Informatica (Version 9.6.0)

Rule Builder Guide

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Preface

Rule Builder is an Informatica Analyst feature that converts business rule logic to a mapplet in the Model repository. An Informatica Developer user can add the mapplet to a mapping and verify that a data source conforms to the business rule.

The Informatica Rule Builder Guide is written for the business user who wants to represent a business rule in a software application.

Informatica Resources

Informatica My Support Portal


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CHAPTER 1

Introduction to Informatica Rule Builder

This chapter includes the following topics:

- Introduction to Informatica Rule Builder, 1
- Collaboration with Other Users, 1
- Business Rules and Rule Specifications, 2
- Rule Specification Process Flow, 2

Introduction to Informatica Rule Builder

Rule Builder is an Informatica Analyst feature that converts business rules into logical objects that analyze business data. Data stewards and other desktop users use Rule Builder to design and store business rule objects in a software environment. Informatica Developer users connect the objects to the business data sources and run the objects on the data.

The business rule objects that you design are rule specifications. A rule specification uses a series of configurable icons called rule sets to represent the business rule logic. You configure the rule sets in the Design workspace of the Analyst tool. You use the properties of each rule set to define IF-THEN statements that represent the business rule requirements. You also indicate the types of data that the rule specification can apply to. The rule sets define a data flow that leads from the input data analysis to the validation of the data source against the business rule.

Collaboration with Other Users

When you design a rule specification, you create an object for the Developer tool users in the organization. You must cooperate with the Developer tool users so that the users apply the rule specifications to the correct data sources. You must also understand the Developer tool terminology.

The Analyst tool stores rule specifications in the Model repository. When you create a rule specification, you select a project in the Model repository as the location for the rule specification object. When you are ready to pass the rule specification to the Developer tool user, you compile the rule specification in Rule Builder. Rule Builder saves a copy of the rule specification in the Model repository. The Developer tool user works on the copy of the rule specification object. In the Developer tool, the object copies appear as mapplets.
The Developer tool user adds the mapplet to a mapping. A mapping is a run-time object that applies the mapplet logic to a data source. The mapplet writes the results of the mapplet analysis to a database table or a file.

The Developer tool user sends you the results. You evaluate the results to determine if the business data conforms to the business rule. If the data does not conform to the business rule, the Developer tool can configure an additional mapping to update the data.

**Note:** If you update the rule specification and compile the rule specification, you update the corresponding mapplet in the Model repository. If you update the rule specification but you do not compile it, you do not change the corresponding mapplet in the Model repository.

You cannot view mapplets in the Analyst tool. A Developer tool user cannot view rule specifications in the Developer tool.

---

### Business Rules and Rule Specifications

A business rule describes the data in an organization in terms of requirements that the data must satisfy. You define rule specifications that represent the business rule requirements as a software object.

You can build a rule specification that returns the current status of the data with regard to the business rule. You can also build a rule specification that updates the data so that it conforms to the business rule.

Consider the following guidelines when you define a rule specification:

- A rule specification defines a single requirement for the data set that it analyzes. A rule specification validates or invalidates each record in the data set according to the business requirement.
- An organization might define simple business rules and complex business rules. If the logic in a business rule is highly complex, split the business rule into single data requirements. Create a rule specification for each requirement.
- A business rule rarely exists in isolation from other business rules in the organization. Verify that you understand all the business rules in the organization before you define the rule specifications. You might find that some business rules provide the input for other business rules. Build an integrated set of rule specifications for the organization.
- A rule specification can be reusable. You might want to apply the same data requirements to different data sources. When you create a rule specification, identify similar business rules that might analyze data in the same way.

---

### Rule Specification Process Flow

The steps to create and use a rule specification begin when you select a business rule to apply to the business data. The steps end when you analyze the data results and verify that the business data conforms to the business rule. When you perform the steps, you consult with other data owners in the organization.

To create and use a rule specification, perform the following tasks:

1. Select a business rule to convert to a rule specification.
2. Analyze the business rule and identify the data requirements that it defines.
3. Discuss the data requirements with the Developer tool user who will run a mapping on the data.
4. Configure the rule specification.
   - When you configure the rule specification, you also validate and test the rule specification.

5. Compile the rule specification.
   - When you compile the rule specification, you create a mapplet in the Model repository. The Developer tool user adds the mapplet to a mapping. The Developer tool user returns the mapping results to you.

6. Review the mapping results.

Preparing to Configure the Rule Specification

A rule specification represents the data requirements of a business rule. When you create a rule specification, you must understand the business rule.

Before you create a rule specification, discuss the business rules with other data owners in the organization. Verify that the business rule is valid and ready to apply to the business data.

1. Identify the business rule to represent in a rule specification.

2. Identify the business data set to validate.

3. List the business rule requirements that apply to the data. Verify that you can create a rule statement for each requirement.
   - Identify any business requirement that needs more than one rule statement in the rule specification. If one rule statement provides the input to another rule statement, you might decide to add the rule statements to rule sets at different levels.

4. Identify the data columns that the business requirements apply to. Verify that you can create a rule set input for each column.
   - If the same business requirement applies to multiple columns, you might decide to add inputs for the columns to parallel rule sets in the rule specification.
   - If multiple business requirements apply to a single column, review the business rule. You might need to simplify the business rule. A business rule establishes a single fact about each

   Note: When you plan the design of a rule specification, you identify the lowest dependencies in the business rule and ensure that you add a rule set for each dependency. A rule set generates a single output, and the output from a dependent rule set becomes an input to the rule set above it in the workspace.

Contacting an Informatica Developer

When you compile a rule specification, you create a mapplet object that other users can work on. A Developer tool user adds the mapplet to a mapping and runs the mapping on the business data. Contact the Developer tool user.

Before you design and compile a rule specification, verify the following items with the Developer tool user:

1. Verify the data sets that must conform to the requirements of the rule specification and the corresponding business rule.
   - The Developer tool user runs the mapping on each data set.

2. Verify the data types of the data columns that you want to analyze.
   - You identify the data types when you create data inputs in the rule specification.
3. Verify the steps to follow after each mapping runs.
   The Developer tool user provides you with the results of each mapping.
   You can determine if the data sets meet the business rule requirements. You can also determine if you need to update the rule specification and compile the mapplet again.

Configuring the Rule Specification

After you analyze the business requirements and the business data, you can configure the rule specification.

To configure the rule specification, perform the following tasks:

1. Select Rule Specification from the New menu.
2. Enter a name for the rule specification.
3. Optionally, enter a description.
   Tip: Enter the business rule as the description.
4. Select a location for the rule specification.
   The Location field specifies a project in the Model repository.
5. Save the rule specification.
   The rule specification opens in the Design workspace.
6. Verify the general properties.
   • Select the top-level icon in the rule, and select Rule Properties.
   • Verify that the settings are correct for the data inputs that you create.
7. Configure a rule statement in the primary rule set.
   The primary rule set defines the data output from the rule specification.
8. Optionally, update the primary rule set name.
   • Select the primary rule set, and select General.
   • Update the rule set name.
9. Add any rule set that the rule specification requires.
   You add a rule set below another rule set.
10. Add one or more inputs to each rule set.
    • Select the top-level icon in the rule, and select Inputs.
    • Enter an input name, and verify the input properties.
11. Add any rule statement that the rule specification requires.
    You can add a rule statement to the primary rule set or to another rule set.
12. Save the rule specification.

After you configure the rule specification, test the rule specification with sample data.

After you test the rule, compile the rule to create a mapplet in the Model repository.

Validating a Rule Specification

Before you compile a rule specification, validate the rule logic. The rule logic is valid when each rule set can calculate the data outputs for each rule statement.

1. Open the rule specification.
2. Click Validate.
   The rule specification highlights any rule set that is not valid. Click a rule set to read a message that
describes the validation error.

**Testing a Rule Specification**

Test a rule specification to verify the logic that you defined in the rule specification. If possible, use business
data to test the rule specification. You can test the logic in the rule specification and in the rule sets.

1. Open the rule specification.
2. Select the top-level icon in the rule specification.
3. In the rule specification properties, click **Test**.
   The properties view displays the input columns that you configured in the rule specification.
   **Note:** The properties view does not display the rule set outputs.
4. Enter one or more data values in an input column. You can enter data values for any rule set in the rule
   specification.
   If you enter date data in an input column, use one of the following date formats:
   - yyyy-MM-dd
   - yyyy-MM-dd hh:mm:ss
   - yyyy-MM-dd hh:mm:ss.SSS
5. Click **Test Rule**.
   The properties view displays the path of the data values through the rule specification.
6. Verify that the rule sets read the data values and write the outputs that you expect.
   - If you expect a data value from a low-level rule set to generate outputs on multiple rule sets, verify
     that the test results indicate a data value on each rule set.
   - If a data value does not generate an output on a rule set, the test results show an empty field for the
     rule set.

**Compiling a Rule Specification**

Compile a rule specification to create a mapplet object in the Model repository. The mapplet is a copy of the
rule specification that a Developer tool user can connect to a data set and add to a mapping. Compile a rule
specification after you validate and test the rule specification.

1. Open the rule specification.
2. Click **Compile**.
   The Analyst tool creates a mapping in the Model repository.
   If you update a rule specification that you compiled, compile the rule specification again to update the
   mapplet in the Model repository.
Rule Specifications

This chapter includes the following topics:
- Rule Specifications Overview, 6
- Rule Specification Properties, 7
- Rule Sets, 8
- Rule Statements, 9
- Creating a Rule Specification, 10
- Opening a Rule Specification, 11

Rule Specifications Overview

A rule specification can be simple or complex. You can configure a rule specification to validate a single fact or multiple facts about an organization. When you configure a rule specification, you add one or more icons to the Rule Builder workspace. Each icon represents a rule set, and each rule set contains one or more logical statements about the data.

You can also enter descriptive metadata about the business rule. Use the descriptive metadata as a guideline when you configure the rule specification.

A rule specification contains the following elements:

Name
The name of the rule specification. Use letters, numbers, and underscore characters when you enter the rule specification name.

Description
The text description of the rule specification. Enter the business rule as the description.
Rule Builder displays the text description in the top-level workspace icon. Use the description as a guideline when you configure the rule sets and rule statements.

Location
The location of the rule specification in the Model repository. If the Model repository does not contain a project to store the rule specification, create a project in the Analyst tool.

Rule set
A set of rule statements to apply to the data. The rule set also identifies one or more data inputs for the rule statements.
Rule Statement

A logical operation that determines a fact about the input data. The rule specification analyzes the data that the rule statement specifies and generates an output based on the status of the data.

Note: When you edit a rule specification in the workspace, you can also update the high-level properties for the rule specification. Save the rule specification before you update the properties. The properties include the rule specification name, the description, and the maximum length of the data output from the rule specification. To open the properties view, select the top-level icon in the rule specification.

Rule Specification Properties

The rule specification properties include the name and description that you entered when you saved the rule specification. The properties also determine the maximum length of the output data values.

You can edit the properties in the Design workspace after you save the rule specification. To update the properties, click the top-level icon in the rule specification. When you click the icon, Rule Builder displays the properties on a series of views in the Design workspace.

The following table describes the views that you can configure on a rule specification:

<table>
<thead>
<tr>
<th>View</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>Use to update the rule specification name and description.</td>
</tr>
</tbody>
</table>
| Rule Properties | Use to specify a maximum character length for each row of data output from the rule specification. The rule specification applies the following default values to each row of output data:  
- Maximum string length. Determines the maximum length for text data. Default is 100.  
- Maximum number length. Determines the maximum length for numeric data. Default is 10.  
- Number of decimal places. Determines the number of decimal places to include for decimal places. Default is 4. |
| Test          | Use to enter sample data and validate the operation of the rule specification. |
Rule Sets

A rule set is a set of rule statements that you define for one or more columns in a data set. When you build a rule specification, you configure one or more rule sets.

To configure a rule set, select the options on the rule set views. Connect the rule sets to define the data flow in the rule specification.

By default, a rule specification contains a primary rule set. You can configure a simple rule specification in the primary rule set. If you plan to add multiple rule statements, consider whether to add rule sets to the rule specification.

The following table describes the views that you can configure on a rule set:

<table>
<thead>
<tr>
<th>View</th>
<th>Description</th>
</tr>
</thead>
</table>
| General  | Use to enter a name for the rule set. Optionally, enter a description for the rule set.  
**Note:** Enter a name that summarizes the type of data operations that the rule statements perform in the rule set. If the rule set creates an input for another rule set, the rule specification uses the rule set name as the input name. |
| Inputs   | Use to define the inputs that you add to the rule statements in the rule set. |
| Rule Logic | Use to define the rule statement logic.                                      |
| Test     | Use to enter sample data and validate the rule set output.                   |

Consider the following guidelines when you configure rule sets:

- A rule set can read one or more input values for each record in a data set. A rule set writes a single output for each record.
- You can organize rule sets in a hierarchical manner in the workspace, so that one rule set reads the output from another rule set. Create a hierarchy of rule sets when a rule statement in one rule set is a dependent object of a rule statement in another rule set.
- The rule specification applies input values to the rule statements in the order in which they appear in the rule set. A rule set writes the output from the first rule statement that returns a valid value for the input value. You must organize the rule statements in the rule set so that the rule statements do not conflict.

For example, a rule set might contain the following rules:

1. IF PASSENGER AGE < 18 THEN "JUNIOR FARE"
2. IF PASSENGER AGE >= 18 THEN "STANDARD FARE"
3. IF PASSENGER AGE > 65 THEN "SENIOR FARE"

In the example, the passenger age data cannot reach the third rule statement. The first and second rule statements cover all the data options before the data can reach the third rule statement.

Inputs in Rule Sets

Each rule set specifies one or more data inputs. You define the inputs on the Inputs view in the rule set. You add an input to each rule statement that you define in the rule set.

The data input represents a data column in a business data set. When a user opens a mapplet rule in the Developer tool, the user reviews the data inputs in the rule. The user connects the mapplet rule to the columns in the data set that the business rule applies to.
You specify the properties of the inputs in the rule set. The properties include the type of data that the column must contain and the maximum number of characters in each field in the column. For example, you can specify that an input reads data strings with a maximum length of 30 characters.

When you create a rule set below a rule set, the outputs from the lower rule set appear as inputs in the upper rule set.

**Rule Statements**

A rule statement is a logical element in a rule set. A rule statement defines an operation to perform on the values in a data column. You can define a rule statement to validate or update a data value based on a business rule requirement.

You can add multiple rule statements to a rule set. If you define rule statements that perform the same type of analysis on a set of data inputs, add the rule statements to a single rule set. If you define rule statements that perform different types of analysis, add each type of rule statement to a different rule set.

The following image shows a rule statement in a rule set:

**Rule Logic**

A rule statement uses IF-THEN logic to analyze a column of data values and determine the action to take for each data value. Use the rule statement logic to define analysis or update operations that meet the requirements of the business rule.
The following table describes the logical elements in a rule statement:

<table>
<thead>
<tr>
<th>Logical Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF</td>
<td>Begins the IF clause in the rule statement. The IF clause identifies the input data, defines the analysis to perform on the data, and specifies a logical operator to filter the data analysis. You cannot edit the IF element.</td>
</tr>
<tr>
<td>Input</td>
<td>Identifies the data to analyze or update. An input represents a column of business data.</td>
</tr>
<tr>
<td>Operator</td>
<td>Specifies a logical operator to apply to the input data. Select an operator from the following list: - IS - IS GREATER THAN - IS GREATER THAN OR EQUAL TO - IS LESS THAN - IS LESS THAN OR EQUAL TO - IS NOT - IS WITHIN</td>
</tr>
<tr>
<td>Condition</td>
<td>Specifies the data analysis operation to perform on the data.</td>
</tr>
<tr>
<td>THEN</td>
<td>Begins the THEN clause in the rule statement. The THEN clause specifies the output of the rule statement. You cannot edit the THEN element.</td>
</tr>
<tr>
<td>Action</td>
<td>Specifies the output that the rule statement generates if the input data satisfies the logical requirements of the IF clause. If the input data does not satisfy the logic of the IF clause, the rule statement generates no output.</td>
</tr>
<tr>
<td>Add</td>
<td>Adds a rule statement to the rule set.</td>
</tr>
<tr>
<td>Add using result</td>
<td>Adds a rule statement to the rule set and links the two rule statements. The output from the first rule statement becomes the input to the second rule statement.</td>
</tr>
</tbody>
</table>

Creating a Rule Specification

Before you configure any rule logic, you create and save the rule specification.

1. Select Rule Specification from the New menu.
2. Enter a name for the rule specification.
3. Optionally, enter a description. **Tip:** Enter the business rule as the description.
4. Select a location for the rule specification.
The Location field specifies a project in the Model repository.

5. Save the rule specification.
   The rule specification opens in the Design workspace.

Opening a Rule Specification

Open a rule specification from the Analyst tool library.

1. Open the library.

2. Select **Rule Specifications** from the list of assets.
   The library shows the available rule specifications.

3. Select a rule specification.
   The rule specification opens in the Design workspace.
CHAPTER 3

Rule Statements

This chapter includes the following topics:

- Rule Statements Overview, 12
- Conditions, 13
- Operators, 14
- Actions, 15
- Reference Tables, 17
- Function Descriptions, 18

Rule Statements Overview

The rule statement is the principal element in a rule specification. The rule statement defines the operation to perform on the input data and generates a possible output for the rule set.

You can configure a rule specification with one or more rule statements. Use multiple rule statements to analyze or update multiple columns, or when the status of the data in a column depends on the data in another column.

A rule statement contains the following elements:

Input

The input represents a column of data in a business data set. Configure the input properties so that the mapplet rule can read the business data.

When a Developer tool user adds a mapplet rule to a mapping, the user connects the mapplet to data columns that match the input properties.

Condition

The condition defines the type of analysis that the rule statement performs on the input data. Configure a condition to apply a mathematical function to the data or to compare the data to data values that you specify.

Operator

The operator is a mathematical function that determines how the rule statement handles the result of the condition analysis. The operator determines if the rule statement performs any action.

Action

The action generates the output from the rule statement.
Conditions

A condition defines the type of analysis that the rule statement performs on input data.

To configure a condition, select the condition field in a rule statement. When you select a condition field, you open the Define Condition dialog box.

The following image shows the Define Condition dialog box:

The Define Condition dialog box includes the following condition types:

**Input**
- Use to select the data values to compare to the rule statement input data.

**Reference Table**
- Use to select a reference data set to compare to the rule statement input data.

**Functions**
- Use to define a function to apply to the rule statement input data.

### Types of Condition Analysis

When you configure a condition, you select the input data to analyze and you select the type of analysis to perform.

Configure a condition to perform one of the following types of analysis:

**Compare the input data to a value that you enter.**
- Configure the condition to compare the input data values to a specified value. The condition determines if the data values match.
  - For example, configure a condition to identify data values that include the year 2014.
Compare the input data to the values in a reference table.

Configure the condition to compare the input data values to the values in a column of reference data. The condition determines if the input data match any value in the reference data column. The condition reads all the data values in the reference table. For example, configure a condition to compare a column of product codes in a data set to the formal list of product codes in the organization.

Apply a function to the input data.

Configure the condition to apply a function expression to the input data and determine if the data satisfies the function parameters. For example, configure a condition to evaluate if a number is the highest number in a range that you specify.

Operators

An operator is a mathematical function that defines the outcome of a condition. Select an operator determines whether the results of the condition analysis pass to the action in the rule statement. The following table describes the operators that you can select:

<table>
<thead>
<tr>
<th>Operator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>is</td>
<td>Tests whether the input data matches the data that the condition specifies.</td>
</tr>
<tr>
<td>is not</td>
<td>Tests whether the input data does not match the data that the condition specifies.</td>
</tr>
<tr>
<td>is within</td>
<td>Tests whether the input data matches a value in a set of values. Select the operator when you use a reference table in the condition.</td>
</tr>
<tr>
<td>is not within</td>
<td>Tests whether the input data does not match a value in a set of values. Select the operator when you use a reference table in the condition.</td>
</tr>
<tr>
<td>is less than</td>
<td>Tests whether the input data value is less than the value that the condition specifies. Select the operator with numeric input data.</td>
</tr>
<tr>
<td>is less than or equal to</td>
<td>Tests whether the input data value is less than or equal to the value that the condition specifies. Select the operator with numeric input data.</td>
</tr>
<tr>
<td>is greater than</td>
<td>Tests whether the input data value is greater than the value that the condition specifies. Select the operator with numeric input data.</td>
</tr>
<tr>
<td>is greater than or equal to</td>
<td>Tests whether the input data value is greater than or equal to the value that the condition specifies. Select the operator with numeric input data.</td>
</tr>
</tbody>
</table>

You can define the same condition in multiple rule statements. Use different operators to specify different actions. For example, you define a condition to analyze an input column of date data. You want to specify different actions if the input data indicates an age greater than 18 or lower than 18.
You configure the following rule statements:

\[
\begin{align*}
\text{IF } \text{AGE } \geq 18 & \text{ THEN ADULT} \\
\text{IF } \text{AGE } < 18 & \text{ THEN CHILD}
\end{align*}
\]

The rule statements use the same inputs and conditions. The operators determine the actions that the rule statement can take.

**Actions**

An action specifies the output from a rule statement.

To configure an action, select the action field in a rule statement. When you select the field, you open the **Define Action** dialog box.

The following image shows the **Define Action** dialog box:

The **Define Action** dialog box includes the following condition types:

**Input**

Use to specify a data value as the output from the action. Enter a data value, or select an input from the rule set.

When you select an input, the rule statement writes the input field from the same row as the input field in the condition.

**Functions**

Use to define a function that specifies the output from the action. The function might read data values that you enter, or function might read data inputs from the rule set.

**Standardize**

Use to replace words or characters in an input or to replace words or characters from an input.
Types of Actions

When you configure an action, you specify the data that the rule statement writes when the operator validates the input data on the condition.

Configure an action to generate an output in one of the following ways:

**Write a value that you enter.**

Configure an action to write a data value that you specify.

For example, you might configure an action to return the word "VALID" when the input data matches a reference data value.

**Replace an input with another input.**

Configure an action to write a data value from another input in place of the current input. The action reads the data value on the corresponding row of the input that you select.

For example, a business might define a rule that requires all product records to use Quick Response (QR) codes in place of bar codes. You configure an action to replace an input column of bar code values with a corresponding column of QR code values.

**Write a value from a reference table.**

Configure an action to write a data value from a reference table. The action compares the input data to the values in the reference table that you specify. If the action finds the input data in the reference table, the action writes a reference data value that corresponds to the input data.

For example, you might configure an action to compare first name data to a reference table that identifies the gender of the first name. The action might write the word "MALE" as the output when the word "John" is the input. The action might read the word "JOHN" and write the word "MALE" as the output.

**Remove data values from the input data.**

Configure an action to remove a data value that you specify.

For example, the input data might include product terms that the business no longer uses. Configure the action to delete the write a version of the input data that omits the product terms.

**Remove reference data values from the input data.**

Configure an action to delete reference data values from an input.

The action compares the input data to the values in the reference table that you specify. If the action finds an input data value in the reference table, the action deletes the value from the corresponds to the input data. The action writes the edited version of the input data as output.

For example, you might configure an action to compare an input string to a reference table of salutation terms. The action might read the input string "MR JOHN SMITH" and write the string "JOHN SMITH" as the output.

**Remove character spaces from the input data.**

Configure an action to delete character spaces from the input data. Remove character spaces when the input data includes redundant character spaces.
For example, you might configure an action to remove character spaces from the following telephone number:

212 555 1234

**Use a function to determine the output value.**

Configure an action to apply a function expression to the input data.

For example, you might configure the action to return the character length of the input data.

**Merge values from multiple inputs.**

Configure an action to merge data from two or more inputs.

For example, you might configure an action to merge a column of first name data and a column of second name data. The action writes a single field that contains the first name and second name.

**Change the character case of the input data.**

Configure an action to convert the character case of an input that you select.

For example, a rule statement might read a data set that stores data values in sentence case. Configure an action to write the data in uppercase.

---

**Reference Tables**

You can add a reference table to a condition or an action. Add a reference table to a condition to verify that the input data contains the data values that you expect. Add a reference table to an action to return a value from the table that corresponds to the input data value.

A reference table contains the standard versions of a set of business values. A reference table might contain public terms, such as telephone area codes or address abbreviations. Or, a reference table might contain values that are specific to an organization, such as employee codes or product codes. You can create reference tables in the Analyst tool, or you can ask a Developer tool user to create a reference table. You select a rule from a project in the Model repository when you configure the condition or the action.

A reference table contains two or more columns. Each row in the table represents a single business value. A row might contain two or more identical values, or it might contain alternative versions of the same value, including incorrect values.

If you add the reference table to a condition, the condition compares the input data to the values in the first column in the reference table. If the condition finds an input value in the reference data, the condition applies the operator to the input data to determine the action to take.

If you add the reference table to an action, the action compares the input data to the values in the second or additional columns. If the action finds an input data value in the reference table, the action returns the value on the same row in the first column.

**Reference Table Example**

The following table contains sample reference table data:

<table>
<thead>
<tr>
<th>Name1</th>
<th>Name2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mumbai</td>
<td>Bombay</td>
</tr>
<tr>
<td>Chennai</td>
<td>Madras</td>
</tr>
</tbody>
</table>
The Name1 column contains the current names of cities in India. The Name2 column contains the previous version of each name. Add the reference table to a condition to verify that the input data contains the current city names. Add the reference table to an action to find the older city names and replace them with the current city names.

### Function Descriptions

A function is a logical element in a condition or an action. A function reads the input data that you specify, performs a calculation on the input data, and returns a result.

When you add a function to a condition, the function performs the calculation and returns the result to the condition. The condition uses the rule statement operator to determine the next step. When you add a function to an action, the action performs the calculation and returns the result as the rule statement output.

You can select the following functions in a condition or an action:

**Add to Date**
- Reads a date value and adds a numeric value to an element in the date. Enter the value to add to the element, or select a rule set input that contains the value to add.

**Choose**
- Reads input data that contains multiple values and selects the value at the position that you specify.
  - For example, the following string contains values at four positions:
    \[
    Q_1, Q_2, Q_3, Q_4
    \]
    - You can enter a position, or you can select a rule set input to specify a position.

**Concatenate**
- Reads two inputs that you select and concatenates the values from the inputs.

**Date Difference**
- Reads date values from two inputs that you select and calculates the numeric difference between the dates. You select the date element that the function uses to measure the difference. Enter the date element, or select a rule set input that contains the date element.

**Date Part**
- Reads a date from an input and identifies the numeric value of a date element that you specify. Enter the date element, or select a rule set input that contains the date element.
Date Time
Uses multiple values to specify a date and time. Enter a value for each date element, or select a rule set input to add a value to each element.

Greatest
Reads two or more values and identifies the highest value. Enter the values, or select rule set inputs to add each value. You can specify numeric values, alphabetic values, or date values. Specify a single type of value.
When you specify numeric values, the function identifies the highest number.
When you specify alphabetic values, the function identifies the value that is last in alphabetic order.
When you specify date values, the function identifies the latest date.

Last Day
Reads a date value from an input and identifies the last day in the month that the date specifies. The function identifies the last day as a numeric value.

Least
Reads two or more values and identifies the lowest value. Enter the values, or select rule set inputs to add each value. You can specify numeric values, alphabetic values, or date values. Specify a single type of value.
When you specify numeric values, the function identifies the lowest number.
When you specify alphabetic values, the function identifies the value that is first in alphabetic order.
When you specify date values, the function identifies the earliest date.

Length
Reads an input value and calculates the number of characters in the value.

Lower
Reads an input string and identifies the lowercase version of the characters in the string.

Null
Reads an input value and determines if the value is null.

Replace Character
Reads an input value and replaces a sequence of characters in the value with a sequence that you specify.

Replace String
Reads an input value and replaces the value with a value that you specify.

Reverse
Reads an input value and reverses the characters in the value.

Truncate
Reads an input value and truncates the value to the number of places that you specify. The function reads a numeric value. Enter the value, or select a rule set input to add the value. You can also enter the number of places to truncate, or select a rule set input to specify the number of places.

Upper
Reads an input string and identifies the uppercase version of the characters in the string.
Date Elements in Functions

When you add a date element to a function, enter the function in the format that the function recognizes.

The following table describes the date formats to use:

<table>
<thead>
<tr>
<th>Date Element</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>YYYY</td>
</tr>
<tr>
<td>Month</td>
<td>MM</td>
</tr>
<tr>
<td>Day</td>
<td>DD</td>
</tr>
<tr>
<td>Hour</td>
<td>HH</td>
</tr>
<tr>
<td>Minute</td>
<td>MM</td>
</tr>
<tr>
<td>Second</td>
<td>SS</td>
</tr>
</tbody>
</table>
Chapter 4

Common Types of Rule Statements

This chapter includes the following topics:

- Business Rules and Rule Statements Overview, 21
- Verifying the Accuracy of Business Data, 22
- Standardizing Business Data Values, 22
- Improving the Usability of Business Data, 23
- Discovering Information About Business Users, 24

Business Rules and Rule Statements Overview

You can define all or part of a business rule in a rule statement. Define a rule statement for each fact that a business rule must discover. The type of rule statement that you define depends on the business rule requirements.

You can use rule statements to verify and update the following business facts:

Verify the accuracy of business data

Define a rule statement that compares input data to a reference table.

Use the rule statement to verify that the business data is accurate. For example, define a rule statement to verify that a product description table uses the current product codes.

Standardize business data values

Define a rule statement that searches for values that you specify and replaces them with other values.

Use the rule statement to verify that the business data follows a standard format. For example, define a rule statement to verify that financial data does not use currency symbols. The rule statement replaces the currency symbols with agreed abbreviations for the currency names.

Improve the usability of business data

Define a rule statement that removes redundant characters and redundant strings.

Use the rule statement to ensure that users and software applications can read the business data correctly. For example, define a rule statement to delete character spaces at the start and end of a data fields.
Use data values to discover information about business users

Define rule statements that correlate information from different inputs. Use different rule statements to analyze the inputs and connect the inputs with AND logic. For example, define rule statements to link different facts about customers and improve the customer service to the customers.

Verifying the Accuracy of Business Data

To verify the accuracy of a column of business data, configure a rule statement that compares the column to a reference table. For example, you might configure a rule statement to verify that a data column contains the current product codes for the organization.

1. Select a rule set in a rule specification.
2. In the rule set properties, click Rule Logic.
3. Click Add Rule Statement.
4. Select an input for the rule statement.
   • If the rule set does not contain an input, create an input. Configure the input properties represent the type of column that contains the business data.
5. Configure the condition.
   • Click the condition icon to open the Define Condition dialog box.
   • Select Reference Table.
   • Browse to the reference table that contains the standard versions of the business data. For example, select a reference table that contains a set of product codes.
   • Select or clear the option to perform a case-sensitive search of the reference table.
   • Click OK.
6. Select an operator to validate the results of the condition analysis.
   • To identify input values that match the reference table values, select the following operator: is within
7. Configure the action to write a value when the input data contains a reference table value.
   • Click the action icon to open the Define Action dialog box.
   • Select Input.
   • Specify the type of data to enter. Use string data to return a text value.
   • Enter a data value. For example, enter "VALID."
   • Click OK.
8. Save the rule specification.

Standardizing Business Data Values

To standardize data values, configure a rule statement that replaces the values with the value that you require. For example, you might configure a rule statement to replace any currency symbol in a data column with the agreed abbreviation for the currency name.
To standardize multiple values, you can create additional rule statements. Alternatively, use a reference table.

1. Select a rule set in a rule specification.
2. In the rule set properties, click **Rule Logic**.
3. Click **Add Rule Statement**.
4. Select an input for the rule statement.
   - If the rule set does not contain an input, create an input. Configure the input properties represent the type of column that contains the business data.
5. Configure the condition.
   - Click the condition icon to open the **Define Condition** dialog box.
   - Select **Input**.
   - Specify the type of data to enter. Use string data to specify a text value.
   - Enter a data value. For example, enter "$.
   - Click **OK**.
6. Select an operator to validate the results of the condition analysis.
   - To specify that the input data must match the data that you enter, select the following operator: **is**
7. Configure the action to write a value when the input data matches the condition data.
   - Click the action icon to open the **Define Action** dialog box.
   - Select **Input**.
   - Specify the type of data to enter. Use string data to return a text value.
   - Enter a data value. For example, enter "USD."
   - Click **OK**.
8. Save the rule specification.
9. Repeat the steps for other currency symbols that you want to standardize.
   For example, standardize £ to GBP.

---

**Improving the Usability of Business Data**

To improve the usability of data values, you can delete character spaces at the start and the end of a data field. The redundant spaces introduce errors when you sort or compare data values that contain the same information.

Configure a rule statement that deletes the redundant spaces. If you want to specify longer character strings, create a rule statement that uses the "Replace Character" function.

1. Select a rule set in a rule specification.
2. In the rule set properties, click **Rule Logic**.
3. Click **Add Rule Statement**.
4. Select an input for the rule statement.
   - If the rule set does not contain an input, create an input. Configure the input properties represent the type of column that contains the business data.
5. Configure the condition.
   • Click the condition icon to open the Define Condition dialog box.
   • Select Functions.
   • Select the Null function.
   • Select the rule statement input.
   • Click OK.

6. Select an operator to validate the results of the condition analysis.
   • To specify that the condition does not apply to null data, select the following operator:
     is not

7. Configure the action to remove the redundant spaces from the input data.
   • Click the action icon to open the Define Action dialog box.
   • Select Standardize, and select Remove Leading and Trailing Spaces.
   • Select the input that you specified in the condition.
   • Click OK.

8. Save the rule specification.

Discovering Information About Business Users

To discover information about business users, configure a rule statement that measures a fact about the users. When you combine rule statements to measure related facts, you discover additional information.

For example, you might configure a rule statement for a financial institution to identify customers who hold credit balances. You might also configure a rule statement to identify customers who earn a high salary.

Use the "AND" feature to combine the rule statements.

1. Select a rule set in a rule specification.
2. In the rule set properties, click Rule Logic.
3. Click Add Rule Statement.
4. Select an input for the rule statement.
   • If the rule set does not contain an input, create an input. Configure the input properties represent the type of column that contains the business data.
     Note: The rule statement analyzes salary data.
5. Configure the condition.
   • Click the condition icon to open the Define Condition dialog box.
   • Select Input.
   • Specify the type of data to enter. Use integer data to specify a numeric value.
   • Enter a data value to represent a salary. For example, enter 100,000.
   • Click OK.
6. Select an operator to validate the results of the condition analysis.
   • To identify input values that indicate a minimum salary of $100,000, select the following operator:
     >=
7. Click the "*+" icon in the rule statement.
   The rule specification adds a rule statement under the current rule statement and creates an AND relationship between the rule statements.

8. Select an input for the rule statement that you added.
   • If the rule set does not contain an input, create an input. Configure the input properties represent the type of column that contains the business data.
     **Note:** The rule statement analyzes the customer account balances.

9. Configure the condition in the rule statement.
   • Click the condition icon to open the Define Condition dialog box.
   • Select **Input**.
   • Specify the type of data to enter. Use integer data to specify a numeric value.
   • Enter a data value to represent an account balance. For example, enter 10,000.
   • Click **OK**.

10. Select an operator to validate the results of the condition analysis.
    • To identify input values that indicate a minimum balance of $10,000, select the following operator: 
      \[ \geq \]

11. Configure the action to write a value when the input data values are greater than or equal to the condition values.
    • Click the action icon to open the Define Action dialog box.
    • Select **Input**.
    • Specify the type of data to enter. Use string data to return a text value.
    • Enter a data value. For example, enter "HIGH" to indicate the customer salary and balance levels.
    • Click **OK**.

12. Save the rule specification.
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