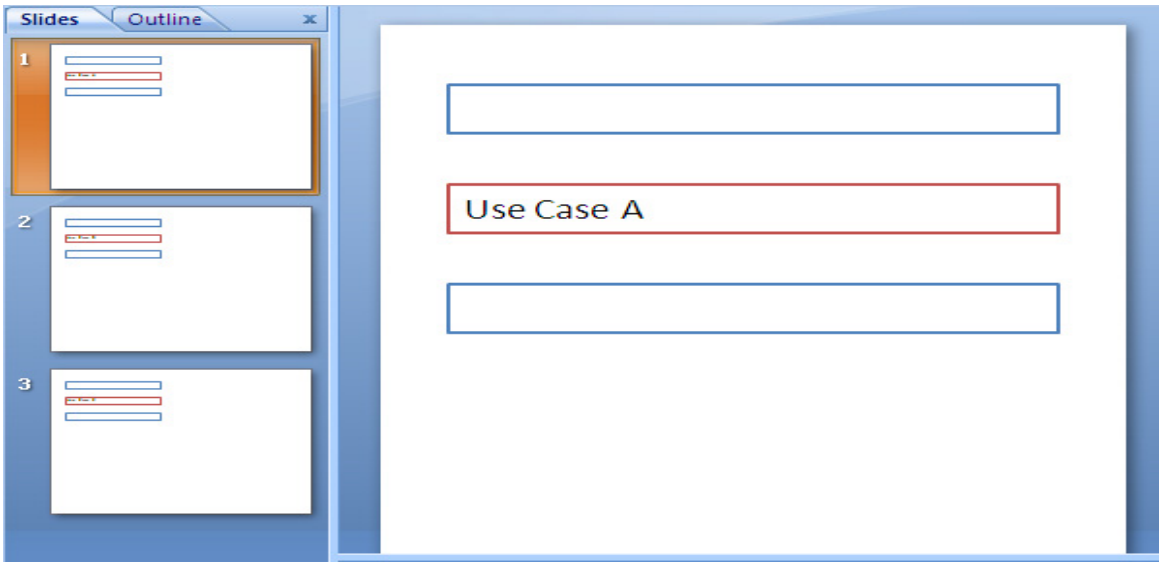


Figure 240 -- Sample Output of Valid Usage of #forpage in PPTX

3.3 Creating a Page with Conditions

Since a directive in the PPTX report template does not provide any statement order (unless residing in the same text box), you cannot used the `#if` directive together with the `#forpage` directive (Figure 241).

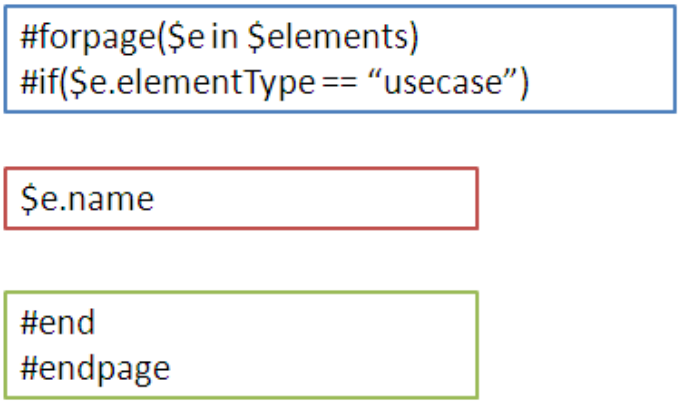


Figure 241 -- Sample of Looping With Condition in General Style

The code in Figure 241 will not produce the output report as expected, because the `#forpage` directive automatically covers all directives in the current page regardless of the statement order. Consequently, the `#if` directive may not be interpreted after the `#forpage` directive.

To avoid this problem, you can use the `$report.filterElement($elements, $types)` method. This helper method provides the element filter for the specified type. In this case, use the following code (Figure 242).

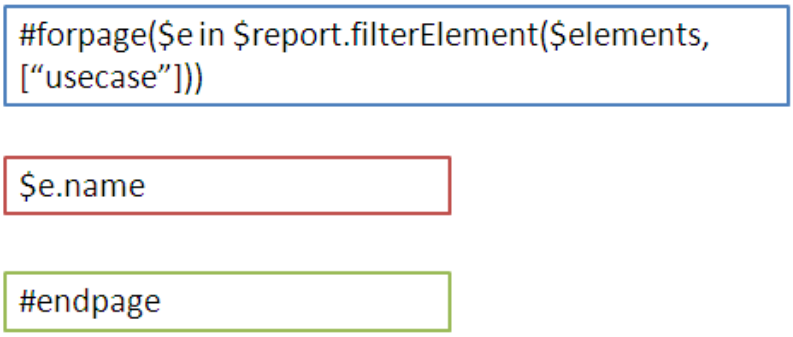


Figure 242 -- Sample of Looping With Conditional Filter

For more details on `$report.filterElement($elements, $types)`, see Section 4 Helper Modules.

3.4 Limitation when Used in Microsoft Office PowerPoint Presentation

`#sectionBegin`, `#includeSection`, `#forrow`, and `#forcol` cannot be used in any PPTX report template. If you try, for example, to use `#sectionBegin` in a PPTX report template (Figure 243), an error message (Figure 244) will open.

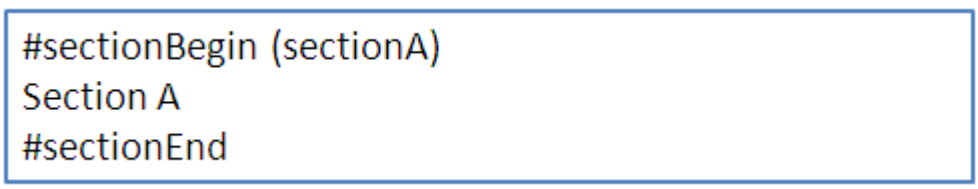


Figure 243 -- Using #sectionBegin in PPTX

Figure 244 -- Error Message When Using #sectionBegin in PPTX

Appendix C: OpenDocument Format Template

The **OpenDocument** format (ODF) is an open file format for office documents, such as spreadsheets, presentations, and word processing documents. The standard was developed by the Open Office XML technical committee of the Organization for the Advancement of Structured Information Standards (OASIS) consortium.

The version 1.0 manifestation was published as an **ISO/IEC International Standard, ISO/IEC 26300:2006 Open Document Format for Office Applications (OpenDocument) v1.0**.

The most common files supported by Report Wizard are:

- ODT - for word processing (text) documents
- ODS - for spreadsheets
- ODP - for presentations

1. OpenDocument Text

Report Wizard supports most OpenDocument Text (ODT) features. It enables you to input the VTL codes inside meta-data, styles, and text content. All syntax usable inside RTF can be used with ODT.

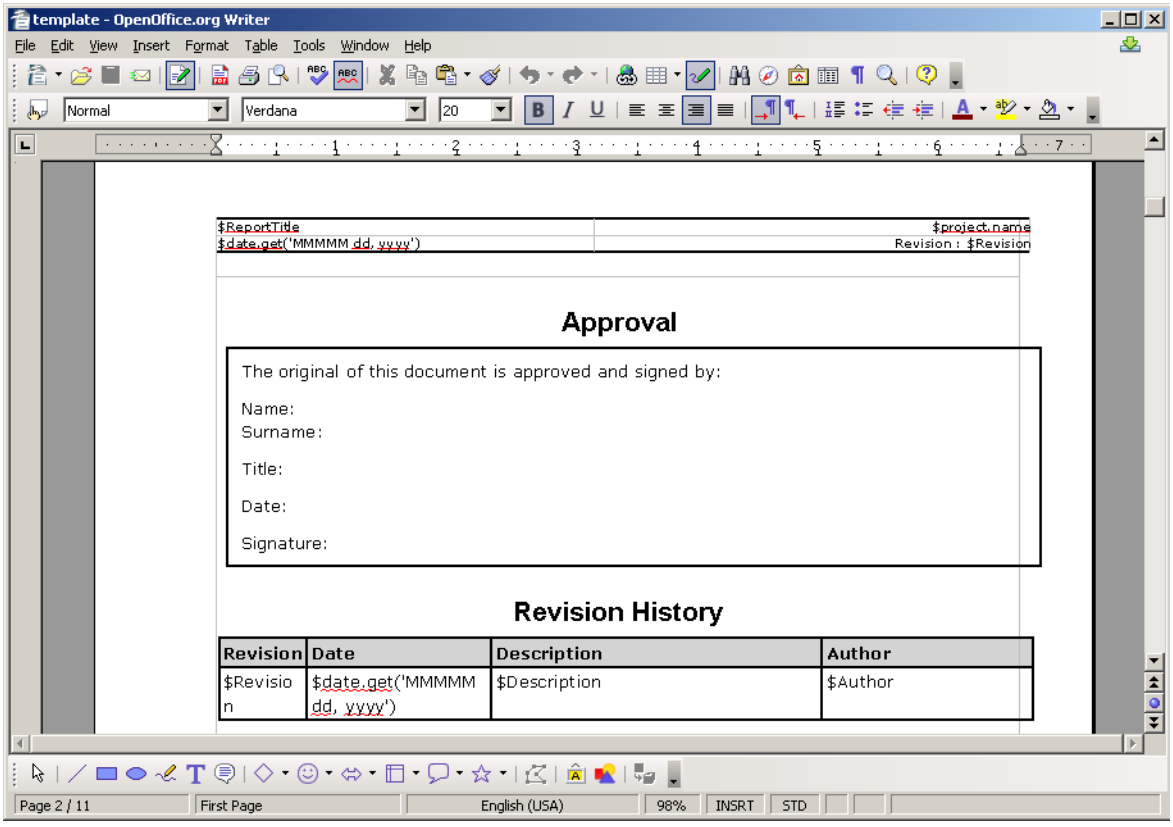


Figure 245 -- Sample of OpenDocument Text Converted From RTF Document

2. OpenDocument Spreadsheet

All multiline directives such as `#if-#else-#elseif`, `#foreach`, and `#macro` must be used under the following conditions:

1. The beginning and ending statements must be declared within a single cell. Figure 246 and 247 below show two samples of invalid usage of the multiline statements between cells.

	A	B
1	#if ($e.elementType == "usecase")	
2	$e.name	
3	#end	
4		

Figure 246 -- Invalid Usage of the Multiline #if Statement in ODS

	A	B	C	D
1				
2		**Use Case**		
3		#foreach ($uc in $UseCase)	$name	#end
4				

Figure 247 -- Invalid Usage of Multiline #foreach Statement in ODS

Since the body of the `#if` statement is contained in the cell A2, this cell will not be generated if the condition is not true (the element type is not “usecase”). Due to the constraints of spreadsheet document structure, the number of cells in a column must be equal to the number of cells in all columns, and the number of cells in a row must be equal to the number of cells in all rows.

The codes in Figure 247 will break the structure of a spreadsheet document. Figure 248 and 249 demonstrate two samples of valid usage of the multiline statements.

	A	B
1	#if ($e.elementType == "usecase")$e.name#end	
2		

Figure 248 -- Valid Usage of Multiline #if Statement in ODS

	A	B	C
1			
2		**Use Case**	
3		#foreach ($uc in $UseCase) $name #end	
4			

Figure 249 -- Valid Usage of Multiline #foreach Statement in ODS

2. VTL Macro must be declared within a single cell. Do not insert the multi-cell recorded macros in a single cell (Figure 250).

	A	B	C
1			
2		**Macro**	
3		#macro(insertCell $e)	
4		#if ($e=="red") $e.name	
5		#else $e.name	
6		#end	
7		#end	
8			
9		**Use Macro**	
10		#foreach ($e in $elements)	
11		#insertCell($e)	
12		#end	
13			

Figure 250 -- Invalid Usage of Macro Statement in ODS

The macro will copy all contents between `#macro` and `#end`. Cells and rows will be included in the macro as well. Once this record has been inserted, the macro content will break the document's structure.

2.1 Creating Data for Multiple Rows

The `#foreach` directive can only be used in a single cell record. To create data for multiple rows, use the `#forrow` directive instead (Figure 251).

	A	B	C
1	#forrow($uc in $UseCase)	$uc.name	#endrow

Figure 251 -- Usage of #forrow

As shown in Figure 251, the output will be:

	A	B	C
1		Use Case A	
2		Use Case B	
3		Use Case C	
4		Use Case D	
5			

Figure 252 -- Output of #forrow

2.2 Creating Data for Multiple Columns

`#forcol` is used to create data for multiple columns (Figure 253). This statement can be used with `#forrow` (see the sample from the "Other Document" template).

	A	B
1	#forcol($uc in $UseCase)$uc.name#endcol	
2		

Figure 253 -- Usage of #forcol

From the usage of `#forcol` shown in Figure 253, the output will be:

	A	B	C	D	E
1	Use Case A	Use Case B	Use Case C	Use Case D	
2					

Figure 254 -- The Output of #forcol

3. OpenDocument Presentation

A presentation document is a special document template. This template does not contain a content order. The text content used within this document is inserted inside a text box. A text box is an image structure (An image structure keeps the position of each image in x, y coordinates).

You can change the position of a Text box. You can also place Text boxes in the same positions as others (Figure 255).

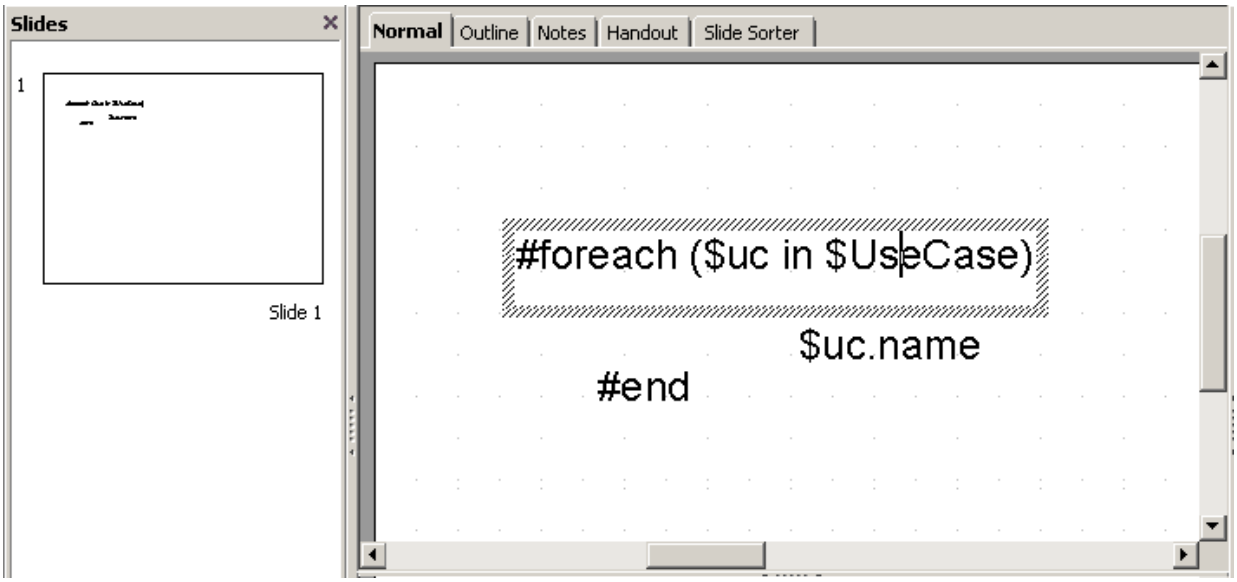


Figure 255 -- Sample of ODP Template

Using the same concept as ODS, all multi-line directives such as `#if-#else-#elseif`, `#foreach`, and `#macro` must be used under conditions.

- The beginning and ending statements must be declared within a single text box. Figure 256 below shows the sample of invalid usage of the multiline `#foreach` statement between the text boxes.

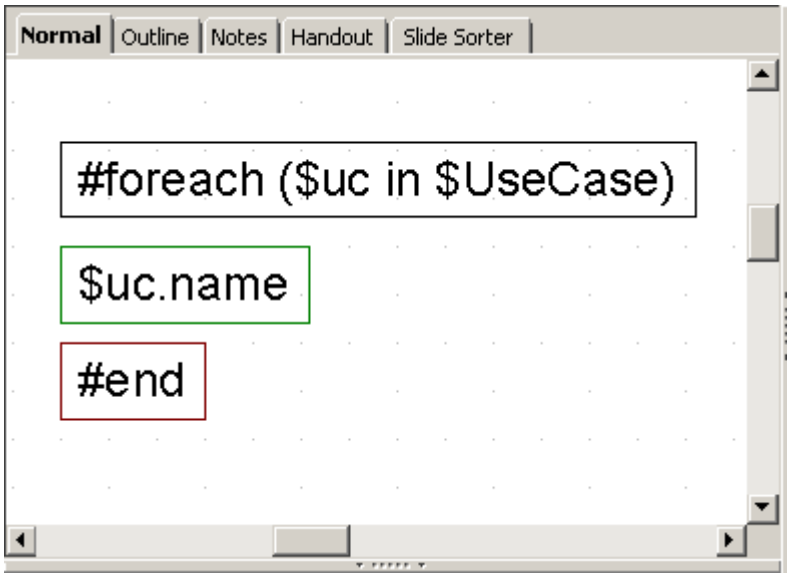


Figure 256 -- Invalid Usage of Multiline Statement in ODP

Since the ODP template does not provide the statement order, the template will not be interpreted in the order of the displayed images. For example, `$uc`.name may not be processed after `#foreach($uc in $UseCase)` has been completed.

Figure 257 below shows the sample of valid usage of the `#foreach` statement.

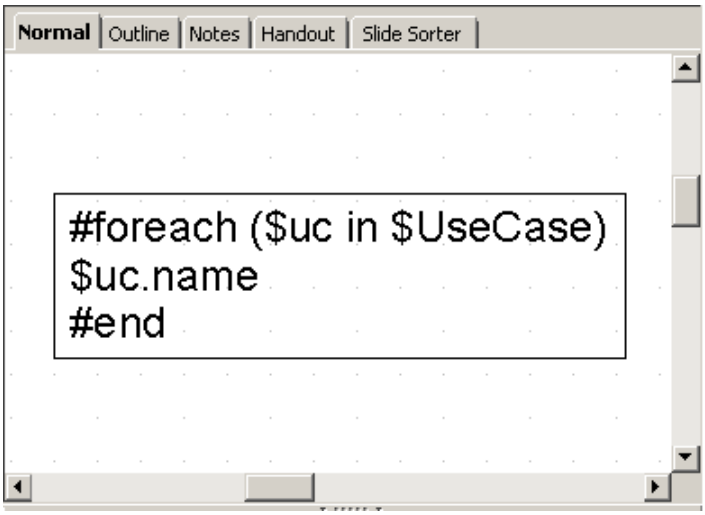


Figure 257 -- Valid Usage of Multiline #foreach Statement in ODP

- A VTL Macro must be declared within a single text box. Do not insert the multi-cell recorded macros in a single text box (Figure 258).

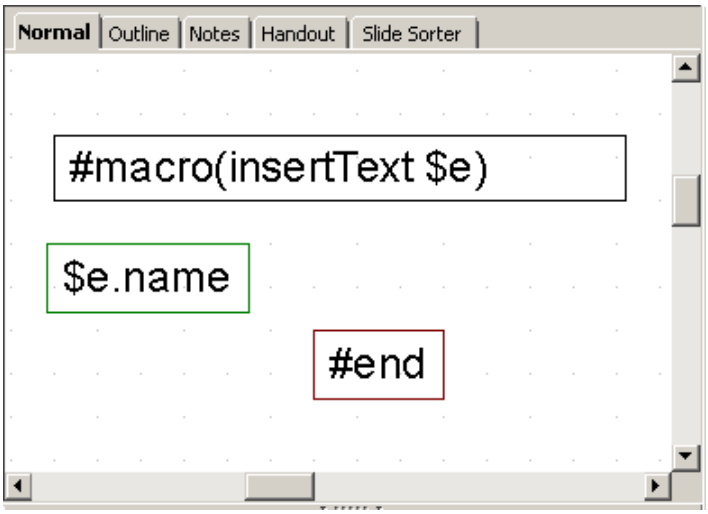


Figure 258 -- Invalid Usage of Macro Statement in ODP

The text box does not have a sequence order; therefore, macros cannot record any content between the text boxes (Figure 259).

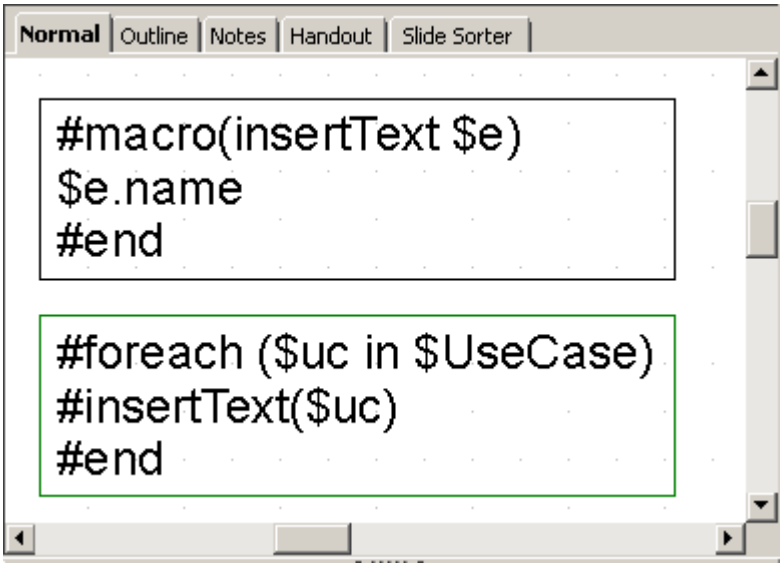


Figure 259 -- Valid Usage of Macro Statement in ODP

3.1 Creating Data for Multiple Slides

ODP uses the `#forpage` directive to create a slide for each data. The `#forpage` directive does not contain any order. You can use `#forpage` and `#endpage` in any text boxes. All directives on the slide will be included within the `#forpage` statement (Figure 260).

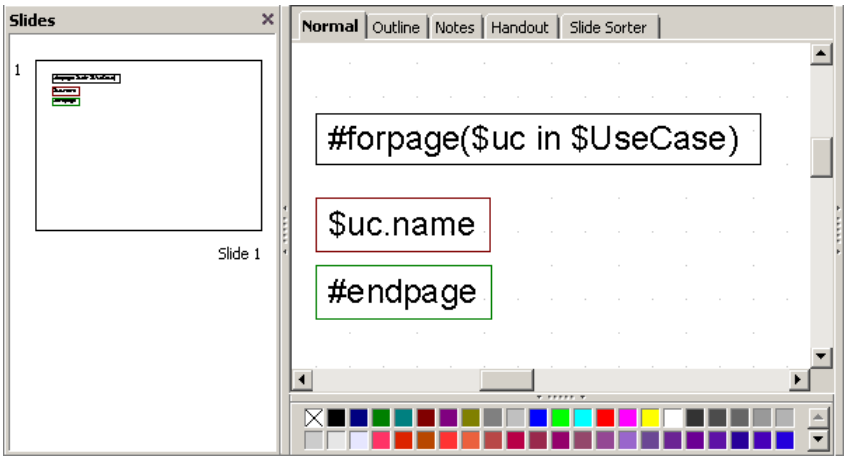


Figure 260 -- Sample of #forpage Usage

The output from the code in Figure 261 is an ODP with a single use case name for each slide.

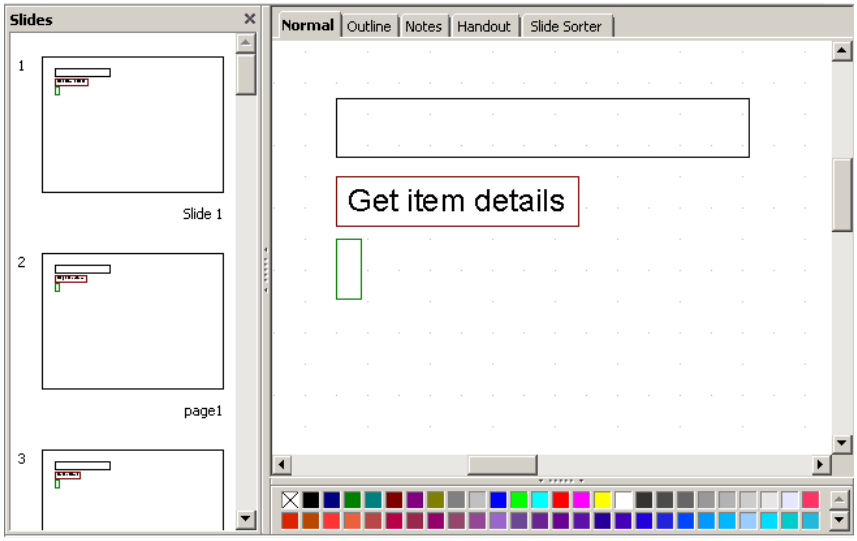


Figure 261 -- Sample Output from #forpage

For more samples of ODP reports, see the “Other Document” template.

3.2 Creating Page with Conditions

The ODP directive does not provide any statement order; therefore, the `#if` directive will not be attached to the `#forpage` statement (Figure 262).

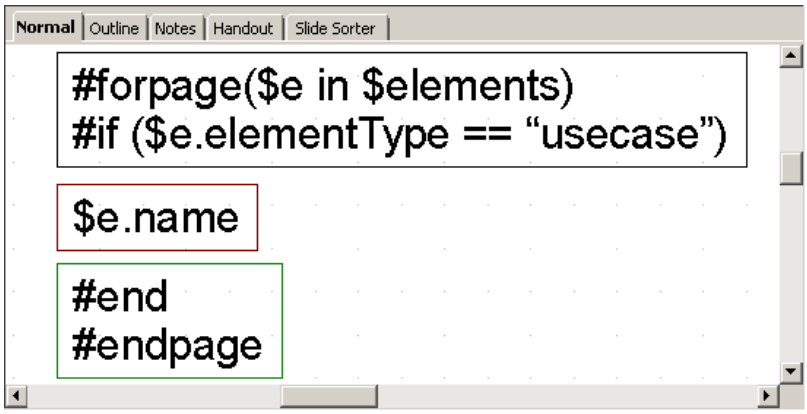


Figure 262 -- Sample of Looping with Condition in General Style

The codes in Figure 262 may not produce the report exactly as expected. `#forpage` automatically covers all directives in the current page without any statement order. Therefore, the `#if` directive may not be interpreted after `#forpage`.

To solve this problem you can use the `$report.filterElement($elements, $types)` method. This helper method provides the element filter for the specified type. The codes are shown in Figure 263:

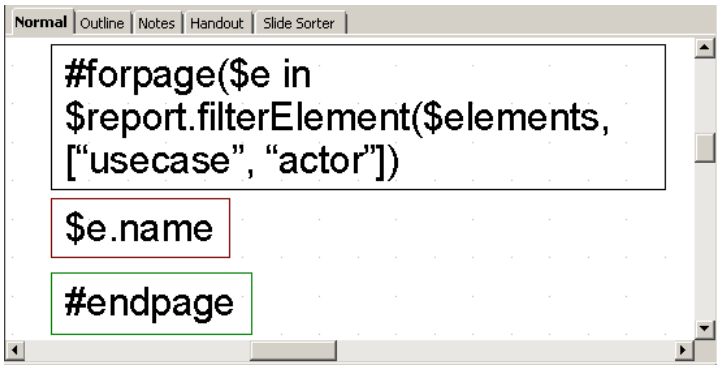


Figure 263 -- Sample of Looping with Conditional Filter

For more details on `$report.filterElement($elements, $types)`, see Section **4 Helper Modules**.

4. OpenDocument Conversion Tool

The following tools can convert RTF documents to ODF documents.

4.1 Microsoft Office ODF Extensions

This Microsoft Office add-on allows Microsoft Office to open ODF documents and save Microsoft Office documents in the OpenDocument format.

Download Microsoft Office ODF Extensions from http://odf-converter.sourceforge.net/

4.2 OpenOffice.org

OpenOffice.org is an office suite that can open and save documents in many formats. This tool can also open RTF documents and save them as ODF documents.

Download OpenOffice.org from http://www.openoffice.org.

5. OpenDocument References

ISO/IEC 26300:2006 Information Technology - Open Document Format for Office Applications (OpenDocument) v1.0.

- http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=43485

Application Supports for the OpenDocument Format

- http://opendocumentfellowship.com/applications

Microsoft expands List of Formats Supported in Microsoft Office

- http://www.microsoft.com/Presspass/press/2008/may08/05-21ExpandedFormatsPR.mspx

OpenOffice.org

- http://www.openoffice.org/

Microsoft Office ODF Extensions

- http://odf-converter.sourceforge.net/

Appendix D: HTML Tag Support

Report Wizard supports HTML code conversion to RTF, ODF, and OOXML file formats. The HTML code is created from the Element Documentation pane (Figure 264).

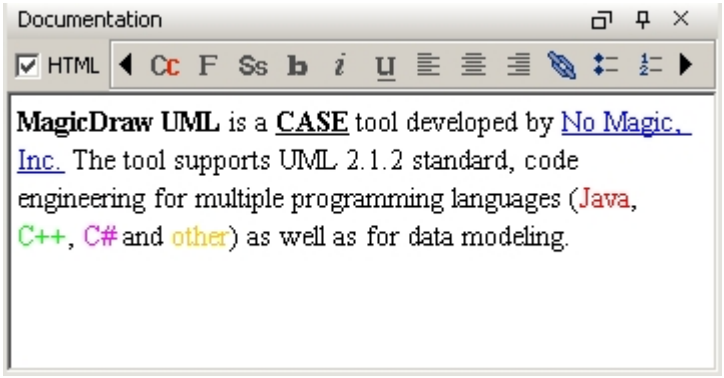


Figure 264 -- MagicDraw Documentation Pane

The element documentation can also be retrieved by the following VTL code:

```
#foreach ($e in $elements)
$e.documentation
#end
```

Whenever the report engine encounters HTML content, it will automatically convert the content into a valid output format style.

1. Supported HTML Tags

1.1 Font Tags

A font tag consists of three attributes: (1.1.1) Size, (1.1.2) Face, and (1.1.3) Color.

1.1.1 Size

The Size attribute determines the font size. Possible values are integers from 1 to 7. The default base font size is 3. The greater the value is, the larger the size becomes.

- The base font size for RTF documents is 24 dot (equivalent to 12 pt).
- The base font size for ODF documents is 12 pt.
- The base font size for OOXML documents is 12 pt.
- The base font size for HTML documents is determined by the web browser.

Each value will be multiplied by two. Shown below is an example of the size attribute:

```
<font size="5">
It will be rendered as font size 16 pt
<font size="3">
It will be rendered as font size 12 pt
<font size="1">
It will be rendered as font size 8 pt
```

If the size attribute is specified without the face attribute, the default font will be determined by the template or document editor, unless the font tag is covered by other HTML elements such as `<code>` or `<tt>`.

1.1.2 Face

The Face attribute defines the font name. If the face attribute is specified without the size attribute, the default size will be determined by the template or the document editor.

1.1.3 Color

The Color attribute specifies the text color. A color value can be either a hexadecimal number (prefixed with a hash mark) or one of the following sixteen colors. Colors are case-insensitive.

Table 35 -- Font Colors

Color	Hexadecimal code
Black	#000000
Silver	#C0C0C0
Gray	#808080
White	#FFFFFF
Maroon	#800000
Red	#FF0000
Purple	#800080
Fuchsia	#FF00FF
Green	#008000
Lime	#00FF00
Olive	#808000
Yellow	#FFFF00
Navy	#000080
Blue	#0000FF
Teal	#008080
Aqua	#00FFFF

For example:

```
<font face="Arial"> This is Arial text</font><br>
<font face="Comic Sans MS">This is Comic Sans text</font><br>
<font face="Arial" size="1">This is small Arial</font><br>
<font face="Arial" size="7">This is large Arial</font><br>
<font face="Arial" color="Red">This is red Arial</font><br>
<font face="Arial" color="#FF0000">and this is red Arial too</font><br>
```

Figure 265 -- Sample of Font Tags

As shown in Figure 266, the outputs in RTF, ODF, or HTML will be as follows:

This is Arial text

This is Comic Sans MS text

This is small Arial

This is large Arial

This is red Arial

and this is red Arial too

Figure 266 -- Sample of RTF, ODF, or HTML Document Outputs

1.2 Font Style Tag

Table 36 -- Font Style Elements

Tag name	Description
TT	Renders teletyped or monospaced text.
I	Renders italic text.
B	Renders bold text.
BIG	Renders text in large font.
SMALL	Renders text in small font.
STRIKE and S	Renders strikethrough text.
U	Renders underlined text.

- TT – This tag will be rendered as `<font face="Courier New">`
- I – This tag is supported by the existing HTML conversion component.
- B – This tag is supported by the existing HTML conversion component.
- BIG – This tag will be rendered as `<font size="5">`
- SMALL – This tag will be rendered as `<font size="1">`
- STRIKE and S – This tag will be rendered in a strikethrough text.
- U – This tag is supported by the existing HTML conversion component.

1.3 Phrase Elements

Table 37 -- Phrase Elements

Tag name	Function
EM	Indicates emphasis.
STRONG	Indicates stronger emphasis.
CITE	Contains a citation or a reference to other sources.
DFN	Indicates that this is the defining instance of the enclosed term.
CODE	Designates a fragment of computer code.
SAMP	Designates a sample output from programs, scripts, etc.
KBD	Indicates the text to be entered by the user.
VAR	Indicates an instance of a variable or program argument.
ABBR	Indicates an abbreviated form such as WWW, HTTP, URI, and Mass.
ACRONYM	Indicates an acronym such as WAC and radar.

- EM – This tag will be rendered as `<i>`
- STRONG – This tag will be rendered as `<b>`
- CITE – This tag will be rendered as `<i>`
- DFN – This tag will be rendered as `<i>`
- CODE – This tag will be rendered as `<font face=”Courier New”>`
- SAMP – This tag will be rendered as `<font face=”Courier New”>`
- KBD – This tag will be rendered as `<font face=”Courier New”>`
- VAR – This tag will be rendered as `<i>`
- ABBR – This tag will be rendered as normal text.
- ACRONYM – This tag will be rendered as normal text.

1.4 Ordered and Unordered Lists and List Item Tags

Ordered and unordered lists are rendered in an identical manner, except that ordered list items are numbered.

The report engine supports both unordered and ordered lists without attributes. The list tag attributes will be ignored in the report output. The list tag attributes are type, start, value, and compact.

Both unordered and ordered lists are not supported in XLSX and ODS templates.

1.4.1 Ordered Lists

An Ordered List is defined by the <OL> element. The element contains one or more <LI> elements that define the actual items of the list.

Unlike unordered lists (UL), items in an ordered list have a definite sequence. A conversion will render each item in the list with a number. All <OL> attributes will be ignored in the report output. An example of the Ordered List tag is shown in Figure 267:

```
<OL>
   <LI>Apple</LI>
   <LI>Orange</LI>
   <LI>Banana</LI>
</OL>
```

Figure 267 -- Sample of Ordered List Tag

As shown in Figure 268, the outputs in RTF, ODF, or HTML will be as follows:

1. Apple
2. Orange
3. Banana

Figure 268 -- The Sample of RTF, ODF, or HTML Document Outputs

1.4.2 Nested Ordered Lists

HTML conversion will indent nested lists with respect to the current level of nesting. A number for each level will start over at 1. An example of the Nested Ordered List tag is shown in Figure 269:

```
<OL>
  <LI>Apple</LI>
  <LI>Orange</LI>
  <OL>
    <LI>Banana</LI>
    <OL>
      <LI>Grape</LI>
      <OL>
        <LI>Mango</LI>
      </OL>
    </OL>
  </OL>
</OL>
```

Figure 269 -- Sample of Nested OL Tags

As shown in Figure 270, the outputs in RTF, ODF, or HTML will be as follows:

1. Apple
2. Orange
    1. Banana
        1. Grape
            1. Mango

Figure 270 -- The Sample of RTF, ODF, or HTML Document Outputs

1.4.3 Unordered Lists

An Unordered List is defined by the UL element. The element contains one or more LI elements that define the actual items of the list.

A conversion will render the UL element with a bullet preceding each list item. All UL attributes will be ignored in the report output. Figure 271 shows an example of an Unordered List tag:

```
<UL>
  <LI>Apple</LI>
  <LI>Orange</LI>
  <LI>Banana</LI>
</UL>
```

Figure 271 -- Sample of UL Tags

As shown in Figure 272, the outputs in RTF, ODF, or HTML will be as follows:

- Apple
- Orange
- Banana

Figure 272 -- Sample of RTF, ODF, or HTML Document Outputs

1.4.4 Nested Unordered Lists

Lists can also be nested. HTML conversion will indent nested lists with respect to the current level of nesting.

HTML conversion should attempt to present a small filled-in circle to the first level, a small circle outline to the second level, and a filled-in square to the third level. Bullets after the third level are filled-in squares. An example of the Nested Unordered List tag is shown in Figure 273:

```
<UL>
  <LI>Apple</LI>
  <LI>Orange</LI>
  <UL>
    <LI>Banana</LI>
    <UL>
      <LI>Grape</LI>
      <UL>
        <LI>Mango</LI>
      </UL>
    </UL>
  </UL>
</UL>
```

Figure 273 -- Sample of Nested UL Tags

As shown in Figure 274, the outputs in RTF, ODF, or HTML will be as follows:

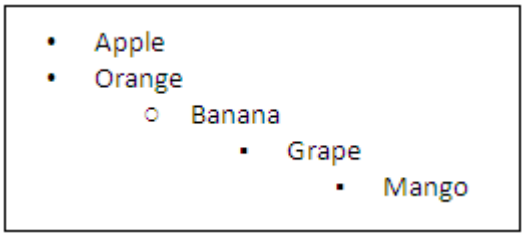


Figure 274 -- Sample of RTF, ODF or HTML Document Outputs

1.5 Definition List Tags

A Definition List is defined by the DL element. An entry in the list is created using the DT element for the term being defined and the DD element for the definition of the term.

A definition list can have multiple terms for a given definition as well as multiple definitions for a given term. Authors can also give a term without a corresponding definition, and vice versa, but such a structure rarely makes sense.

A conversion will render DT as a non-indent item and DD as a single indent item. The Definition List tag is not supported in the XLSX template. Figure 275 shows an example of a Definition List tag:

```
<DL>
  <DT>Dweeb</DT>
  <DD>young excitable person who may mature into a Nerd or Geek</DD>
  <DT>Hacker</DT>
  <DD>a clever programmer</DD>
  <DT>Nerd</DT>
  <DD>technically bright but socially inept person</DD>
</DL>
```

Figure 275 -- Sample of DL Tags

As shown in Figure 276, the outputs in RTF, ODF or HTML will be as follows:

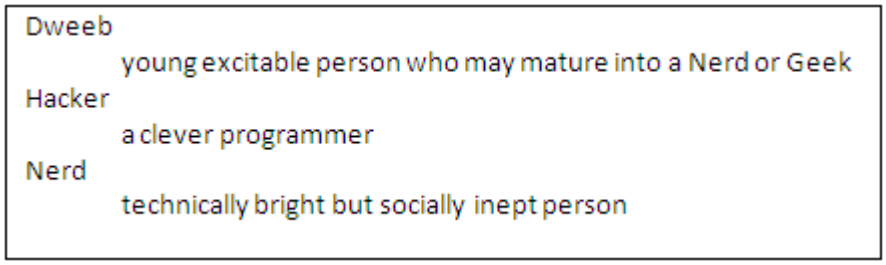


Figure 276 -- Sample of RTF, ODF, or HTML Document Outputs

1.6 Line and Paragraph Tags

A line break is defined by the
 element. The element inserts a single line break. It is an empty tag. This means that it has no end tag. The line attributes will be ignored in the report output.

A paragraph is defined by the <P> element. The element automatically creates some space before and after itself. The paragraph attributes will be ignored in the report output. Figure 277 shows an example of a Line Break and Paragraph tag:

```
This is first text
This is second text <br>
This is third text
<p> This is paragraph </p>
```

Figure 277 -- Sample of Line and Paragraph Tags

As shown in Figure 278, the outputs in RTF, ODF, or HTML will be as follows:

This is first text This is second text

This is third text

This is paragraph

Figure 278 -- The Sample of RTF, ODF, or HTML Document Outputs

1.7 Preformatted Text

A preformatted text is defined by the <PRE> element. All the space and carriage returns are rendered exactly as you type them. The preformatted attributes will be ignored in the report output. Figure 279 shows an example of the preformatted text:

```
<p>
  The PRE element tells visual
     user agents that
        the enclosed text
      is "preformatted"
</p>
<pre>
  The PRE element tells visual
     user agents that
        the enclosed text
      is "preformatted"
</pre>
```

Figure 279 -- Sample of Preformatted Text

As shown in Figure 280 and 281 respectively, the outputs in RTF/ ODF and HTML will be as follows:

```
The PRE element tells visual user agents that the enclosed text is "preformatted"

    The PRE element tells visual
       user agents that
          the enclosed text
        is "preformatted"
```

Figure 280 -- Sample of RTF / ODF Document Output

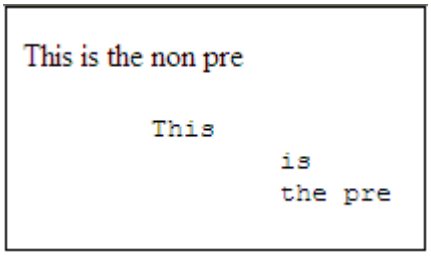


Figure 281 -- Sample of HTML Document Output (Open in Internet Explorer 7.0)

1.8 Heading Tags

A heading is defined by the <H1>, <H2>, <H3>, <H4>, <H5>, or <H6> element. In this report, all heading tags will be rendered as <b> for ODT, RTF, and OOXML document outputs. The heading attributes will be ignored in the report output. Figure 282 shows an example of Heading tags.

```
<h1>Heading 1</h1>
<h2>Heading 2</h2>
<h3>Heading 3</h3>
<h4>Heading 4</h4>
<h5>Heading 5</h5>
<h6>Heading 6</h6>
```

Figure 282 -- Sample of Heading Tags

As shown in Figure 283 and 284 respectively, the outputs in RTF / ODF and HTML will be as follows:

```
Heading 1
Heading 2
Heading 3
Heading 4
Heading 5
Heading 6
```

Figure 283 -- Sample of RTF / ODF Document Output

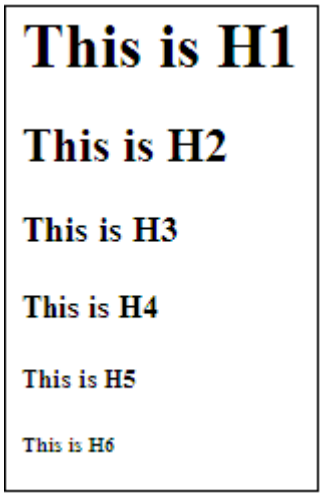


Figure 284 -- Sample of HTML Document Output (Open in Internet Explorer 7.0)

1.9 Link Tags

A Link tag is defined by the <A> element. This element is used to create a link to another document with the href attribute. The href attribute specifies the destination of the link. Link tag is not supported in the XLSX template. Figure 285 shows an example of a Link tag:

```
<A href="http://www.google.co.th">
This is a link to www.google.com
</A>
```

Figure 285 -- Sample of Link Tag

As shown in Figure 286, 287, and 288 respectively, the outputs in RTF, ODF, and HTML will be as follows:

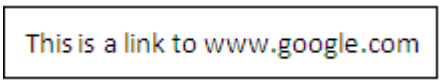


Figure 286 -- Sample of RTF Document Output

Figure 287 -- Sample of ODF Document Output

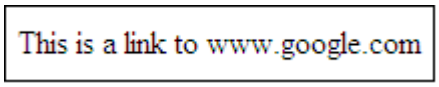


Figure 288 -- Sample of HTML Document Output (Open in Internet Explorer 7.0)

1.10 Table Tags

A table is defined by the <TABLE> element. A table consists of multi-dimensional data arranged in rows and columns.

1.10.1 Table Elements

The <TABLE> element takes a number of optional attributes to provide presentational alternatives in a document. The table attributes will be ignored in the report output except the following attributes:

(i) border - specifies the width in unit of the border of a table.

(ii) bgcolor - specifies table background color. Apply the background color here will affect the whole table.

Table elements are not supported in XLSX, PPTX, ODS, and ODP templates.

Figure 289 shows an example of table tags:

```
<TABLE border="1" bgcolor="Silver">
    <TR>
        <TH>Abbreviation</TH>
        <TH>Long Form</TH>
    </TR>
    <TR>
        <TD>AFAIK</TD>
        <TD>As Far As I Know</TD>
    </TR>
    <TR>
        <TD>IMHO</TD>
        <TD>In My Humble Opinion</TD>
    </TR>
    <TR>
        <TD>OTOH</TD>
        <TD>On The Other Hand</TD>
    </TR>
</TABLE>
```

Figure 289 -- Sample of Table Tags

As shown in Figure 290 and 291 respectively, the outputs in RTF / ODF and HTML will be as follows:

Abbreviation	Long Form
AFAIK	As Far As I Know
IMHO	In My Humble Opinion
OTOH	On The Other Hand

Figure 290 -- Sample of RTF Document Output

Abbreviation	Long Form
AFAIK	As Far As I Know
IMHO	In My Humble Opinion
OTOH	On The Other Hand

Figure 291 -- Sample of HTML Document Output (Open in Internet Explorer 7.0)

(i) Border

Border width in HTML is specified in pixels. When the table attributes are converted into RTF, ODF, or OOXML, 1 pixel will be equal to 1 pt.

(ii) Color

The attribute value type "bgcolor" refers to color definitions as specified in [SRGB]. A color value may be either a hexadecimal number (prefixed by a hash mark) or one of the following sixteen colors. Colors are case-insensitive.

Table 38 -- Table Element Colors

Color	Hexadecimal Code
Black	#00000000
Silver	#C0C0C0
Gray	#808080
White	#FFFFFF
Maroon	#800000
Red	#FF0000
Purple	#800080
Fuchsia	#FF00FF
Green	#008000
Lime	#00FF00
Olive	#808000
Yellow	#FFFF00
Navy	#000080
Blue	#0000FF
Teal	#008080
Aqua	#00FFFF

1.10.2 Row Elements

The <TR> elements act as a container for a row of table cells. The <TR> elements must be contained within <TABLE>.

<TR> contains <TH> or <TD> elements, which in turn contain the actual data of the table. <TR> takes presentational attributes for specifying the alignment of cells within the row and the row's background color. The row attributes will be ignored in the report output except for the following attributes:

(i) align - Specifies the horizontal alignment for each cell in a row.

(ii) valign - Specifies the vertical position of a cell's content.

(iii) bgcolor - Specifies the table background color. A background color will apply to rows only (See Color in 1.10.1 Table Elements for more details).

Row elements are not supported in XLSX, PPTX, ODS, and ODP templates.

(i) Align

This attribute specifies the alignment of data and the justification of text in a cell. Possible values are:

- left - Left-flushed data/Left-justified text. This is the default value for table data.
- center - Centered data/Center-justified text. This is the default value for table headers.
- right - Right-flushed data/Right-justified text.
- justify - Double -justified text.
- char - No text alignment set.

(ii) Valign

This attribute specifies the vertical position of data within a cell. Possible values are:

- top: Cell data is flushed with the top of a cell.
- middle: Cell data is centered vertically within a cell. This is the default value.
- bottom: Cell data is flushed with the bottom of a cell.
- baseline: No text alignment set.

Figure 292 shows an example of TR tags:

```
<TABLE border="1">
    <TR align="center">
        <TD>This is center tr</TD>
        <TD>This center tr</TD>
    </TR>
    <TR bgcolor="Gray">
        <TD>This is gray tr</TD>
        <TD>This gray tr</TD>
    </TR>
    <TR valign="bottom">
        <TD>This is bottom tr<br>This is bottom tr</TD>
        <TD>This bottom tr</TD>
    </TR>
    <TR>
        <TD>This is normal tr, This is normal tr</TD>
        <TD>This is normal tr, This is normal tr</TD>
    </TR>
</TABLE>
```

Figure 292 -- Sample of TR Tags

As shown in Figure 293 and 294 respectively, the outputs in RTF / ODF and HTML will be as follows:

This is center tr	This center tr
This is gray tr	This gray tr
This is bottom tr This is bottom tr	This bottom tr
This is normal tr, This is normal tr	This is normal tr, This is normal tr

Figure 293 -- Sample of RTF Document Output

This is center tr	This center tr
This is gray tr	This gray tr
This is bottom tr This is bottom tr	This bottom tr
This is normal tr, This is normal tr	This is normal tr, This is normal tr

Figure 294 -- Sample of HTML Document Output (Open in Internet Explorer 7.0)

1.10.3 Cell Elements

The <TD> elements define a data cell in a table. <TD> elements are contained within a <TR> element (a table row). The cell attributes will be ignored in the report output except for the following attributes:

- align - specifies the horizontal alignment for each cell in the row. See Align in 1.10.2 Row Elements for more details.
- valign - specifies the vertical position of a cell's contents. See Valign in 1.10.2 Row Elements for more details.
- bgcolor - specifies the table background color. A background color will apply only to cells. See Color in 1.10.1 Table Elements for more details.
- rowspan - rows spanned by the cell
- colspan - columns spanned by the cell

Cell elements are not supported in XLSX, PPTX, ODS, and ODP templates.

Row Span

This attribute specifies the number of rows spanned by the current cell. The default value of this attribute is one ("1"). For an RTF output, the result of row span (*.rtf) is readable only in Word on Mac, and MS Word.

Column Span

This attribute specifies the number of columns spanned by the current cell. The default value of this attribute is one ("1"). Figure 295 shows an example of a column span:

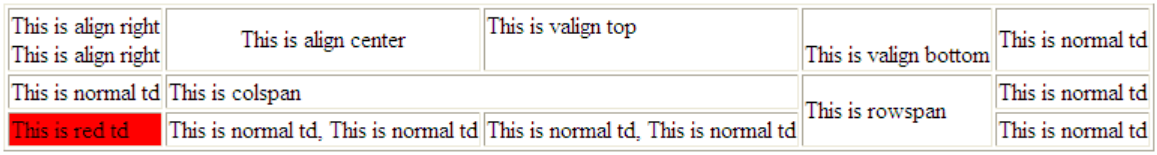
```
<TABLE border="1">
    <TR>
        <TD align="right">This is align right<br>This is align right</TD>
        <TD align="center">This is align center</TD>
        <TD valign="top">This is valign top</TD>
        <TD valign="bottom">This is valign bottom</TD>
        <TD>This is normal td</TD>
    </TR>
    <TR>
        <TD>This is normal td</TD>
        <TD colspan="2">This is colspan</TD>
        <TD rowspan="2">This is rowspan</TD>
        <TD>This is normal td</TD>
    </TR>
    <TR>
        <TD bgcolor="red">This is red td</TD>
        <TD>This is normal td, This is normal td</TD>
        <TD>This is normal td, This is normal td</TD>
        <TD>This is normal td</TD>
    </TR>
</TABLE>
```

Figure 295 -- Sample of TD Tags As Column Spans

As shown in Figure 296 and 297 respectively, the outputs in RTF / ODF and HTML will be as follows:

This is align right This is align right	This is align center	This is valign top	This is valign bottom	This is normal td
This is normal td	This is colspan		This is rowspan	This is normal td
This is red td	This is normal td, This is normal td	This is normal td, This is normal td		This is normal td

Figure 296 -- Sample of RTF / ODF Document Output



This is align right This is align right	This is align center	This is valign top	This is valign bottom	This is normal td
This is normal td	This is colspan		This is rowspan	This is normal td
This is red td	This is normal td, This is normal td	This is normal td, This is normal td		This is normal td

Figure 297 -- Sample of HTML Document Output (Open in Internet Explorer 7.0)

1.10.4 Header Elements

The <TH> elements define a header cell in a table. <TH> elements are contained within a <TR> element (a table row). The header attributes will be ignored in the report output, except for the following attributes:

- align - specifies the horizontal alignment for each cell in the row. See Align in 1.10.2 Row Elements for more details.
- valign - specifies the vertical position of a cell's contents. See Valign in 1.10.2 Row Elements for more details.
- bgcolor - specifies the table background color. A background color will apply to the whole table. See Color in 1.10.1 Table Elements for more details.
- rowspan - rows spanned by the cell. See Row span in 1.10.3 Cell Elements for more details.
- colspan - columns spanned by the cell. See Column span in 1.10.3 Cell Elements for more details.

The default alignment for <TH> is center and the default font style for <TH> is bold. Header elements are not supported in XLSX, PPTX, ODS, and ODP templates. Figure 298 shows an example of header elements:

```
<TABLE border="1" bgcolor="Silver">
    <TR>
        <TH>Name</TH>
        <TH>Cups</TH>
        <TH>Type of Coffee</TH>
        <TH>Sugar?</TH>
    </TR>
    <TR>
        <TD>T. Sexton</TD>
        <TD>10</TD>
        <TD>Espresso</TD>
        <TD>No</TD>
    </TR>
    <TR>
        <TD>J. Dinnen</TD>
        <TD>5</TD>
        <TD>Decaf</TD>
        <TD>Yes</TD>
    </TR>
</TABLE>
```

Figure 298 -- Sample of TH Tags As Header Elements

As shown in Figure 299 and 300 respectively, the outputs in RTF / ODF and HTML will be as follows:

Name	Cups	Type of Coffee	Sugar?
T. Sexton	10	Espresso	No
J. Dinnen	5	Decaf	Yes

Figure 299 -- Sample of RTF / ODF Document Output

Name	Cups	Type of Coffee	Sugar?
T. Sexton	10	Espresso	No
J. Dinnen	5	Decaf	Yes

Figure 300 -- Sample of HTML Document Output (Open in Internet Explorer 7.0)

1.11 Image Tags

The <img> tag embeds an image in a document. The <img> tag consists of three attributes: (1.11.1) src, (1.11.2) width, and (1.11.3) height

1.11.1 src

The src attribute specifies the location of an image resource. The value of this attribute can be one of the following types:

- A URL. The recognized scheme types are HTTP, HTTPS, and FILE
- An absolute path such as c:/user/image.png. The path separator can be either /(slash) or \(blackslash)

The output image format will depend on the format of the image source.

1.11.2 Width

The width attribute specifies the width of an image in pixel units. For example, width = “100” or width = “100px”

1.11.3 Height

The height attribute specifies the height of an image in pixel units. For example, height = “100”, or height = “100px”

NOTE	If the width or height attribute of an image is not specified, the size of the image will be calculated according to the following rules: • For an image file that contains the width and height properties such as JPG, PNG, and GIF, the size of the image output will be calculated from the size of the image. • For an image file that has no width and height properties such as SVG, EMF, and WMF, the size of the image output will be calculated from the size of the paper.

In the event that the HTML code is as follows:

```
<img src="file:/D:/Waterlilies.jpg" width="200" height="200"/>
```

The image will be as shown in Figure 301:

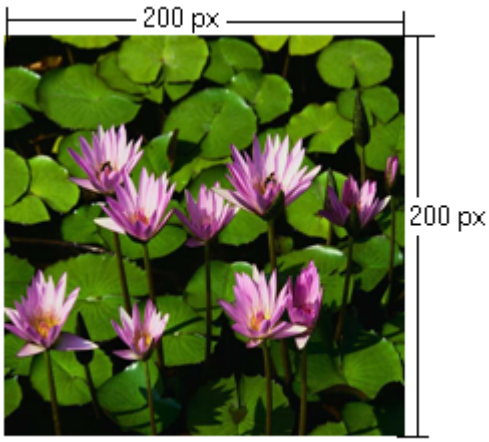


Figure 301 -- Sample of IMG Tag

1.12 Superscript and Subscript Tag

1.12.1 Superscript

The <sup> tag defines a supersript, which is a very small letter, figure, or symbol, and printed above the line. Superscript characters can be used to write footnotes, like www[1], for example:

```
<html>
    <body>
        This is text contains <sup>superscript</sup> text.
    </body>
</html>
```

Figure 302 -- Sample of <sup> Code

This is text contains superscript text.

Figure 303 -- Output of <sup> Code

The <sub> tag defines a subscript, which is a very small letter, figure, or symbol, and printed below the line. Subscript characters can be used to write chemical formulas, like H_2O, for example:

```
<html>
    <body>
        This is text contains <sub>subscript</sub> text.
    </body>
</html>
```

Figure 304 -- Sample <sub> Code

This is text contains subscript text.

Figure 305 -- Output of <sub> Code

2. Supported CSS

2.1 Background

The shorthand property for the background property is 'background', which is used for setting an individual background style. Only the ‘background-color’ attribute is supported. Such attribute can be used in RTF, ODT, and DOCX report templates.

2.1.1 Color Specification

Color attributes such as background-color, can be specified by either a keyword or a numerical RGB specification (hexadecimal, integer, and percentage value). The list of color keywords is displayed in Table 39.

Table 39 -- Color Keywords and Corresponding RGB Specification

Color	RGB Specification - Hexadecimal Code	RGB Specification Integer	RGB Specification Percentage
Maroon	#800000	RGB(128,0,0)	RGB(50%,0%,0%)
Red	#FF0000	RGB(255,0,0)	RGB(100%,0%,0%)
Orange	#FFA500	RGB(255,165,0)	RGB(100%,65%,0%)
Yellow	#FFFF00	RGB(255,255,0)	RGB(100%,100%,0%)
Olive	#808000	RGB(128,128,0)	RGB(50%,50%,0%)
Purple	#800080	RGB(128,0,128)	RGB(50%,0%,50%)
Fuchsia	#FF00FF	RGB(255,0,255)	RGB(100%,0%,100%)
White	#FFFFFF	RGB(255,255,255)	RGB(100%,100%,100%)
Lime	#00FF00	RGB(0,255,0)	RGB(0%,100%,0%)
Green	#008000	RGB(0,128,0)	RGB(0%,50%,0%)
Navy	#000080	RGB(0,0,128)	RGB(0%,0%,50%)
Blue	#0000FF	RGB(0,0,255	RGB(0%,0%,100%)
Aqua	#00FFFF	RGB(0,255,255)	RGB(0%,100%,100%)
Teal	#008080	RGB(0,128,128)	RGB(0%,50%,50%)
Black	#000000	RGB(0,0,0)	RGB(0%,0%,0%)
Silver	#C0C0C0	RGB(192,192,192)	RGB(75%,75%,75%)
Gray	#808080	RGB(128,128,128)	RGB(50%,50%,50%)

The format of an RGB specification value in form of the hexadecimal notation is a '#' immediately followed by either three or six hexadecimal characters. The three-digit RGB notation (#rgb) is converted to the six-digit form (#rrggbb) by replicating digits. For example, #FB0 is converted to #FFBB00.

For example:

```
<p style = “background-color:#FB0”>
<p style = “background-color:#FFBB00”>
```

The RGB specification Integer and Percentage form is "rgb" followed by RGB values in the same format in brackets. You cannot use both integer and percentage at the same time. In the case that an RGB value is more than a maximum value (255 or 100%) or less than a minimum (0 or 0%), the value will be set to the maximum or minimum value instead, for example:

```
<p style = "background-color:rgb(-100,500,0)">

<p style = "background-color:rgb(0,255,0)">

<p style = "background-colr:rgb(-100%,200%,0%)">

<p style = "background-colr:rgb(0%,100%,0%)">
```

The color used in all of the above examples is lime.

2.1.2 Supported Tags

The 'background-color' property can be used in the following tags:

`b, i, u, h1, h2, h3, h4, h5, h6, tt, code, samp, kbd, pre, big, small, strike, s, em, cite, dfn, var, strong, font, a, dl, dt, dd, ul, ol, li, table, tr, td, th, p, div, span, sup,` and `sub`.

For example:

```
background color : <span style="background-color:red;">red </span>
<span style="background-color:#008000;">green </span>
<span style="background-color:blue;">blue </span>
<span style="background-color:#FF8040;">orange </span>
<span style="background-color:yellow;">yellow </span>
```

Figure 306 -- Sample of Background Style

Figure 307 -- Sample of Document Output (Resulted from Figure 306)

2.2 Border

The shorthand property for the border property is 'border', which is used for setting the same width, color, and style of all four borders on four sides of a box. Border can be used in RTF, ODT, and DOCX report templates.

2.2.1 Border Width

Border width properties specify the width of border areas. The value of the border property is length. The border width properties that can be used with a longhand property are as follows:

- `'border-top-width'`
- `'border-right-width'`
- `'border-bottom-width'`
- `'border-left-width'`

2.2.2 Length Specification

The format of a length value is a real number immediately followed by a unit identifier. There are two types of length units: *relative* and *absolute*. Relative length units specify a length relative to another length property of the displaying device.

Relative units are:

- **px**: pixels, relative to the displaying device.

Absolute units are:

- **in**: inches, 1 inch is equal to 2.54 centimeters.
- **cm**: centimeters.
- **mm**: millimeters.
- **pt**: points - the points used by CSS 2.1 are equal to 1/72nd of an inch.
- **pc**: picas - 1 pica is equal to 12 points.

2.2.3 Border Color

Border color properties specify the border colors of a box. The value of the border color has two meanings:

1. **Color**: Specifies a border color. See 2.1.1 Color Specification on page 350 for more details on color.
2. **Transparent**: Referred to as a transparent border.

The border color properties that can be used with a longhand property are as follows:

- `'border-top-color'`
- `'border-right-color'`
- `'border-bottom-color'`
- `'border-left-color'`

2.2.4 Border Style

The Border style properties specify the style of a box's border lines. The border style may take one of the following 10 values:

1. **none**: This value will create no border because the computed border width is zero.
2. **hidden**: The same as 'none'.
3. **dotted**: This value will create a dotted border.
4. **dashed**: This value will create a dashed border.
5. **solid**: This value will create a single line segment border.
6. **double**: This value will create a two solid line border.
7. **groove**: This value will create a border that looks as though it were carved into the rendering surface.
8. **ridge**: The opposite of 'groove'. This value will create a border that looks as though it were coming out of the rendering surface.
9. **inset**: This value will create a border that looks as though it were embedded in the rendering surface.
10. **outset**: The opposite of 'inset'. This value will create a border that looks as though it were coming out of the rendering surface.

NOTE	
	• The supported border values for ODF documents are **none**, **hidden**, **solid**, and **double**. • The supported border values for RTF documents are **none**, **hidden**,**dotted**, **dashed**, **solid**, and **double**. • The supported border values for DOCX documents are **none**, **hidden**,**dotted**, **dashed**, **solid**, **double**, **outset**, and **inset** (**groove** and **ridge** will be rendered as **solid**).

The border style properties that can be used with a longhand property are as follows:

- `'border-top-style'`
- `'border-right-style'`
- `'border-bottom-style'`
- `'border-left-style'`

2.2.5 Supported Tags

Border properties can be used in the following tags:

`h1, h2, h3, h4, h5, h6, td, th, p,` and `div`.

For example, if you want to have a red border, type the following line of code (Figure 308):

```
<p style="border:2px solid red;">This is 2px solid red border.</p>
```

Figure 308 -- Border Style Example

The result of using the above example will be as shown in Figure 309.

Figure 309 -- Red Border Output

2.3 Margin

Margin properties specify the width of margin area within a box. The 'margin' property is a shorthand property for setting the margin of all four sides while the other margin properties only set their respective side. The value of the margin property is length (See 2.2.2 Length Specification on page 352 for more details). Margin can be used in RTF, ODT, ODP, DOCX and PPTX report templates.

The margin properties that can be used with a longhand property are as follows:

- `'margin-top'`
- `'margin-right'`
- `'margin-bottom'`
- `'margin-left'`

2.3.1 Supported Tags

The supported tags for margins are as follows:

`h1, h2, h3, h4, h5, h6, table` (supported only in RTF, ODT, and DOCX), `p`, and `div`.

For example, if you want to set a specific margin width for your cells, type the lines of code as shown in Figure 310.

```
<p>This is first paragraph.</p>

<table width="100%" cellpadding="0" style="margin-top:30px;margin-right:30px;
margin-left:30px;margin-bottom:30px;" cellspacing="0" border="1">
    <tr>
      <td>This is cell1</td>
      <td>This is cell2</td>
    </tr>
    <tr>
      <td>This is cell3</td>
      <td>This is cell4</td>
    </tr>
 </table>

 <p>This is second paragraph.</p>

 <table width="100%" cellpadding="0" style="margin-top:50px;margin-right:50px;
 margin-left:50px;margin-bottom:50px;" cellspacing="0" border="1">
    <tr>
      <td>This is cell1</td>
      <td>This is cell2</td>
    </tr>
    <tr>
      <td>This is cell3</td>
      <td>This is cell4</td>
    </tr>
 </table>

  <p>This is third paragraph.</p>
```

Figure 310 -- Margin Style Example

The result of using the above example will be as indicated in Figure 311.

This is first paragraph.

This is cell1	This is cell2
This is cell3	This is cell4

This is second paragraph.

This is cell1	This is cell2
This is cell3	This is cell4

This is third paragraph.

Figure 311 -- Margin Style Outputs

2.4 Padding

Padding properties specify the width of padding area within a box. The 'padding' property is a shorthand property for setting the padding for all four sides while the other padding properties only set their respective side. The value of the padding property is length (See 2.2.2 Length Specification on page 352 for more details) adding can be used in RTF, ODT and DOCX report templates.

The padding properties that can be used with a longhand property are as follows:

- 'padding-top'
- 'padding-right'
- 'padding-bottom'
- 'padding-left'

2.4.1 Supported Tags

The supported tags for padding are as follows:

h1, h2, h3, h4, h5, h6, td, th, p, and div.

NOTE	• The supported border values of table tags for RTF documents are margin-left and margin-right.for more details. • The supported border values of table tags for DOCX documents are margin-left and margin-right. • The supported border values of all tags for PPTX documents are margin-left, margin-top and margin-bottom.

For example, if you want to create specific padding styles for your cells, type the lines of code shown in Figure 312.

```
<table width="100%"  border="1">
     <tr>
       <td  style="padding-bottom:20px;padding-top:20px;padding-left:20px;padding-right:20px;">This is cell1</td>
       <td>This is cell2</td>
    </tr>
    <tr>
       <td>This is cell3</td>
       <td>This is cell4</td>
    </tr>
</table>
```

Figure 312 -- Padding Style Example

The result of using the above example will be as shown in Figure 313.

This is cell1	This is cell2
This is cell3	This is cell4

Figure 313 -- The Padding Style Outputs

2.5 Color

The 'color' property specifies the foreground color of an element's text contents. Only color values are allowed in this property (See 2.1.1 Color Specification on page 350 for more details on color).

2.5.1 Supported Tags

The supported tags for colors are as follows:

`b`, `i`, `u`, `h1`, `h2`, `h3`, `h4`, `h5`, `h6`, `tt`, `code`, `samp`, `kbd`, `pre`, `big`, `small`, `strike`, `s`, `em`, `cite`, `dfn`, `var`, `strong`, `font`, `a`, `dl`, `dt`, `dd`, `ul`, `ol`, `li`, `table`, `tr`, `td`, `th`, `p`, `div`, `span`, `sup`, and `sub`.

For example, if you want to have a green text color, type the lines of code indicated in Figure 314.

```
<p style="color:green;">This text color is green.</p>
<span style="color:#800080;">This text color is purple. </span>
<span style="color:red;">This text color is red.</span>
```

Figure 314 -- Color Style Example

The result of using the above example will be as shown in Figure 315.

This text color is green.

This text color is purple. This text color is red.

Figure 315 -- Color Style Outputs

2.6 Display

The 'display' property specifies how text will be displayed. The possible display values are:

1. **block**: This value will make an element appear in the output report.
2. **none**: This value will make an element disappear from the output report.

2.6.1 Supported Tags

The supported tags for the display property are:

`br`, `b`, `i`, `u`, `h1`, `h2`, `h3`, `h4`, `h5`, `h6`, `tt`, `code`, `samp`, `kbd`, `pre`, `big`, `small`, `strike`, `s`, `em`, `cite`, `dfn`, `var`, `strong`, `font`, `a`, `dl`, `dt`, `dd`, `ul`, `ol`, `li` (supported only in RTF, DOCX, and PPTX), `table`, `tr`, `p`, `div`, `span`, `sup`, and `sub`.

For example, if you want to display an element but do not want to display the other(s), type the lines of code as shown in Figure 316.

```
<p style="display:none;">This paragraph is none display.</p>
<p style="display:block;">This paragraph is block display.</p>
```

Figure 316 -- Display Style Example

The result of using the above example will be as indicated in Figure 317.

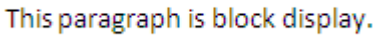


Figure 317 -- Display Style Output

2.7 Font

The 'font' property is a shorthand property for setting, except the following:

- `'font family'`
- `'font-style'`
- `'font-variant'`
- `'font-weight'`
- `'font-size'`

2.7.1 Font Family

Specify a prioritized list of font family names and/or generic family names.

2.7.2 Font Style

Specify either normal or italic face (within the specified font family).

2.7.3 Font Variant

Specify either normal or small-caps of variant (within the specified font family). Font variant is not supported in XLSX report templates.

2.7.4 Font Weight

Specifies the weight of the font. The following values are defined:

- **normal**, **lighter**, **100**, **200**, **300**, and **400** will be rendered as ‘normal’.
- **bold**, **bolder**, **500**, **600**, **700**, **800**, and **900** will be rendered as ‘bold’.

2.7.5 Font size

Specify the font size. Possible values include **xx-small**, **x-small**, **small**, **medium**, **large**, **xx-large**, and the integer number from **1** to **7**.

2.7.6 Supported Tags

The supported tags for the font property are as follows:

`b, i, u, h1, h2, h3, h4, h5, h6, tt, code, samp, kbd, pre, big, small, strike, s, em, cite, dfn, var, strong, font, a, dl, dt, dd, ul, ol, li, table, tr, td, th, p, div, span, sup,` and `sub`.

For example, if you want to have bold fonts in small caps, type the lines of code as displayed in Figure 318.

```
<font style="font-variant:small-caps;font-weight:bold;">
This font is bold and small-caps</font>
```

Figure 318 -- Font Style Example

The result of using the above example will be as indicated in Figure 319.

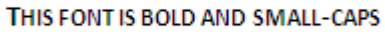


Figure 319 -- Font Style Output

2.8 Text Align

The 'text align' property describes how inline content of a block is aligned. Possible values of the text align property include: **left**, **right**, **center** and **justify**. The ‘text align’ property can be used in RTF, ODT, ODP, DOCX, and PPTX report templates.

2.8.1 Supported Tags

The supported tags for the text align property are as follows:

`table`, `tr`, `td`, `th`, `p`, and `div`.

For example, if you want to align your paragraph to the left, center, and right, type the lines of code as shown in Figure 320.

```
<p style="text-align:right;">This paragraph alignment is right.</p>
<p style="text-align:left;">This paragraph alignment is left.</p>
<p style="text-align:center;">This paragraph alignment is center.</p>
```

Figure 320 -- Text-align Style Example

The result of using the above example will be as displayed in Figure 321.

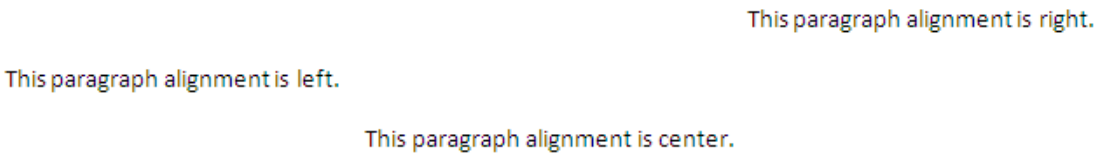


Figure 321 -- Text-align Outputs

2.9 Text Transform

The 'text transform' property controls capitalization effects of an element's text. Possible values of the 'text transform' property include:

1. **capitalize**: This will write the first character in an uppercase letter. Other characters will not be affected.
2. **uppercase**: This will write each word in upper case letters.
3. **lowercase**: This will write each word in lower case letters.

4. **none**: This will not create any capitalization effects.

2.9.1 Supported Tags

The supported tags for the text transform property are as follows:

`b, i, u, h1, h2, h3, h4, h5, h6, tt, code, samp, kbd, pre, big, small, strike, s, em, cite, dfn, var, strong, font, a, dl, dt, dd, ul, ol, li, table, tr, td, th, p, div, span, sup,` and `sub`.

For example, if you want to make all letters in a paragraph become uppercases, type the line of code displayed in Figure 322.

```
<p style="text-transform:uppercase;">This is paragraph uppercase.</p>
```

Figure 322 -- Text-transform Style Example

The result of using the above example will be as shown in Figure 323.

THIS IS PARAGRAPH UPPERCASE.

Figure 323 -- Text-transform Style Output

2.10 White-Space

The 'white-space' property affects the vertical position of white-space inside a lined box. White-space can be used in RTF, ODT, DOCX and PPTX report templates. Possible values of the 'white-space' property include:

1. **normal**: To collapse sequences of white-space and break lines as necessary to fill line boxes.
2. **pre**: To prevent from collapsing sequences of white-space. Lines are only broken at newlines in the source or at occurrences of "\A" in the generated content. Report Wizard will render this value as the **<pre>** tag.
3. **nowrap**: To collapse white-space as for 'normal' but suppressing line breaks within text.
4. **pre-wrap**: To prevent user agents from collapsing sequences of white-space. Lines are broken at newlines in the source, at occurrences of "\A" in the generated content, and as necessary to fill line boxes. This value will not be rendered as **pre**.
5. **pre-line**: To direct user agents to collapse sequences of white-space. Lines are broken at newlines in the source, at occurrences of "\A" in the generated content, and as necessary to fill line boxes. This value will not be rendered as **pre**.

2.10.1 Supported Tags

The supported tags for the 'white-space' property are as follows:

`b, i, u, h1, h2, h3, h4, h5, h6, tt, code, samp, kbd, pre, big, small, strike, s, em, cite, dfn, var, strong, font, a, table, tr, td, th, p, div, span, sup,` and `sub`.

For example, if you want to preserve some white-space, type these lines of code as shown in Figure 324.

```
<p style="white-space:pre;">
 This    white space        is pre.
    This is        white space        pre.
</p>
```

Figure 324 -- White-space Style Example

The result of using the above example will be as indicated in Figure 325.

This white space is pre.

This is white space pre.

Figure 325 -- White-space Style Outputs

2.11 Width

The 'width' property specifies the contents width of each box generated by a block-level. The value of the width property is length (See 2.2.2 Length Specification on page 352 for more details). Width can be used in RTF, ODT, and DOCX report templates.

The supported tag for the width property includes `table`.

For example, if you want to have a specific table width, type the lines of code as described in Figure 326.

```
<table border=1 cellpadding="0" style="width:300px;" cellspacing="0">
  <tr>
     <td>This is cell1</td>
     <td>This is cell2</td>
  </tr>
  <tr>
     <td>This is cell3</td>
     <td>This is cell4</td>
  </tr>
</table>
<br>
<table style="width:6in;" border="1" cellpadding="0" cellspacing="0">
  <tr>
     <td>This is cell1</td>
     <td>This is cell2</td>
  </tr>
  <tr>
     <td>This is cell3</td>
     <td>This is cell4</td>
  </tr>
</table>
```

Figure 326 -- Width Style Example

The result of using the above example will be as shown in Figure 327.

This is cell1	This is cell2
This is cell3	This is cell4

This is cell1	This is cell2
This is cell3	This is cell4

Figure 327 -- Width Style Outputs

2.12 Text Decoration

The 'text decoration' property describes decorations that are added to text. The possible values of the text decoration property are as follows:

1. **none**: To produce no text decoration.
2. **underline**: To underline each line of text.
3. **overline**: To add a line above each line of text.
4. **line-through**: To add a line that strikes through each line of text.
5. **blink**: To add the blinking effect to text (being visible and invisible alternatively). The blink text decoration supports only the ODT report template.

NOTE	Report Wizard does not currently support the **overline** text decoration.

2.12.1 Supported Tags

The supported tags for the text decoration property are:

`b, i, u, h1, h2, h3, h4, h5, h6, tt, code, samp, kbd, pre, big, small, strike, s, em, cite, dfn, var, strong, font, a, dl, dt, dd, ul, ol, li, table, tr, td, th, p, div, span, sup,` and `sub`.

For example, if you want to create a line-through text, type the line of code as displayed in Figure 328.

```
This word is <span style="text-decoration:line-through;">line through.</span>
```

Figure 328 -- Text-decoration Style Example

The result of using the above example will be as indicated in Figure 329.

This word is ~~line through.~~

Figure 329 -- Text-decoration Style Output

2.13 Vertical Align

The 'vertical align' property affects the vertical position of an element inside a lined box. This property can be used in RTF, ODT and DOCX report templates. Possible values of the vertical align property include:

1. **baseline**: This value will align the baseline of a box with the baseline of the parent box. Leave the vertical alignment to be default when you encounter this value.
2. **middle**: This value will align the vertical midpoint of a box.
3. **top**: This value will align the top of the aligned sub-tree with the top of a line box.
4. **bottom**: This value will align the bottom of the aligned sub-tree with the bottom of a line box.

The supported tags for the vertical align property are: `table, tr, td,` and `th`, for example (Figure 330):

```
<table width="100%" cellpadding="0" style="vertical-align:middle;" cellspacing="0" border=1>
  <tr>
    <td>
     This is cell1
     This is cell1
    </td>
    <td>
     This vertical align is middle.
    </td>
 </tr>
 <tr>
    <td>
     This is cell3
     This is cell3
    </td>
    <td>
     This vertical align is middle.
    </td>
 </tr>
</table>
```

Figure 330 -- Vertical-align Style Example

The result of using the above example will be as shown in Figure 331.

This is cell1 This is cell1	This vertical align is middle.
This is cell3 This is cell3	This vertical align is middle.

Figure 331 -- Vertical-Align Style Output

Appendix E: DocBook Support

DocBook was built as an application to write technical documents related to computer hardware and software. It is a semantic markup language that was extended from XML language. As an open source application, DocBook has been adopted as a standard to write other types of documentation as well. The current version of DocBook, published by O'Reilly Media and XML Press, is 5.1.

The Report Wizard's DocBook engine enables you to input the VTL codes inside DocBook's document content. It also allows you to convert HTML into DocBook tags, rearrange tags, and escape special characters. Report Wizard uses "dbk" and "docbook" file extensions to save DocBook files. Figure 332 below shows the DocBook's document content.

```
<?xml version="1.0" encoding="UTF-8"?>
<book xmlns="http://docbook.org/ns/docbook"
    xmlns:xlink="http://www.w3.org/1999/xlink" version="5.0">
    <info>
        <title>Sample Book</title>
        <author>
            <orgname>No Magic Asia</orgname>
            <address>
                <city>Bangkok</city>
                <street>Rama 9</street>
                <postcode>10310</postcode>
                <country>Thailand</country>
            </address>
            <email>sample@nomagicasia.com</email>
        </author>
    </info>
    <part>
        <title>List of Classes</title>
        <subtitle>Display all classed in the project.</subtitle>
        <chapter>
            <title>Class name and documentation</title>
            <subtitle>Display name and documentation of classes</subtitle>
            #foreach($c in $Class)
            <sect1>
                <title>$c.name</title>
                <subtitle></subtitle>
                <para>$c.documentation</para>
            </sect1>
            #end
        </chapter>
    </part>
</book>
```

Figure 332 -- A DocBook Template

1. The Supported HTML Tags

1.1 HTML Paragraph Elements

The HTML tags in the Report Wizard's engine for DocBook defines how a paragraph is arranged in a DocBook document. There are two categories of paragraph elements:

1.1.1 Paragraph

1.1.2 Preformatted Text

1.1.1 Paragraph

The Paragraph element (`<p>`) defines a paragraph. The `<p>` element shown in Figure 333 will be rendered in a DocBook format in Figure 334.

```
<p>This is my first paragraph.</p>
```

Figure 333 -- HTML Tag for Paragraph

```
<para>This is my first paragraph.</para>
```

Figure 334 -- DocBook Tag for Paragraph

1.1.2 Preformatted Text

The Preformatted text element (`<pre>`) displays the text exactly as you expected it to. The `<pre> tag` preserves both spaces and line breaks. The `<pre>` element shown in Figure 335 will be rendered in a DocBook format in Figure 336.

```
<pre>This is my first paragraph.
        This is my second paragraph.</pre>
```

Figure 335 -- HTML Tag for Pre-formatted Text

```
<literallayout>This is my first paragraph.
        This is my second paragraph.</literallayout>
```

Figure 336 -- DocBook Tag for Pre-formatted Text

1.2 HTML Font Styles

Report Wizard specifies a group of HTML tags that you can use to define how fonts will be displayed on rendered text. They are called font style elements.

1.2.1 Teletype Text

1.2.2 Italics

1.2.3 Bold

1.2.1 Teletype Text

The HTML Teletype Text element (<tt>) creates teletype or monospaced text. The <tt> element shown in Figure 337 will be rendered in a DocBook format in Figure 338.

```
<tt>teletype or monospaced</tt>
```

Figure 337 -- HTML Tag for Teletype Text

```
<code>teletype or monospaced</code>
```

Figure 338 -- DocBook Tag for Teletype Text

1.2.2 Italics

The HTML Italics element (<i>) renders text slanted to the right. The <i> element shown in Figure 339 will be rendered in a DocBook format in Figure 340.

```
<i>italic</i>
```

Figure 339 -- HTML Tag for Italics

```
<emphasis role="italic">italic</emphasis>
```

Figure 340 -- DocBook Tag for Italics

1.2.3 Bold

The HTML Bold element (<b>) renders bold text. The <b> element shown in Figure 341 will be rendered in a DocBook format in Figure 342.

```
<b>bold</b>
```

Figure 341 -- HTML Tag for Bold

```
<emphasis role="bold">bold</emphasis>
```

Figure 342 -- DocBook Tag for Bold

1.2.4 Strikethrough

The HTML Strikethrough element (<strike> or <s>) renders text with a horizontal strike or a line through the middle. The <strike> element shown in Figure 343 will be rendered in a DocBook format in Figure 344.

```
<strike>strikethrough</strike>
```

Figure 343 -- HTML Tag for Strikethrough

```
<emphasis role="strikethrough">strikethrough</emphasis>
```

Figure 344 -- DocBook Tag for Strikethrough

1.2.5 Underline

The HTML Underline element (<u>) underlines text. The underline <u> element shown in Figure 345 will be rendered in a DocBook in Figure 346.

```
<u>underline</u>
```

Figure 345 -- HTML Tag for Underline

```
<emphasis role="underline">underline</emphasis>
```

Figure 346 -- DocBook Tag for Underline

1.3 HTML Phrase Elements

There is a group of HTML tags that allows you to specify how fonts will be displayed on rendered text. They are called HTML Phrase Tags or Elements. The following is a list of these font style elements:

1.3.1 Emphasis

1.3.2 Strong

1.3.3 Citation

1.3.4 Definition

1.3.5 A Fragment of Computer Code

1.3.6 Sample Text

1.3.7 Keyboard Input

1.3.8 Variable

1.3.1 Emphasis

The Emphasis element () emphasizes text content and displays it in italics. The element shown in Figure 347 will be rendered in a DocBook format in Figure 348.

```
<em>italic emphasis</em>
```

Figure 347 -- HTML Tag for Emphasis

```
<emphasis>italic emphasis</emphasis>
```

Figure 348 -- DocBook Tag for Emphasis

1.3.2 Strong

The Strong element (`<strong>`) strongly emphasizes text content. It renders the text in bold. The `<strong>` element shown in Figure 349 will be rendered in a DocBook format in Figure 350.

```
<strong>strong</strong>
```

Figure 349 -- HTML Tag for Strong

```
<emphasis role="bold">strong</emphasis>
```

Figure 350 -- DocBook Tag for Strong

1.3.3 Citation

The Citation element (`<cite>`) presents a citation or a reference to other sources. The `<cite>` element shown in Figure 351 will be rendered in a DocBook format in Figure 352.

```
<cite>citation</cite>
```

Figure 351 -- HTML Tag for Citation

```
<emphasis>citation</emphasis>
```

Figure 352 -- DocBook Tag for Citation

1.3.4 Definition

The HTML Definition element (`<dfn>`) gives a definition for the term being defined. The Definition element `<dfn>` shown in Figure 353 will be rendered in a DocBook format in Figure 354.

```
<dfn>defining instance of the enclosed term</dfn>
```

Figure 353 -- HTML Tag for Definition

```
<emphasis>defining instance of the enclosed term</emphasis>
```

Figure 354 -- DocBook Tag for Definition

1.3.5 A Fragment of Computer Code

The HTML fragment of code element (`<code>`) designates part of computer code. The `<code>` element shown in Figure 355 will be rendered in a DocBook format in Figure 356.

```
<code>code</code>
```

Figure 355 -- HTML Tag for a Fragment of Code

```
<code>code</code>
```

Figure 356 -- DocBook Tag for a Fragment of Code

1.3.6 Sample Text

The HTML Sample Text element (`<samp>`) designates sample output of programs or scripts. The `<samp>` element shown in Figure 357 will be rendered in a DocBook format in Figure 358.

```
<samp>SAMP</samp>
```

Figure 357 -- HTML Tag for a Fragment of Sample Text

```
<code>SAMP</code>
```

Figure 358 -- DocBook Tag for a Fragment of Sample Text

1.3.7 Keyboard Input

The HTML Keyboard Input element (`<kbd>`) indicates user input or text to be entered by the user. The `<kbd>` element shown in Figure 359 will be rendered in a DocBook format in Figure 360.

```
<kbd>text to be entered by the user</kbd>
```

Figure 359 -- HTML Tag for a Fragment of Keyboard Input

```
<code>text to be entered by the user</code>
```

Figure 360 -- DocBook Tag for a Fragment of Keyboard Input

1.3.8 Variable

The HTML Variable element (`<var>`) indicates an instance of a variable or program argument. The `<var>` element shown in Figure 361 will be rendered in a DocBook format in Figure 362.

```
<var>variable or program argument</var>
```

Figure 361 -- HTML Tag for a Fragment of Variable

```
<emphasis>variable or program argument</emphasis>
```

Figure 362 -- DocBook Tag for a Fragment of Variable

1.4 HTML Link Element

The HTML Link element (<a>) defines a hyperlink that links one page to another. The <a> element supports the attribute href, which specifies the URL of a page the hyperlink goes to.

The <a> element shown in Figure 363 will be rendered in a DocBook format in Figure 364

```
<a href="www.google.co.th">www.google.co.th</a>
```

Figure 363 -- HTML Tag for a Fragment of Link

```
<link xlink:href="www.google.co.th">www.google.co.th</link>
```

Figure 364 -- DocBook Tag for a Fragment of Link

1.5 HTML Image Element

The HTML Image element (<img>) defines an image in an HTML page. The <img> element supports the attribute src, which specifies the URL of an image.

The <img> element shown in Figure 365 will be rendered in a DocBook format in Figure 366.

```
<img src="files/pic.png"/>
```

Figure 365 -- HTML Tag for a Fragment of Image

```
<inlinemediaobject>
    <imageobject>
        <imagedata fileref="files/pic.png"/>
    </imageobject>
</inlinemediaobject>
```

Figure 366 -- DocBook Tag for a Fragment of Image

2. The Supported HTML Lists

The DocBook engine of Report Wizard supports the following HTML lists:

2.1 Unordered Lists

An unordered list is defined by the <ul> element. An unordered list element <ul> contains one or more <li> elements that define the actual items of the list in bullets. The Unordered List element shown in Figure 367 will be rendered in a DocBook format in Figure 368.

```
<ul>
    <li>Fruit</li>
    <ul>
        <li>Apple</li>
        <li>Orange</li>
    </ul>
    <li>Vegetable</li>
    <ul>
        <li>Cucumber</li>
        <li>Lettuce</li>
    </ul>
</ul>
```

Figure 367 -- HTML Tag for a Fragment of Unordered List

```
<itemizedlist>
    <listitem>
        <para>Fruit</para>
        <itemizedlist>
            <listitem>
                <para>Apple</para>
            </listitem>
            <listitem>
                <para>Orange</para>
            </listitem>
        </itemizedlist>
    </listitem>
    <listitem>
        <para>Vegetable</para>
        <itemizedlist>
            <listitem>
                <para>Cucumber</para>
            </listitem>
            <listitem>
                <para>Lettuce</para>
            </listitem>
        </itemizedlist>
    </listitem>
</itemizedlist>
```

Figure 368 -- DocBook Tag for a Fragment of Unordered List

2.2 Ordered Lists

An ordered list is defined by the `<ol>` element. The ordered list element `<ol>` contains one or more `<li>` elements that define the actual items of the list preceded by numbers. The unordered list element shown in Figure 369 will be rendered in a DocBook format in Figure 370.

```
<ol>
    <li>Fruit</li>
    <ol>
        <li>Apple</li>
        <li>Orange</li>
    </ol>
    <li>Vegetable</li>
    <ol>
        <li>Cucumber</li>
        <li>Lettuce</li>
    </ol>
</ol>
```

Figure 369 -- HTML Tag for a Fragment of Ordered List

```
<orderedlist>
    <listitem>
        <para>Fruit</para>
        <orderedlist>
            <listitem>
                <para>Apple</para>
            </listitem>
            <listitem>
                <para>Orange</para>
            </listitem>
        </orderedlist>
    </listitem>
    <listitem>
        <para>Vegetable</para>
        <orderedlist>
            <listitem>
                <para>Cucumber</para>
            </listitem>
            <listitem>
                <para>Lettuce</para>
            </listitem>
        </orderedlist>
    </listitem>
</orderedlist>
```

Figure 370 -- DocBook Tag for a Fragment of Ordered List

2.3 Definition Lists

A definition list is defined by `<dl>` element. A definition list element `<dl>` consists of two parts: (i) A term that is created using the `<dt>` element and (ii) a description that is created using the `<dd>` element. The definition list supports one to multiple terms and the corresponding definition(s). The term comes before the definition.

The definition list element shown in Figure 371 will be rendered in a DocBook format in Figure 372.

```
<dl>
    <dt>Coffee</dt>
        <dd>Cappuccino</dd>
</dl>
```

Figure 371 -- HTML Tag for a Fragment of Definitions List

```
<variablelist>
    <title></title>
    <varlistentry>
        <term>Coffee</term>
        <listitem>
            <para>Cappuccino</para>
        </listitem>
    </varlistentry>
</variablelist>
```

Figure 372 -- DocBook Tag for a Fragment of Definitions List

3. The Supported HTML Table Elements

The HTML table element (`<table>`) is divided into rows (`<tr>`), and each row may contain a number of table data cells (`<td>`) or (`<th>`).

The `<table>`, `<tr>`, `<td>`, and `<th>` elements support two attributes: (i) align and (ii) valign.

(i) align

You use align to horizontally arrange items within a table cell. The possible values are as follows:

- "`left`" to left-align the content in a cell.
- "`center`" to center-align the content in a cell.
- “`right`” to right-align the content in a cell.
- “`justify`” to stretch the content with equal width.
- "`char`" to align the content to a specific character.

(ii) valign

You use valign to vertically arrange items within a table cell. The possible values are as follows:

- "`top`" to top-align the content in a cell.
- "`middle`" to center-align the content in a cell.
- "`bottom`" to bottom-align the content in a cell.

The table element shown in Figure 373 will be rendered in a DocBook format in Figure 374.

```
<table>
    <tr align = "center">
        <th>Name</th>
        <th>Cups</th>
        <th>Types of coffee</th>
        <th>Sugar?</th>
    </tr>
    <tr>
        <td align = "left">Jame</td>
        <td align = "left">10</td>
        <td align = "left">Espresso</td>
        <td align = "left">No</td>
    </tr>
</table>
```

Figure 373 -- HTML Tag for a Fragment of Table

```
<table>
    <title></title>
    <tgroup cols="4">
        <colspec colname="c1" colnum="1" colwidth="1.01*"/>
        <colspec colname="c2" colnum="2" colwidth="1.0*"/>
        <colspec colname="c3" colnum="3" colwidth="1.01*"/>
        <colspec colname="c4" colnum="4" colwidth="1.01*"/>
        <thead>
            <row>
                <entry align="center">Name</entry>
                <entry align="center">Cups</entry>
                <entry align="center">Types of coffee</entry>
                <entry align="center">Sugar?</entry>
            </row>
        </thead>
        <tbody>
            <row>
                <entry align="left">Jame</entry>
                <entry align="left">10</entry>
                <entry align="left">Espresso</entry>
                <entry align="left">No</entry>
            </row>
        </tbody>
    </tgroup>
</table>
```

Figure 374 -- DocBook Tag for a Fragment of Table

4. The Supported Style Sheet Properties

The DocBook engine of Report Wizard supports specific style sheets within an HTML element. The supported style sheet properties are as follows:

4.1 Font

4.1 Font

The "`font`" property is a shorthand property for setting the "`font-style`", and "`font-weight`" properties.

4.1.1 Font Style

The "`font-style`" property defines that the font be displayed either in normal way or in italics within a specified font family. The font-style shown in Figure 375 will be rendered in a DocBook format in Figure 376.

```
<p style="font-style:normal">This is normal font style paragraph.</p>
<p style="font-style:italic">This is italic font style paragraph.</p>
```

Figure 375 -- HTML Tag for a Fragment of Font Style

```
<para>This is normal font style paragraph.</para>
<para><emphasis role="italic">This is italic font style paragraph.</emphasis></para>
```

Figure 376 -- DocBook Tag for a Fragment of Font Style

4.1.2 Font Weight

The "`font-weight`" property specifies the weight of the font. The values "100" to "900" form an ordered sequence where each value indicates the font weight. The keyword 'normal' is synonymous with "400", and "bold" is synonymous with "700".

The following values are defined:

- normal, lighter, 100, 200, 300, and 400 will be rendered as 'normal'.
- bold, bolder, 500, 600, 700, 800, and 900 will be rendered as 'bold'.

The font-weight property shown in Figure 377 will be rendered in a DocBook format in Figure 378.

```
<p style="font-weight:normal">This is normal font weight paragraph.</p>
<p style="font-weight:lighter">This is lighter font weight paragraph.</p>
<p style="font-weight:300">This is 300 font weight paragraph.</p>

<p style="font-weight:bold">This is normal font weight paragraph.</p>
<p style="font-weight:700">This is 700 font weight paragraph.</p>
```

Figure 377 -- HTML Tag for a Fragment of Font Weight

```
<para>This is normal font weight paragraph.</para>
<para>This is lighter font weight paragraph.</para>
<para>This is 300 font weight paragraph.</para>

<para><emphasis role="bold">This is normal font weight paragraph.</emphasis></para>
<para><emphasis role="bold">This is 700 font weight paragraph.</emphasis></para>
```

Figure 378 -- DocBook Tag for a Fragment of Font Weight

4.2 Text Align

The text-align property specifies the horizontal alignment of inline content of a block. The supported tags of the text-align property are `<table>`, `<tr>`, `<td>`, and `<th>`. The values of this property are:

- "`left`" to left-align the content.
- "`center`" to center-align the content.
- “`right`” to right-align the content.
- “`justify`” to stretch the content with equal width.
- "`char`" to align the content to a specific character.

The text-align property shown in Figure 379 will be rendered in a DocBook format in Figure 380.

```
<table style="text-align:center">
    <tr>
        <td>center</td>
        <td>center</td>
    </tr>
    <tr style="text-align:left">
        <td>left</td>
        <td style="text-align:right">right</td>
    </tr>
</table>
```

Figure 379 -- HTML Tag for a Fragment of Text Align

```
<p style="text-decoration:none">This is none text decoration paragraph.</p>
<p style="text-decoration:underline">This is underline text decoration paragraph.</p>
<p style="text-decoration:line-through">This is line-through text decoration paragraph.</p>
```

Figure 380 -- DocBook Tag for a Fragment of Text Align

4.3 Text Decoration

The text-decoration property specifies decorations that are added to text. The values of this property are none, underline, or line-through. The text-decoration property shown in Figure 381 will be rendered in a DocBook format in Figure 382.

```
<table>
    <title></title>
    <tgroup cols="2">
        <colspec colname="c1" colnum="1" colwidth="1.0*"/>
        <colspec colname="c2" colnum="2" colwidth="1.0*"/>
        <tbody>
            <row>
                <entry align="center">center</entry>
                <entry align="center">center</entry>
            </row>
            <row>
                <entry align="left">left</entry>
                <entry align="right">right</entry>
            </row>
        </tbody>
    </tgroup>
</table>
```

Figure 381 -- HTML Tag for a Fragment of Text Decoration

```
<para>This is none text decoration paragraph.</para>
<para><emphasis role="underline">This is underline text decoration paragraph.</emphasis></para>
<para><emphasis role="strikethrough">This is line-through text decoration</emphasis></para>
```

Figure 382 -- DocBook Tag for a Fragment of Text Decoration

4.4 Vertical Align

The vertical-align property specifies the vertical alignment of text or an element within a lined box. The supported tags of vertical-align are `<table>`, `<tr>`, `<td>`, and `<th>`. The values of the vertical-align property are top, middle, and bottom.

- "`top`" to top-align the content.
- "`middle`" to center-align the content.
- "`bottom`" to bottom-align the content.

The vertical-align property shown in Figure 383 will be rendered in a DocBook format in Figure 384.

```
<table style="vertical-align:top">
    <tr>
        <td>top</td>
        <td>top</td>
    </tr>
    <tr style="vertical-align:bottom">
        <td>bottom</td>
        <td style="vertical-align:middle">middle</td>
    </tr>
</table>
```

Figure 383 -- HTML Tag for a Fragment of Vertical Align

```
<table>
    <title></title>
    <tgroup cols="2">
        <colspec colname="c1" colnum="1" colwidth="1.0*"/>
        <colspec colname="c2" colnum="2" colwidth="1.0*"/>
        <tbody>
            <row>
                <entry valign="top">top</entry>
                <entry valign="top">top</entry>
            </row>
            <row>
                <entry valign="bottom">bottom</entry>
                <entry valign="middle">middle</entry>
            </row>
        </tbody>
    </tgroup>
</table>
```

Figure 384 -- DocBook Tag for a Fragment of Vertical Align