

IBM SPSS Decision Management for
Claims 6.2



Note: Before using this information and the product it supports, read the general information under Notices on p. 127.

This edition applies to IBM SPSS Decision Management 6 and to all subsequent releases and modifications until otherwise indicated in new editions.

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Preface

About IBM Business Analytics

IBM Business Analytics software delivers complete, consistent and accurate information that decision-makers trust to improve business performance. A comprehensive portfolio of [business intelligence](#), [predictive analytics](#), [financial performance and strategy management](#), and [analytic applications](#) provides clear, immediate and actionable insights into current performance and the ability to predict future outcomes. Combined with rich industry solutions, proven practices and professional services, organizations of every size can drive the highest productivity, confidently automate decisions and deliver better results.

As part of this portfolio, IBM SPSS Predictive Analytics software helps organizations predict future events and proactively act upon that insight to drive better business outcomes. Commercial, government and academic customers worldwide rely on IBM SPSS technology as a competitive advantage in attracting, retaining and growing customers, while reducing fraud and mitigating risk. By incorporating IBM SPSS software into their daily operations, organizations become predictive enterprises – able to direct and automate decisions to meet business goals and achieve measurable competitive advantage. For further information or to reach a representative visit <http://www.ibm.com/spss>.

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About IBM SPSS Decision Management

What's new

IBM® SPSS® Decision Management 6.2 adds the following features:

Support for Cognos data. When used with IBM® SPSS® Modeler Server 14.2 or newer, SPSS Decision Management adds the ability read data from a Cognos Business Intelligence server when defining data sources, and to write scoring results back to a Cognos BI Server. After defining a connection to a Cognos BI server, you can browse packages, dimensions, queries, and reports to choose the desired fields. [For more information, see the topic Cognos BI source in Chapter 4 on p. 46.](#)

ILOG Business Rule Management System integration. Rules created in a Business Rules Management System such as ILOG can be referenced and used in SPSS Decision Management applications, provided they have been developed to support the same data model used in the current SPSS Decision Management project. These external rules can be selected and used in the same manner as other models and rules within the SPSS Decision Management application. [For more information, see the topic Using rules from ILOG Business Rule Management System in Chapter 6 on p. 64.](#)

Support for Linux on System Z. SUSE Enterprise Server 10 is supported on 64-bit IBM System z10.

About IBM SPSS Decision Management

IBM® SPSS® Decision Management brings the benefit of predictive analytics to real business problems, allowing you to build custom applications tailored to your customers or industry. While applications are typically configured to solve very specific problems, all are based on a common set of capabilities:

- Automate decisions using business rules.
- Add insight using predictive models.
- Use prioritization or simulation to reach the best decision based on the above.

A number of packaged applications are available, tailored to solving specific business problems. Please contact your sales representative for more information.

Claims management example

IBM SPSS Decision Management for Claims

Using IBM® SPSS® Decision Management for Claims, organizations can harness the power of predictive analytics to process incoming claims in real time. For example, claims can be set on a “fast track” for immediate payment, processed in the normal manner, or referred to the special investigations unit. By combining the logic of business rules with the insight gained through predictive models, the application identifies the best action for each claim according to your business goals.

Figure 2-1
IBM SPSS Decision Management for Claims

Model	Target	Measure	Remove
fraud_model.strfraudulent		Propensity	X

Propensity >= ↓	Allocate to	Remove
1 0.5	Refer	X
2 0.3	Standard	X
3 0	Fast Track	

Managing inbound claims

For this example, a large insurance company wants to manage claims more effectively by focusing on two specific goals:

- Reduce the time needed to process a typical claim.
- Reduce the amount of money paid to fraudulent claims.

Using IBM® SPSS® Decision Management for Claims, organizations can harness the power of predictive analytics to process incoming claims in real time, and determine the best action for each claim. An insurance company can do a better job of processing claims, to fast track them or refer them as appropriate.

This example uses the following data files, which are distributed with the product:

- *insurance_claim_data.txt*
- *insurance_fraud_data.txt*

A completed version of this example is provided in the file *insurance_claims_management.str*. By default, the sample data files are installed in the IBM® SPSS® Modeler Server Demos folder accessible from your application (for example, *C:\Program Files\IBM\SPSS\Modeler\14.2Demos*). Contact your administrator for assistance installing these files if necessary. [For more information, see the topic Sample files in Chapter 12 on p. 122.](#)

Launching the application

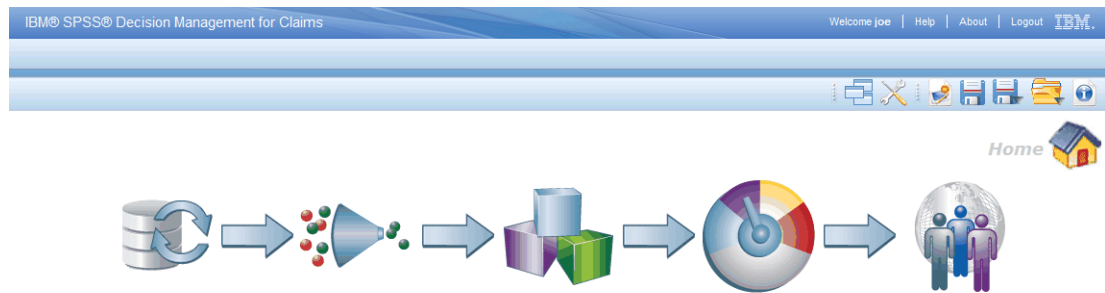
The launch page includes links to available applications at your site. These links may be configured by your administrator; you may be able choose from additional applications by clicking the link in the upper right-hand corner.

Figure 2-2
Application launch page



- ▶ To access the Launch page, navigate to *http://hostname:port/DM*, where *hostname* is the IP address or name of the repository machine and *port* is the application server port number. If you don't know this information, contact your administrator. You can also add a bookmark to this page in your browser, or create a shortcut on your desktop.
- ▶ Log in with a valid username and password. Contact your administrator for details if necessary.
- ▶ To create a new project, select *New* from the drop-down list under IBM® SPSS® Decision Management for Claims, and then click *Go*.

Figure 2-3
IBM SPSS Decision Management for Claims Home page

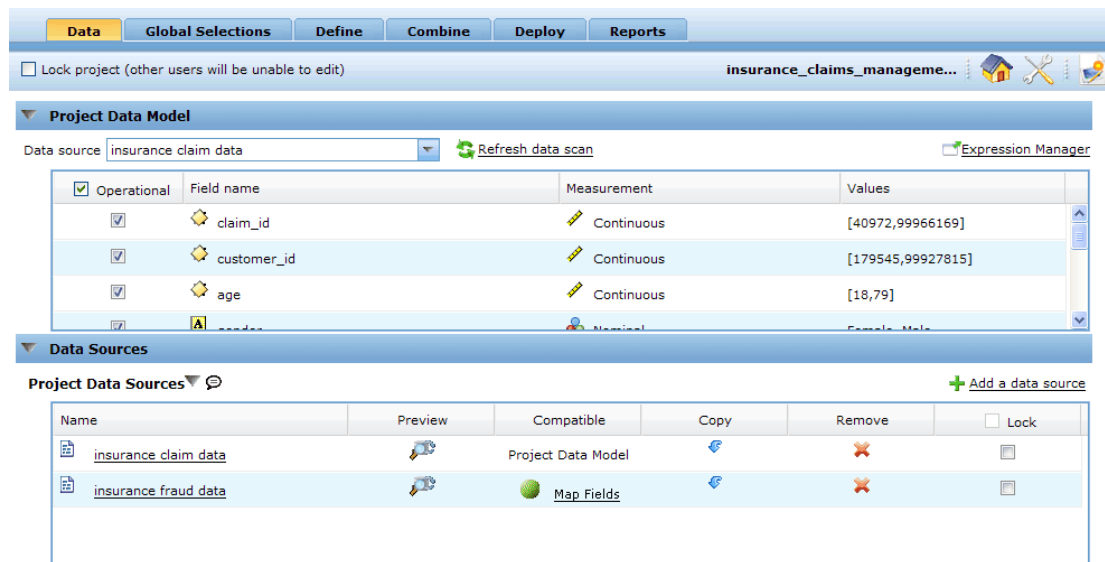


Each icon on the Home page represents a different step in the process, from choosing data through defining, deploying, and reporting on the results. To get started, click the Data icon.

Setting up data sources

The Data tab allows you to configure data sources for the two data files used in the example. Data sets can be configured by your administrator, or you can add your own.

Figure 2-4
Data tab



The project data model defines the fields that are available throughout the application for use in processing claims, such as the claim ID, age of the driver, and initial value of the claim.

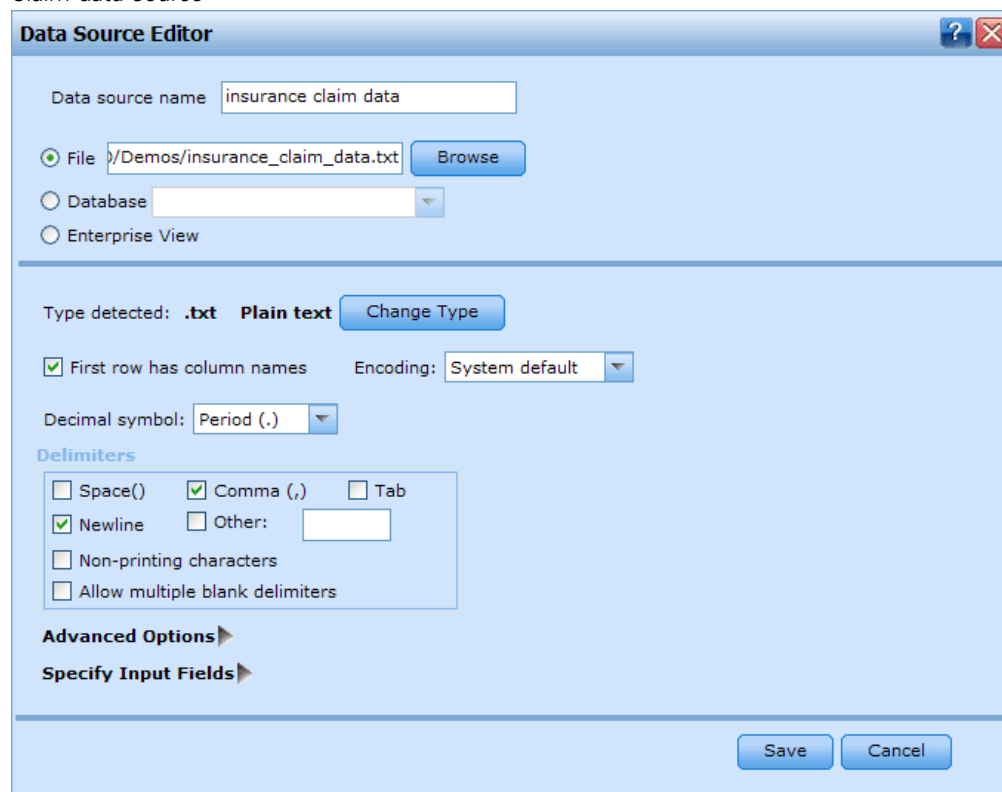
The application uses two data files, both of which are installed in the IBM® SPSS® Modeler Server *Demos* folder (for example *C:\Program Files\IBM\SPSS\Modeler\14.2\Demos*):

- **insurance_claim_data.txt** records information about a number of sample claims. The project data model is based on this file.
- **insurance_fraud_data.txt** contains information about claims that have been investigated for possible fraud. Some of these claims actually turned out to be fraudulent; others not, as indicated by the field named *fraudulent*. By analyzing this data, the application can identify patterns that may indicate fraud, and build a model that predicts which claims are likely to be fraudulent in the future.

To define the project data model

- ▶ On the Project Data Sources panel, click Add a data source.

Figure 2-5
Claim data source



- ▶ Specify *insurance claim data* as the data source name.
- ▶ Select File and select *insurance_claim_data.txt*. It's located in the SPSS Modeler Server*Demos* directory (for example, *C:\Program Files\IBM\SPSS\Modeler\14.2\Demos*).
- ▶ Under Specify Input fields, change the measurement type for the fields *gender*, *incident_cause*, *claim_area*, and *police_report* to nominal. This indicates that these fields have categorical values, with no intrinsic order to them.

- ▶ Click Save.

Since this is the first data source you have defined, it is automatically selected for the project data model, and used to define the fields required by the application. All other data sets are mapped relative to this source.

To define the fraud data source

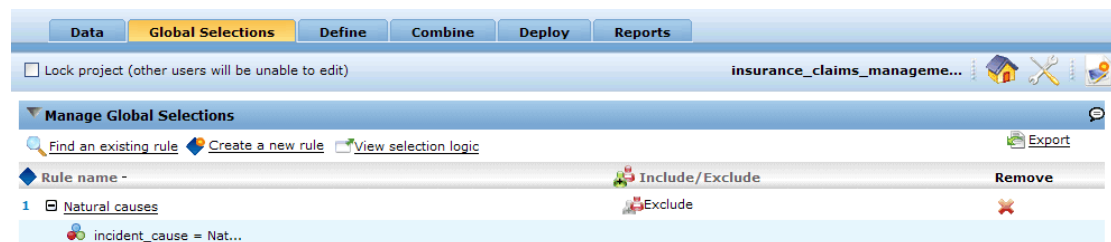
- ▶ On the Project Data Sources panel, click Add a data source.
- ▶ Specify *insurance_fraud_data* as the data source name.
- ▶ Select File and select *insurance_fraud_data.txt*. It's located in the SPSS Modeler Server Demos directory (for example, *C:\Program Files\IBM\SPSS\Modeler\14.2Demos*).
- ▶ Under Specify Input fields, change the measurement type for the *fraudulent* field to flag. This indicates that the field can have one of two possible values (representing *True/False* or *Yes/No*) to indicate the presence or absence of fraud.
- ▶ Click Save.

The fields in this data set match the project data model and are automatically mapped accordingly. As a result, a green icon is displayed for this data source under the *Compatible* column on the Data tab. The only field that is not mapped is the *fraudulent* field, which is a non-operational field, and is not part of the project data model. This field will be used as a target for building models later in the example.

Global selections

Global Selections allow you to specify rules that are applied to all records before any further processing can occur, and are useful for enforcing high-level policies. For example, due to the increasing number of claims attributed to hurricanes, floods, and other natural events, the insurance company has created a special division to process these claims. Any such claims should be excluded from automated processing, and will not be processed by the application.

Figure 2-6
Global Selections tab



- ▶ On the Global Selections tab, click Create a new rule.
- ▶ For the rule name, specify *Natural causes*.

Figure 2-7
Creating a rule

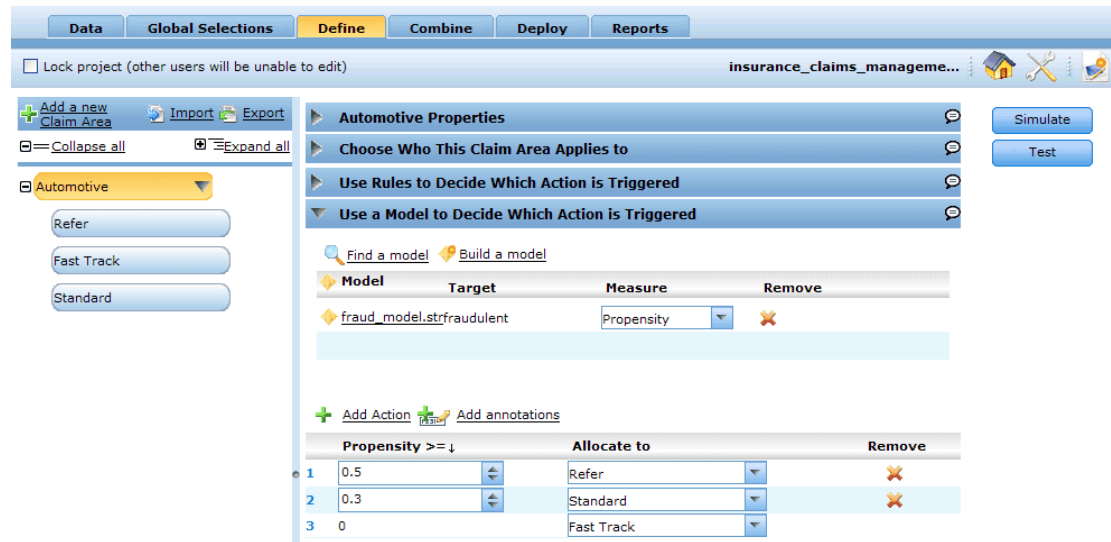
The screenshot shows a 'New Rule' dialog box. The 'Name*' field contains 'Natural causes'. The 'Expressions*' section shows a dropdown menu with 'incident_cause', a blue arrow pointing down, an equals sign, another blue arrow pointing down, and a dropdown menu with 'Natural causes' and a red 'X' icon. Below the dropdowns is a 'Choose value...' button. At the bottom is a 'Description:' field. The dialog has 'OK' and 'Cancel' buttons at the bottom right.

- ▶ For the expression, choose *incident_cause* as the input field. (Click the down arrow to choose between field, rule, and model inputs, then choose the desired field.)
- ▶ To complete the expression, choose *Natural causes* from the list of values at right.
- ▶ On the Global Selections tab, click the Include/Exclude icon to change the state to *Exclude*.

Defining claim areas and actions

The settings and controls on the Define tab determine the possible actions that may be taken for a given claim.

Figure 2-8
Define tab



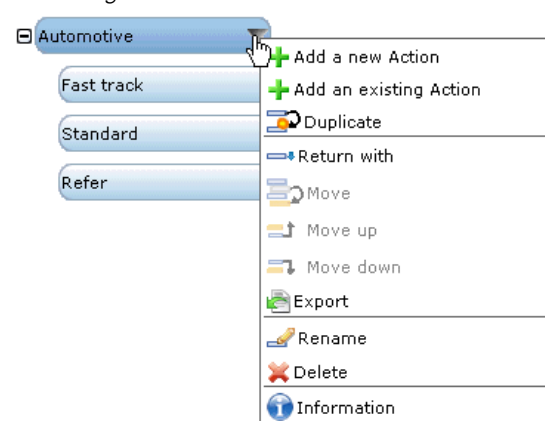
- The dimension tree in the left pane specifies the possible actions that can be taken for each claim: either fast track the claim for rapid payment, process in the normal manner, or refer to a special investigations unit.
- The settings on the right determine which actions are recommended for each claim based on rules and models.

To define claim areas and actions

When you first navigate to the Define tab, a single default claim area is displayed (*My Claim Area*).

- Change the name of the default claim area to *Automotive*. (With the mouse pointer on *My Claim Area*, click the down arrow icon to display the context menu, and choose *Rename*.)

Figure 2-9
Renaming a dimension



- ▶ Under the *Automotive* claim area, add actions for *Fast track*, *Standard*, and *Refer*. (To add an action, display the context menu for the *Auto* dimension in the same manner as above and choose Add a new Action.)
- ▶ With the *Automotive* dimension selected at left, click the Automotive Properties panel at right.

Figure 2-10
Automotive dimension properties

- ▶ Use the calendar chooser to select a date.
- ▶ Under Choose Who This Claim Area Applies to, add a selection rule to include records for *claim_area = Auto*.

Figure 2-11
Automotive dimension selections

- ▶ With the *Automotive* dimension still selected, select Use Rules to Decide Which Claim Area is Triggered and add rules. Following are example rules, but you can create any rules you want.

Figure 2-12
Allocation based on rules

Use Rules to Decide Which Action is Triggered

Remainder: Apply when no rules hit

Find an existing rule Create a new rule Add annotations OR Split OR Export

Rule name -	Risk points	Sort	Remove
1 Police Intervention	1	▲▼	✖
2 Multiple Claims	3	▲▼	✖
3 Cost over 5k	2	▲▼	✖
4 Cost over 3k	1	▲▼	✖
5 Material and Injury Claim	1	▲▼	✖
6 Remainder	0		

+ Add Action Add annotations

Sum of Points>= ↓	Allocate to	Remove
1 5	Refer	✖
2 3	Standard	✖
3 0	Fast Track	

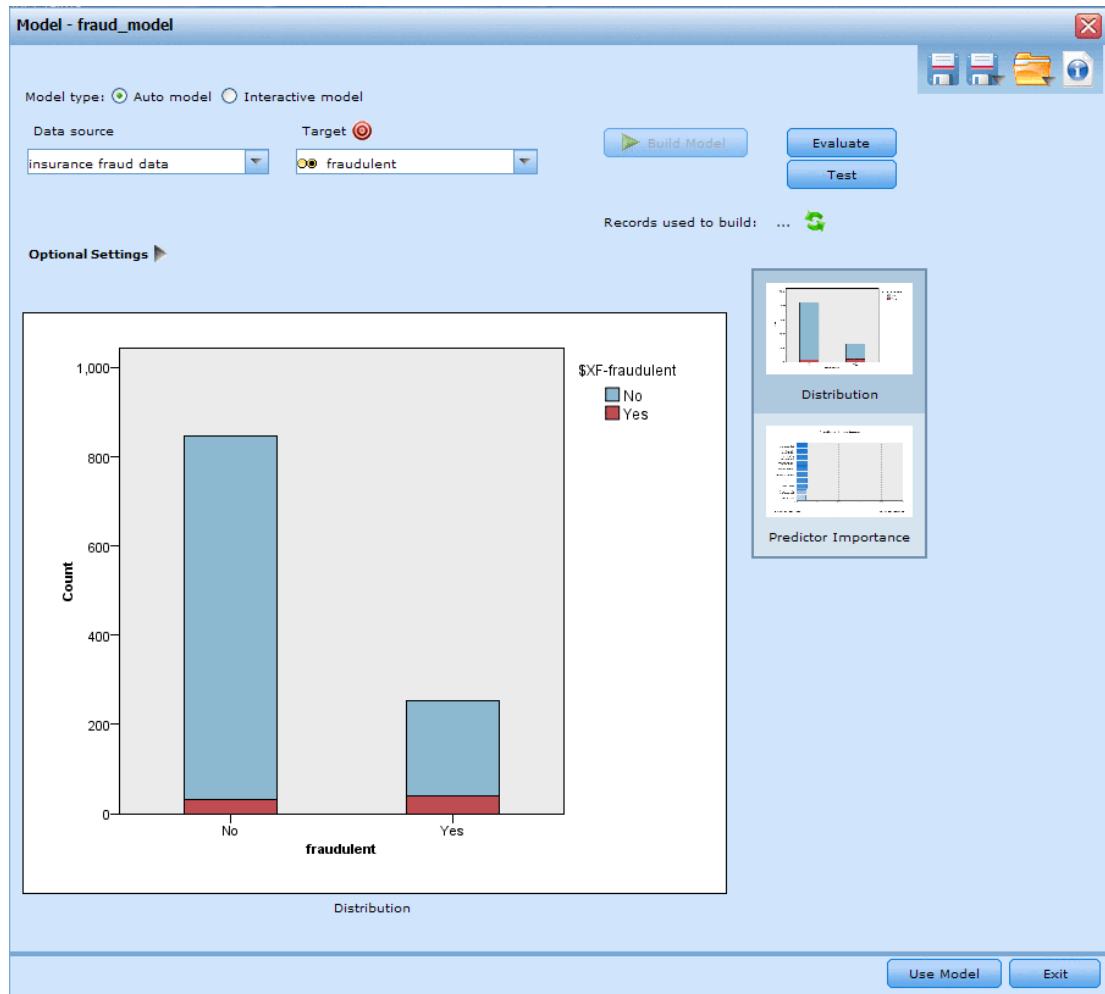
Table 2-1
Rule details

Rule Name	Syntax	Risk Points
Police Intervention	police_report = Yes	1
Multiple Claims	total_policy_claims > 1	3
Cost Over 5k	claim_amount > 5000	2
Cost Over 3k	claim_amount > 3000	1
Claim Type	claim_type = Material and injury	1

Each rule specifies one or more conditions that can be evaluated for each claim, with risk points assigned accordingly. For example, a claim may be judged risky if the policy is still in its first year, or if multiple claims have been made against the same policy. For the purposes of this example, it is not necessary to match the rules shown in the figure exactly. You may find it useful to experiment with different rule and risk point combinations.

- ▶ As shown in the previous figure, add actions to allocate to *Refer*, *Standard*, or *Fast track* based on the number of aggregated points. For example, you may want to refer claims with five or more risk points, while fast-tracking those with fewer than three.
- ▶ With the *Automotive* dimension selected on the Define tab, select Use a Model to Decide Which Claim Area is Triggered and click Build a model.

Figure 2-13
Modeling fraud risk

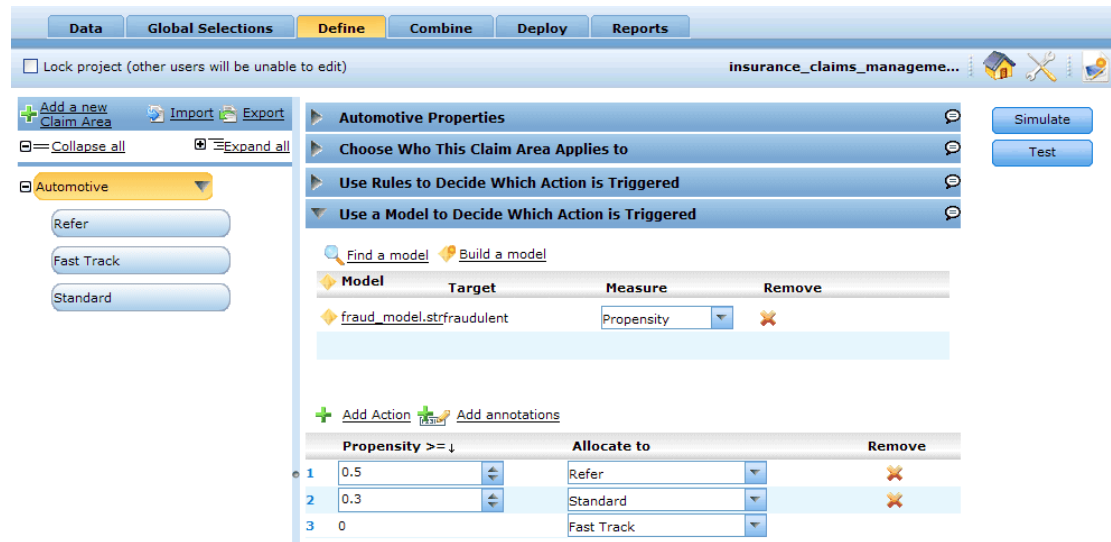


- ▶ Select *insurance fraud data* as the source.
- ▶ Select *fraudulent* as the target and click Build Model.

When the model completes, a distribution chart of the results is displayed. The horizontal axis shows the actual values from the data sample used to test the model. Based on the relative heights of the two bars, you can see that less than a third of the claims that were investigated actually turned out to be fraudulent. By contrast, the colored regions *within* each bar show the number of claims that were predicted to be fraudulent by the model, with red indicating true (fraudulent) and blue indicating false (not fraudulent) predictions. While not a perfect match, the relative size of the red areas indicates that more than half of the claims that were predicted to be fraudulent actually were.

- ▶ Save the completed model as *fraud_model*.
- ▶ Click Use Model.

Figure 2-14
Define tab



- ▶ In the Measure column drop-down, select Propensity.

Propensity is a measure of how likely the claim is to be fraudulent, with higher values indicating greater risk in this case. By selecting this field, you are indicating you want to base the recommended action on the propensity score returned by the model for each claim.

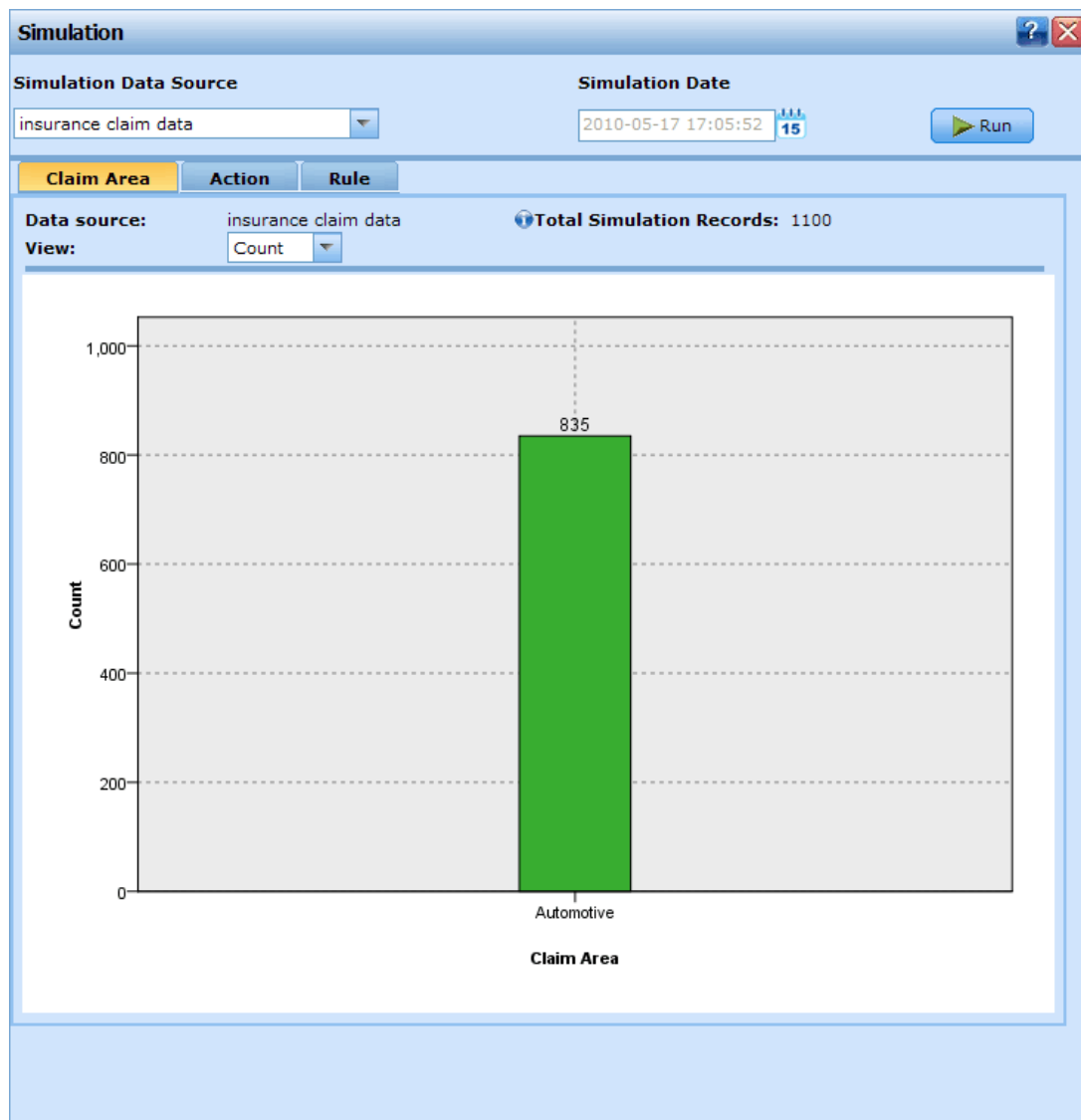
- ▶ Add actions to allocate to *Refer*, *Standard*, or *Fast track* based on the propensity score. For example, you may want to refer claims with a propensity of 0.5 or greater, and fast-track those with a propensity lower than 0.3.

Running a simulation

By running a simulation, you can see how the current rules and models apply to your sample data.

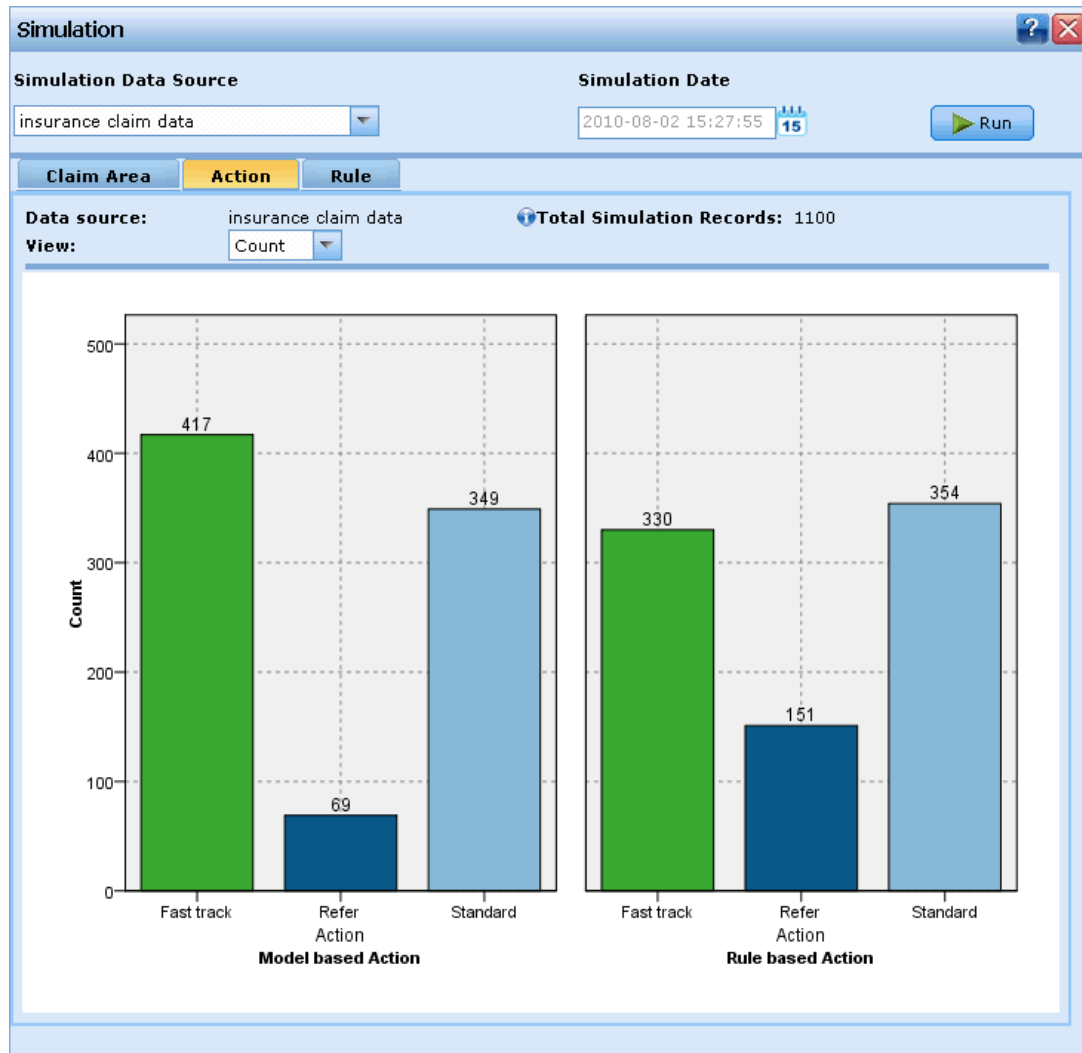
- ▶ On the Define tab, click Simulate.
- ▶ Select *insurance claim data* for the simulation data source.
- ▶ Specify a date that falls within the active range specified for the claim area (on the Define tab, under Automotive Properties).
- ▶ Click Run.

Figure 2-15
Simulation by claim area



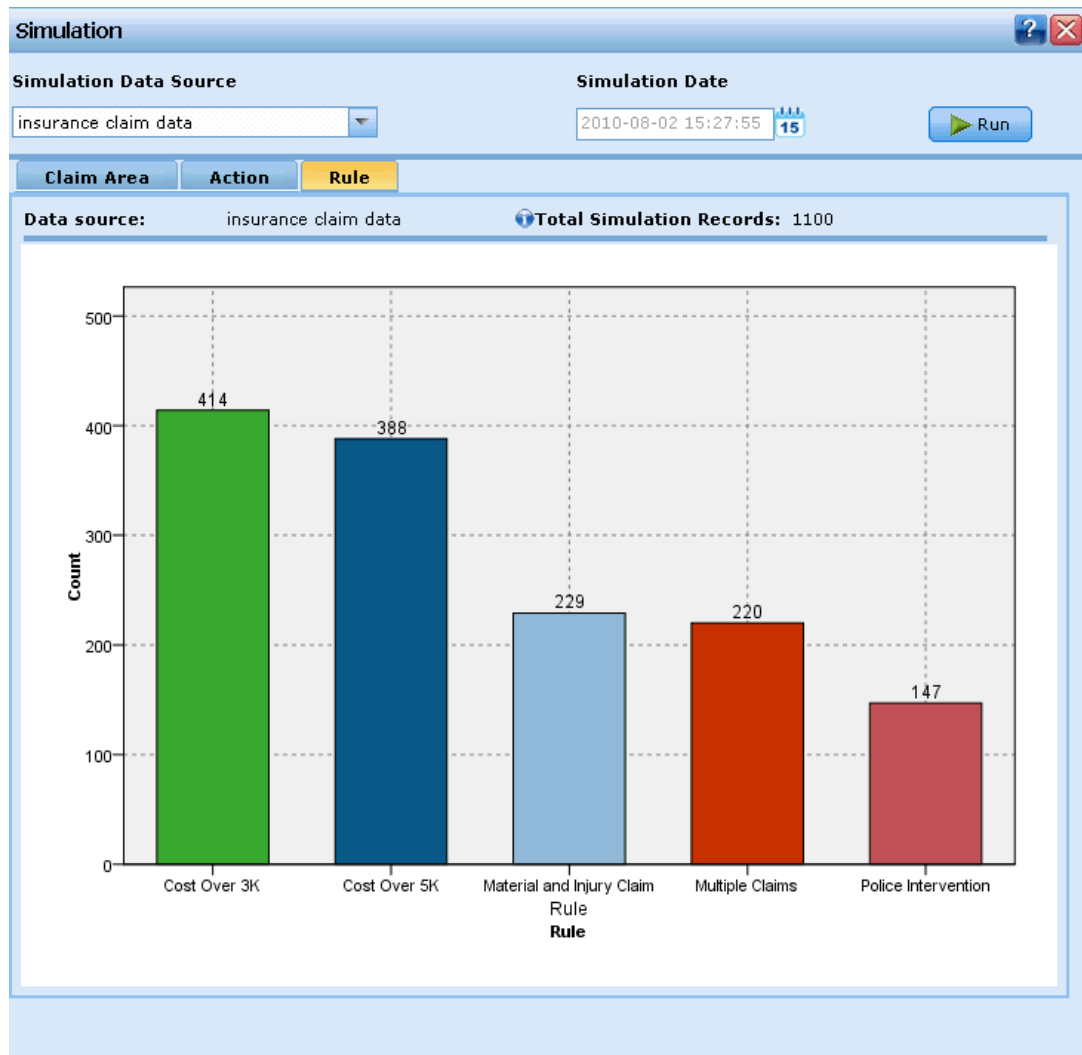
The Simulation displays a tab for each of the two dimensions (*Claim Area* and *Action*), as well as a tab that shows how the current rules are applied. In this example, the *Claim Area* tab shows that most claims in the sample data apply to the *Automotive* claim area. (Since only one claim area is defined, there is only one bar.)

Figure 2-16
Simulation results showing how actions are allocated by models and rules



The *Action* tab shows how claims are allocated by both models and rules. You can see from the results that the model-based allocation is fast-tracking more claims, while the rules send slightly more claims for referral. If desired, you could adjust the rules or thresholds to change this.

Figure 2-17
Simulation by rule



The *Rule* tab shows the number of records that apply to each rule.

Based on the simulation results, you can choose to update the models or rules. For example, you might add additional rules, or edit existing ones so they apply to more claims. Or you could change the thresholds that determine which action to recommend. Experiment with settings on the Define tab and until you are happy with the simulation results, then continue to the Combine tab to specify how the outputs from models and rules are combined.

Running a test

You can test a selection of records to see how one or more sample records will be scored by the current rule, model, or application. For example, you can look at a handful of specific claims and see which actions are allocated to each of them. The test details at bottom allow you to understand how specific selections and rules are applied as factors in the decision.

- ▶ To see how specific records are processed by the application, click **Test** from the Define tab.
- ▶ For the test data source, select insurance claim data.
- ▶ Under **Select Fields to Display**, select one or more fields you want to include in the results, and click **Run**.

Figure 2-18
Test summary

The screenshot shows a software interface for running tests. At the top, there's a 'Test' window with a title bar. Below the title bar, there are two sections: 'Test data source' and 'Test date'. The 'Test data source' is set to 'insurance claim data' and the 'Test date' is '2010-05-14 11:41:00' with a '15' icon. Below these, there's a 'Specify Selections to Use' section with a 'Records' subsection. It has a radio button selected for 'Return 10 record(s) based on first hit' and another for 'Specify custom data'. Below that is a 'Select Fields to Display' section with a 'Run' button. At the bottom, there's a 'Test Summary' section with a table of results.

Preview	claim id	Rule Action	Model Action
	28015402		
	86926208	Refer; Automotive	Standard; Automotive
	14338044	Standard; Automotive	Fast Track; Automotive
	58917605		
	24253422		
	81081567	Fast Track; Automotive	Standard; Automotive
	65416119	Fast Track; Automotive	Fast Track; Automotive

At the bottom of the window, there is a 'Test Detail' section with a right-pointing arrow.

- ▶ Expand the **Test Detail** section to see details about a selected record. For example you can see which selections and rules fired true or false for that record.

Figure 2-19
Test details

Test Summary ▼			
Preview	claim id	Rule Action	Model Action
	28015402		
	86926208	Refer; Automotive	Standard; Automotive
	14338044	Standard; Automotive	Fast Track; Automotive
	58917605		
	24253422		
	81081567	Fast Track; Automotive	Standard; Automotive
	65416119	Fast Track; Automotive	Fast Track; Automotive

Test Detail ▼						
Claim Area	Global Selections	Define	Selection	Schedule	Rule Action	Model Action
Automotive	✓	✓	✓	✓	Standard	Fast Track
Fast Track	✓	✓	✓		Standard	Fast Track

- To see additional details about a specific record, click the information icon at left.

Figure 2-20
Additional test details

Additional Test Details - Fast Track	
OK Global Selections	
Inclusions	
Exclusions	- OK Natural causes
OK Define	
OK Automotive	
OK Selections	
Inclusions	- OK Automotive claims
Exclusions	
OK Properties	- OK Schedule
Rule	
Rule name:	Cost over 5k
Rule points:	2
Index:	3
Rule name:	Cost over 3k
Rule points:	1
Index:	4
Rule name:	Material and Injury Claim
Rule points:	1
Index:	5
Total points:	4.0
Threshold:	2
Threshold value:	3
Threshold Allocation:	Standard
Model	
Model name:	fraud_model.str
Model measure value:	0.202509
Threshold:	0
Threshold value:	
Threshold Allocation:	Fast Track

Combining actions to reach a decision

The Combine tab allows you to combine the results from the Define tab to arrive at a single decision for each claim. In the previous section, you specified two different methods for allocating actions—one based on business rules, the other using a model. Each of these methods may return a different result (for example, the rule may say to fast track a claim, while the model says to refer). By combining the two methods, any biases inherent in one may be balanced by the other, allowing you to arrive at the decision that best meets your business objectives for each claim.

Figure 2-21
Combine tab

Combine matrix		Model actions		
		Refer	Standard	Fast track
Rules actions	Refer	Refer	Refer	Standard
	Standard	Refer	Standard	Fast track
	Fast track	Standard	Fast track	Fast track

The actions returned by rules are displayed in rows, and model actions are displayed in columns. Each cell indicates the decision for a specific combination. For example, if both rule and model choose to *Refer*, you probably want to refer, as seen in the cell in the upper left corner of the matrix. The cell at lower right is set to *Fast Track* for similar reasons. In between are the cases where rules and models disagree, and you can specify how each is handled.

- ▶ Use the Matrix colors palette on the right to choose the color for each action. Colors are used solely as a visual indicator, and do not change the outcome in any way.
- ▶ Click individual cells within the matrix to specify how that combination of actions is handled.

Figure 2-22
Choosing an action

Combine matrix		Model actions		
		Refer	Standard	Fast track
Rules actions	Refer	Refer	Refer	Standard
	Standard	Refer	Standard	Fast track
	Fast track	Standard	Standard	Fast track

- ▶ If desired, click Test... to see how specific records are processed by the application. For more information, see the topic [Running a test on p. 16](#).

WhatIf? analysis

To find out how the current selections will apply to your simulation data, click WhatIf?... on the Combine tab.

Figure 2-23
WhatIf? analysis

The screenshot shows the 'WhatIf?' analysis window. At the top, there are three dropdown menus: 'Simulation Data Source' (insurance claim data), 'Simulation Date' (2010-05-20 12:14:39), and 'Claim Area' (Automotive). Below these is a table with columns for 'Combine matrix', 'Model actions', and 'Results'. The 'Model actions' table has columns for 'Refer', 'Standard', and 'Fast Track'. The 'Results' table has columns for 'Action', 'Count', and 'Percent'. Below the table is a 'Name' field with 'Run 2' and a 'Run' button. At the bottom, there is a 'Total Simulation Records: 1100' label and a 'Display' dropdown set to 'Count' with 'Number of runs retained: 1'. A distribution chart shows the counts for each action: Fast Track (412), Refer (66), Standard (357), and Total (835).

Combine matrix		Model actions			Results		
		Refer	Standard	Fast Track	Action	Count	Percent
Rules actions	Refer	Refer	Standard	Fast Track	Fast Track	412	49.34%
	Standard	Refer	Standard	Fast Track	Refer	66	7.9%
	Fast Track	Refer	Standard	Fast Track	Standard	357	42.75%
						835	100%

Name: Run 2 [Run] [Update Settings] [Close]

Total Simulation Records: 1100

Display: Count Number of runs retained: 1

Action	Count	Distribution
Fast Track	412	[Bar]
Refer	66	[Bar]
Standard	357	[Bar]
Total	835	

The matrix at left shows your current specifications. The results panel at right is initially blank.

- ▶ To see how claims will be allocated based on the current settings, type *Run1* for the name and then click Run.

When the simulation is complete, the results panel shows the percentage of claims that will be allocated to each action. Based on the initial result, nearly half of all claims will be fast-tracked. If this seems like too many, you can adjust the matrix to reduce this number.

- ▶ For example, in the first column, change the bottom cell from *Refer* to *Standard*. In the third column, change the top cell from *Fast track* to *Standard*.
- ▶ Type *Run2* for the simulation name, and click Run again.

Figure 2-24
WhatIf? analysis showing multiple simulation results

The screenshot shows the 'WhatIf?' application window. At the top, there are three dropdown menus: 'Simulation Data Source' (insurance claim data), 'Simulation Date' (2010-05-17 16:48:49), and 'Claim Area' (Automotive). Below these is a table with columns for 'Combine matrix', 'Model actions', and 'Results'. The 'Model actions' table has rows for 'Refer', 'Standard', and 'Fast Track' and columns for 'Refer', 'Standard', and 'Fast Track'. The 'Results' table has columns for 'Action', 'Count', and 'Percent'. Below the table is a 'Name' field with 'Run 3' and a 'Run' button. At the bottom, there is a 'Total Simulation Records: 1100' section with a 'Display' dropdown set to 'Count' and 'Number of runs retained: 2'. Below this is a comparison table for 'Run 1' and 'Run 2' with a 'Distribution' column.

Combine matrix		Model actions			Results	
		Refer	Standard	Fast Track	Action	Percent
Rules actions	Refer	Refer	Standard	Standard	Fast Track	40.84%
	Standard	Refer	Standard	Fast Track	Refer	7.78%
	Fast Track	Standard	Standard	Fast Track	Standard	51.38%
					835	100%

Action	Run 1	Run 2	Distribution
Fast Track	412	341	
Refer	66	65	
Standard	357	429	
Total	835	835	

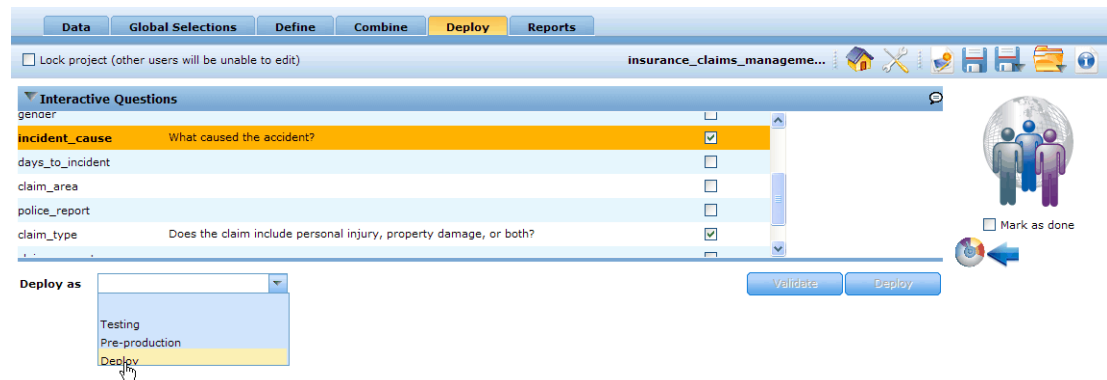
When the simulation completes, the updated results are shown. The panel at lower left allows you to compare any previous simulations to the current one. Continue running simulations as needed until the results are in line with your objectives.

- ▶ To revert to the settings from a previous run, select that column in the lower left panel.
- ▶ When you are satisfied with the results, click Update Settings to apply the current settings to the matrix on the Combine tab.
- ▶ Click Close to exit the WhatIf? dialog.

Deploying the application

After you update your models and rules and are satisfied with the simulation results, you can apply a label to indicate this is the version of the application you want to put into production.

Figure 2-25
Deploy tab



- ▶ On the Deploy tab, select the label you want to apply. Depending on your process, you may have a testing or preproduction phase that precedes the actual deployment.
- ▶ Click Validate to check for errors in the project, such as references to rules or models that cannot be resolved. This can happen, for example, if a label is moved or updated by another user.
- ▶ Optionally, under Interactive Questions, you can specify the text used to prompt for any data values that may be missing after the application is deployed. For example, this can provide your call center employees with the right questions to ask when data is missing. To add text for a particular field, select the check box at right to enable that field.
- ▶ To apply the label, click Deploy.

Once the label is applied, a services engagement is typically required to integrate the application with your call center, web site, or other IT infrastructure. For more information, see the *Application Designer's Guide* and contact your sales or support representative.

Navigating the workspace

Launching applications

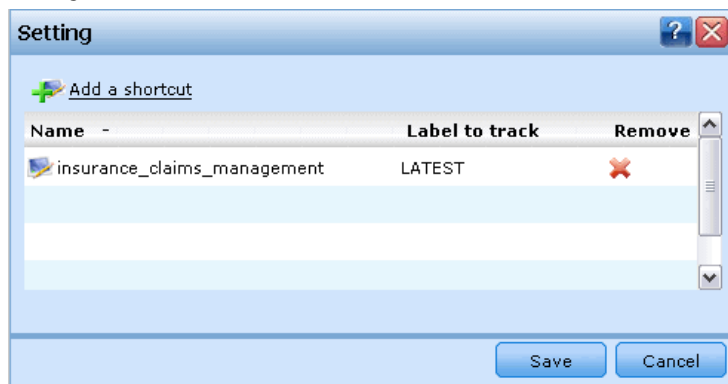
The Applications Launch page provides configurable links to your installed applications. Each panel represents an installed application. Click the drop-down to choose from recently-saved projects, models, or rules. You can also add one or more custom shortcuts that point to specific, labeled versions.

Figure 3-1
Applications launch page



- ▶ To access the Applications Launch page, navigate to `http://hostname:port/DM`, where *hostname* is the IP address or name of the repository machine and *port* is the application server port number. If you don't know this information, contact your administrator. You can also add a bookmark to this page in your browser, or create a shortcut on your desktop.
- ▶ To create a new project, model, or rule, select *New* from the drop-down list for the desired application and click *Go*.
- ▶ To open a saved project, model, or rule, select a recently-used version or shortcut from the drop-down list in the application panel, or select *Browse* from the drop-down list to choose a different object or version.
- ▶ To add a new custom shortcut that will always be available in the drop-down list, click the triangular arrow icon in the upper right corner of the application panel. Optionally, you can specify the number of shortcuts to display.

Figure 3-2
Adding a custom shortcut



Other ways to open an application

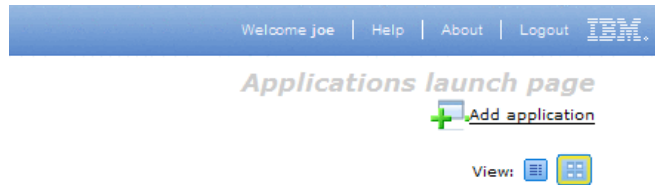
- Copy or type the URL into the address bar in your browser, or add the URL to the list of saved bookmarks or favorites in your browser.
- Create a desktop shortcut pointing to the URL.
- Link to an application URL from within your company's Intranet site or portal.

Customizing the launch page

The controls in the upper right corner of the Application Launch page allow you to add applications, and to toggle the display between panel and list view. You can also drag panels to rearrange them on the page.

- ▶ To add a new application panel, select Add application in the upper right corner of the Application Launch page. (If no additional applications are available, this link is not available.)

Figure 3-3
Link to add an application



A list of available applications is displayed. Optionally, you can create shortcuts to one or more labeled versions.

Figure 3-4
Adding a new application to the launch page

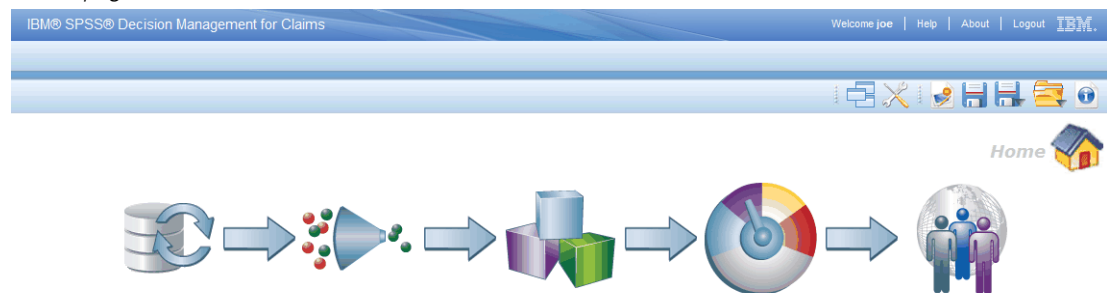


- ▶ To change the arrangement of application panels on the Launch page, click on the title bar of any panel and hold down the mouse button to drag the panel to a new location.
- ▶ To remove an application, click the remove icon (red X) in the upper right corner of the application panel. Any shortcuts that point to that application will also be removed. (The remove icon will not be available if the application panel has been locked on the page by the administrator.)
- ▶ Unsaved projects, models, and rules may be listed in the gallery on the launch page. This gallery displays models that are still building, as well as those that have completed building but are not yet saved. [For more information, see the topic Gallery on p. 25.](#)

The Home page

The application provides a step-by-step workflow, as represented by the icons on the Home page. Click any icon to jump to that step.

Figure 3-5
Home page



Data. Define data sets for use by the application. Operational data pertains to current claims, while models are based on past data, such as claims that have been previously been investigated for possible fraud.

Global Selections. Choose the records to include or exclude from all processing by the application. For example, you could exclude claims attributed to natural causes, or claims filed during the first six months of a new policy.

Define. Define the actions that can be taken for each claim, and the rules and models that are used to decide.

Combine. Combine the recommended actions from the Define tab to reach the best decision for each claim.

Deploy. Deploy the application for use in a test or production environment such as a call center, Web site, ATM, or store location as appropriate.

Report. Monitor the status of deployed applications.

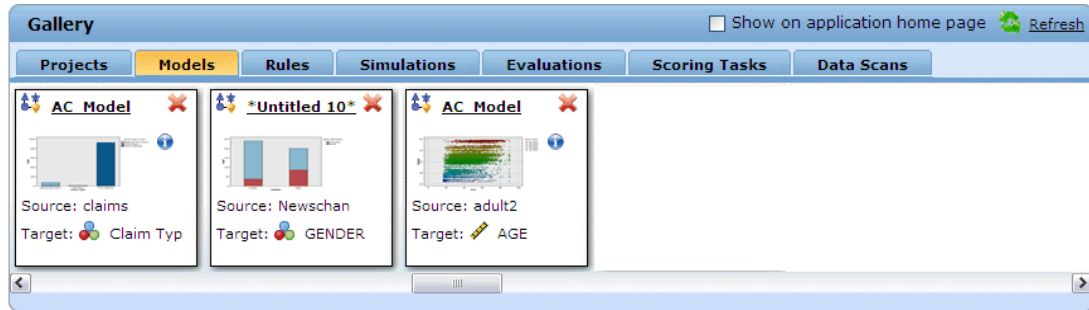
Tracking step completion. While working through the application, you can mark major sections as done. These sections are highlighted with a green check mark for easy reference. Optionally, your administrator may complete one or more sections for you (such as data sources).

Gallery

The gallery may be displayed on the Applications Launch Page, as well as each application home page, depending on how your administrator has set up your system. It lists unsaved work, such as a model that has been left to build overnight—you can start the model before you leave work, close your browser, and return to find your results in the morning. You can also use the gallery to retrieve your work after accidentally closing your browser. Items in the gallery may include

projects, rules, models, data scans, evaluations, and other long-running tasks as appropriate to the application.

Figure 3-6
Gallery on Applications Launch Page



If the name of the item is underlined, click the name to open the relevant item. For example, if you have an unsaved data scan, click on the data scan title in the gallery to open the Data tab.

If you do not require any item shown in the gallery click the delete icon to remove it; a warning message is displayed to confirm you want to permanently delete the item.

Setting preferences

There are a number of preferences you can adjust to customize IBM® SPSS® Decision Management to your needs. Primarily, this customization consists of setting your own default options to save you having to repeatedly select the same actions when creating, testing, and saving your work. The preferences you set are unique to you and apply to any application that you use.

To access the User Preferences settings dialog, from within any application, click the User Preferences icon on the toolbar.

Figure 3-7
User preferences icon



Figure 3-8
User Preferences settings dialog

Setting

User Settings

Login name: joe

Role: Business user

General Settings

Default number of recently opened objects in application shortcuts: 3

Date format: YYYY-MM-DD

Time format: HH:MM:SS

Currency: \$

Decimal places: 2

Number of rows to show on preview: 10

Test and Simulate Settings

Define Step Settings

Combine Step Settings

Rule Settings

Save Cancel

You can specify your own preferred settings for each area as detailed in the sections that follow.

User settings

Figure 3-9
User Settings

User Settings

Login name: joe

Role: Business user

General settings

Figure 3-10
General Settings

General Settings

Default number of recently opened objects in application shortcuts: 3

Date format: YYYY-MM-DD

Time format: HH:MM:SS

Currency: \$

Decimal places: 2

Number of rows to show on preview: 10

Default number of recently opened objects in application shortcuts. Select the number of items to be available from the drop-down list on the Application Launch page.

Date format. Select the format to use when displaying or recording dates.

Time format. Select the format to use when displaying or recording time.

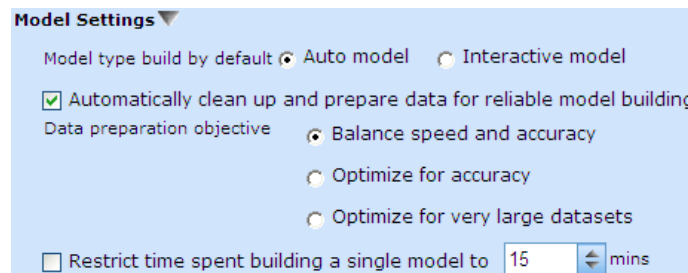
Currency. Select the default currency for each new project. Note that this will not overwrite existing data brought in as a different currency.

Number of rows to show on preview. Select the maximum number of records to show when displaying previews; for example, when checking a data source upon import.

Always prompt before deleting. Select this to override any deletion prompts that have been removed within individual applications.

Model settings

Figure 3-11
Model Settings



Model type build by default. Specify whether by default you want the application to build the best model automatically from the available data, or if you want to fine tune the building options each time a model is built.

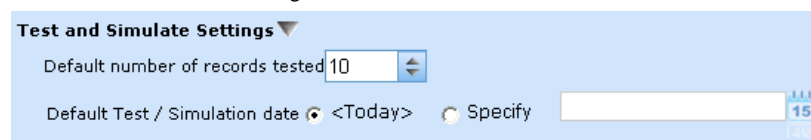
Automatically clean up. Selecting this option enables you to let the application do a lot of the data preparation. For example, repairing data issues, screening less useful data, or deriving new attributes.

You can choose whether the clean up operation should give an equal balance to both speed and accuracy, give priority to accuracy over speed, or give priority to speed such as when you are working with very large datasets or are looking for a quick result.

Restrict time spent building. Use this option to specify the default amount of time to spend building each model. This can be especially useful when processing large datasets, and can have a significant impact on the time needed for modeling building to complete.

Test and simulation settings

Figure 3-12
Test and Simulation Settings



Default number of records tested. Specify the default number of records to include when running a test.

Default Test/Simulation Date. Specify whether the default simulation date is set to the current date, or a specific date.

Define step settings

Figure 3-13
Define Step Settings

If you are creating new dimensions, such as campaigns or claims depending on the application, you can specify the default From and To dates applied to each new item. Alternatively, for open-ended offers, you can choose No expiration.

Combine step settings

Figure 3-14

Combination enables you to take several outputs, such as the results of different rules, and combine them, using a matrix, to produce a single output; however, when you have more than one way of analyzing records you may set up different combination action matrices. For example, if you are analyzing data from different sources, or interaction points, you may have different ways of combining the results for each.

You can specify whether to copy your existing combination settings to each new interaction point you set up, or create them with no preset combination matrices.

Rules settings

Figure 3-15

Aggregation. When using aggregation rules, specify whether by default all records have the value of the Remainder value points added to them or if the points are only added to those records to which no rules apply.

Allocation. When using allocation rules, specify whether the allocation type is established by using rules or just applied randomly. In addition, you can select whether rules-based allocation allocates records to the first valid option or all valid allocations.

Saving projects, models, and rules

You can save your work to the IBM® SPSS® Collaboration and Deployment Services Repository, or download to the local file system. Saving to the IBM SPSS Collaboration and Deployment Services Repository provides important benefits including support for multiple versions, labeling, and security. Depending on the local configuration, not all options may be supported.



Creates a new project, model, or rule. The specific type of object depends on the application.



Saves the current project, model, or rule to its last known location in the IBM SPSS Collaboration and Deployment Services Repository. Optionally, you can apply a new label when saving.



Saves the current project, model, or rule under a new name. Where applicable, you can choose between saving to the IBM SPSS Collaboration and Deployment Services Repository, and downloading to the local file system.

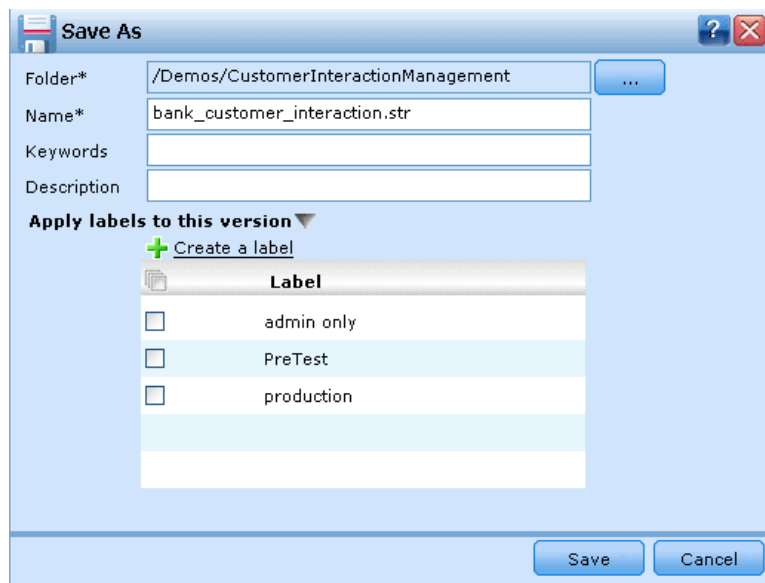


Opens a project, model, or rule from the IBM SPSS Collaboration and Deployment Services Repository and/or local file system as applicable.

Saving to IBM SPSS Collaboration and Deployment Services Repository

IBM® SPSS® Collaboration and Deployment Services Repository provides important benefits including support for multiple versions, labeling, and security. Each time you save you create a new version, and you can revert to an earlier version at any time. You can also manage versions using labels, and apply security settings to determine who can access, view, or remove an object. Support for IBM® SPSS® Collaboration and Deployment Services is required to access these features.

Figure 3-16
Save As dialog box



Folder. Choose the folder to save to (see below).

Name. Enter a unique name for the object you are saving.

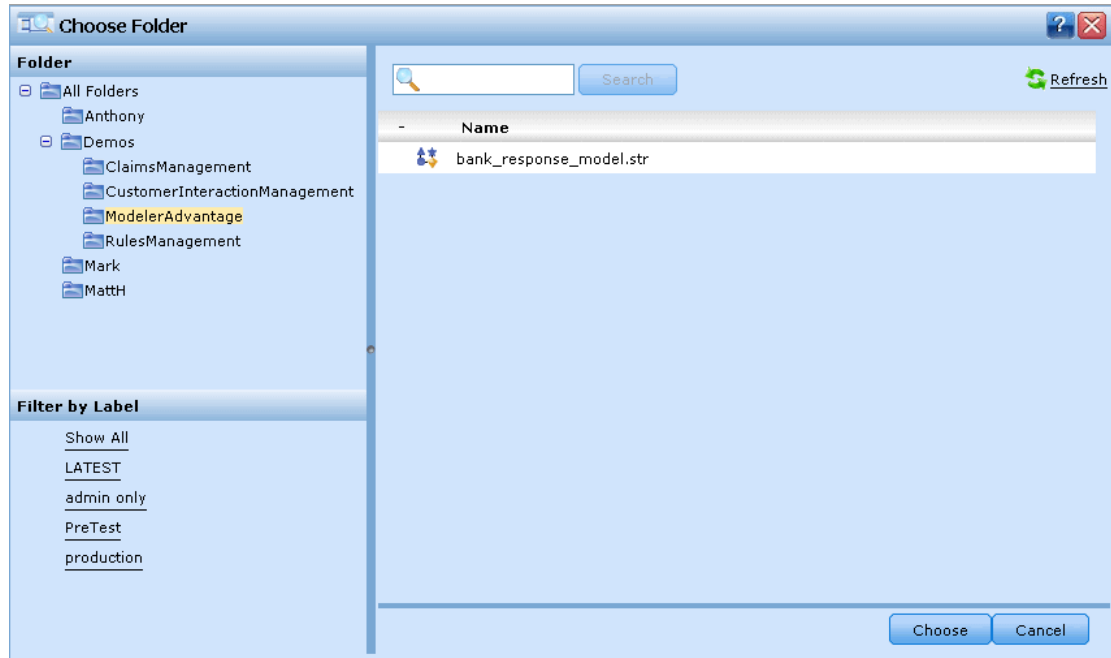
Keywords. Enter any keywords to quickly identify the saved object when searching for it. For example these might be “Sales” and “1-2009”.

Description. Enter a longer description of the object saved. For example, this might be “Analysis of retail sales; 1st quarter of 2009”.

Apply labels to this version. If you are likely to have several versions of the same saved object you can identify each with a unique label. Either select an existing label or create a new one.

Choosing a folder

Figure 3-17
Choosing the folder to save to



The tree view in the left pane displays folders in the IBM SPSS Collaboration and Deployment Services Repository you have authority to see. Navigate the folder tree or perform a search to find what you're looking for. You can also filter the file list by labels available in the lower-left pane. For example, you might click a *production* label to only display files marked with that label.

To see more details about a file, click the information icon beside it. A properties panel is displayed, with details such as keywords, labels, author, and date.

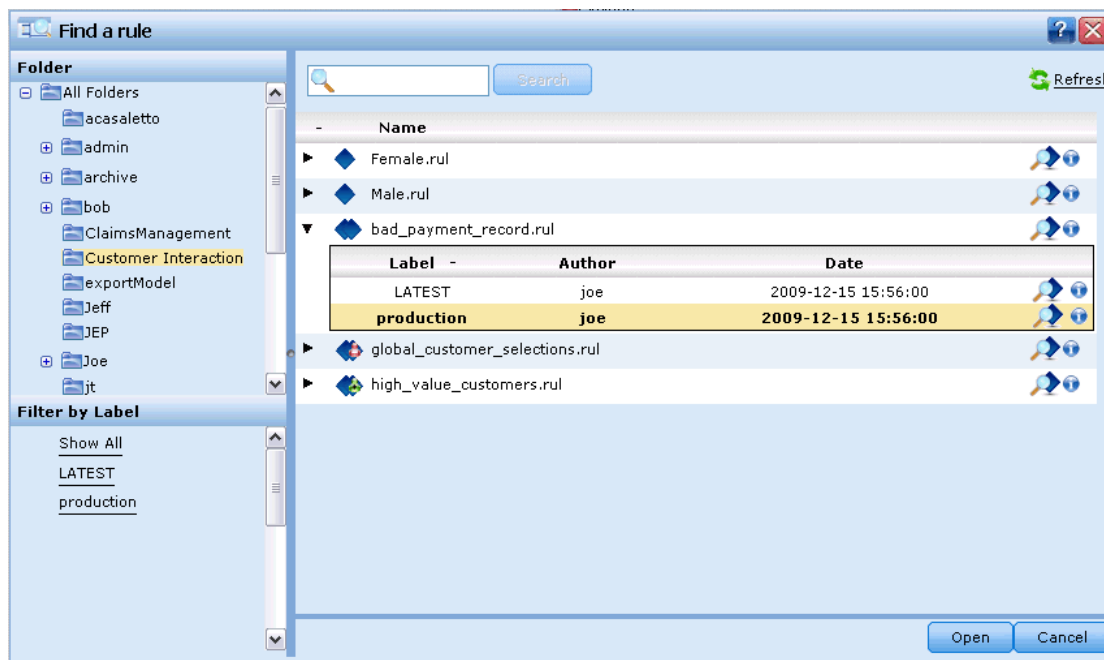
Folder. Displays available folders and allows you to navigate the hierarchy.

Filter by Label. Limits the display to objects with the selected label. When browsing folders, only objects with this label are shown.

Working with labels

Labels are used to identify a specific version of a project, model, or rule. When you share a rule between multiple projects, for example, you can specify that you want to use the version labeled *production*. If a newer version of the rule is created, the one used in your project won't change unless the *production* label is explicitly moved to that version.

Figure 3-18
Finding an existing rule



When referencing shared objects, using a labeled version is strongly recommended, particularly in a production environment, as any changes to the latest version may otherwise have unintended consequences. In certain cases, such as when referencing a rule from within a rule, a labeled version must be used. [For more information, see the topic Exporting and reusing rules in Chapter 6 on p. 60.](#)

If no version is specified, the latest version is used, which means that subsequent changes to the rule will automatically be picked up. (Think of *LATEST* as a special label that is automatically rolled to each new version as it is created.)

Each time you save a new object or version, you can choose the labels to apply to that version. [For more information, see the topic Saving projects, models, and rules on p. 30.](#)

Restrictions on label names. When defining labels for use with IBM® SPSS® Decision Management, the characters **? # &** and **:** (colon) cannot be included in label names, as they may prevent the application for correctly interpreting references to objects that use these labels. For example, the following would not be usable as a label names.

Test & Deploy

DEPLOY:PHASE1

Locking projects

When you open a project, model, or rule for editing, the object is locked in the IBM® SPSS® Collaboration and Deployment Services Repository so that other users cannot edit it. This is indicated by a check box in the upper right corner of the workspace. Alternatively, you can deselect this check box to allow others to edit the object.

Figure 3-19
Locking a workspace



- When a project is locked, other users can open it for viewing, but cannot save changes.
- When you close a locked project (for example by closing the browser) the lock is released so that others may edit the object.
- If you choose to unlock a project without closing it (by deselecting the Lock check box) you will be prompted to save any changes. Unsaved changes will be lost after the object is unlocked.
- After unlocking a project, you can continue to browse the workspace, but you can no longer save changes.

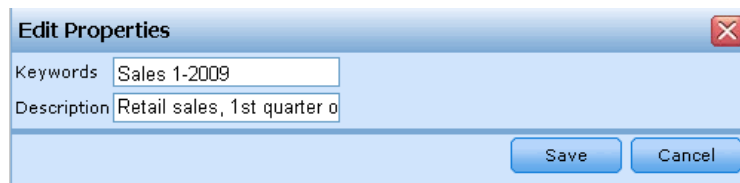
Object properties

When editing a ruleset, model, or project, you can add keywords and a description to help identify the object when browsing for it at a later date. To display the Edit Properties dialog, click the Properties icon in any application.

Figure 3-20
Properties icon



Figure 3-21
Properties for a model, rule, or project



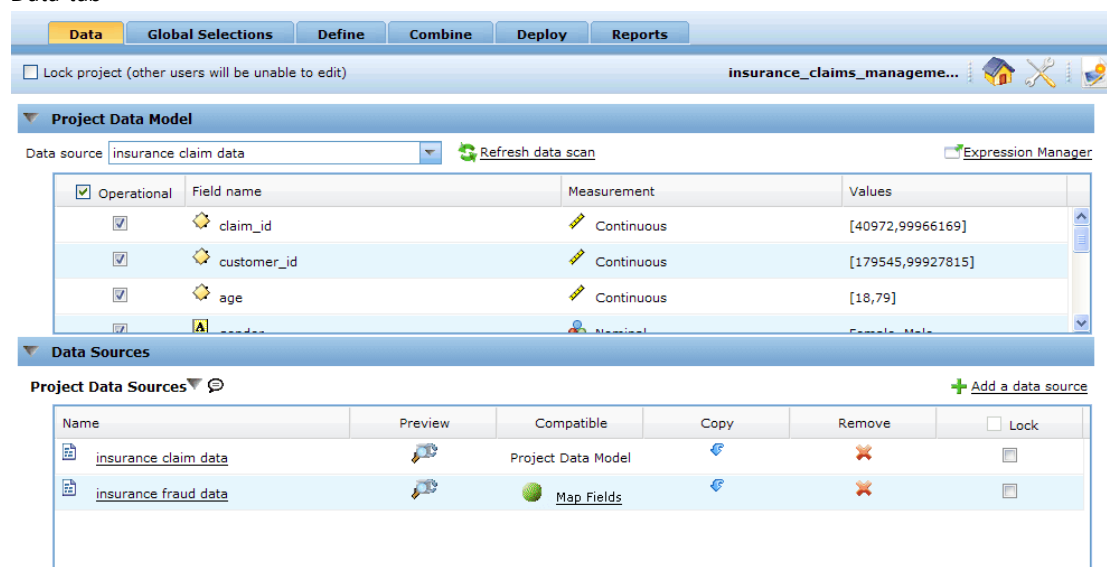
Keywords. Enter any keywords to quickly identify the saved object when searching for it. For example these might be “Sales” and “1-2009”

Description. Enter a longer description of the object saved. For example, this might be “Analysis of retail sales; 1st quarter of 2009”.

Managing data sources

The Data tab enables you to define data sources for analysis, simulation and testing, scoring, or other use. Data sets can be configured by your administrator, or you can add your own.

Figure 4-1
Data tab



The tab is divided into three main areas:

- **Project Data Model.** Defines the fields required by the application. All other data sets are mapped relative to this source.
- **Project Data Sources.** Lists the data sources that have been saved for use with the current project, model, or rule.
- **My Data Sources.** Lists data sources you have defined or saved. Data sets from this list can be copied to or from different projects, making it possible to share data across applications.

Project data model

The project data model acts like a template listing the input fields and types your project will use.

Operational. A check in this box shows that the data in the field is available for use in rules and expressions, and for predictions. Remove the check box if the field is to be used as the target field for analysis; for example, if you are running a query to see how well customers will respond to a direct mail campaign, the results field would be analytical since you do not know the response values in advance.

Note: If you select an IBM® SPSS® Collaboration and Deployment Services Enterprise View data source as the project data model, the boxes in this column are disabled.

Field Name. Displays the name of each field, as listed in the data source, along with an icon that identifies its storage type.

Measurement. Displays the measurement type of each field in the data source. If you change any of the measurement types, you must refresh the data scan to ensure data compatibility. [For more information, see the topic Measurement levels on p. 38.](#)

Value. Lists the values for each field in the data source. For example, maximum and minimum values in a range. For flag fields, hold the mouse pointer over the value to display a tool tip that indicates the “true” and “false” values defined for the field.

Project data sources

Project data sources may include those predefined by the administrator, or added by users. Optionally, the administrator may have locked one or more data sources to prevent users from modifying or removing them, or locked all data options so users can’t create new data sources.

If a data source’s inputs don’t directly match those of the project data model you can map the former to the latter and fix the discrepancy. For example, if the project data model requires a field named *purchase* with values *Yes* and *No* (measurement level flag), then any data source used must have a comparable field that can be mapped accordingly.

Name. Displays the data source name and shows an icon that identifies its file type.

Preview. Enables you to preview a sample of the data contained in the source. [For more information, see the topic Previewing data on p. 37.](#)

Compatible. Either displays a note that the data source is used as the project data model, or shows a green, orange, or red ball to indicate how compatible with the project data model the data source is.

- A green ball shows that the data source is operationally compatible with the project data model data source. An operationally compatible data source is one that includes all the operational fields of the project data model, but can have additional fields. This data source is suitable for rules, scoring, simulation, and test operations.
- An orange ball shows that the data source has at least one field that is compatible with the project data model, with the same name and type. This data source may also have additional fields, and is suitable for building and evaluating models.
- A red ball shows that the data source is incompatible with the project data model, and fields must be mapped before it can be used in the application. An incompatible data source is one which has at least one field whose type is incompatible with the equivalent project data model type.

Map fields. This option allows you to compare the data source fields with those in the project data model and map or unmap any compatible fields to match those required by the project data model. [For more information, see the topic Mapping fields on p. 51.](#)

Copy. Enables you to copy the data source to the My Data Sources area.

My data sources

Data sources on this list are saved with your user account, so they are available whenever you log in, and can be copied to any project, model, or rule that you open (assuming your administrator has given you authority to do so). Fields in this part of the tab work in the same way as those in the Project Data Sources area; although there is no Compatibility column.

The Copy column enables you to copy the data source into the Project Data Sources area.

Working with data sources

- ▶ To add a new data source to either the Project Data Sources or My Data Sources lists, select Add a data source. [For more information, see the topic Creating a new data source on p. 39.](#)
- ▶ To change the measurement level, or type, of a field in the data source in the Project Data Model, select the relevant level. [For more information, see the topic Measurement levels on p. 38.](#)
- ▶ To copy data sources to or from the Project Data Sources list, click the appropriate arrow in the Copy column.
- ▶ To map field names for a data source to the project data model, click the appropriate link under the Compatible column. (Once field names have been mapped, the link is no longer displayed.) [For more information, see the topic Mapping fields on p. 51.](#)
- ▶ To preview a data source, click the Preview icon. [For more information, see the topic Previewing data on p. 37.](#)

Previewing data

To verify that you have selected the correct data source, click the Preview icon to display a sample of the data contained in the source.

Figure 4-2
Data preview

Age	Months as a C	Number of Prods	RFM Score	Average Balance	Number
40	24	3	9.83	229	2
47	12	2	11.81	8	1
35	36	0	0	0	0
45	0	0	0	0	0
13	48	0	0	0	0
45	12	2	11.82	119	1
40	12	0	0	0	0
36	36	0	0	0	0
26	12	1	7.88	179	1
33	36	2	9.92	120	1

Measurement levels

The measurement level helps characterize the information represented by each data field, and may determine how a given field is used in rules, modeling, or other applications. The measurement level can be specified in the Project Data Model for a data source; for example, you may want to set the measurement level for an integer field with values of 0 and 1 to *Flag*, to indicate that 0 = *False* and 1 = *True*. Alternatively, you can change the level in the Data Source Editor dialog when you specify the input fields to be used. [For more information, see the topic Selecting input fields on p. 49.](#)

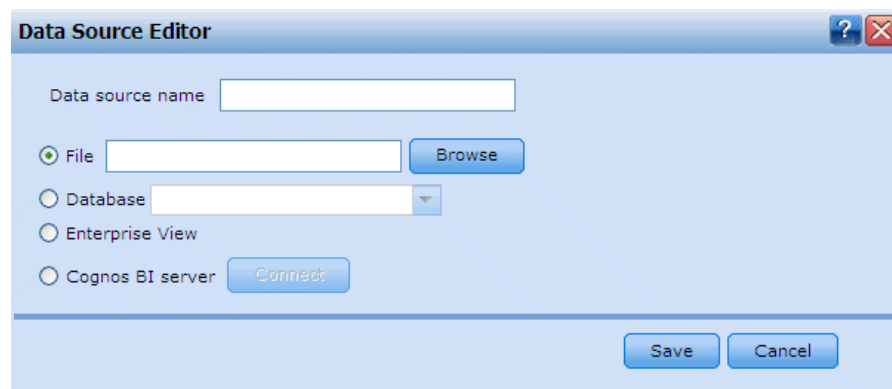
The following measurement levels are available:

- **Continuous.** Used to describe numeric values, such as a range of 0–100 or 0.75–1.25. A continuous value can be an integer, real number, or date/time.
- **Categorical.** Used for string values when an exact number of distinct values is unknown. This is an **uninstantiated** data type, meaning that all possible information about the storage and usage of the data is not yet known. Once data have been read, the measurement level will be *Flag*, *Nominal*, or *Typeless*.
- **Flag.** Used for data with two distinct values that indicate the presence or absence of a trait, such as true and false, Yes and No or 0 and 1. In IBM® SPSS® Decision Management, the first value from the category list will be used as “false” value and the second will be the “true” value, as indicated by a tool tip when hovering over the values when displayed on the Data tab. Data may be represented as text, integer, real number, date, time, or timestamp.

- **Nominal.** Used to describe data with multiple distinct values, each treated as a member of a set, such as *small/medium/large*. Nominal data can have any storage—numeric, string, or date/time. Note that setting the measurement level to *Nominal* does not automatically change the values to string storage.
- **Ordinal.** Used to describe data with multiple distinct values that have an inherent order. For example, salary categories or satisfaction rankings can be typed as ordinal data. The order is defined by the natural sort order of the data elements. For example, 1, 3, 5 is the default sort order for a set of integers, while HIGH, LOW, NORMAL (ascending alphabetically) is the order for a set of strings. The ordinal measurement level enables you to define a set of categorical data as ordinal data for the purposes of visualization, model building, and export to other applications (such as IBM® SPSS® Statistics) that recognize ordinal data as a distinct type. You can use an ordinal field anywhere that a nominal field can be used. Additionally, fields of any storage type (real, integer, string, date, time, and so on) can be defined as ordinal.
- **Typeless.** Used for data that does not conform to any of the above types, for fields with a single value, or for nominal data where the set has more members than the defined maximum. It is also useful for cases in which the measurement level would otherwise be a set with many members (such as an account number).

Creating a new data source

Figure 4-3
Data Source Editor



- ▶ To access the Data Source Editor, select Add a data source under either the Project Data Sources or My Data Sources area.
- ▶ Type a name for the data source.
- ▶ Select the source type:
 - **File.** Supported file types include text (*.txt, *.csv), Excel, and the *.sav format used by IBM® SPSS® Statistics. [For more information, see the topic File source on p. 40.](#)
 - **Database.** Any database that supports ODBC, including Microsoft SQL Server, DB2, Oracle, and others. [For more information, see the topic Database source on p. 44.](#)

- **IBM SPSS Collaboration and Deployment Services Enterprise View.** Creates a connection to an IBM® SPSS® Collaboration and Deployment Services Enterprise View as defined in IBM® SPSS® Collaboration and Deployment Services. [For more information, see the topic IBM SPSS Collaboration and Deployment Services Enterprise View source on p. 45.](#)
 - **Cognos BI server.** Any database that supports Cognos BI server, version 14.1 or lower. [For more information, see the topic Cognos BI source on p. 46.](#)
- Specify options as appropriate for the source type.

File source

The application supports several data file types. When you enter the filename or browse for the file, the application automatically detects the type and expands the Data Source Editor to display additional fields that relate to that type.

If the file type is incorrect, or requires a specific version (for example Microsoft Excel 1997-2003), you can change the type to the one required.

Text-based data files

When you select a text-based data source, you are prompted to enter further details.

Figure 4-4
Text-based data source settings

The screenshot shows the 'Data Source Editor' dialog box. The 'Data source name' field contains 'bank customer data'. The 'File' radio button is selected, and the file path is 'C:\LEO\Demos\bank_customer_data.txt'. Below this, there are radio buttons for 'Database' and 'Enterprise View'. The 'Type detected' section shows '.txt Plain text' with a 'Change Type' button. The 'First row has column names' checkbox is checked, and the 'Encoding' is set to 'System default'. The 'Decimal symbol' is set to 'Period (.)'. The 'Delimiters' section has checkboxes for 'Space()', 'Comma (,)', 'Tab', 'Newline', 'Other:', 'Non-printing characters', and 'Allow multiple blank delimiters'. The 'Advanced Options' and 'Specify Input Fields' sections are collapsed. 'Save' and 'Cancel' buttons are at the bottom right.

First row has column names. Select this if the names of each column are included as a heading row in the data source.

Encoding. Specifies the text-encoding method used. You can choose between the system default or UTF-8.

Decimal symbol. Specifies how decimals should be represented in the data.

- **Period (.).** The period character will be used as the decimal separator.
- **Comma (,).** The comma character will be used as the decimal separator.

Delimiters. Using the check boxes listed for this control, you can specify which characters, such as the comma (,), define field boundaries in the file. You can also specify more than one delimiter, such as “,|” for records that use multiple delimiters. The default delimiter is the comma.

Note: If the comma is also defined as the decimal separator, the default settings here will not work. In cases where the comma is both the field delimiter and the decimal separator, select Other in the Delimiters list. Then manually specify a comma in the entry field.

Select Allow multiple blank delimiters to treat multiple adjacent blank delimiter characters as a single delimiter. For example, if one data value is followed by four spaces and then another data value, this group would be treated as two fields rather than five.

Advanced options

Figure 4-5
Advanced options

EOL comment characters. Specify characters, such as # or !, to indicate annotations in the data. Wherever one of these characters appears in the data file, everything up to but not including the next new-line character will be ignored.

Specify input fields. Specify the number of input fields to be used from each record.

Skip header characters. Specify how many characters you want to ignore at the beginning of the first record.

Lines to scan for type. Specify how many lines to scan for specified data types.

Strip lead and trail spaces. Select to discard leading and trailing spaces in strings on import. You can choose to strip from the left, right, both sides, or none.

Invalid characters. Select Discard to remove invalid characters from the data source. Select Replace with to replace invalid characters with the specified symbol (one character only). Invalid characters are null characters or any character that does not exist in the encoding method specified.

Quotes. Using the drop-down lists, you can specify how single and double quotation marks are treated on import. You can choose to Discard all quotation marks, Include as text by including them in the field value, or Pair and discard to match pairs of quotation marks and remove them. If a quotation mark is unmatched, you will receive an error message. Both Discard and Pair and discard store the field value (without quotation marks) as a string.

Specify input fields. For more information, see the topic [Selecting input fields](#) on p. 49.

Excel data files

When you select an Excel data source, you are prompted to enter further details.

Figure 4-6
Excel data source settings

The screenshot shows the 'Data Source Editor' dialog box. At the top, the 'Data source name' is 'bank customer data'. Below this, the 'File' radio button is selected, with the path '\$CLEO/Demos/bank_customer_d:' and a 'Browse' button. The 'Database' and 'Enterprise View' radio buttons are unselected. A horizontal line separates the source selection from the file type settings. Below the line, 'Type detected: .xls Microsoft Excel 97-2003' is shown with a 'Change Type' button. The 'First row has column names' checkbox is checked. The 'Use named range' checkbox is unchecked, with an empty text box next to it. Under 'Choose worksheet:', 'By index' is selected with the value '0'. Under 'Range on worksheet:', 'Range starts on first non-blank row' is selected. The 'Explicit range of cells' option is unselected with empty text boxes. The 'On blank row' dropdown is set to 'Stop'. At the bottom, there is a 'Specify Input Fields' button with a right-pointing arrow, a 'Lock data source' checkbox (unchecked), and 'Save' and 'Cancel' buttons.

First row has column names. Select this if the names of each column are included as a heading row in the data source.

Named range. Enables you to select a named range of cells as defined in the Excel worksheet. If you use a named range, other worksheet and data range settings are no longer applicable and are disabled as a result.

Choose worksheet. Specifies the worksheet to import, either by name or by index.

- **By name.** Select the name of the worksheet you want to import.
- **By index.** Specify the index value for the worksheet you want to import, beginning with 0 for the first worksheet, 1 for the second worksheet, and so on.

Range on worksheet. You can import data beginning with the first non-blank row or with an explicit range of cells.

- **Range starts on first non-blank row.** Locates the first non-blank cell and uses this as the upper left corner of the data range.
- **Explicit range of cells.** Enables you to specify an explicit range by row and column. For example, to specify the Excel range A1:D5, you can enter A1 in the first field and D5 in the second (or alternatively, R1C1 and R5C4). All rows in the specified range are returned, including blank rows.

On blank rows. If a blank row is encountered, you can choose whether to skip and ignore the row or choose Return blank rows to continue reading all data to the end of the worksheet, including blank rows.

Specify input fields. For more information, see the topic [Selecting input fields on p. 49](#).

IBM SPSS Statistics data files

When you select a IBM® SPSS® Statistics data source, you are prompted to enter further details.

Figure 4-7
IBM SPSS Statistics data source settings

Variable names. Select a method of handling variable names and labels upon import from a SPSS Statistics *.sav* file.

- **Read names and labels.** Select to read in both variable names and labels; this is the default option. Labels may be displayed in charts, model browsers, and other types of output.
- **Read labels as names.** Select to read in the descriptive variable labels from the SPSS Statistics *.sav* file rather than the short field names, and use these labels as variable names.

Values. Select a method of handling values and labels upon import from a SPSS Statistics *.sav* file.

- **Read data and labels.** Select to read in both actual values and value labels; this is the default option.
- **Read labels as data.** Select if you want to use the value labels from the *.sav* file rather than the numerical or symbolic codes used to represent the values. For example, selecting this option for data with a gender field whose values of 1 and 2 actually represent *male* and *female*, respectively, will convert the field to a string and import *male* and *female* as the actual values.

It is important to consider missing values in your SPSS Statistics data before selecting this option. For example, if a numeric field uses labels only for missing values (0 = *No Answer*, -99 = *Unknown*), then selecting the option above will import only the value labels *No Answer* and *Unknown* and will convert the field to a string. In such cases, you should import the values themselves.

Specify input fields. For more information, see the topic [Selecting input fields on p. 49](#).

Database source

When you select a Database source, you are prompted to enter further details.

Figure 4-8
Database data source settings

Test connection. Enter your database username and password and click to check that you have access to the database.

Table Name. Select the table from which data is to be used.

Strip lead and trail spaces. Select to discard leading and trailing spaces in strings on import. You can choose to strip from the left, right, both sides, or none.

Quote table and column names. Specify whether you want table and column names to be enclosed in quotation marks when queries are sent to the database (if, for example, they contain spaces or punctuation).

- The As needed option will quote table and field names *only* if they include nonstandard characters. Nonstandard characters include non-ASCII characters, space characters, and any non-alphanumeric character other than a full stop (.

- Select Never if you *never* want table and field names quoted.
- Select Always if you want *all* table and field names quoted.

Specify input fields. For more information, see the topic [Selecting input fields on p. 49](#).

IBM SPSS Collaboration and Deployment Services Enterprise View source

When you select an IBM® SPSS® Collaboration and Deployment Services Enterprise View source, you are prompted to enter further details.

Figure 4-9

IBM SPSS Collaboration and Deployment Services Enterprise View data source settings

The screenshot shows the 'Data Source Editor' dialog box. At the top, the title bar reads 'Data Source Editor'. Below it, the 'Data source name' field contains 'Employee Records'. There are three radio buttons: 'File', 'Database', and 'Enterprise View', with 'Enterprise View' selected. Below the radio buttons, there are three rows of configuration: 'Application View' with a dropdown set to 'av_yaliu' and 'LATEST' next to it, and a 'Browse' button; 'Table' with a dropdown set to 'Employees'; and 'Data Provider' with a dropdown set to 'analyticDPD_yaliu'. Below these is the text 'Environment: Analytic'. At the bottom left is a 'Specify Input Fields' button with a right-pointing arrow. At the bottom right are 'Save' and 'Cancel' buttons.

Application view. The drop-down list displays the selected application view, if any. If connections have been made to other Application Views in the current session, these also appear on the drop-down list. Click the adjacent Browse button to search for other Application Views in the repository.

Table. Select the table from which data is to be used.

Data provider. The drop-down list displays the names of up to ten Data Provider Definitions (DPDs) for the selected Application View. Only DPDs that reference the selected Application View are shown.

Environment. The environment value, which is set in IBM® SPSS® Collaboration and Deployment Services, determines which DPDs are available.

Specify input fields. For more information, see the topic [Selecting input fields on p. 49](#).

For more details about the IBM SPSS Collaboration and Deployment Services Enterprise View, and complete details about how this data is configured, see the IBM SPSS Collaboration and Deployment Services documentation.

Cognos BI source

Note: If the IBM® SPSS® Modeler Server in use with IBM® SPSS® Decision Management does not support Cognos BI server, version 14.1 or lower, then this option is not available.

Figure 4-10
Data Source Editor - Cognos BI server selected

The screenshot shows the 'Data Source Editor' dialog box. At the top, the title bar reads 'Data Source Editor'. Below it, the 'Data source name' field is filled with 'SEB01'. There are four radio button options: 'File', 'Database', 'Enterprise View', and 'Cognos BI server'. The 'Cognos BI server' option is selected, and a 'Connect' button is next to it. To the left of the 'File' and 'Database' options are empty text boxes, and a 'Browse' button is next to the 'File' box. Below these options is a 'Package' field with an empty text box and a 'Browse' button. At the bottom of the dialog, there are two buttons: 'Save' and 'Cancel'. There are also two expandable sections: 'Select Package Objects' and 'Review Input fields', both with right-pointing arrows.

When you select Cognos BI server and click Connect you are prompted to enter the server connection details.

Figure 4-11
Cognos server selection

The screenshot shows the 'Connect to Cognos BI Server' dialog box. The title bar reads 'Connect to Cognos BI Server'. The 'Server URL' field is filled with 'http://9.119.83.17:9300/p2pd/servlet/dispatch'. Below this, there are two radio button options for 'Mode': 'Set credentials' and 'Use Anonymous Connection'. The 'Use Anonymous Connection' option is selected. There are three text input fields: 'Namespace', 'User name', and 'Password'. At the bottom, there are two buttons: 'Connect' and 'Cancel'.

- ▶ Type the Server URL of the Cognos server from which to import or export data. Contact your Cognos system administrator if you are not sure which URL to use.
- ▶ Select the Mode in which you will connect.

- ▶ To log in as a specific user (for example, as an administrator), select **Set Credentials** and enter the Cognos namespace, username, and password:
 - Specify the Cognos security authentication provider Namespace used to log on to the server. The authentication provider is used to define and maintain users, groups, and roles, and to control the authentication process.
 - Enter the Cognos User name with which to log on to the server.
 - Enter the Password associated with the specified user name.
- ▶ Alternatively, to log in with no user credentials, in which case you can not fill in the namespace, username, and password fields, select **Use Anonymous connection**.

Note: Some server connections do not allow Anonymous connections.

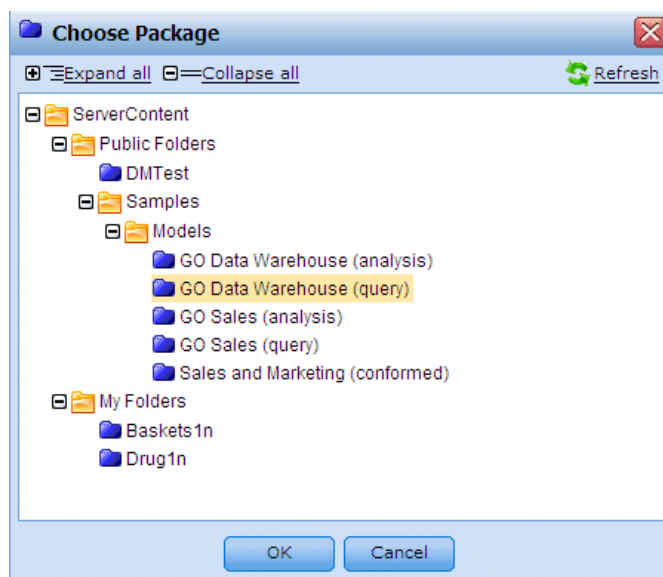
Selecting Cognos package details

When you have set up a Cognos server connection, you first select a package from which to import data and then select the query subjects or individual query items that you want to import from the selected package.

A package contains a Cognos model and all of the folders, queries, reports, views, shortcuts, URLs, and job definitions associated with that model. A Cognos model defines business rules, data descriptions, data relationships, business dimensions and hierarchies, and other administrative tasks.

To select a package, click **Browse**, the **Choose Package** dialog box is displayed and lists all available packages from which you can import content.

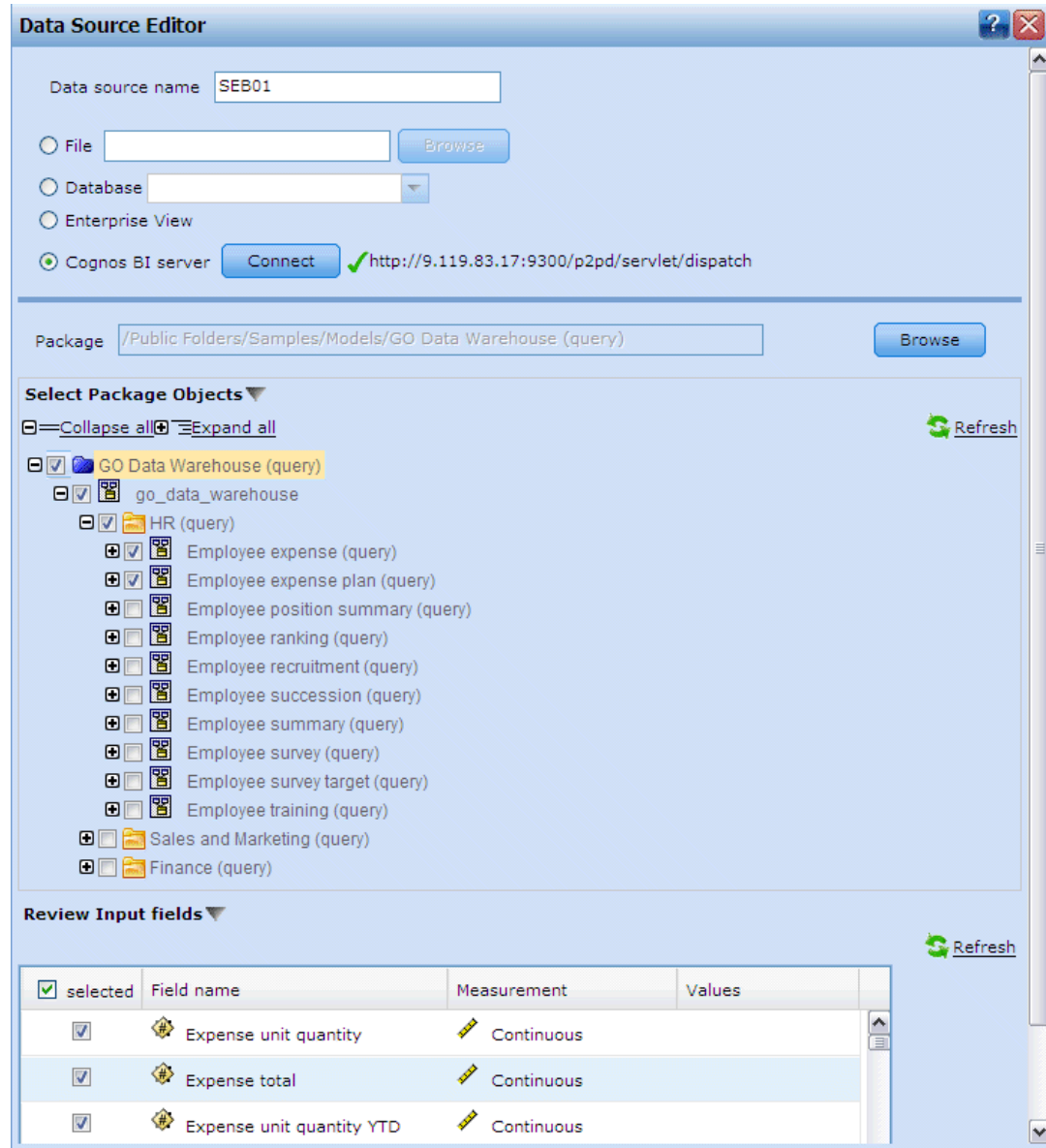
Figure 4-12
Cognos package selection



Where necessary, expand the list to find the package you require; click on the package name to select it, and click OK. The package details are shown in the Data Source Editor.

After you have selected a package you then choose the package object query subjects (which represent database tables) or individual field query items (which represent table columns) that you want to use from the package. *Note:* The data must be in UTF-8 format.

Figure 4-13
Cognos input field selection



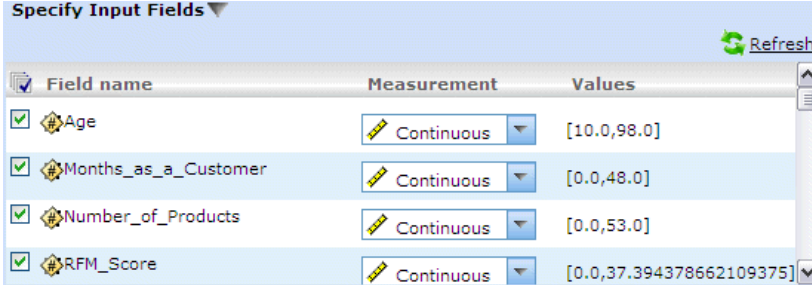
Select Package Objects. Displays the name of the selected package, together with the package objects (also known as namespaces) associated with the package that you can select. Expand one or more package objects to display the input fields that you can import. Selecting a package object automatically selects all of its input fields.

Review Input Fields. Lists the input fields (also known as database objects) that will be imported into IBM® SPSS® Decision Management for processing. If you do not require a particular field, clear the check box next to the field name.

Selecting input fields

When you have a large amount of data, you may want to reduce or fine tune the data imported from your source; for example, to only use the fields that are relevant to your area of interest.

Figure 4-14
Data input fields



Field name	Measurement	Values
<input checked="" type="checkbox"/> Age	Continuous	[10.0,98.0]
<input checked="" type="checkbox"/> Months_as_a_Customer	Continuous	[0.0,48.0]
<input checked="" type="checkbox"/> Number_of_Products	Continuous	[0.0,53.0]
<input checked="" type="checkbox"/> RFM_Score	Continuous	[0.0,37.394378662109375]

- ▶ At the bottom of the Data Source Editor dialog, click Specify Input Fields; the dialog expands to display all of the data fields in your source. In addition, all expressions that you have defined are also displayed. [For more information, see the topic Expression manager on p. 49.](#)
- ▶ Select each of the fields and expressions that you want to use.

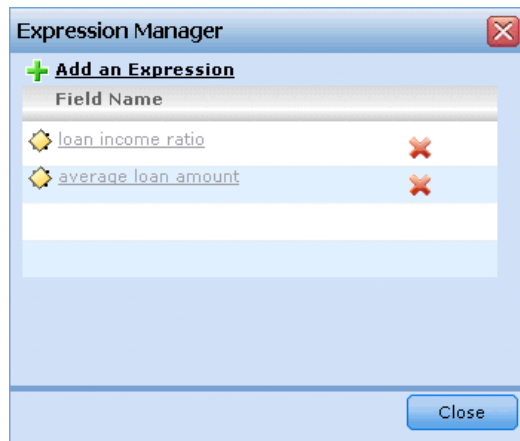
In addition to selecting data you can, where required, change the measurement level for one or more of the data fields. [For more information, see the topic Measurement levels on p. 38.](#)

Expression manager

You can use the expression manager to derive additional fields or attributes for use by the application. For example, if you are using banking data, you may want to create an expression that shows the ratio between a customer's income and the number of loan accounts they have. Expressions are always numeric with a measurement of Continuous; this can not be changed.

Note: Expressions are available throughout the application in the same way as operational data; for example, in rules and model predictors.

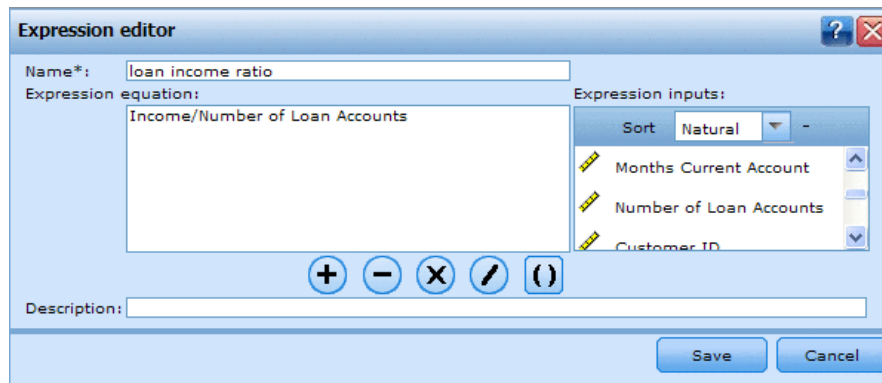
Figure 4-15
Expression manager



- ▶ To display existing expressions, click Expression Manager on either the Data tab or the Data Source Editor.

Creating an expression

Figure 4-16
Creating a new expression



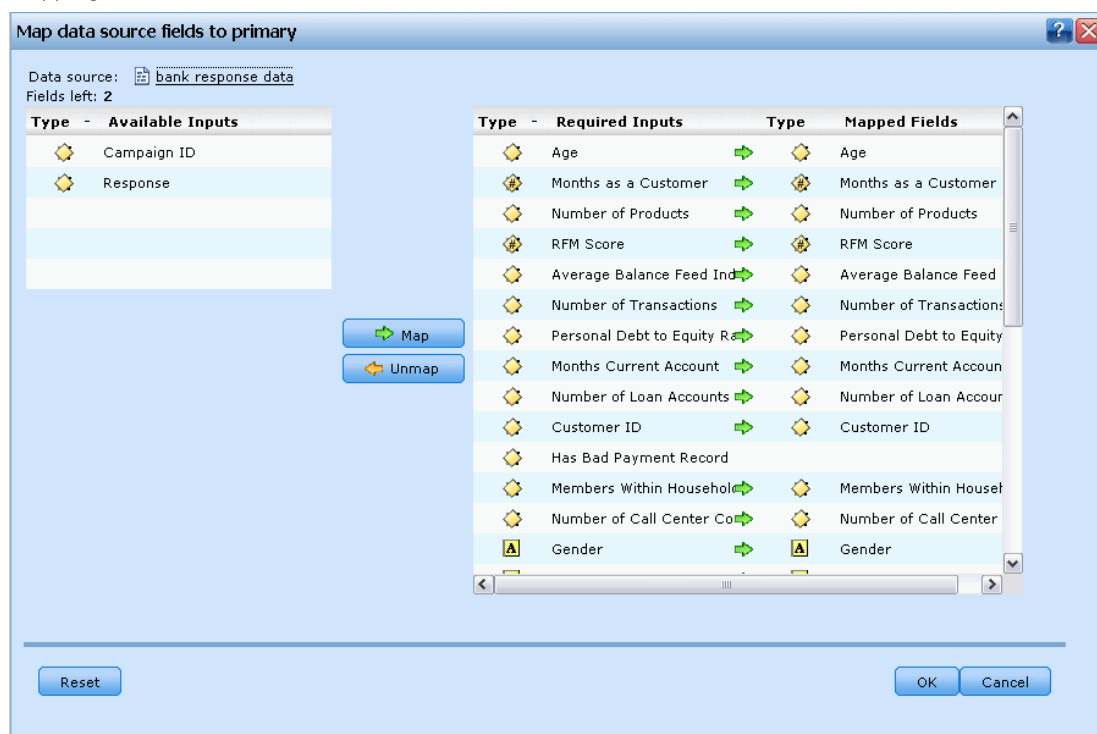
- ▶ In the Expression Manager dialog, click Add an Expression; the Expression Editor dialog is displayed, showing all available inputs from the data source.
- ▶ Enter a unique Name for the expression.
- ▶ Either double-click or drag the required inputs and mathematical symbols to the Expression Equation field to build your expression.
- ▶ Enter a Description that explains what the expression is used for.
- ▶ Click Save to return to the Expression Manager dialog.

Mapping fields

When adding a new data source, you may need to map all of its fields to ensure compatibility with the project data model. For example, if the project data model requires a field named *purchase* with values *Yes* and *No* (measurement level flag), then any data source used must have a compatible field. If the field names are not identical, they can be mapped accordingly. Note that the input and associated mapped field must have the same data type.

Alternatively, if the project data model changes, then it may be that many data sources no longer map to it correctly. If that is the case, then the compatibility indicator ball in the Project Data Sources area will change to the appropriate color for each of those data sources; you will then have to remap all of them to the new project data model.

Figure 4-17
Mapping data fields

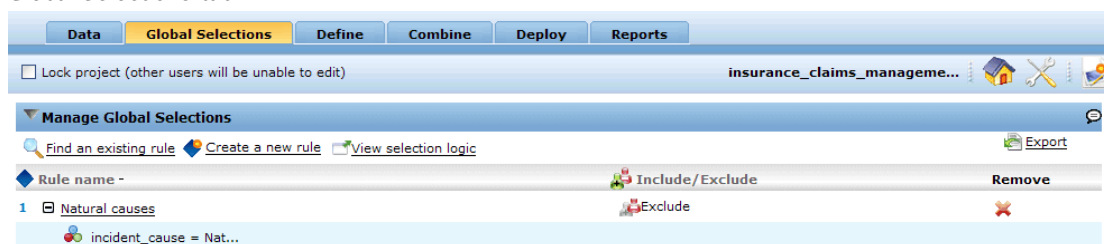


- ▶ In the Project Data Sources area, click Map fields. A dialog opens, and the system makes a best guess at mapping fields for you. At any point, you can return to the system's best guess by clicking Reset.
- ▶ Select a field in the Available Inputs column, and its corresponding field in the Required Input Fields column, and click Map to map the two fields. Repeat this until all fields in the Available Inputs column have been mapped.
- ▶ When finished, click OK.

Global selections

Global selections allow you to choose the records to be included or excluded from processing by the application. They provide an effective means to enforce corporate-wide policies, such as excluding customers with poor credit or payment history from all future campaigns.

Figure 5-1
Global Selections tab



In a risk management application, you could enforce a mandatory exclusion to ensure that all insurance claims stemming from natural causes are forwarded to a designated office due to special handling requirements.

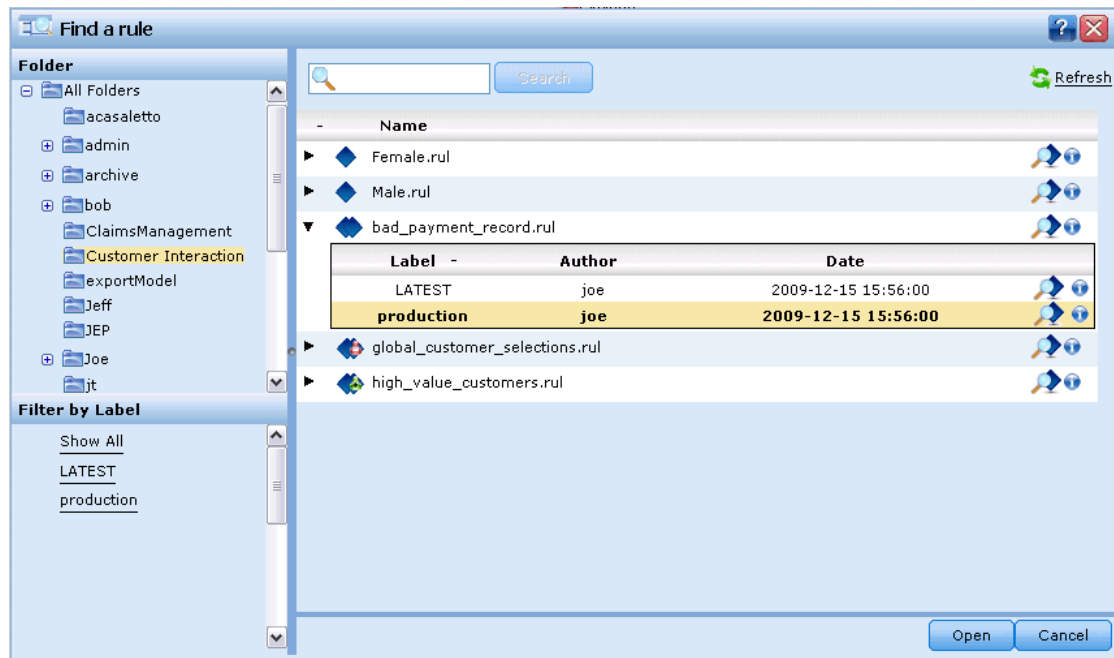
Global selections are implemented using standard selection rules, which can be defined applied at multiple points in an application. [For more information, see the topic Defining selection rules in Chapter 6 on p. 57.](#)

- You can toggle the selection between include and exclude by clicking the icon in the appropriate column for each rule.
- Because global selections are applied before other processing occurs, they may help to speed processing by reducing the number of records to be evaluated.
- An administrator or application designer may have already included one or more rules in your application that you cannot remove, even though you can add additional rules. For example, if your organization only targets people over 18 years old, a rule may be in place to enforce this policy.

Using shared rules

Global selections can be particularly effective when used in combination with shared rules, which are saved as separate objects that can be referenced (used) by multiple applications. If the shared rule changes, all applications that use the rule can then be updated. To search for rules by name or label, select Find an existing rule.

Figure 5-2
Finding a rule



Optionally, you can export the rules you create for use in other applications. [For more information, see the topic Exporting and reusing rules in Chapter 6 on p. 60.](#)

Working with rules

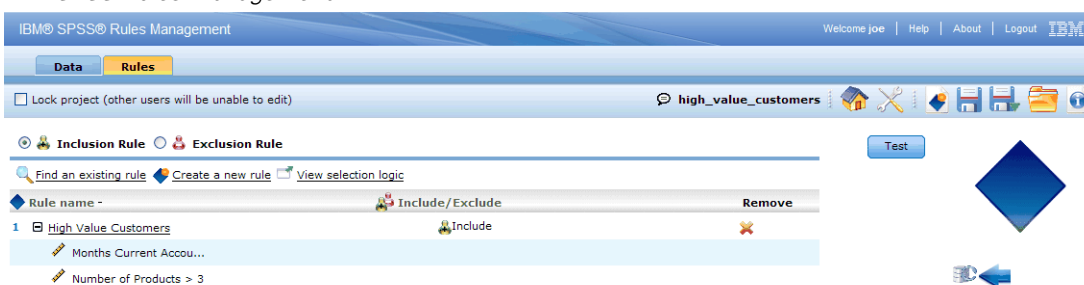
Rules are used to automate decisions based on business logic, or on the output from predictive models. Depending on the application, you might use rules to exclude customers based on payment history, to refer risky claims to a special investigations unit, or to target those with the highest propensity to churn, buy, or commit fraud as identified by a predictive model. While rules bring automation, models provide predictive power, and the ability to combine them is one of the key features that distinguish predictive applications from other analytical tools.

Rules can be created, applied, and saved at different points within each application. Alternatively, you can create and edit shared rules using IBM® SPSS® Rules Management.

IBM SPSS Rules Management

IBM® SPSS® Rules Management provides a central tool for creating and editing shared rules, which can be used throughout applications to select and process records, and to automate decisions accordingly. While rules can also be created and saved within each application, SPSS Rules Management allows you to save rules as separate objects that can be referenced from multiple applications. For example a rule to exclude customers who are below legal age could be shared across all applications to enforce a global policy, and any changes to the shared rule would be applied across all applications.

Figure 6-1
IBM SPSS Rules Management



Note that SPSS Rules Management may not be installed at all sites or available to all users. As an alternative, rules can also be defined and saved locally for use within each application.

Creating rules

- ▶ At the point in the application where you want to add a rule, select **Create a new rule**.
- ▶ Alternatively, select **Find an existing rule** to browse for existing rules which can be added or reused in the current application. [For more information, see the topic Exporting and reusing rules on p. 60.](#)

- ▶ To create a shared rule, launch IBM® SPSS® Rules Management from the Application Launch page.

Defining segment rules

Segment rules are used throughout the application to select and allocate records in different applications as appropriate. Segments are defined by one or more expressions that return a true or false result. For example you might have a rule with a single segment that returned true if the value of the age field was less than 18. Segments can be defined based on fields or expressions defined in the data, or on the propensity scores or predictions returned by a model.

Figure 6-2
Segment rule editor

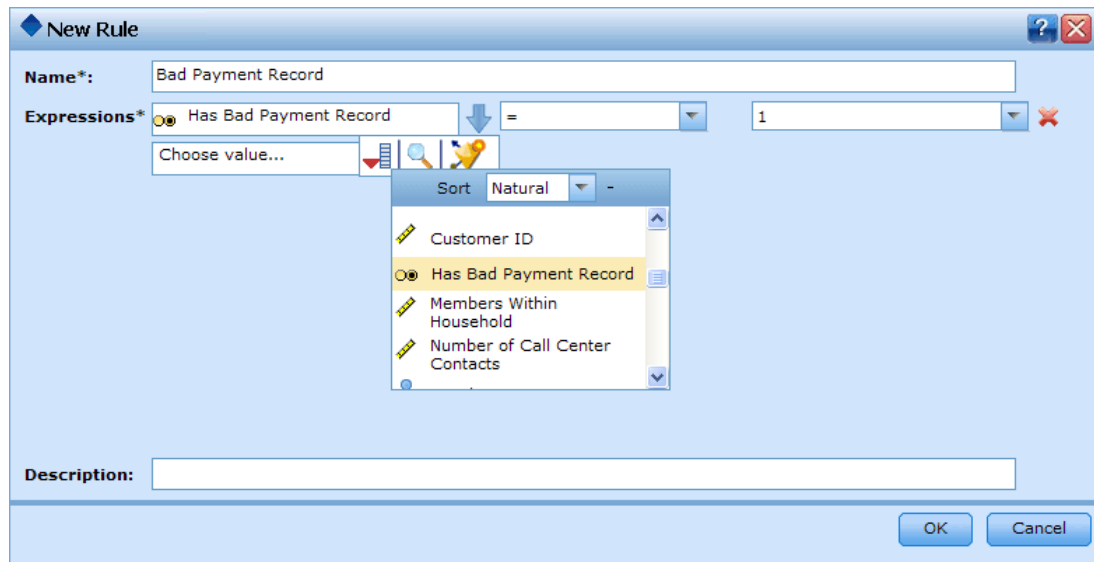
The screenshot shows the 'Edit Rule' dialog box. The 'Name*' field is 'High Value Customers'. The 'Expressions*' section contains three rows. The first row is 'Months Current Account' with a dropdown arrow, a comparison operator '>', a dropdown arrow, an information icon, and a text field containing '12'. The second row is 'Number of Products' with a dropdown arrow, a comparison operator '>', a dropdown arrow, an information icon, and a text field containing '3'. The third row is 'Choose value...' with a dropdown arrow. At the bottom of the dialog is a 'Description :' field and two buttons: 'OK' and 'Cancel'.

Each segment is defined by one or more expressions, and returns a value of true if all conditions are met. For example a segment defined by age and gender would only include records that met both conditions, and the rule would return *false* for all others.

To create or edit a segment rule

- ▶ In the application where you want to add the rule, select Create a new rule.

Figure 6-3
Creating a new segment rule



- ▶ Specify a name for the rule.
- ▶ For the input column, click the down-arrow icon to specify a field, rule, or model, as desired.



Allows you to choose a field from the current data set.



Allows you to choose an existing model or rule from the repository.



Allows you to build a new model.

- ▶ Choose the function you want to use. For numeric range inputs, options include the following:
 - = (equals)
 - != (not equal to)
 - > (greater than)
 - < (less than)
 - >= (greater than or equal to)
 - <= (less than or equal to)
 - BETWEEN
 - ISNIL

For categorical values:

- = (equals)
- != (not equal to)

- ONE OF
 - ISNIL
- Specify a value as appropriate for the input type. For non-numeric values, a dropdown list of choices is provided.

Alternatively, select Find an existing rule to browse for rules that have already been defined. [For more information, see the topic Exporting and reusing rules on p. 60.](#)

Segment rule sets

- Segment rules can also be combined into sets. A segment ruleset returns a value of true if *any* of the individual segments is true. Note this differs from the expressions *within* a segment, all of which must be true.
- You can export segment rulesets from any application that uses rules, or you can do this in IBM® SPSS® Rules Management if available. [For more information, see the topic Exporting and reusing rules on p. 60.](#)

Defining selection rules

A selection rule is a set of one or more segment rules or rule sets with an *Include* or *Exclude* attribute assigned to each. Selection rules are used throughout the applications to select subsets of records for modeling, or scoring, or other processing.

Figure 6-4
Selection rule

Rule name -	Include/Exclude	Remove
1 <input type="checkbox"/> Bad Payment Record ● Has Bad Payment Reco...	Exclude	
2 <input type="checkbox"/> Weeks Since Last Offer ✎ Weeks Since Last Off...	Exclude	

- In the application where you want to add the rule, select Create a new rule. This link is available at points where selection rules can be applied.
- Specify a name for the rule and add one or more expressions as desired. [For more information, see the topic Defining segment rules on p. 55.](#)
- Click OK to save the segment rule.
- In the selection rule editor, click the icons in the Include/Exclude column to toggle this setting for each rule. For referenced selection rulesets, this setting cannot be changed.

Alternatively, select Find an existing rule to browse for rules that have already been defined. [For more information, see the topic Exporting and reusing rules on p. 60.](#)

Evaluating selection rules

Select View selection logic to see details on how selections are made (logical AND versus OR).

Figure 6-5
Selection rule logic



- When evaluating selection rules, if multiple include segments are specified, records matching *any* of the segments are included. For example, customers might be included based on credit rating OR tenure.
- If multiple exclude segments are specified, records matching any of the segments are excluded. For example, customers might be excluded based on age OR credit rating.
- In case of a conflict, exclude rules take precedence. For example, a customer that falls into any excluded segment will be excluded regardless of any segments they would otherwise qualify for.
- When creating selection rule sets in IBM® SPSS® Rules Management, all rules must be of the same type—either *Include* or *Exclude*. You cannot combine inclusion and exclusion rules in the same rule set.

Defining aggregation rules

Aggregation rules allow you to sum one or more measures across a set of segment rules. For example, you can assign risk points based on the number of risk factors that apply. The sum of each measure for all true segments is included in the result.

Figure 6-6
Allocation based on rules

Use Rules to Decide Which Action is Triggered

Reminder:

[Find an existing rule](#)
[Create a new rule](#)
[Add annotations](#)
[OR](#)
[Split OR](#)
[Export](#)

Rule name -	Risk points	Sort	Remove
1 <input type="checkbox"/> Police Intervention	1	▲▼	✖
2 <input type="checkbox"/> Multiple Claims	3	▲▼	✖
3 <input type="checkbox"/> Cost over 5k	2	▲▼	✖
4 <input type="checkbox"/> Cost over 3k	1	▲▼	✖
5 <input type="checkbox"/> Material and Injury Claim	1	▲▼	✖
6 Remainder	0		

[+ Add Action](#)
[+ Add annotations](#)

Sum of Points>= ↓	Allocate to	Remove
1 5	Refer	✖
2 3	Standard	✖
3 0	Fast Track	

- ▶ In the application where you want to add the rule, select **Create a new rule**. This link is available on the **Define** tab in applications where aggregation rules can be applied.
- ▶ Specify a name for the rule and add one or more expressions as desired. [For more information, see the topic Defining segment rules on p. 55.](#)
- ▶ Click **OK** to save the segment rule, and repeat as needed to add additional segments.
- ▶ In the aggregation rule editor, specify the number of risk points assigned to each segment.
- ▶ Specify the number of risk points assigned to the remainder. Using the drop-down list toward the upper right, you can also specify whether this value is added to all records, or only in cases where no other rules apply.
- ▶ Optionally, you can export aggregation rulesets for use in other applications. [For more information, see the topic Exporting and reusing rules on p. 60.](#)
- ▶ Optionally, select **Add Annotations** to add a column into which you can enter text to be returned with the rule. [For more information, see the topic Adding annotations on p. 64.](#)
- ▶ Optionally, use the arrows to change the order in which items are displayed. The order has no effect on rule execution as the aggregation returns the same value regardless of order.
- ▶ To specify how actions are allocated based on the aggregated total, select **Add Action**. Specify a threshold value under **Sum of Points**, and select the desired action. Repeat as needed to specify additional actions.

Combine/split rules

You can select one or more rules and select OR to combine multiple rules into a single OR statement that assigns a specified number of points if *any* of the conditions is met.

Figure 6-7
Combining aggregation rules



To split an OR statement so that each condition is evaluated separately, select the statement and select Split OR.

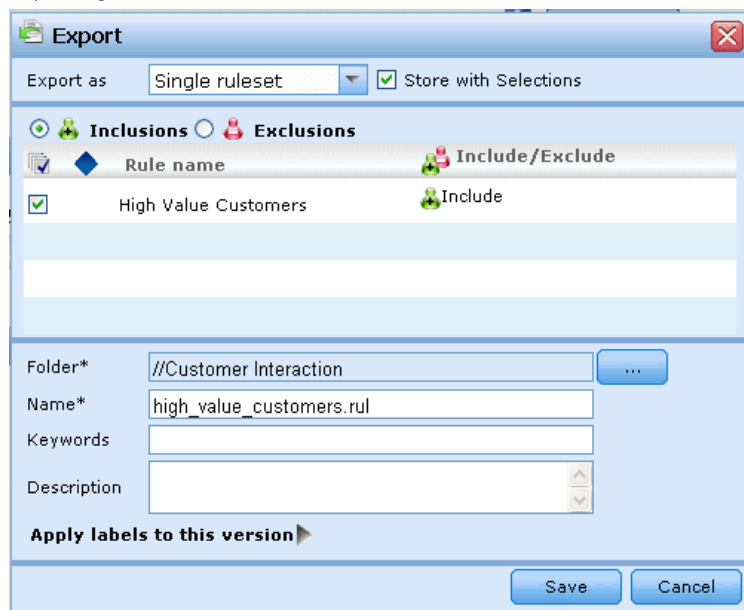
Exporting and reusing rules

By default, rules created in an application are saved with that application. Alternatively, rules can be exported or saved to IBM® SPSS® Collaboration and Deployment Services Repository for use in multiple applications. In this case each application stores a reference to a specific, labeled version of the shared rule; any changes to the rule are automatically applied to all applications that use that version.

Exporting rules

- From any application that contains a local rule you want to share, choose Export to save the rule to IBM SPSS Collaboration and Deployment Services Repository where it can be reused as needed.

Figure 6-8
Exporting a selection rule

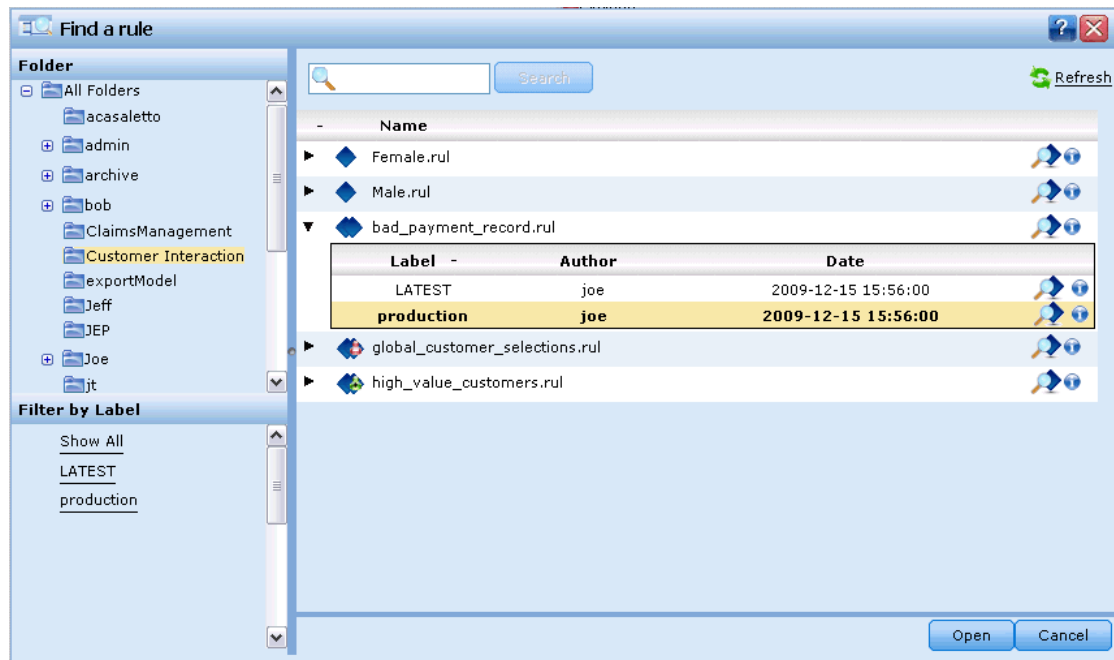


- When exporting multiple rules, specify whether you want to export them all in a single ruleset, or individual rules. In the case of individual rules, each segment is exported as a separate rule.
- When exporting multiple selection rules, if you choose Store with selections, a selection ruleset is exported. In this case you can export either inclusions or exclusions, but not both. If you need a mix of inclusions and exclusions, these need to be exported in separate rulesets. If Store with selections is not selected, a segment ruleset is exported.
- When exporting from an aggregation rule editor, if you choose Export with risk points, an aggregation ruleset is created. If this option is not selected, a segment ruleset is exported.

Using existing rules

- ▶ In any application where you want to make use of a shared rule, select Find an existing rule to browse IBM SPSS Collaboration and Deployment Services Repository for existing rules that can be reused in the current application.

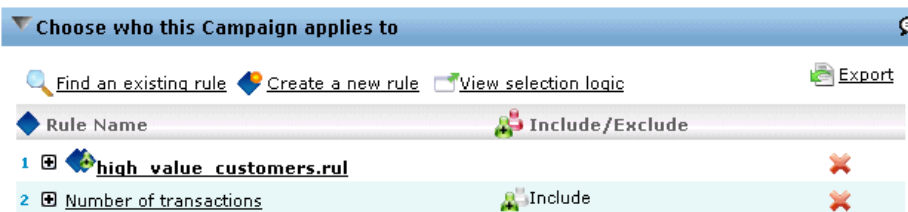
Figure 6-9
Finding an existing rule



- ▶ To reference a specific labeled version, click the arrow next to the rule name and choose the desired version. If no version is selected, the latest is used. (Think of *LATEST* as a special label that is automatically rolled to each new version as it is created.) Using a specific labeled version is recommended to avoid unexpected results that can occur when a new version of a rule is created.

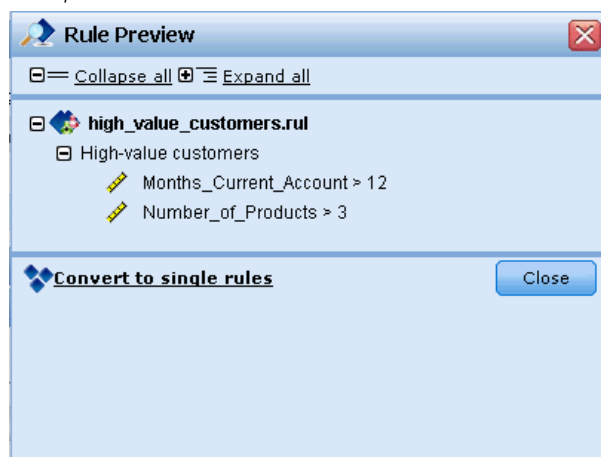
Referenced rules can be combined with local rules in many cases, but are visually distinguished from local rules by bold text, and by an icon that indicates the type of rule (or ruleset). Referenced rules cannot be edited directly in the application where they are used, but can be edited in IBM® SPSS® Rules Management, which can be accessed from the Application Launch page. Note SPSS Rules Management may not be installed at all sites or available to all users.

Figure 6-10
Selection rule editor with both shared and local rules



- ▶ Alternatively, referenced rules can be converted to local rules and saved in the current application if desired. To do this, click on the name of any referenced rule, and then select Convert to single rules in the Rule Preview dialog box.

Figure 6-11
Rule preview



Guidelines for sharing rules

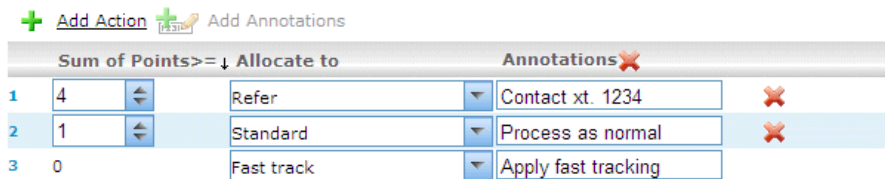
When browsing and working with shared rules, the following guidelines apply:

- Rules can be exported for reuse from any application, but once exported, can be edited in SPSS Rules Management, and cannot be edited in any other application. Note that SPSS Rules Management may not be installed at all sites or available to all users.
- Using a specific labeled version (other than *LATEST*) is strongly recommended, particularly in a production environment, as ongoing changes the latest version may otherwise have unintended consequences. In certain cases, such as when referencing a rule from within a rule, a labeled version must be used.
- Single rules can be added from IBM SPSS Collaboration and Deployment Services Repository by reference, or converted to local rules from the Rule Preview dialog box.
- Single rules can be referenced and combined with local rules in any rule editor. If exported as a rule set, nested references to single rules will be preserved.
- Segment and selection rule sets can be referenced and combined like single rules in most cases, but the combined rule set cannot be exported without first converting any nested rule sets to single rules. Thus an exported rule set can contain references to nested rules, *but not to nested rule sets*.
- Aggregation rule sets can also be referenced, but cannot be combined with other rules, and cannot contain nested references to other rules. When referencing an aggregation rule set, the referenced rule replaces the entire contents of the aggregation rule editor. (Alternatively, if not referencing an aggregation rule set, the aggregation editor can contain a mix of local rules, referenced segment rules, and segment rule sets.)
- When using SPSS Rules Management, the same restrictions apply as for exported rules. Nested rules are allowed, nested rule sets are not. This is because SPSS Rules Management is designed to create and edit shared rules (similar to exporting from any of the other applications).
- To avoid any of the restrictions on referenced rule sets, whether in SPSS Rules Management or elsewhere, a rule set can always be converted to separate, local rules.

Adding annotations

In an aggregation or allocation, select Add Annotations to add a column of free text fields into which you can enter a note that will be included with the rule output. For example, this may be extra information that tells a call center operator who to contact when an insurance claim is flagged for referral.

Figure 6-12
Adding annotations



	Sum of Points>=	Allocate to	Annotations
1	4	Refer	Contact xt. 1234
2	1	Standard	Process as normal
3	0	Fast track	Apply fast tracking

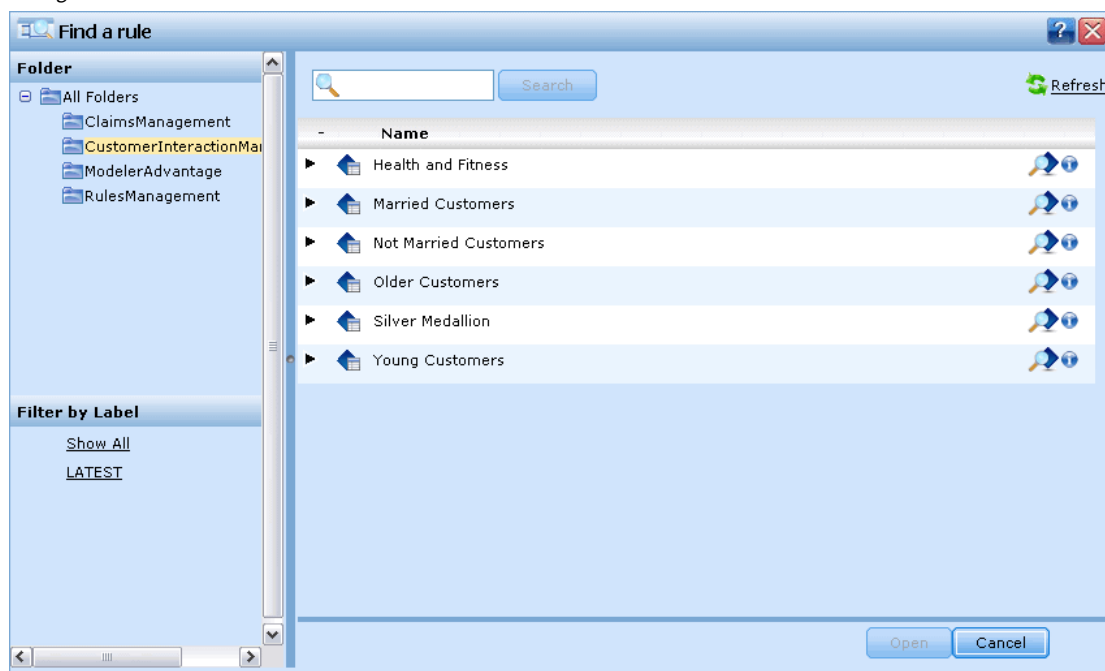
Annotations can be used in combination with the Return with value specified for a dimension, to provide additional detail. While the Return with value is associated with the dimension or decision that is returned, the annotation tells you which rules fired as input to that decision. [For more information, see the topic Defining claim areas and actions in Chapter 8 on p. 90.](#)

Using rules from ILOG Business Rule Management System

Rules created in a Business Rules Management System such as ILOG can be referenced and used in IBM® SPSS® Decision Management applications. These external rules can be selected and used in the same manner as other rules, by selecting Find an existing rule at the desired point in the application. External rules are distinguished by their icon, but otherwise usable in the standard manner.

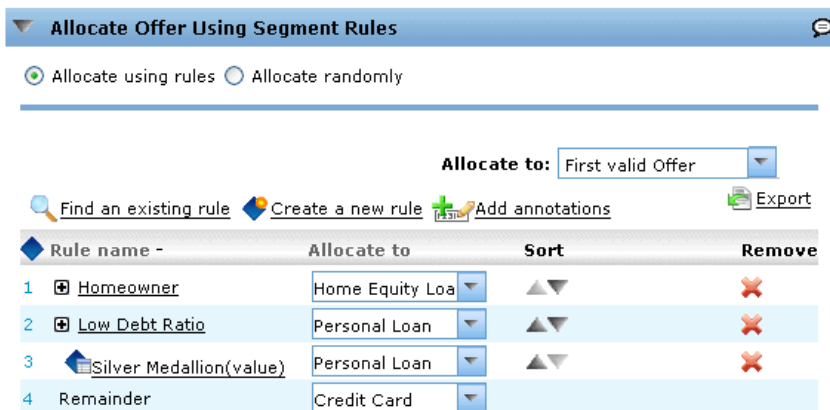
For information on creating external rules for use in SPSS Decision Management, see the *Application Designers Guide*.

Figure 6-13
Using an external rule



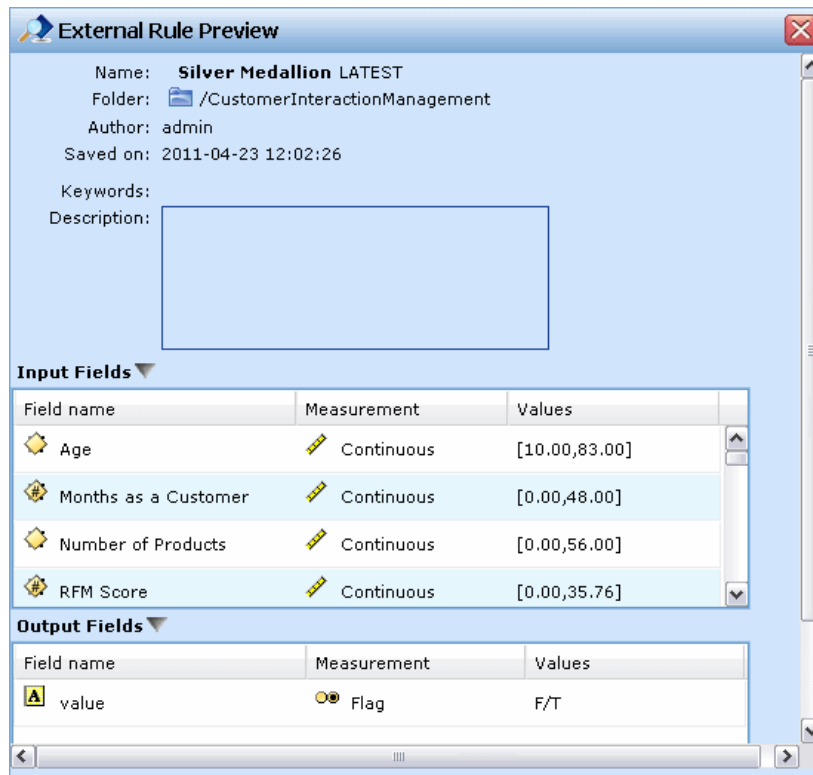
The rule is inserted into the application in the same manner as any other rule. Note that rule outputs must match the context in which the rule is used; for example allocations require a true/false or yes/no (boolean) value as input to the decision.

Figure 6-14
Using an external rule in an allocation



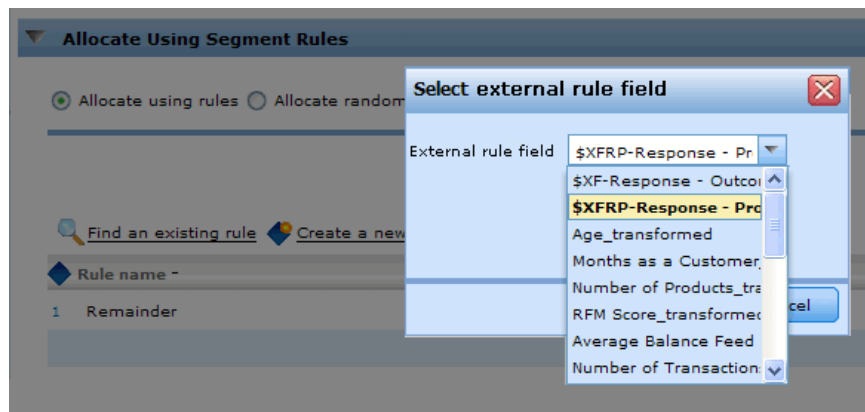
As with other rules, click the name of any external rule used in the application to view details on the rule including input and fields, along with the rule description and other properties.

Figure 6-15
External rule preview



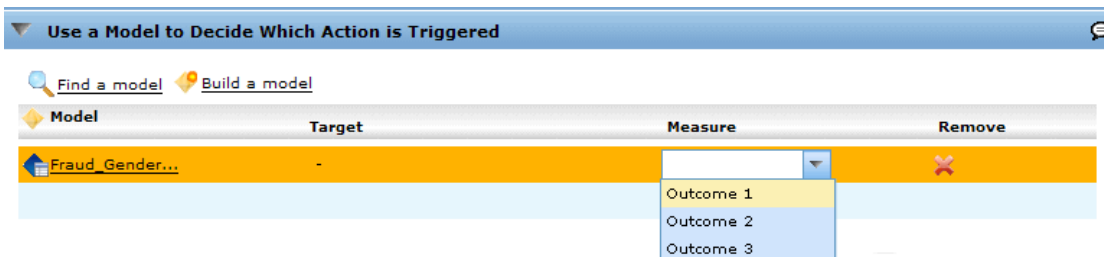
If an external rule has multiple output fields, a prompt is displayed allowing you to choose the desired field.

Figure 6-16
Selecting an external rule field



If an external rule is used in place of a model, no target field is shown, and all configured outputs are shown in the drop-down list.

Figure 6-17
Using an external rule in place of a model



Tips for using external rules

- Rules that return a value of *true* or *false* (or *yes/no* or *0/1*) can be used in any selection or allocation, as input to any rule in the rule editor, or as a Return with field associated with a specific dimension item.
- Rules that return categorical outputs (*red, white, or blue; north, south, east, west, etc.*) can be used in the Use a model to decide section on the Define tab, as an input in the rule editor, or as a Return with field associated with a dimension item.
- Rules that return numerical outputs can be used in the Use a model to decide section on the Define tab, as input to a prioritization, as an input in the rule editor, or as a Return with field associated with a dimension item.

Building predictive models

About predictive models

Models can be used to predict what is likely to happen in the future, based on patterns in past data. For example, you might use a model to predict which customers are least likely to churn, or most likely to respond to a particular offer, based on characteristics such as income, age, and the organizations and memberships they subscribe to.

Models can be used in the same way as rules, but while rules may be based on corporate policies, business logic, or other assumptions, models are built on actual observations of past results, and can discover patterns that may not otherwise be apparent. While rules bring common business logic to applications, models lend insight and predictive power.

Data for building and scoring models

Two different types of data are used in the modeling process:

- To build the model, you need information about the thing you want to predict. For example, if you want to predict churn, you need information about customers who have churned in the past. This is often referred to as historical or analytical data, and must contain some or all of the fields in the project data model, plus an additional field that records the outcome or result you want to predict. This extra field is used as the **target** for modeling.
- To use the model in predicting future results, you need data about the group or population you are interested in, such as potential customers or incoming claims, for example. This is often referred to as **operational** data, or **scoring** data. The project data model is typically based on this data.
- If the target field is included in the data model, the Operational column should not be selected for this field, because it is not available when scoring the model. Having built the model using historical data, the goal in scoring is to apply the model to new data where the outcome is not already known.

Building models

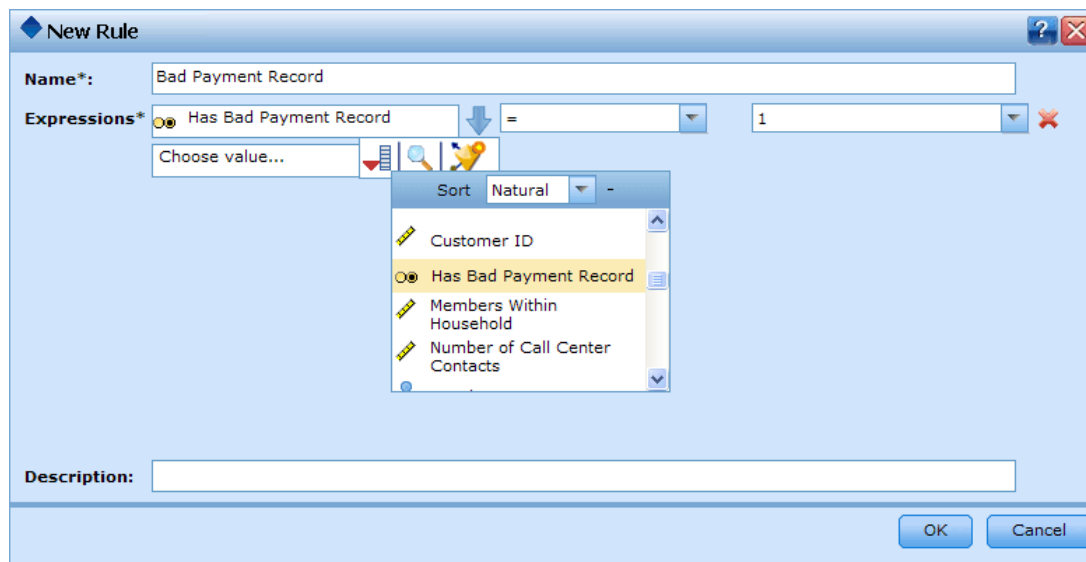
You can build a new model using any of the following methods:

- From the Define tab, select Build a model under any panel where applicable. [For more information, see the topic Defining decisions in Chapter 8 on p. 90.](#)
- When creating or editing a rule, select the build new model icon from the input field toolbar in the rule editor.

Figure 7-1
Build model icon



Figure 7-2
Building a model from the rule editor

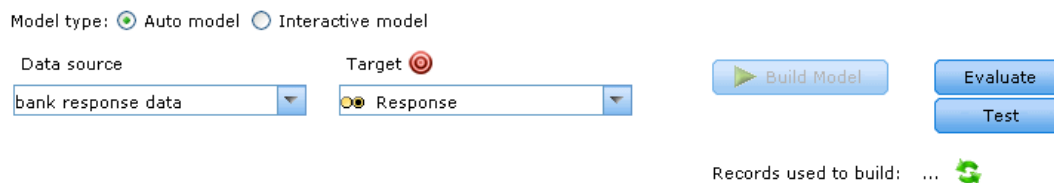


To build an automated model

When building an automated model, the only required specifications are a data source and target field. You can also choose options for preparing and partitioning data, and for selecting the fields and records to use. The model is generated by applying a range of methods as appropriate to the target type, and automatically identifying the specific technique or combination that performs best on the selected data.

When scored, the model returns one or more fields containing predictions, as well as confidence values associated with those predictions. For example if the target field is a flag field named *Response*, the model returns a field named *XF-Response* containing predicted values for that field. The predictions or scores returned by the model can then be used as input to rules, prioritization, and other points in the application as appropriate.

Figure 7-3
Model settings



- Specify a data source. This can be any analytical data source that records the outcome you want to predict.

- ▶ Specify a target field the records the result you want to predict. For example, the target field might indicate which customers have churned, responded to past offers, raised fraudulent claims, and so on.

All other fields will automatically be included as inputs that may be useful in predicting this value.

- ▶ Specify optional settings as desired. [For more information, see the topic Optional model settings on p. 76.](#)
- ▶ Select Build Model.

You can close the browser or work on other tasks while the model builds. The model can be accessed from the Gallery once building is complete. [For more information, see the topic Gallery in Chapter 3 on p. 25.](#) If the model is taking longer to build than expected, click the Stop button to revert to the previously-saved version.

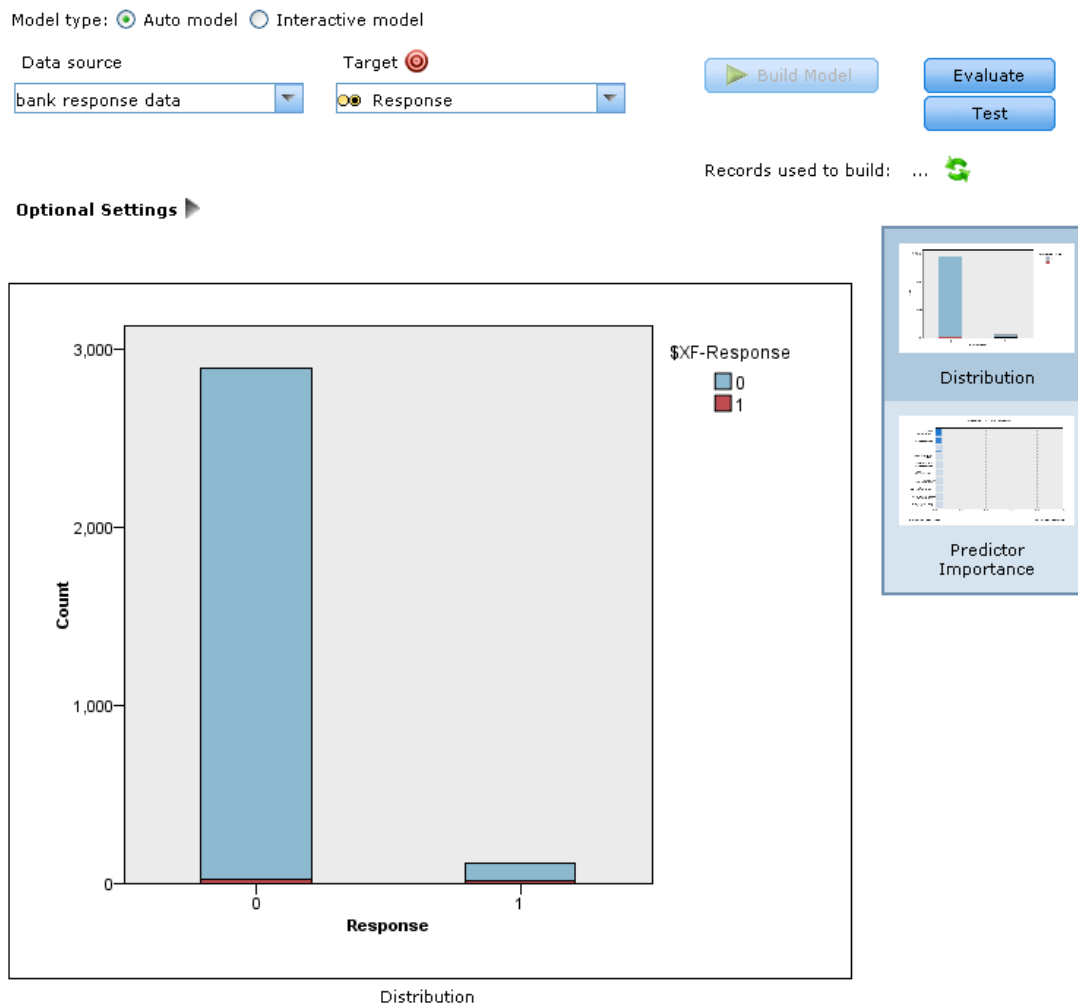
When model building is complete, distribution and predictor importance charts are displayed. [For more information, see the topic Automated modeling results on p. 70.](#)

- ▶ Optionally, use the Evaluate and Test features to see how the model performs on your sample data. [For more information, see the topic Evaluating models on p. 78.](#)
- ▶ Save the model before closing the model builder or returning to the application.
- ▶ Click Use Model, and select the model field you want to use. For example if you want to use the value predicted by the model as input to a rule, select the field that contains the predictions.

Automated modeling results

When an automated model completes, distribution and variable importance charts are displayed, providing a quick visual assessment of model performance, and of the importance of different predictors in obtaining the final result.

Figure 7-4
Distribution of observed and predicted values



Distribution charts

The model distribution charts display observed values on the horizontal axis, with predicted values on the vertical axis or overlay. This allows you to see how often each value or response was predicted, and how often that prediction was correct, providing a quick visual assessment of model accuracy.

- For flag or set targets, the distribution is shown using a bar chart, with one bar for each category of the target field. The height of each bar indicates how many times that result is predicted by the model. The colored regions within each bar indicate how many times the

matching result was actually observed in the testing data. If the model is reasonably accurate, then the largest area within each bar should match the corresponding response.

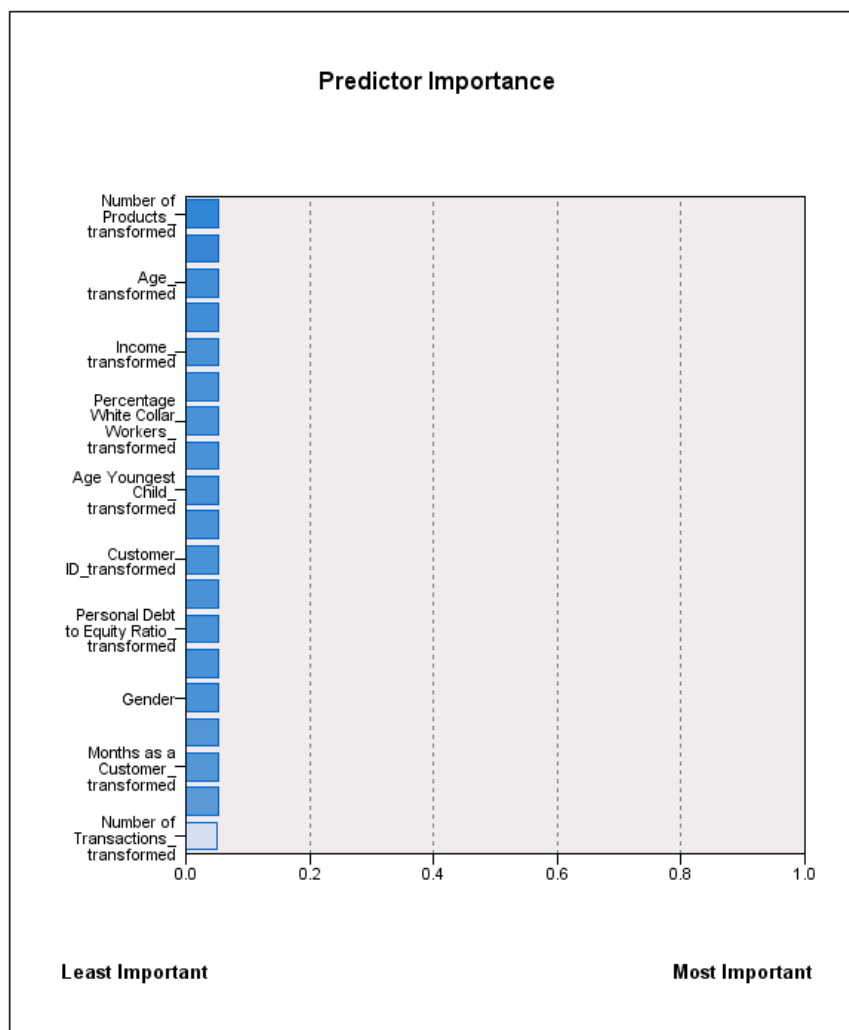
- For range targets, the distribution is represented by a binned scatterplot. Again, predicted values are plotted on the horizontal axis, and observed values are plotted on the vertical axis. Ideally the dots should cluster along a diagonal line. The more scattered the dots (results) and the farther from a linear distribution, the less accurate the model is.

Predictor importance charts

Typically, you will want to focus your modeling efforts on the predictor fields that matter most and consider dropping or ignoring those that matter least. The predictor importance chart helps you do this by indicating the relative importance of each predictor in estimating the model. Since the values are relative, the sum of the values for all predictors on the display is 1.0. Predictor importance does not relate to model accuracy. It just relates to the importance of each predictor in making a prediction, not whether or not the prediction is accurate.

Calculating predictor importance may take significantly longer than model building, particularly when using large datasets.

Figure 7-5
Variable Importance chart



If the option to automatically partition data was selected when the model was built, then the testing partition will automatically be selected on the Evaluate page.

If partitioning was not turned on, you will need to select a data source for evaluating the model. Selecting a data source other than the one used to build the model is recommended. Note that partitioning is on by default, so this should not be necessary unless you have changed this setting.

Interactive models

Interactive models allow you to identify segments that show a higher or lower likelihood relative to a specific outcome. For example, you might look for customers who are least likely to churn, or most likely to say yes to a particular offer. The resulting model resembles a list of selection rules, with an Include or Exclude attribute that specifies how each segment is scored.

Interactive models resemble selection rules, but differ in how they are scored. In the case of a selection rule, excluded records are removed, resulting in fewer records in the output. In the case of a model, no records are removed, but additional fields are added indicating the prediction and propensity values for each record. Included segments are scored as *True* (or *False*, or whatever outcome you are trying to predict). Excluded segments are scored as *NULL*, as are any records that fall to the remainder because they do not match any rule.

Each record is also given a propensity score that indicates the likelihood of the target response, making it possible to identify the customers who are most likely to respond. As such, interactive models are well-suited for generating mailing lists, and they are widely used in customer relationship management, including call center or marketing applications.

- Interactive modeling is available for categorical targets only.
- You can view, modify, and reorganize segments and to choose which to include or exclude for purposes of scoring. For example, you can choose to exclude one group of customers from future offers and include others and immediately see how this affects your overall hit rate.
- As with a selection rules, you can manually add or edit segments as needed. It is often easier to let the model find them for you, however, and a number of options are provided to help you fine-tune the result.
- Rules are applied in the order listed, with the first matching rule determining the outcome for a given record. Taken independently, rules or conditions may overlap, but the order of rules resolves ambiguity. If no rule matches, the record is assigned to the remainder rule.

To obtain an interactive model

Figure 7-6
Building an interactive model

Model type: Auto model Interactive model

Data source: bank response data

Target: Response

Response sought:

0

1

Start Build Evaluate Test

Records used to build: ...

- ▶ Specify a data source. This can be any analytical source that records the outcome you want to predict.
- ▶ Specify a target field that records the result you want to predict.

- ▶ Specify the specific value or response you want to find. For example if the target field is named *response*, you could choose *True* or *False* to find customers who responded — or who didn't — accordingly.

For example, the target might indicate which customers have churned, responded to past offers, raised fraudulent claims, etc. All other fields will automatically be included as inputs that may be useful in predicting this value.

- ▶ Select Start Build.

Figure 7-7
Building an interactive model

Model type: Auto model Interactive model

Data source: bank response data Target: Response{1} [Restart model](#) [Grow Model](#) [Evaluate](#) [Test](#)

Records used to build: 1413

Find segments with: High probability Max. number of segments: 5

Optional Settings

- [Create a new rule](#)

Rule name	Count	Hits	Probability
1 Remainder	1413	52	3.68%

- ▶ Specify whether you want to find segments with high or low probability relative to the specified target. For example, you could look for groups or customers who are mostly likely to churn, or least likely, and include them accordingly.
- ▶ Specify the maximum number of segments to be found. Typically this number is kept small in the interest of simplicity and performance.
- ▶ Select Grow Model to obtain a list of one or more segment rules that identify groups with higher or lower probability.
- ▶ Click the Include/Exclude icons to specify how the rules are to be used and how the relevant segments are scored.
Included segments are given a score that matches the target value (for example *response=true*). Excluded segments are scored as *NULL*, but are not removed from the file.
- ▶ Optionally, you can manually add or edit segments as desired. [For more information, see the topic Defining segment rules in Chapter 6 on p. 55.](#)
- ▶ Optionally, use the Evaluate and Test features to see how the model performs on your sample data.
- ▶ Save the model before closing the model builder or returning to the application.
- ▶ Click Use Model, and select the model field you want to use. For example if you want to use the value predicted by the model as input to a rule, select the field that contains the predictions.

Tips

- Use the up/down arrows to move rules up or down. Each record is scored based on the first hit, so the order of rules will change the result. For example a record that matches multiple rules will be scored based on the first that applies.
- Change one or more options and select Grow Model again to find additional rules. For example, you might lower the threshold for minimum segment or confidence interval in order to identify additional segments.
- Clicking Grow Model does not clear the table or rebuild the model from scratch, it only finds more segment rules to add to the table.

Optional model settings

When building models, you can choose from the following optional settings. If changing any of these settings for an existing model, the model must be rebuilt for changes to apply.

Figure 7-8
Specifying optional settings

Optional Settings ▼

Automatically partition data to enable model evaluation on build data source for evaluation and testing

Automatically clean up and prepare data for reliable model building

Specify inputs to use ▼

Type	Field name	Target
<input checked="" type="checkbox"/> long	Age	
<input checked="" type="checkbox"/> double	Months as a Customer	
<input checked="" type="checkbox"/> long	Number of Products	
<input checked="" type="checkbox"/> double	RFM Score	

Specify selection to use ▼

Rule name	Include/Exclude	Remove

Automatically partition data, to enable model validation on build data source. Splits the data into separate subsets or samples for training and testing the model. By building the model on one subset and testing it on another, you can get an idea how it will generalize to other data sets.

Automatically clean up and prepare data for reliable model building. Identifies and repairs data issues to make modeling faster, more predictable, and more reliable. Screens fields that are problematic or not likely to be useful, for example by handling missing and extreme values, deriving new attributes when appropriate, and improving performance through intelligent screening and sampling techniques. The first time a model is built with a new data source, the analysis is done to identify issues and fixes, which may slow performance on the first pass only. On subsequent runs, the fixes are applied, but the analysis is not repeated unless the data source changes. This setting may be disabled for some models, including those with custom data preparation settings specified by an expert user.

Specify inputs to use. Allows you to select the fields you want to use. Typically these would be those that have some practical relationship to the thing you are trying to predict, such as age or income. If you have a large data set, limiting the number of fields is one way of simplifying the model. If the data contains fields such as customer id or contact number, these would not typically be useful in modeling and should not be selected. Fields that duplicate other data may also be excluded.

Clicking on a linked input field (an expression) opens the expression viewer for that expression. To edit an expression, see the Data tab. [For more information, see the topic Expression manager in Chapter 4 on p. 49.](#)

Specify selections to use. Specifies which records to include or exclude when modeling. You can search for existing rules, or create new ones as appropriate. [For more information, see the topic Defining selection rules in Chapter 6 on p. 57.](#)

In addition, if global selections have been defined, they will be displayed here, and you can specify whether they should also apply during modeling. You can either choose to use all or none of the global selection rules; you cannot choose a subset.

Segmentation options

Figure 7-9
Segmentation options

Segmentation Options ▼

Minimum segment size: % of previous segment	5.0	%
Absolute value	50	
Maximum number of attributes used in a rule	5	
<input checked="" type="checkbox"/> Allow attribute reuse		
Confidence interval for new conditions	95.0	%

When build interactive models, a number of segmentation options are available. These are in addition to the options available with other types of models.

Minimum segment size. These settings dictate the minimum segment size, with the larger of the two values taking precedence. For example, if the percentage value equates to a number higher than the absolute value, the percentage setting takes precedence.

- **Percentage of previous segment.** Specifies the minimum group size as a percentage of records. The minimum allowed setting is 0; the maximum allowed setting is 99.9.
- **Absolute value.** Specifies the minimum group size as an absolute number of records. The minimum allowed setting is 1; there is no maximum setting.

Maximum number of attributes. Specifies the maximum number of conditions per segment rule. The minimum allowed setting is 1; there is no maximum setting.

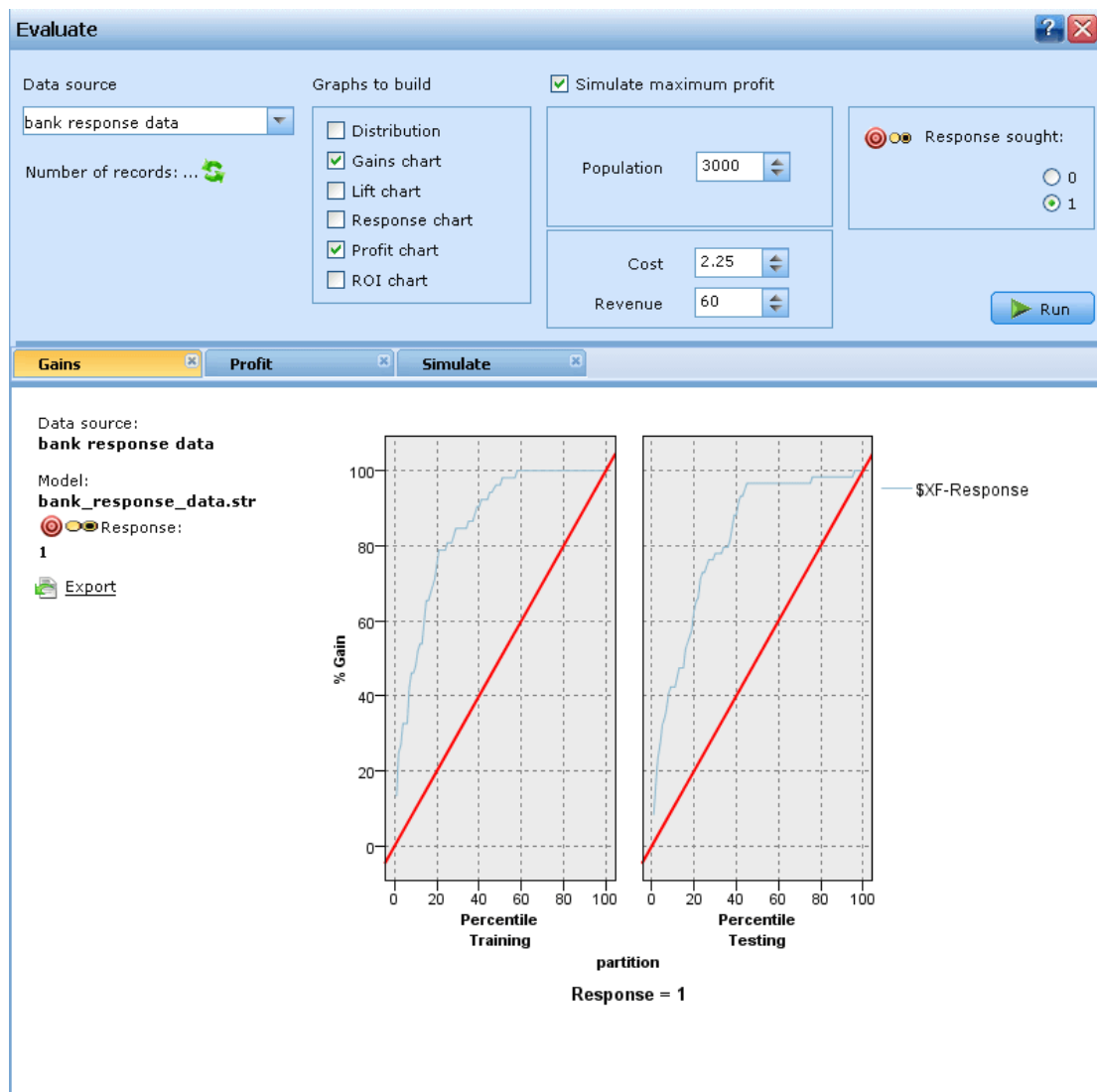
Allow attribute re-use. When enabled, each cycle can consider all attributes, even those that have been used in previous cycles. The conditions for a segment are built up in cycles, where each cycle adds a new condition. The number of cycles is defined using the Maximum number of attributes setting.

Confidence interval for new conditions. Specifies the confidence level for testing segment significance. This setting plays a significant role in the number of segments (if any) that are returned as well as the number-of-conditions-per-segment rule. The higher the value, the smaller the returned result set. The minimum allowed setting is 50; the maximum allowed setting is 99.9.

Evaluating models

After building or opening a completed model, select Evaluate to obtain distribution, gains, lift, response, profit, and ROI charts, and to simulate the maximum profit possible. This dialog is only available if the selected model is complete.

Figure 7-10
Gains chart



- ▶ In the upper panel, select an evaluation data set. As with model building, this must be an analytical data set for which actual responses are known. (Otherwise you have no way to compare actual responses to those predicted by the model.)
- ▶ Select the graphs you want to build.
- ▶ If simulating profit, select the Simulate maximum profit box and enter the population on which to base the profit calculation. [For more information, see the topic Simulating maximum profit on p. 84.](#)
- ▶ If requesting a profit or ROI chart, or if simulating profit, specify cost and revenue values. These values indicate the cost for each offer, and the amount of revenue you expect to make from each favorable response, respectively.

- ▶ Select the response value that is considered as a “hit.” This must be one of the values for the target field used to build the model, such as *response = true* to indicate a positive or favorable response.
- ▶ Select Run to view the results.

Distribution charts (all targets)

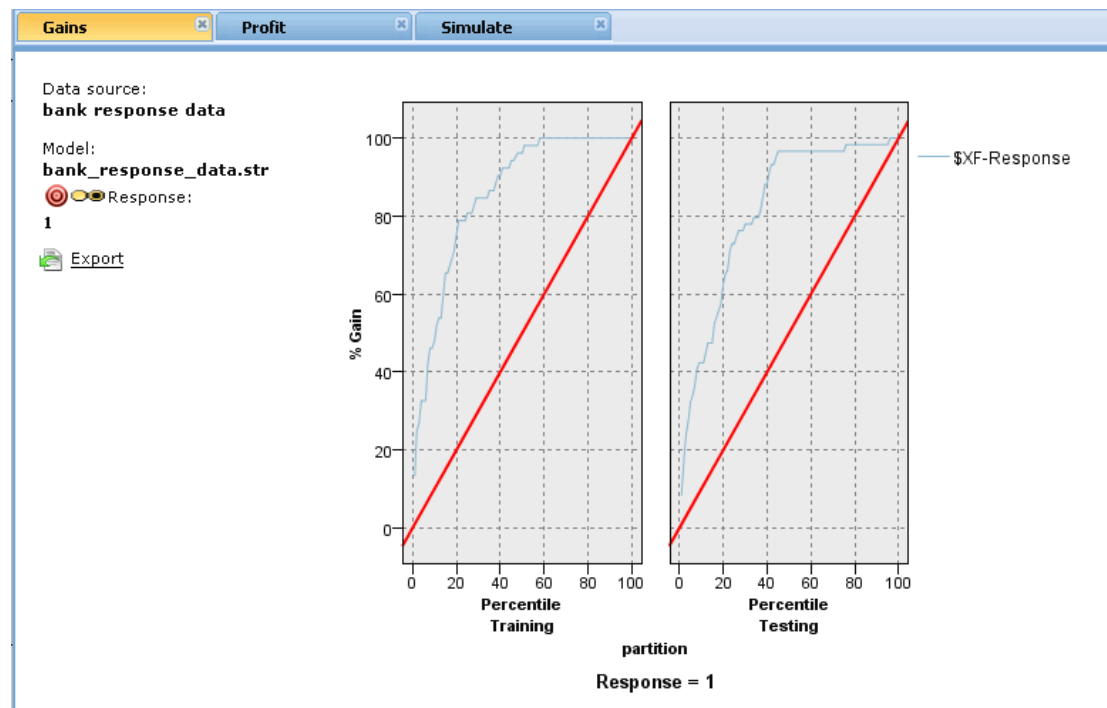
Distribution charts plot observed versus expected values, and are displayed by default when the model completes. The Evaluate dialog box allows you to obtain distribution charts for a data set other than the testing data set. For range targets, the distribution chart is the only chart type available.

For flag and set targets, you can choose from the following additional charts:

Gains charts

Gains are used to show the gain or “lift” that can be obtained by using the model, and are defined as the proportion of hits in each increment relative to the total number of available hits. The flat diagonal line plots the expected response for the entire sample, if no model were used. In this case, the response rate would be constant, since one person is just as likely to respond as another. To double your yield, you would need to ask twice as many people. The curved line indicates how much you can improve this result by targeting those who are most likely to respond. The steeper the curve, the higher the gain.

Figure 7-11
Gains chart

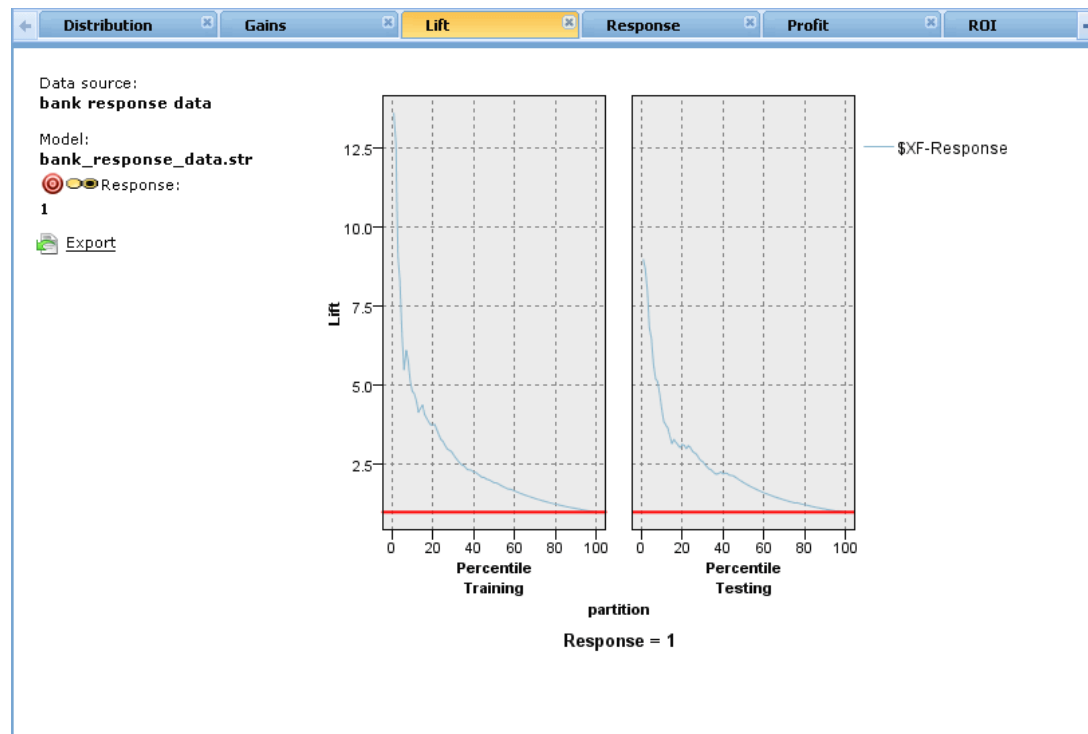


Lift charts

The lift chart plots the percentage of records in each increment that are hits with the overall percentage of hits in the training data set.

Figure 7-12

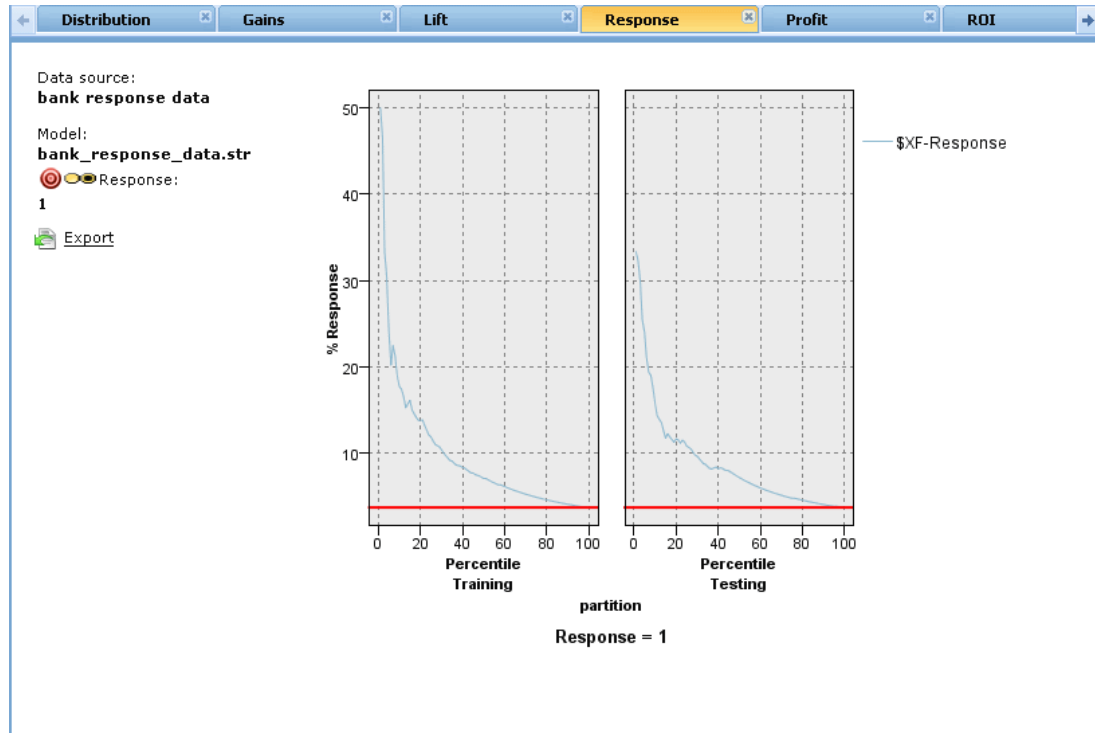
Lift chart



Response charts

The response chart plots the percentage of records in the increment that are hits.

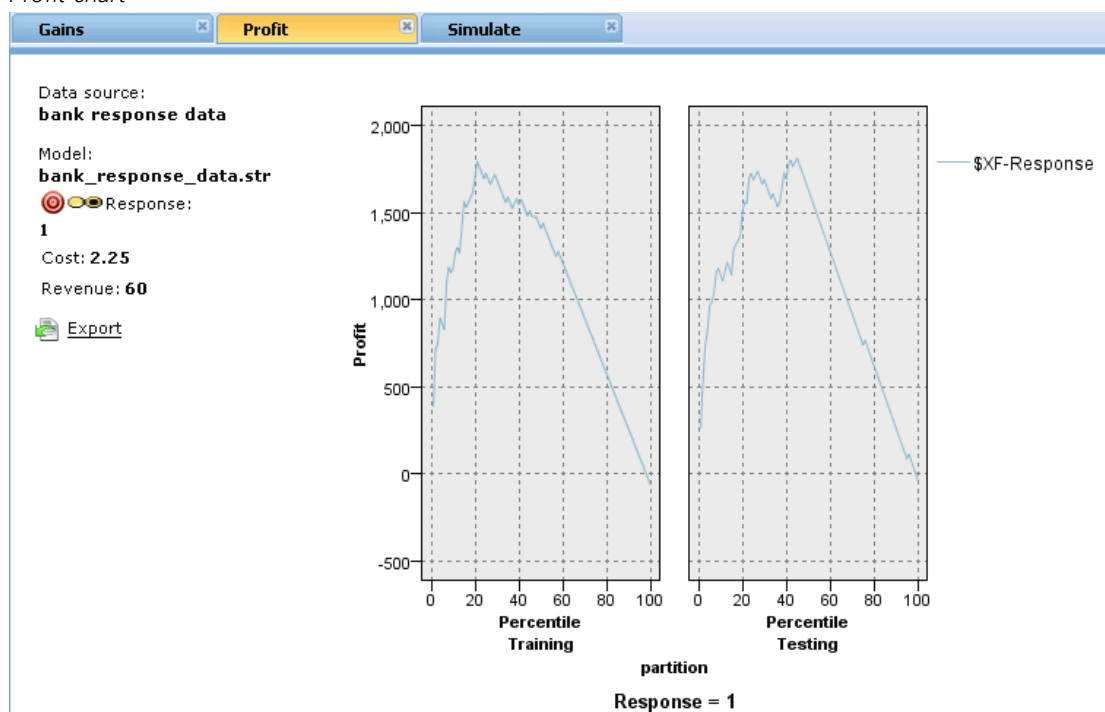
Figure 7-13
Response chart



Profit charts

Profit equals the revenue for each record minus the cost for the record. Profits for a quantile are simply the sum of profits for all records in the quantile. Revenues are assumed to apply only to hits, but costs apply to all records. [For more information, see the topic Simulating maximum profit on p. 84.](#)

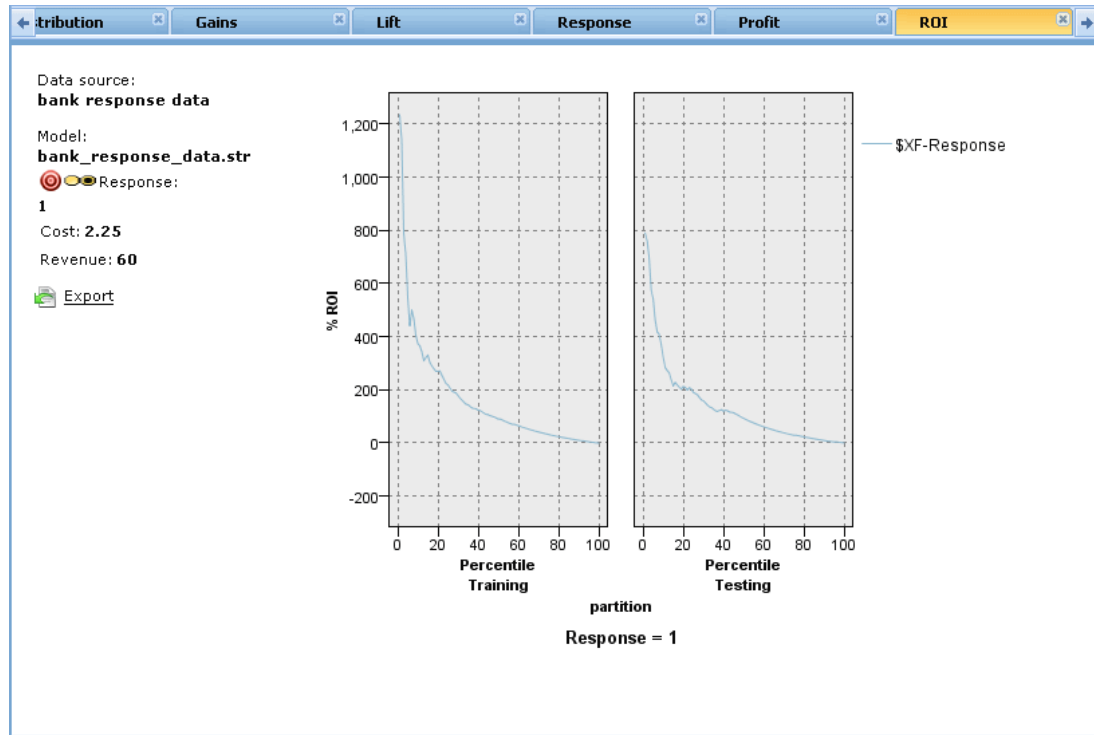
Figure 7-14
Profit chart



ROI charts

ROI (return on investment) is similar to profit in that it involves defining revenues and costs. ROI compares profits to costs for each interval.

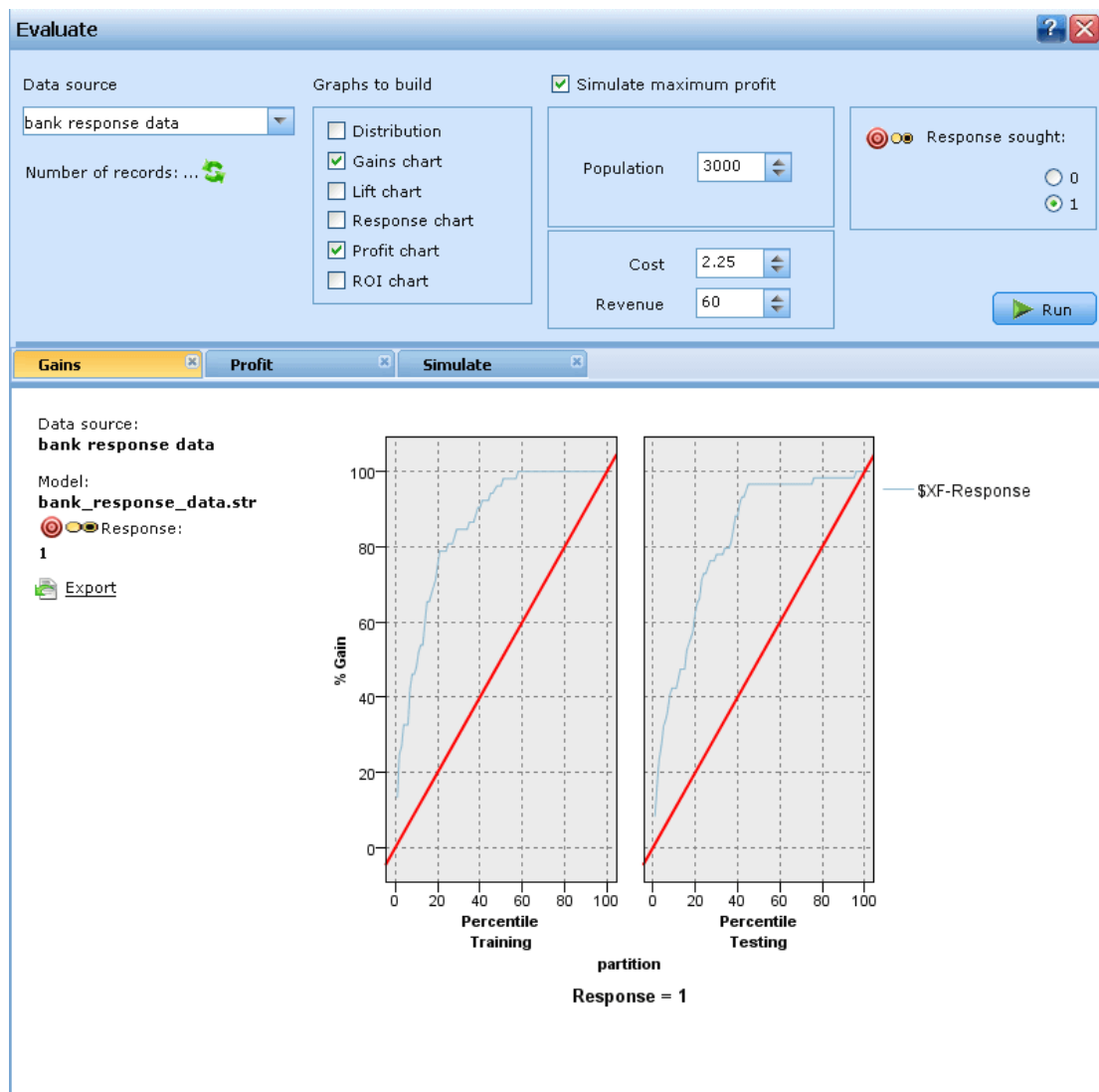
Figure 7-15
ROI chart



Simulating maximum profit

Based on the response rates predicted by the model, you can simulate the maximum profit to be made for a given population. To do this you need to specify cost and revenue values, as well as the size of the population.

Figure 7-16
Simulation settings

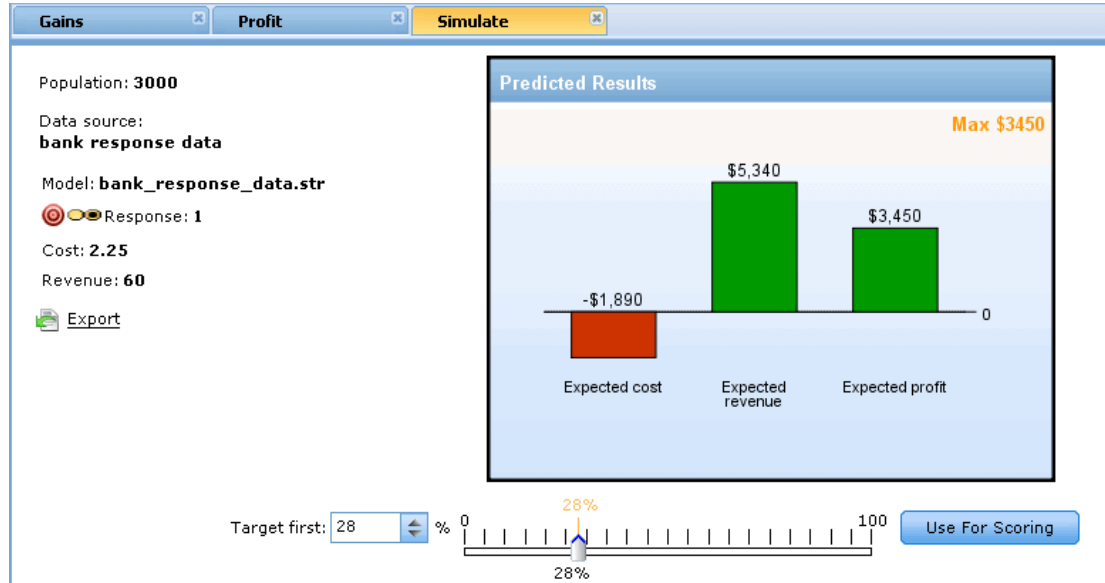


To predict the maximum profit:

- ▶ Specify the population, or total number of records, on which the prediction should be based.
Note: When scoring a model, this is automatically set to the total number of records in the data source or subset.
- ▶ Specify the cost associated with each record. For example, this could be the print and mailing cost, per person, of promotional literature for a campaign.
- ▶ Specify the expected revenue that a positive response would generate. For example, the retail cost of an item in a campaign.
- ▶ Select the response you are interested in.

- ▶ Click Run.

Figure 7-17
Simulated profit prediction



The predicted results graph shows the best result for maximum profit, and identifies the percentage of records you would need to target to achieve this, based on propensity to respond as identified by the model.

Beneath the graph you can move a slider bar from zero to 100% of the records to target to see how this would affect your profit.

Profit comparison

To verify that the chosen records are a good selection, you can compare the likely profit to be made from those records, a random group of the same percentage of records, and the whole set of records.

Figure 7-18
Profit comparison

Compare Profit

	Targeted28%	Random28%	Everyone
Offers made	840	840	3000
Expected response	89	31.08	111
Expected response(%)	10.6	3.7	3.7
Expected cost	\$1890	\$1890	\$6750
Expected revenue	\$5340	\$1864.8	\$6660
Expected profit	\$3450	-\$25.2	-\$90

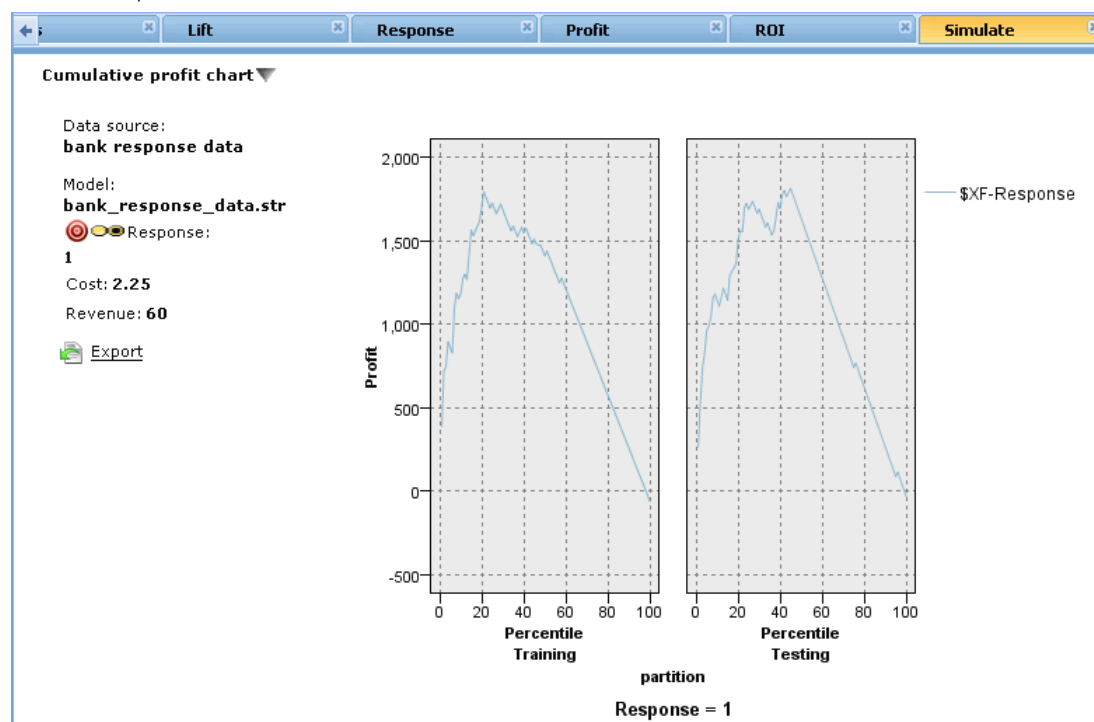
Details shown include the number of records targeted, the likely response rate, costs, income, and overall profit. You can export this information in html format for use in other applications.

Profit chart

You can display the predicted cumulative or non-cumulative profit from the selected records as a graph.

Note: This graph is generated when you first run the evaluation and is not automatically updated with any changes you make via the slider in the profit simulation section.

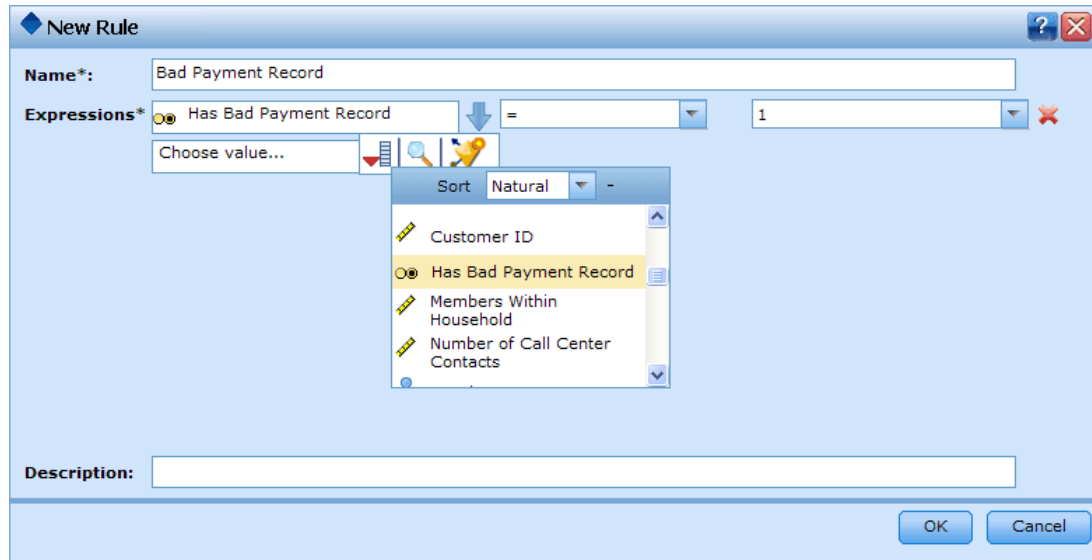
Figure 7-19
Cumulative profit chart



Using model scores in applications

To score a model means to apply it to some data or population in order to obtain a result or prediction that can be used as input to decisions. For example, you might score all customers in your database to identify prospects for a direct mail campaign, or score customers one at a time as they contact your call center in order to decide which products or services to offer them. Depending on the application, scoring results can be written to a database table or flat file, or used as inputs to the segment, selection, and allocation rules that drive decisions in an application.

Figure 7-23
Creating a new segment rule



Model scores can be used in the following ways:

- As input to rules. [For more information, see the topic Creating rules in Chapter 6 on p. 54.](#)
- To allocate decisions on the Define tab. [For more information, see the topic Allocations based on model scores in Chapter 8 on p. 95.](#)
- As inputs to the combine matrix.

Model output fields

By convention, the names of the scoring output fields are based on the name of the target field, but with a custom prefix added. For example if the target field is named *Response*, the output fields will have names like *\$XF-Response* and *\$XFRP-Response*. The specific fields depend on the type of model, and the measurement level for the selected target field, as detailed below. [For more information, see the topic Measurement levels in Chapter 4 on p. 38.](#)

Flag targets. Automated models with flag targets output the following fields:

- **\$XF-<target>**. Predicted value for each record, reported in terms of the “true” and “false” values defined for the field.
- **\$XFRP-<target>**. Propensity score; indicates the likelihood of the “true” value for each record. Propensity scores differ from confidence scores, which are typically reported in terms of the prediction for that record. For example a “false” prediction with a high confidence will translate to a low propensity as this would indicate a high likelihood *not* to respond.

Categorical targets. Automated models with categorical targets (nominal or ordinal) output the following fields:

- **\$XS-<target>**. Predicted value for each record.
- **\$XSC-<target>**. Confidence value associated with the prediction

Continuous targets. Automated models with continuous numeric targets output the following fields:

- **\$XR-<target>**. Predicted value for each record.
- **\$XRE-<target>**. Standard error for the prediction.

Interactive models. Interactive models (flag or categorical targets only) output the following fields:

- **\$D-<target>**. Predicted outcome for each record, with the “true” value defined for the field used to indicate the desired response, and null indicating any other value.
- **\$DP-<target>**. Probability of desired outcome for each record; matches the probability displayed for the segment in the results table when building the model. [For more information, see the topic Interactive models on p. 73.](#)
- **\$DI-<target>**. Index number used to identify the segment into which the record falls (displayed in the left-most column in the modeling results).
- **\$DRP-<target>**. Propensity score indicating the likelihood of the desired response. Available for flag targets only.

Defining decisions

The Define tab allows you to specify the range of possible decisions or recommendations that can be returned by the application, as well as the models and rules that determine how they are allocated.

Two separate recommendations are returned, one based on rules and one based on models. The final determination is made in the Combine step.

Figure 8-1
Defining claim areas

Model	Target	Measure	Remove
fraud_model.strfraudulent		Propensity	X

Propensity >= ↓	Allocate to	Remove
1 0.5	Refer	X
2 0.3	Standard	X
3 0	Fast Track	

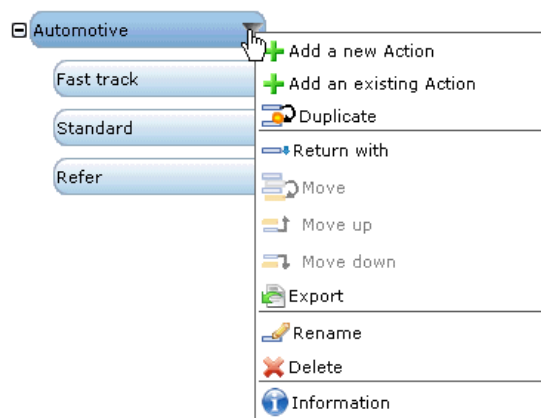
The dimension tree at left specifies the range of possible decisions or recommendations that can be returned.

- The settings on the right determine how records are selected and allocated to specific dimensions using models and rules. The rules need not be mutually-exclusive; the same record may be allocated to multiple items, or none, as appropriate.
- In cases where multiple recommendations are returned on the Define tab, a combine matrix can be used to choose which items are actually allocated.
- When a combine matrix is used, a third rule can be used to override the matrix in specific cases.
- The output from the rules is returned as either a single decision or multiple recommendations.

Defining claim areas and actions

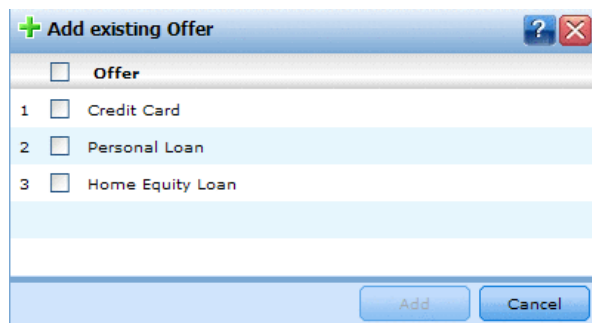
The tree view at left defines the claim areas and actions that are available in the application. These items define the possible decisions, or results, that can be returned. The right pane displays properties, selections, and allocations for the selected item.

Figure 8-2
Dimension tree



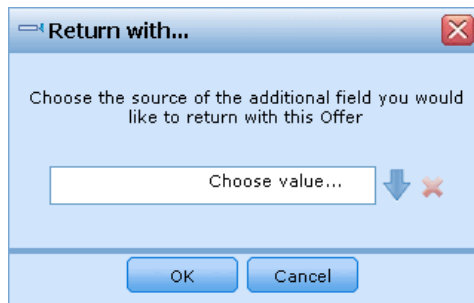
- ▶ Click Add... at the top of the tree to add dimension items.
- ▶ Click Expand all or Collapse all to show or hide items.
- ▶ Click on individual items to display a context menu that allows you to add, rename, move, and duplicate items.
- ▶ To move an item, select Move from the context menu, and select the new location from the drop-down list.
- ▶ To reuse an existing item, select Add an existing... from the context menu, and choose the item you want to reuse.

Figure 8-3
Reusing an existing item



- ▶ To specify a field, text, or model output to be returned with an item, select Return with from the context menu. Return fields are extremely useful in tailoring recommendations to specific cases, or providing additional information that may be useful in processing the result.

Figure 8-4
Specifying a return field or value

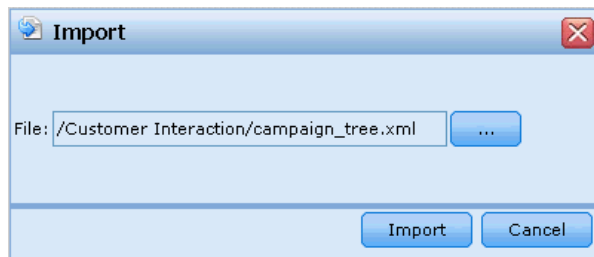


- ▶ If the tree is too large to be visible, you can drag the right border to resize the panel.

Importing and exporting dimension tree items

You can export dimension tree information to an external file, and import for reuse as needed. For example, this would allow you to restore the items used in a previous version of the tree. Dimensions are imported from the top most level down. For example you can import claim areas, including any child actions. But you cannot import only actions within an existing claim area.

Figure 8-5
Importing dimension items



- ▶ To export the current tree, select the Export link displayed just above the tree, then specify a folder and filename.
- ▶ To import dimension items, select Import, and specify an XML file containing the items you want to import. This should be a file exported from a compatible application that uses dimensions types matching the current project (such as customers and offers, claims and actions, etc.) Attempting to manually edit the XML source is not recommended.

Imported dimensions are added to the current tree. If the file contains more dimension levels than the current project allows, you can choose to import only the levels that are allowed. Dimensions that cannot be imported are listed in gray to indicate this.

Claim area properties

Figure 8-6
Dimension properties

Automotive Properties

Active

From: 30/01/2010 00:00 AM

No expiration

To:

Active. Specify start and end dates to indicate when the item is valid.

Interaction points. Specifies where the item applies. The available options are configured for each application, and may include call center, Web site, ATM, in-store locations, etc. Interaction point settings also constrain child dimensions, for example an offer cannot be valid longer than the campaign to which it belongs.

Note: Interaction points must be configured by the administrator. [For more information, see the topic Defining interaction points in Chapter 12 on p. 117.](#)

Claim area selections

Selections specify which records a given set of recommendations can be applied to. They are similar to global selections, but applied to specific dimensions.

Figure 8-7
Claim area selections

Choose Who This Claim Area Applies to

Find an existing rule Create a new rule View selection logic Export

Rule name	Include/Exclude	Remove
1 Automotive claims	Include	Remove
claim_area = Auto		

You can choose from existing rules, or create your own. Optionally, any new rules can be exported to the IBM® SPSS® Collaboration and Deployment Services Repository for reuse in other applications. [For more information, see the topic Defining selection rules in Chapter 6 on p. 57.](#)

Defining allocations

Recommendations can be allocated using the following methods:

- Based on aggregated point totals
- Based on model scores

Allocation using aggregated point totals

You can assign records to dimensions using based on aggregated point totals as returned by an aggregation rule.

Defining aggregation rules

Aggregation rules allow you to sum one or more measures across a set of segment rules. For example, you can assign risk points based on the number of risk factors that apply. The sum of each measure for all true segments is included in the result.

Figure 8-8
Allocation based on rules

Use Rules to Decide Which Action is Triggered

Remainder: Apply when no rules hit

Find an existing rule Create a new rule Add annotations OR Split OR Export

Rule name -	Risk points	Sort	Remove
1 Police Intervention	1	▲▼	✖
2 Multiple Claims	3	▲▼	✖
3 Cost over 5k	2	▲▼	✖
4 Cost over 3k	1	▲▼	✖
5 Material and Injury Claim	1	▲▼	✖
6 Remainder	0		

+ Add Action + Add annotations

Sum of Points>= ↓	Allocate to	Remove
1 5	Refer	✖
2 3	Standard	✖
3 0	Fast Track	

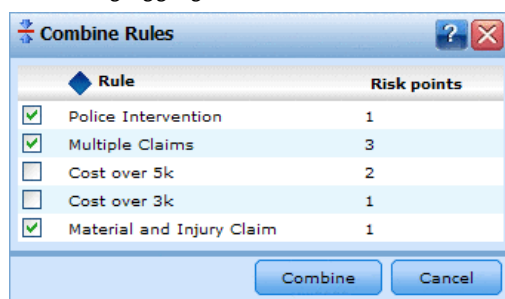
- ▶ In the application where you want to add the rule, select Create a new rule. This link is available on the Define tab in applications where aggregation rules can be applied.
- ▶ Specify a name for the rule and add one or more expressions as desired. [For more information, see the topic Defining segment rules in Chapter 6 on p. 55.](#)
- ▶ Click OK to save the segment rule, and repeat as needed to add additional segments.
- ▶ In the aggregation rule editor, specify the number of risk points assigned to each segment.
- ▶ Specify the number of risk points assigned to the remainder. Using the drop-down list toward the upper right, you can also specify whether this value is added to all records, or only in cases where no other rules apply.
- ▶ Optionally, you can export aggregation rulesets for use in other applications. [For more information, see the topic Exporting and reusing rules in Chapter 6 on p. 60.](#)
- ▶ Optionally, select Add Annotations to add a column into which you can enter text to be returned with the rule. [For more information, see the topic Adding annotations in Chapter 6 on p. 64.](#)

- ▶ Optionally, use the arrows to change the order in which items are displayed. The order has no effect on rule execution as the aggregation returns the same value regardless of order.
- ▶ To specify how actions are allocated based on the aggregated total, select **Add Action**. Specify a threshold value under **Sum of Points**, and select the desired action. Repeat as needed to specify additional actions.

Combine/split rules

You can select one or more rules and select **OR** to combine multiple rules into a single **OR** statement that assigns a specified number of points if *any* of the conditions is met.

Figure 8-9
Combining aggregation rules

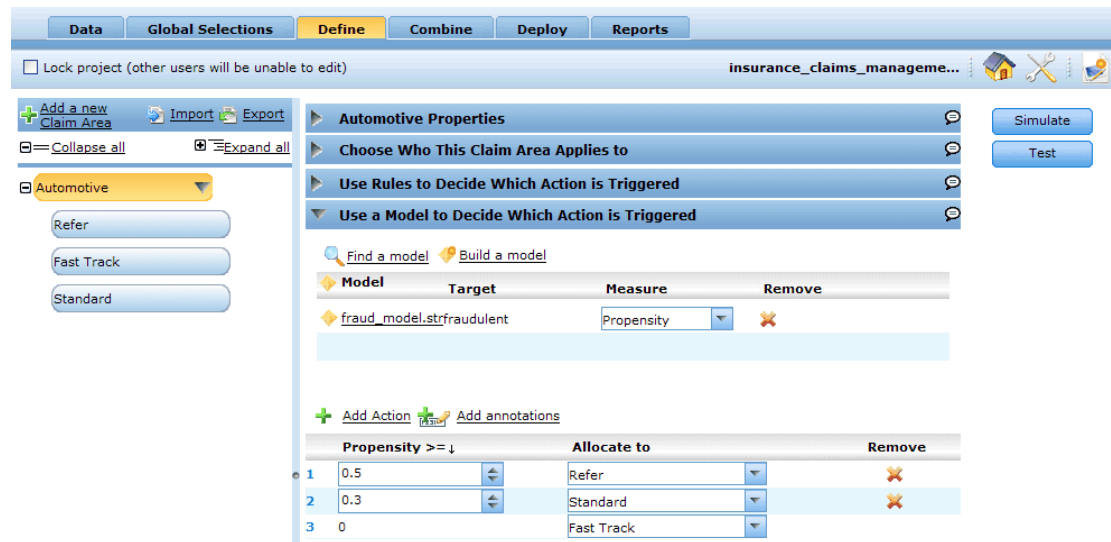


To split an **OR** statement so that each condition is evaluated separately, select the statement and select **Split OR**.

Allocations based on model scores

You can allocate decisions based on the output from a predictive model. For example, you can assign records to a specific dimension based predicted values, propensity scores, or any other value returned by the model.

Figure 8-10
Combining aggregation rules



- ▶ On the Define tab, select Use a Model to Decide Which Action is Triggered. Note this link may not be available in all applications.

Select Find a model to browse and select an existing model.

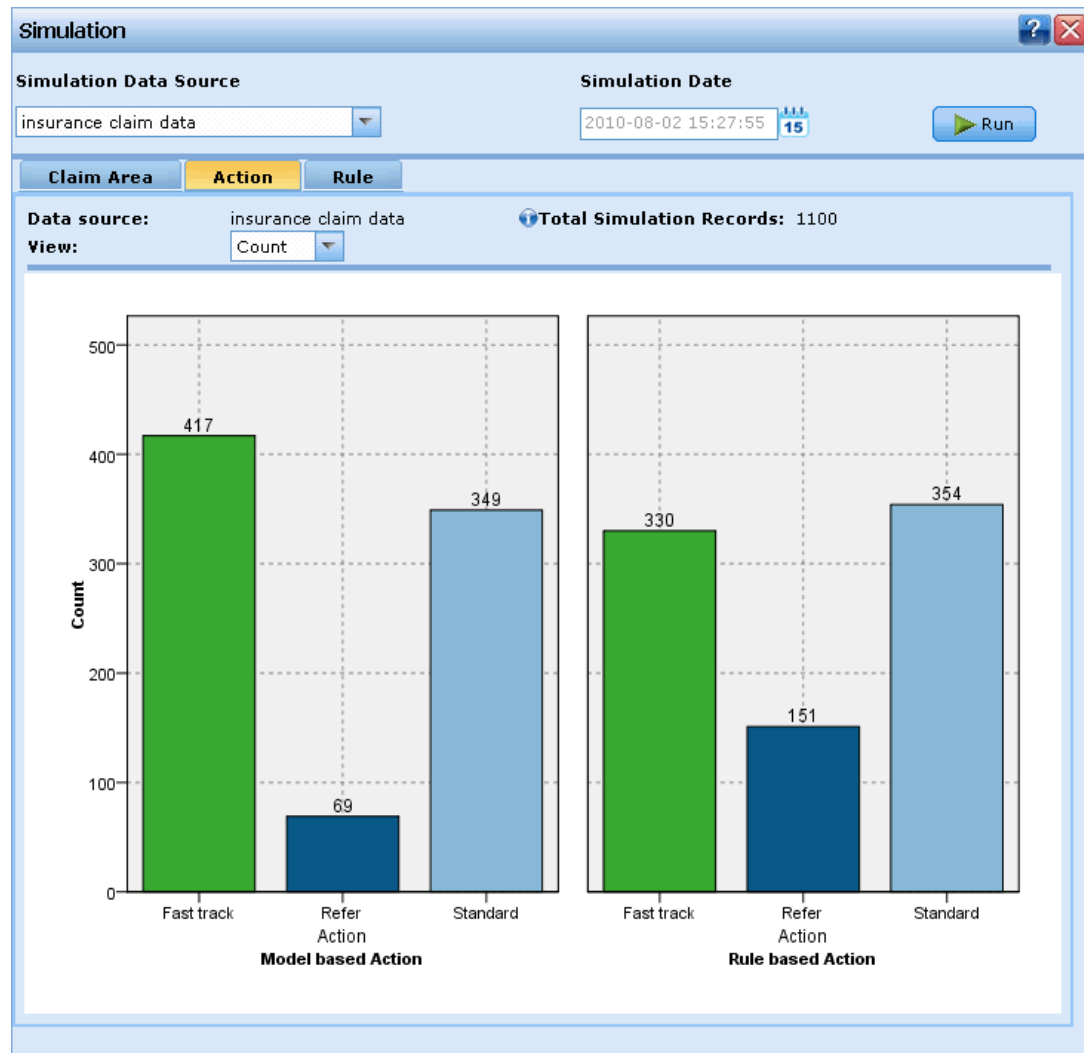
Alternatively, select Build a model to create a new model. [For more information, see the topic Building models in Chapter 7 on p. 68.](#) Once model building has completed, select Use Model to proceed.

- ▶ Under the Measure column on the Define tab, select the model output value you want to use, such as the predicted value, propensity, or confidence value returned by the model.
- ▶ For each allocation, select Add Action, specify the threshold value, and the desired action. You can add as many actions as you wish, with a different threshold for each.

Simulate

From the Define tab, you can run a simulation to see how records will be allocated based on the current settings.

Figure 8-11
Simulation results



- Specify the data source you want to use. This can be any data source that has Simulation selected under as the usage type. Typically this would be a sample of a few thousand records (though it can be larger or smaller) that is representative of your operational data.
- Specify the simulation date and interaction point to use when running the simulation. These settings depend on the current application, but can have significant impact on the results.

The simulation results display a separate chart for each dimension, indicating how records are allocated across the items in that dimension. The numbers indicated in each dimension are the sum of those in the sub dimensions, for example the total number of people eligible for a campaign is the sum of those eligible for offers within the campaign.

- Choose Count or Percent to customize the view.

Testing the application

The Test dialog box allows you to see how one or more sample records will be scored. Results are specific to the context in which the test is run, and may reflect the scores returned by a model or rule, or the recommendations returned by the current application. For example, you can look at a handful of specific claims and see which actions are allocated to each of them. In addition, you can view details to see how specific selections and rules are applied as factors in the decision.

Figure 8-12
Test results

The screenshot shows a 'Test' dialog box with the following sections:

- Test data source:** A dropdown menu set to 'insurance claim data'.
- Test date:** A date and time field set to '2010-05-14 11:41:00' with a calendar icon and the number '15'.
- Specify Selections to Use:** A section with a right-pointing arrow.
- Records:** A section with two radio buttons. The first is selected and labeled 'Return 10 record(s) based on first hit'. The second is labeled 'Specify custom data'.
- Select Fields to Display:** A section with a right-pointing arrow.
- Run:** A green button with a play icon and the text 'Run'.
- Test Summary:** A table with columns for 'Preview', 'claim id', 'Rule Action', and 'Model Action'. It contains seven rows of data.
- Test Detail:** A section with a right-pointing arrow.

Preview	claim id	Rule Action	Model Action
	28015402		
	86926208	Refer; Automotive	Standard; Automotive
	14338044	Standard; Automotive	Fast Track; Automotive
	58917605		
	24253422		
	81081567	Fast Track; Automotive	Standard; Automotive
	65416119	Fast Track; Automotive	Fast Track; Automotive

- ▶ Select the data source you want to use, or select Specify custom data in the Records section to enter test records manually.
- ▶ Specify the test date and interaction point to use where applicable. These settings depend on the current application, but can have significant impact on the results.
- ▶ Specify selections to use, if any. For example, you may want to include or exclude certain records from the test. You can search for existing rules, or create new ones as appropriate. [For more information, see the topic Defining selection rules in Chapter 6 on p. 57.](#)
- ▶ If using a data source, specify the number of records you want to return. You can return the first N records, up to a maximum of 100, read from the top of the data or from a random sample of records.

- ▶ If using custom data, select Specify custom data and click Add custom record. All fields defined in the project data model are listed, allowing you to specify a value for each. Click Save when finished.
- ▶ Under Select Fields to Display, select the fields you want to appear in the test output.
- ▶ Click Run.
- ▶ The test summary displays results for each record. Values for the selected input fields will be displayed.
- ▶ Click the information icon at the beginning of each row to obtain details for that row.

Figure 8-13
Test record preview



The screenshot shows a window titled "Record Preview" with a close button in the top right corner. The window contains a table with two columns: "Field name" and "Value". The table lists the following data:

Field name	Value
Age	26
Months as a Customer	12.0
Number of Products	1
RFM Score	7.879
Average Balance Feed Index	179
Number of Transactions	1
Personal Debt to Equity Ratio	26
Months Current Account	8

Where available, select Test Detail to see additional details as available. For example you can see how recommendations are determined for the current record based on rules or models that fired at each step.

Figure 8-14
Test details

Test Summary ▼				
Preview	Customer ID	Offer 1	Offer 2	
	5409	Credit Card; Cross Sell;		
	5477	Credit Card; Cross Sell;		
	5507	Home Equity Loan; Cross Sell;		
	8	Credit Card; Cross Sell;		
	158	Home Equity Loan; Cross Sell;		
	173	Credit Card; Cross Sell;		
	5408	Credit Card; Cross Sell;		

Test Detail ▼				
Campaign	Global Selections	Define	Selection	Schedule ↕
Cross Sell	✓	✓	✓	✓
Credit Card	✓	✓	✓	
Retention	✓	✗	✗	✓

Figure 8-15
Additional details

Additional Test Details - Retention ✗

OK Global Selections

- Inclusions
- Exclusions
 - OK Bad Payment Record
 - OK Weeks Since Last Offer

NOT OK Define

- OK Retention
 - NOT OK Selections
 - Inclusions
 - NOT OK High value Customers

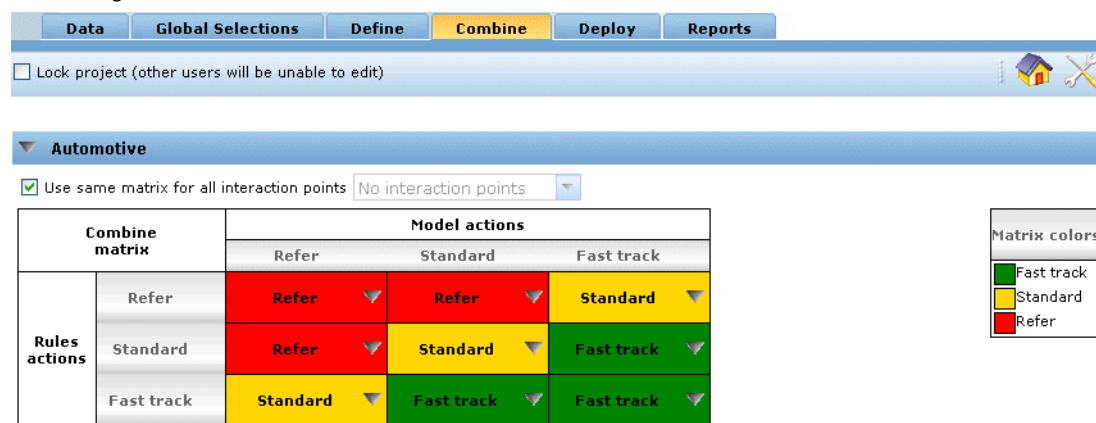
Combining decisions

While the selections and allocations on the Define tab may return multiple possible decisions or recommendations for each record, the Combine tab specifies how the final decision is made.

Combining rules and models using a matrix

For applications that use a matrix, the best decision is determined by combining the aggregated results from multiple rules and/or models. On the previous tab, you specified two different methods for allocating actions—one based on business rules, the other using a model. Each of these methods may return a different result (for example, the rule may say to fast track a claim, while the model says to refer). By combining the two methods, any biases inherent in one may be balanced by the other, allowing you to arrive at the best decision for each claim.

Figure 9-1
Combining rule- and model-based risk



The actions returned by rules are displayed in rows, and model actions are displayed in columns. Each cell indicates the decision for a specific combination. For example, if both rule and model choose a certain action such as *Refer*, you probably want to go with that action, as seen in the cell in the upper left corner of the matrix. The cell at lower right is set to *Fast track* for similar reasons. But in cases where the rules and model disagree, which should take precedence? You can use the matrix to specify how each combination is handled.

- ▶ Use the Matrix Colors palette on the right to choose the color for each action. Colors are used solely as a visual indicator, and do not change the outcome in any way.
- ▶ Click individual cells within the matrix to specify how that combination of actions is handled.

Figure 9-2
Choosing an action

Combine matrix		Model actions		
		Refer	Standard	Fast track
Rules actions	Refer	Refer	Refer	Standard
	Standard	Refer	Standard	Fast track
	Fast track	Standard	Standard	Fast track

- ▶ After setting the matrix, click WhatIf?... to experiment with different matrix combinations, compare how each will apply to your simulation data, and choose the one that best meets your goal. For more information, see the topic WhatIf? analysis on p. 102.

WhatIf? analysis

Select WhatIf?... on the Combine tab to experiment with different parameters and see how changes impact the final result. Each simulation run adds a new column in the results table at lower left, allowing a side-by-side comparison.

Figure 9-3
WhatIf? dialog box

WhatIf?

Simulation Data Source: Simulation Date: Claim Area:

Combine matrix		Model actions			Results		
		Refer	Standard	Fast Track	Action	Count	Percent
Rules actions	Refer	Refer	Standard	Standard	Fast Track	341	40.84%
	Standard	Refer	Standard	Fast Track	Refer	65	7.78%
	Fast Track	Standard	Standard	Fast Track	Standard	429	51.38%
						835	100%

Name:

Total Simulation Records: 1100

Display: Number of runs retained: 2

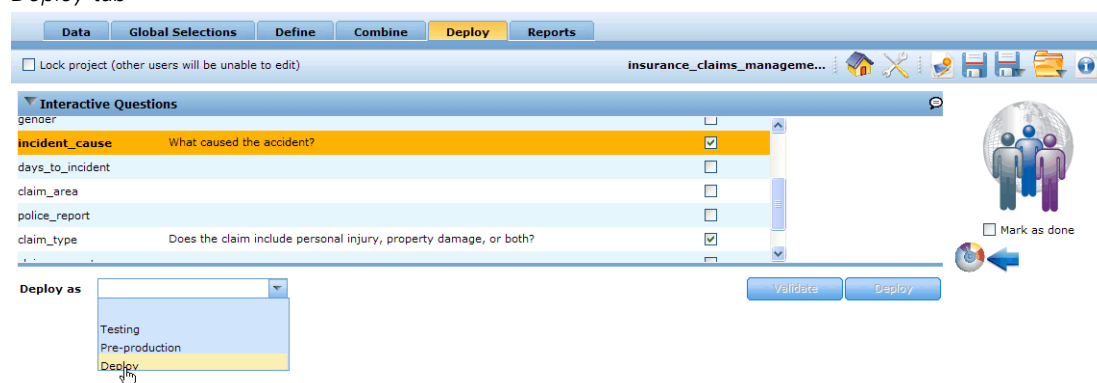
Action	Run 1	Run 2	Distribution
Fast Track	412	341	<div style="width: 100%; height: 10px; background: linear-gradient(to right, red, blue);"></div>
Refer	66	65	<div style="width: 100%; height: 10px; background: linear-gradient(to right, red, blue);"></div>
Standard	357	429	<div style="width: 100%; height: 10px; background: linear-gradient(to right, red, blue);"></div>
Total	835	835	

- ▶ Select a data source, and specify a date for the simulation. Depending on the active dates defined for each claim area, this can have a big impact on the result.
- ▶ Select an interaction point to use for the simulation, if available. Interaction points are configured by the administrator. [For more information, see the topic Defining interaction points in Chapter 12 on p. 117.](#)
- ▶ To try a new combination, edit the matrix settings , type a name for the simulation, and click Run. Simulation results are displayed in the panel at lower left. Each simulation adds a new column. Results are displayed for each claim area, as well as the total across all dimensions.
- ▶ Select the measure to display from the drop-down list. The following measures are available:
 - **Count.** The number of records allocated to that item.
 - **Percent.** The percentage of total records accounted for by the current item.
- ▶ Click on any simulation column to make it current.
- ▶ To apply settings from the current simulation to the Combine tab, click **Update Settings**. Alternatively, you can close the WhatIf? dialog without updating settings to restore the original state.

Deploying applications

The Deploy tab enables you to check that all parts of a project have been correctly set up and then label the project as ready for use within your organization. The project could be for testing purposes, batch processing, or deployed in a real-time production environment such as a call center, Web site, ATM, or store location as appropriate.

Figure 10-1
Deploy tab



To specify interactive questions

Interactive questions can be used to prompt users for additional information when needed. Each question is linked to a specific field in the data model. For example, you may have a promotional campaign for the retired, in which case you need either their age or date of birth; if your data doesn't have this detail, you can create a question that prompts a call center operator to ask for it and enter the response. Your administrator will need to link these questions to whichever system the operator uses when dealing with customers to ensure the correct questions are presented at the right time.

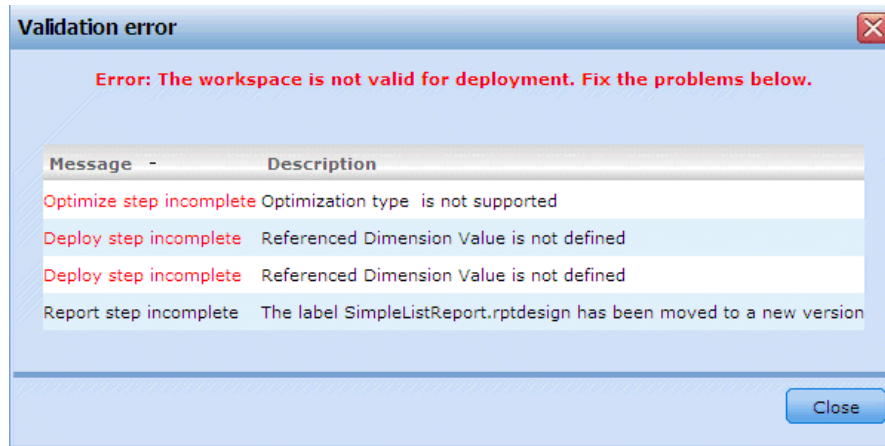
- ▶ For each question you want to specify, select the Enable check box for the appropriate field, and specify the text to be used.
- ▶ If interaction points are enabled, you can use the same questions for all interaction points, or specify different questions for each. For example, the phrasing of a question may be different if you are setting it up for use by a call center operator or for display on a web site. [For more information, see the topic Defining interaction points in Chapter 12 on p. 117.](#)

To label the project for deployment

- ▶ From the Deploy As list, select the label to apply to the project. Available labels are configured by the local administrator, but would typically include options such as *Test*, *Pre-production*, and *Deploy*.

- ▶ Click Validate; any errors or missing steps are listed for you to address.

Figure 10-2
Validation errors



- ▶ To apply the label, click Deploy. If a previous version of the project is already deployed a warning is displayed; you can choose whether to deploy your latest version or keep the existing deployed version.

When a project is labeled for deployment, it can be configured for use with batch or real-time scoring, and integration with existing IT systems (such as a call center or Web site). Typically this is done by a consultant as part of a service engagement. If scoring has already been configured, labeling a new version will cause this version to be used in place of the previous one. Any external models or rules referenced in the project must also be labeled.

Reporting results

Report types

IBM® SPSS® Decision Management is able to read reports from many formats, these include:

- Text files (.txt, .csv)
- Spreadsheets (.xls, .xlsx)
- Images (.png, .jpeg, .gif, .bmp)
- HTML
- PDF

In addition to these file types, SPSS Decision Management supports the reporting functionality enabled by BIRT (Business Intelligence and Reporting Tools), an open-source package distributed by Eclipse Foundation under the Eclipse Public License. BIRT provides core reporting features, such as report layout, data access, and scripting. For more information about BIRT, see the [BIRT project page \(http://www.eclipse.org/birt\)](http://www.eclipse.org/birt). BIRT Report Designer for IBM® SPSS® is a standalone application that can be used in conjunction with SPSS Decision Management. It provides a rich user interface with a number of advanced features for creating reports and must be installed separately.

Note: If a BIRT Report Designer for IBM SPSS report requires a JDBC-based database connection, a corresponding JDBC driver must be installed with the IBM® SPSS® Collaboration and Deployment Services Repository. For application server-specific information on the location of the JDBC drivers, see the corresponding section of the IBM SPSS Collaboration and Deployment Services Repository installation instructions.

Accessing a report

Depending on how your system has been set up, you can access reports from a link on the main application page, from a dedicated report tab, or both.

Figure 11-1
Report link on main application page

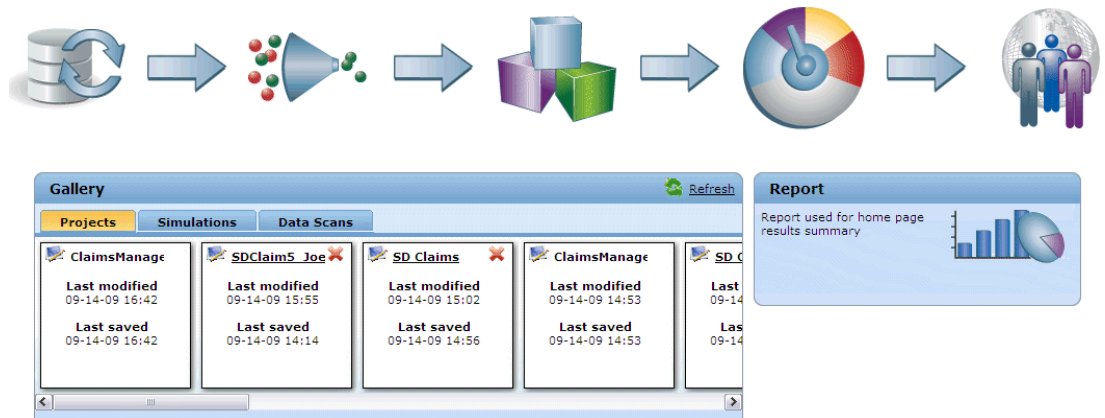
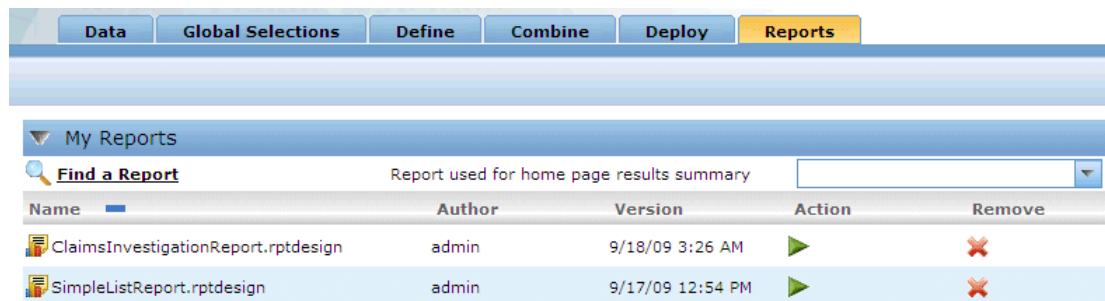


Figure 11-2
Reports tab within an application

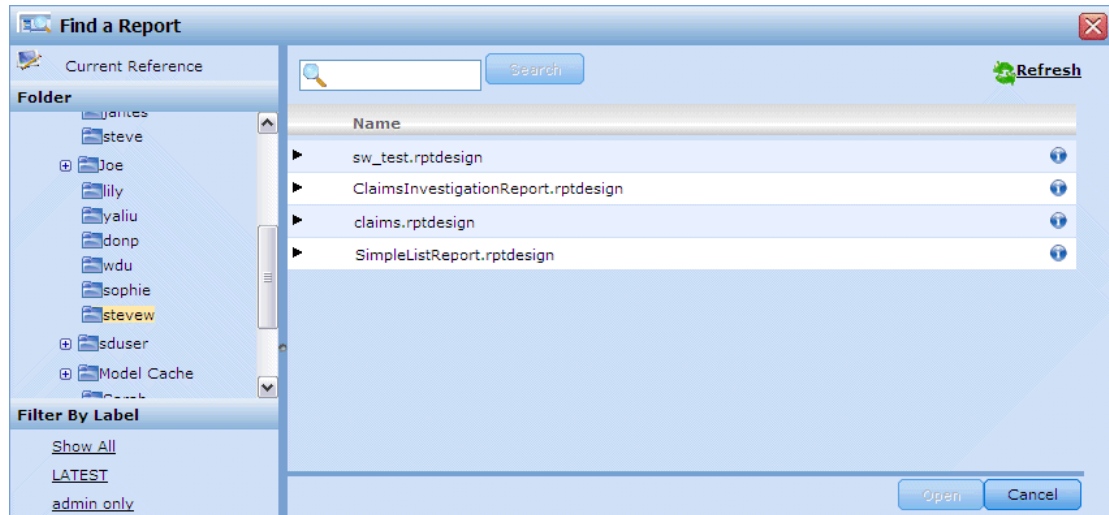


Any reports that you have already viewed are displayed.

To retrieve a report:

- ▶ Click Find a Report to display a browser window where you can search for the report.

Figure 11-3
Browse for existing reports

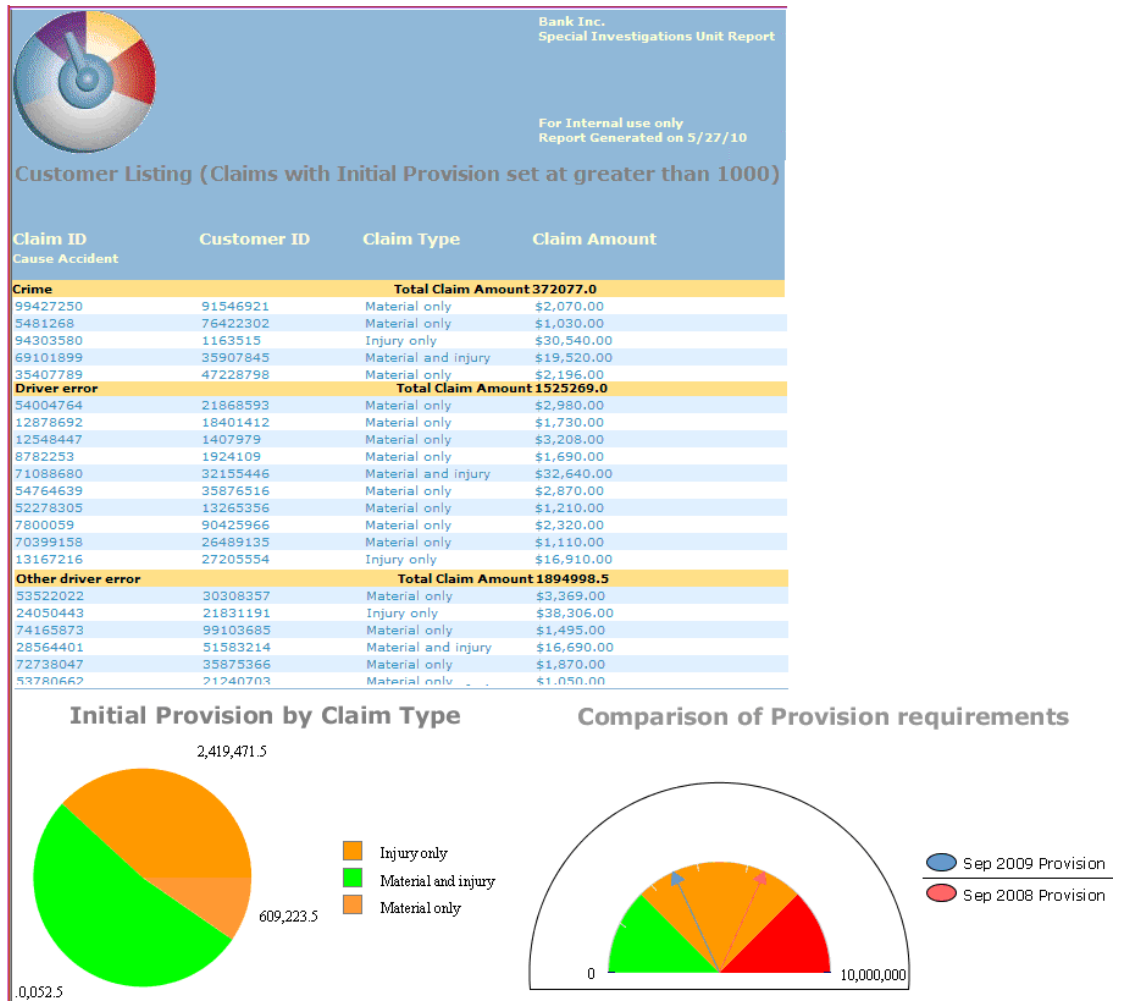


- ▶ Select the report.
- ▶ Click Open; the report is added to the list of those you can access from within the application.
- ▶ To view the report's contents, click the icon in the Action column. The report opens in a new window.

Example report

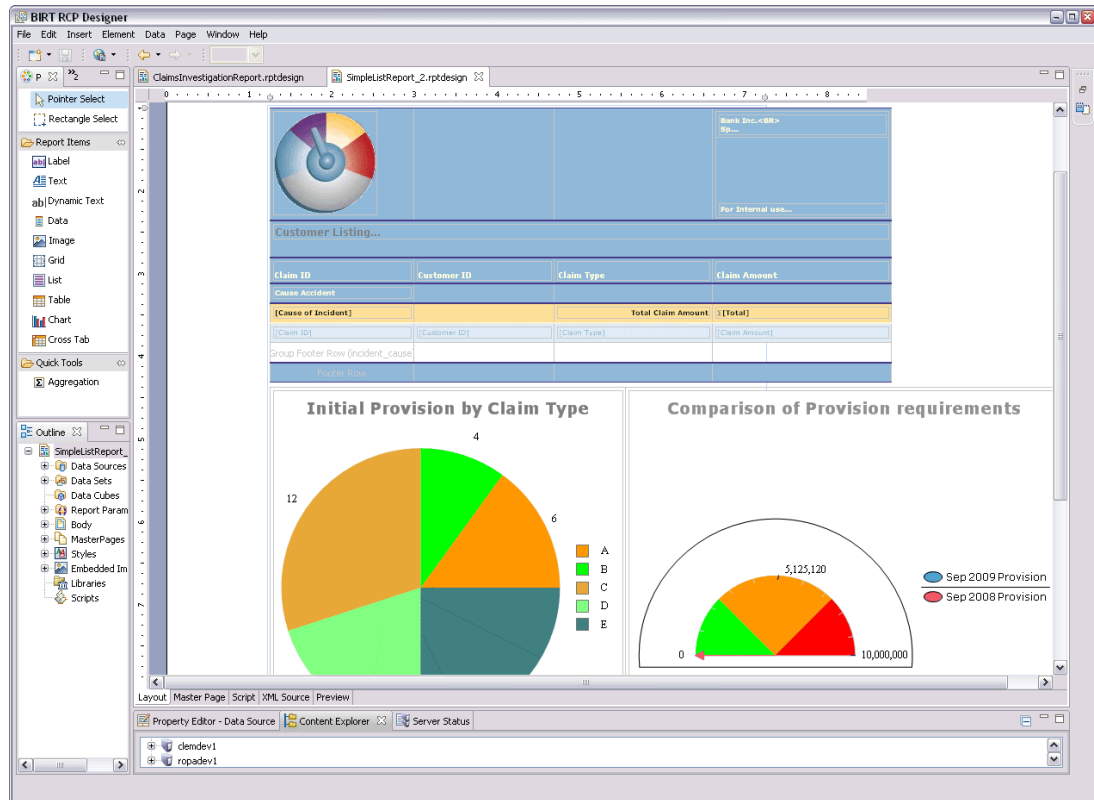
An example of a report produced using BIRT reporting tools is shown below.

Figure 11-4
BIRT-produced report example



To produce this, the basic report layout was created in BIRT Report Designer for IBM® SPSS® and then accessed and run from within the Reports tab.

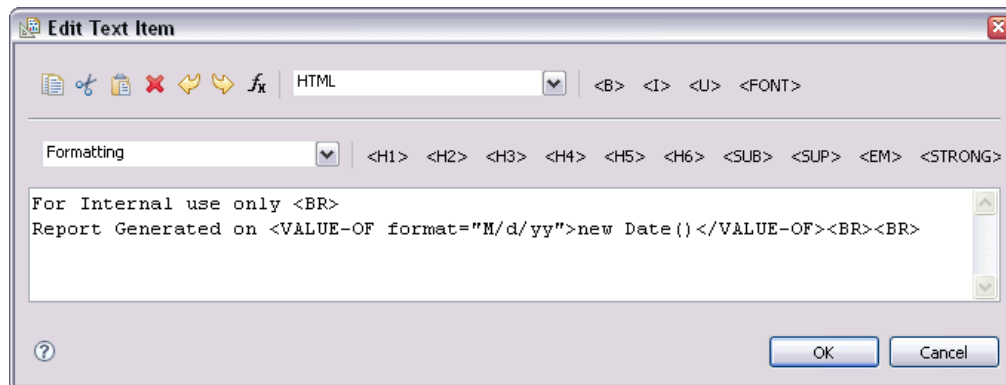
Figure 11-5
BIRT RCP Designer



For full details of how to use BIRT Report Designer for IBM SPSS, please see the documentation supplied with it. Some of the main parts that were used to create the report are listed below.

- Basic text is entered to give the report title details.

Figure 11-6
Text entry, including automatic date entry



- The relevant data items are dragged from the data set and dropped onto the report layout.

Figure 11-7
Data item used in the report

Edit Data Binding

Column Binding Name: Claim Amount

Display Name: Claim Amount

Data Type: Integer

Expression: dataSetRow["claim_amount"]

OK Cancel

- Graphic chart elements are added to the report layout; the data to be displayed in them is selected.

Figure 11-8
Chart data selection

Edit Chart

Cannot fetch the next data row.
Cannot move down to next row in the result set.

Select Chart Type Select Data Format Chart

Chart Preview

Initial Provision by Claim Type

38,306.5

13,689.5

Legend: Injury only (orange), Material only (green)

Slice Size Definition: Series 1 row["claim_amount"]

Category Definition: row["claim_type"]

Select Data

Inherit Data from Container

Use Data from Bank Claims Data

Data Preview

Use the right-click menu or drag the column into series fields.

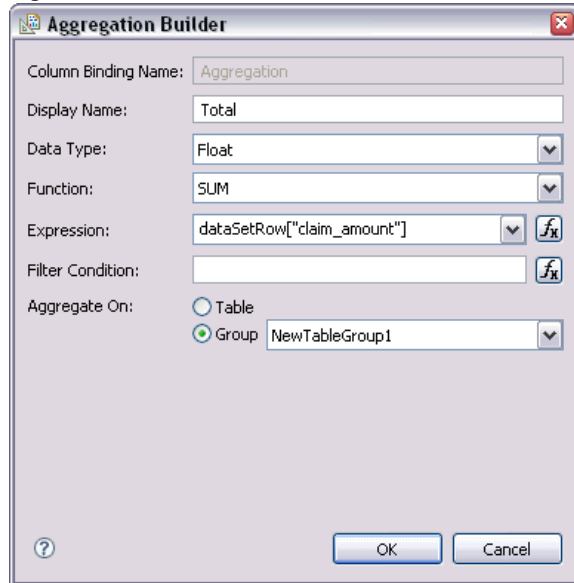
claim_id	customer_id	age	gender	incident_type
54,004,764	21,868,593	32	Female	Driver e
33,985,796	75,740,424	60	Female	Crime
53,522,022	30,308,357	27	Female	Other c
13,015,401	47,830,476	39	Female	Natural
22,890,252	19,269,962	47	Male	Crime

Filters... Parameters... Data Binding...

< Back Next > Finish Cancel Apply

- ▶ Expressions and mathematical calculations are added as required. For example, to aggregate the values of each insurance claim type.

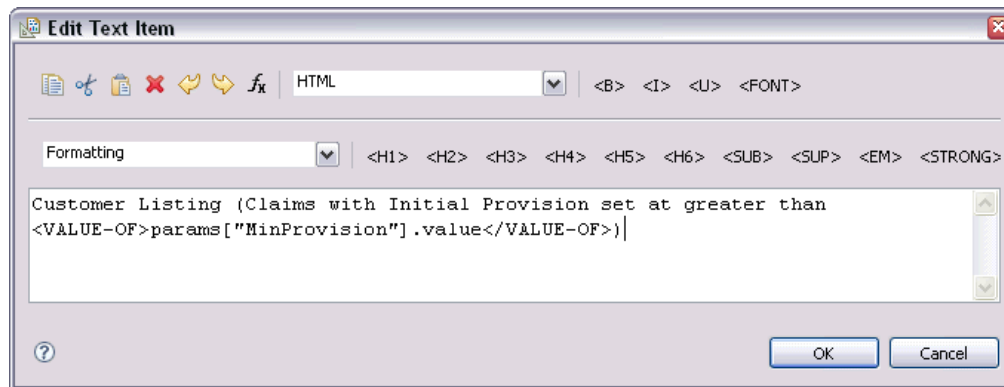
Figure 11-9



- ▶ Any required parameters are created and added to the report. For example, when the report is run the user is prompted to enter the value of financial provision that they are interested in.

Figure 11-10

Parameter details added to user prompt



Administering applications

Administrators can control the way business users interact with IBM® SPSS® Decision Management applications. This level of control makes business users' jobs easier so they can more quickly and efficiently use the application to help solve business problems. It also enables administrators to restrict access to certain functionality.

Use IBM® SPSS® Collaboration and Deployment Services Deployment Manager to grant administrative authority to specific users or groups as needed. Only users who are granted the *Decision Management Administration* action have access to the features described in this section.

- ▶ Open Deployment Manager.
- ▶ From the Tools menu, select Server Administration.
- ▶ On the Server Administration tab, connect to your server.
- ▶ Under Users and Groups, select Local User Repository.
- ▶ Click New Group to create a new group for administrators and a new group for business users. For example:
 - Decision Management Administrators.
 - Decision Management Users.

You can also create new users at this time, if desired. While creating the groups, add the appropriate users to each group. For example, members of the administrators group will be granted authority to administer SPSS Decision Management applications at your organization.
- ▶ Go to Roles and click New Role to create a new administrative role and a new business user role. For example:
 - SPSS Decision Management administrator.
 - SPSS Decision Management user.

While creating the new roles, assign them the following actions, at a minimum.

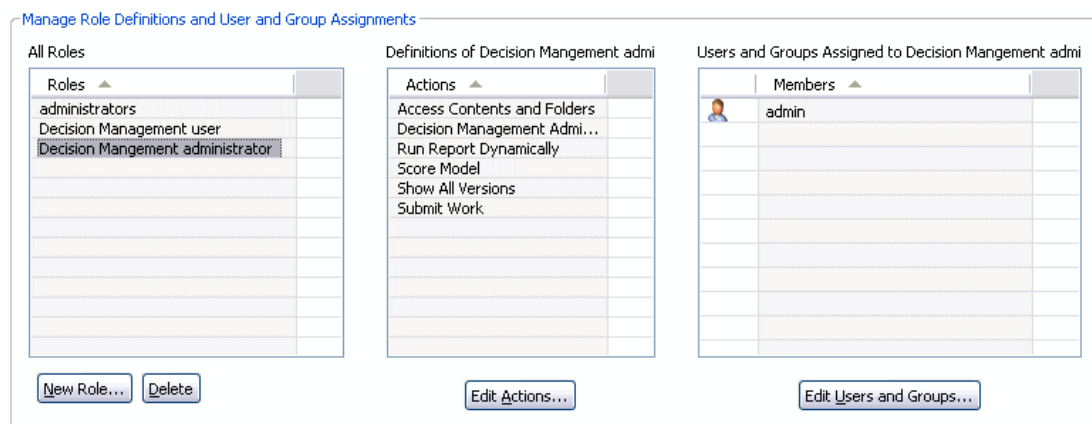
Role	Actions Required
Decision Management administrator	Access Contents and Folders Decision Management Administration Run Report Dynamically Score Model Submit Work Show All Versions
Decision Management user	Access Contents and Folders Run Report Dynamically Score Model Submit Work Show latest* OR Show All Versions*

**Note:* Either the Show latest or Show All Versions action is required if users need access to project versions they did not create. Otherwise projects will open in read-only mode if the current user does not have access to the latest version.

- ▶ Select the Decision Management administrator role and click Edit Users and Groups. Add the Decision Management Administrators group you just created.
- ▶ Select the Decision Management user role and click Edit Users and Groups. Add the Decision Management Users group you just created.

Figure 12-1

Decision Management Administration action in IBM SPSS Collaboration and Deployment Services Deployment Manager



General options

Certain general options are available to administrators on all tabs of the IBM® SPSS® Decision Management user interface. These options allow administrators to hide or lock tabs from business users.

- The top of each tab has the option Hide <tab name> within the Application, where <tab name> is the name of a tab. This hides the entire tab from the business user. For example, if you don't want users to see the Data tab for an application, log on to the application, go to the Data tab, and select Hide Data tab within the Application.
- The top of each tab has the option Lock all <tab name> options, where <tab name> is the name of the tab. This locks all controls on the tab so they're read-only for the business user. For example, if you want business users to be able to view current data settings but not change them, you can set this option on the Data tab of an application. This setting is also very useful for situations when you want to set certain things up in advance for the business user to simplify their job.
- Administrators can also lock and unlock individual settings on each tab by clicking the padlock icon when available. Clicking the icon locks or unlocks its associated control. Business users will see the locked padlock icon for controls the administrator locks, but will never see an unlocked padlock icon.

Individual items that are locked may also be displayed with a grayed-out background or muted colors to indicate that they are unavailable for selection; an error message is displayed if a user attempts to select them. When an entire tab is locked a message to that effect is displayed at the top of the tab.



Controlling application shortcuts

The Applications Launch Page provides an easy way for business users to open applications and add custom shortcuts to specific, labeled versions of applications. Administrators can specify which application shortcuts will show up on the launch page for all users. After logging on with administrator authority:

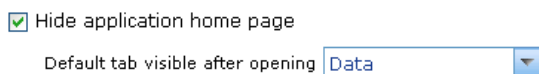
- ▶ Select In default launcher for applications you want all users to see on their launch page.
- ▶ If desired, click the padlock icon on an application shortcut so business users cannot remove it from their launch page. Note that business users can still add and remove other applications shortcuts. Users will see the locked padlock icon instead of the close icon for shortcuts that are locked. [For more information, see the topic Launching applications in Chapter 3 on p. 22.](#)

Hiding the Home page

Each application provides a step-by-step workflow, as represented by the graphics on the Home page. Clicking a graphic jumps to that section of the user interface. However, business users may not always need access to every step in an application's workflow.

Administrators can hide the Home page from business users. For example, in a certain application business users might only use the Reports tab. In this case an administrator could hide the Home page and all other tabs from business users. So when the business user logs on he is taken directly to the Reports tab and never sees any other tabs.

Figure 12-2
Hiding an application home page



- ▶ On the Home page, select Hide Application home page.
- ▶ In the drop-down, specify which tab to display when users first open the application.

Note that if you subsequently hide this selected tab, the next unhidden tab in the application is displayed.

Locking data options

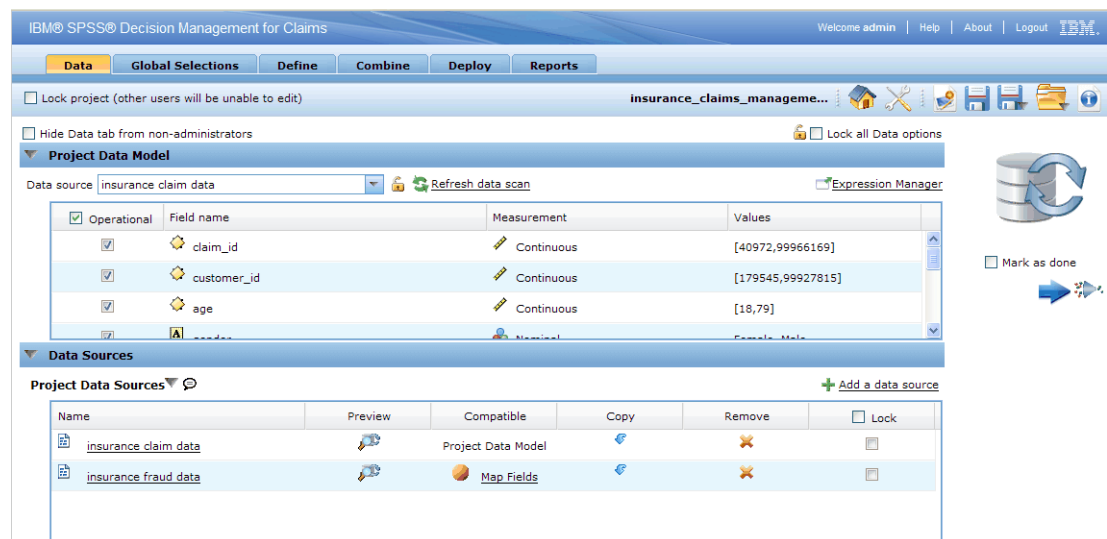
Data

The Data tab defines the data sets the application uses for analysis, simulation and testing, scoring, or other operational use. These data sources are defined relative to your server installation; hence all paths to data files, odbc sources, and so on are all relative to the server.

As an administrator, you may want to set up some or all data before business users start using their applications. Administrators can:

- Select Lock Datasource when creating a new data source to lock it after it's created.
- Lock and unlock individual data sources by clicking the padlock icon next to a data source in the table, or in the Data Source Editor dialog.
- Set and lock the data model used in the application by selecting a data model in the Project Data Model drop-down and clicking the padlock icon.

Figure 12-3
Administrator options on the Data tab



Note that business users can copy a locked data source from Project Data Sets to their My Data Sets section, but it remains locked in both sets. [For more information, see the topic Managing data sources in Chapter 4 on p. 35.](#)

Enforcing global selections

Global selections allow you to choose the records to include or exclude from an application. For example, you could exclude customers with bad credit, or select certain types of claims for special processing. As an administrator, you may want to set up some global selections and enforce them for all users of an application.

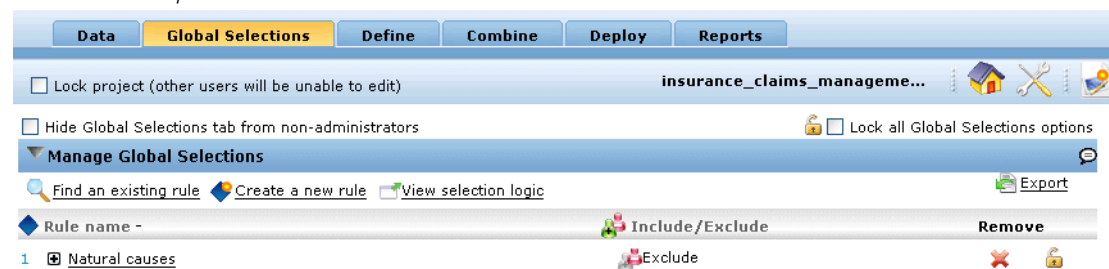
For example, to exclude customers under a certain age, you can create a rule like *Age<18* and set it to *Exclude*. You can then lock this rule on the Global Selections tab to ensure it is always enforced by the application.

Administrators can:

- Lock and unlock individual selections by clicking the padlock icon next to a selection in the table.
- Select Lock Rule when creating a new rule to lock it after it's created.

For more information, see the topic [Working with rules in Chapter 6 on p. 54](#).

Figure 12-4
Administrator options on the Global Selections tab



For more information, see the topic [Global selections in Chapter 5 on p. 52](#).

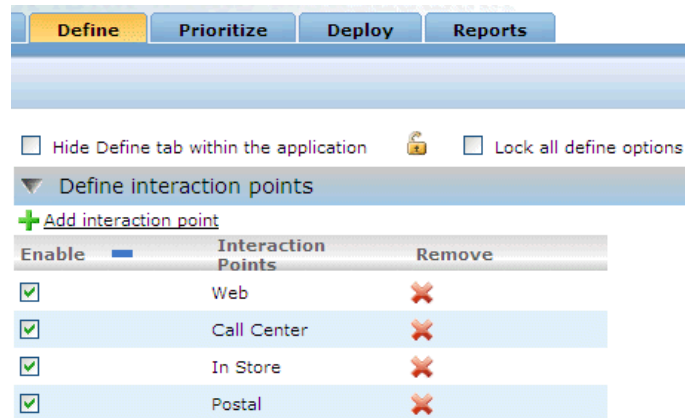
Defining interaction points

Interaction points specify where an item such as a campaign or offer applies. Options might include a call center, web site, ATM, or in-store location. Administrators use the Define Interaction Points section of the Define tab to predefine the interaction points, which are then available for selection by business users.

Administrators can:

- Create, modify, or remove interaction points available in the application.
- Enable or disable interaction points. If enabled, an interaction point is selected for business users by default. Business users can select which available interaction points apply to the item they're defining.

Figure 12-5
Defining interaction points



Locking constraint and interaction point options

Interaction points can be used in both the prioritization and combination steps; these are effectively two versions of the same step, but with different ways of calculating a result.

For applications that use prioritization, the best decision is determined by using a prioritization equation that defines your goal, such as maximizing profit. The goal of prioritization is to maximize (or minimize) the value of this function in order to make the best decision for each record. On the Prioritize tab, as an administrator you can:

- Lock all prioritization options to prevent business users from specifying different settings.
- Set and lock the interaction point option Use same settings for all interaction points if you don't want business users to be able to specify different settings for each interaction point.
- Set and lock the Max number of offers value for constraints) if you don't want business users to change the maximum number of offers you specify.

For applications that use combination, the best decision is made by taking rule and model outputs from the Define tab and combining them to result in a single output. On the Combine tab, as an administrator you can:

- Lock all combination options to prevent business users from specifying different settings.

For complete details about the Prioritize or Combine step, see the *Application User's Guide*.

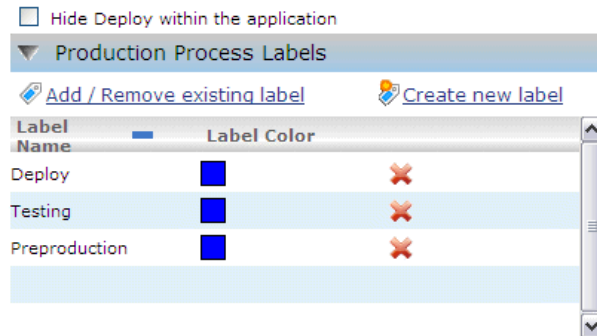
Defining labels for use in production process

Business users can use the Deploy tab to deploy applications for use in a test or product environment such as a call center, web site, ATM or store location as appropriate. During deployment, business users can select a specific version of the application to deploy. When deployed, the selected version and all its artifacts are given a label to identify them as the deployed version. As an administrator, you can create labels to be used during this process. For example,

you may want to create a label called *Deploy*, a label called *Test*, and a label called *Pre-production* — all with different colors assigned to them for quick identification purposes.

On the Deploy tab, the Production Process Labels section is only visible to administrators (as indicated by the gray title bar). Business users don't have access to these options.

Figure 12-6
Labels for use in production process



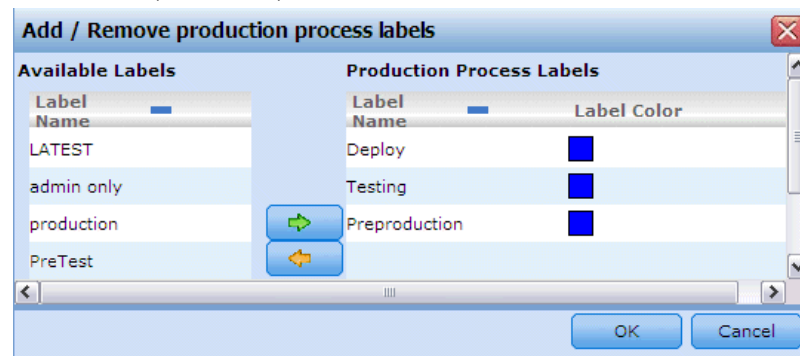
Administrators can set, modify, or remove production process labels available to business users in an application by:

- Selecting from a list of labels that already exists in the IBM® SPSS® Collaboration and Deployment Services Repository.
- Creating new labels in the IBM SPSS Collaboration and Deployment Services Repository.

To add or remove a label:

- ▶ Click Add/Remove Existing Label. The Add/Remove Production Process Labels dialog opens.

Figure 12-7
Add/Remove production process labels



- ▶ Select labels in the Available Labels column and move them to the Production Process Labels column to make them available for use in the production process. Move labels back to the Available Labels column to remove them from the production process. Only labels appearing in the Production Process Labels column can be used in the production process.

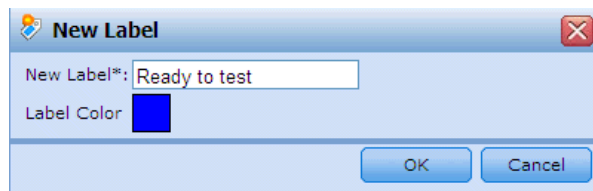
Note: When you create a new label, it is applied to a temporary object in the IBM SPSS Collaboration and Deployment Services Repository (labels cannot exist without being assigned to an object). Until the new label is used in an application, it will be deleted if it is removed from the Production Process Labels section.

- Assign a color to each label used in the production process. When finished, click OK.

To create a new label:

Click Create New Label. The New Label dialog opens.

Figure 12-8
New label



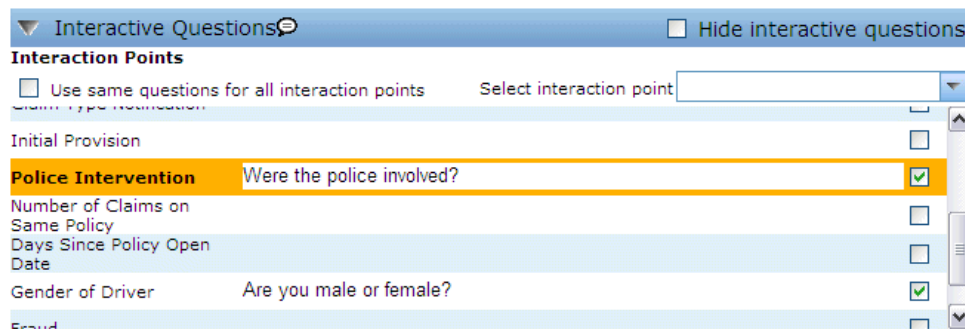
Type a name for the new label, assign a color to it, and click OK.

Hiding interactive questions

Business users can use interactive questions to request additional data that may not be in the data source. For example, a promotional campaign for the retired would need a person's age or date of birth to confirm their eligibility; the interactive question can be set up to prompt a telesales operator to request this information.

On the Deploy tab, administrators can select Hide Interactive Questions to hide the section from business users.

Figure 12-9
Interactive questions



Locking scoring destination options

For applications configured to use the Score Now section (Deploy or Score tab), there is a section that allows business users to specify the destination for storing score data (to database or file). For example, if storing scores in a database, you specify the database name and the method for storing the scores (such as creating a new table in the database).

As an administrator, you can lock the destination options for scoring. For example, you may want scores to only be appended to an existing table in a certain database—instead of giving business users the option to overwrite existing data, append new data to an existing table, create a new table, or store data in a file.

- ▶ To lock all scoring destination options, click the padlock icon next to the Destination drop-down on the Deploy tab. Business users will be able to see the destination options, but not edit them.

For more information, see the topic [Deploying applications in Chapter 10 on p. 104](#).

Locking report options

On the Reports tab, business users can view reports available in an application, specify which report is used on the Home page of the application, and give a title to the report used on the Home page. The report on the Home page is displayed in a small panel on the bottom of the screen, providing a quick summary of current results. If desired, administrators can lock report options:

- ▶ To lock the report used on the Home page of an application, go to the Reports tab and click the padlock next to the drop-down. Locking this option also prevents business users from removing the associated report from the table.

Report used for homepage results summary 

- ▶ To lock the title used for the Reports section on the Home page of an application, go to the Reports tab and click the padlock icon next to the text field.

Title of homepage results summary panel 

Downloading project metadata for use in creating external rules

Rules created in a Business Rules Management System such as ILOG can be referenced and used in IBM® SPSS® Decision Management applications, provided they have been developed to support the same data model used in the current SPSS Decision Management project, and can be deployed as a Web service for use the application. To accomplish this, the SPSS Decision Management administrator can download a .ZIP file with metadata for the current project. The downloaded file is saved locally on the system used by the administrator to trigger the download.

Figure 12-10

Download metadata icon

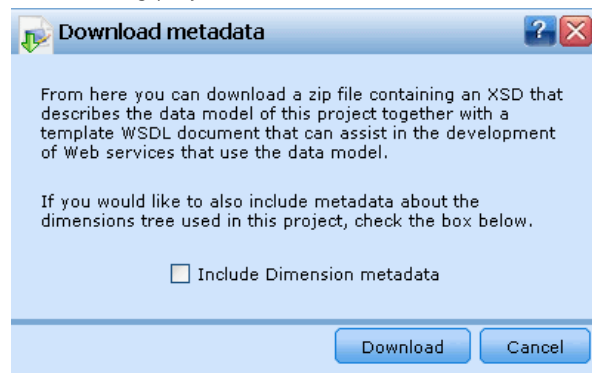


The following files are included in the *.ZIP* file:

- **XML schema definition (*.XSD)**. Contains definitions of the field types in the data model for the current SPSS Decision Management project. This file can be imported into an external development tool such as ILOG Rules Studio in order to develop rules for use with the current project.
- **Web service description language template (*.WSDL)**. Included to assist in development of Web services that use the data model. The *.WSDL* file is provided as a template that can be used to build Web services responsible for mediating messages between the SPSS Decision Management application and an external rule service. Details on the mediating Web service can be manually supplied by the integrator.

Include dimension metadata. If a dimension tree has been defined for the project on the Define tab, dimension tree metadata can optionally be included.

Figure 12-11
Downloading project metadata



For information on creating external rules for use in SPSS Decision Management, see the *Application Designers Guide*.

Sample files

Many IBM® SPSS® Decision Management applications ship with data and other sample files that can be used to replicate the examples shown in the user guides.

Data

During installation, a number of sample data files are installed under the IBM® SPSS® Modeler Server \Demos directory (for example, *C:\Program Files\IBM\SPSS\Modeler\14.2Demos*). These files may be used with prebuilt sample applications, and include:

- *insurance_claim_data.txt*
- *insurance_fraud_data.txt*
- *bank_customer_data.txt*
- *bank_response_data.txt*

Sample application files, models, and rules that use these data files assume the default location indicated above. If data files are installed to a different drive or location, the data source paths will need to be updated accordingly.

Samples

A number of sample application files, models, and rules are provided for use with prebuilt IBM® SPSS® Decision Management applications. The samples are packaged in the *Demo* directory on the application DVD, or provided in separate files available for download. Complete the following steps to import sample files for one or more prebuilt applications into IBM® SPSS® Collaboration and Deployment Services Repository.

- ▶ **DVD.** Copy the files from the *Demo* folder on the DVD to a temporary location, for example *c:\temp\ClaimsManagement*. If samples are packaged in a *.zip* file, be sure to extract all files before proceeding.

or

- ▶ **Downloaded file.** Download the desired sample file for the application, for example *SPSS_Decision_Mgmt_61_Claims_demo.zip*. Extract all files before proceeding.
- ▶ Open IBM® SPSS® Collaboration and Deployment Services Deployment Manager and log on to your Content Server connection.
- ▶ In Deployment Manager, create a new folder for the application, for example *ClaimsManagement*.
- ▶ In Deployment Manager, right-click on the folder you created in the previous step and select Add File to Repository.
- ▶ Browse to the temporary location where you copied the sample files, for example *c:\temp\ClaimsManagement*. Select all files in the folder, and then click Open. The files will be added to the folder in IBM SPSS Collaboration and Deployment Services Repository. (If demo files were packaged in a *.zip* file, be sure to extract all files before uploading.)

Note that all sample application files, models, and rules assume that data files are installed under the IBM® SPSS® Modeler Server *Demos* directory (for example, *C:\Program Files\IBM\SPSS\Modeller\14.2Demos*). If data files are installed to a different drive or location, the data source paths will need to be updated for the local configuration.

Help and accessibility

Getting help

Three levels of user-assistance are provided:

- Custom help is provided for each application packaged with IBM® SPSS® Decision Management. To launch the help, click the help icon on any screen or dialog:



- Coach text, which is displayed in a small pop-up window, providing details on the current application or business problem. Coach text provides an additional layer of customized, context-sensitive help that can be easily configured for a specific site or application. Coach text appears throughout the user interface when you click the small coach text icon:



- Standard tool tips, which are provided for individual controls within a page or dialog. To display a tool tip, hover the button, link, or other control.

Accessibility

Because IBM® SPSS® Decision Management is a browser-based application accessibility options for disabled users, such as those who are visually impaired, are controlled from your browser settings. For details about user interface actions, including keyboard shortcuts, screen readers, and so on, please refer to your browser's help or user guide.

Help accessibility

An alternate version of the user help system is available to provide additional support for screen readers. To switch to the alternate version you will need to run a batch file to convert the existing help system into a format more efficiently read by a screen reader. In the alternate version the table of contents is on the right and help topics display on the left.

To enable support for screen readers

- ▶ Navigate to the root directory of the help on the server (for example, *C:\Program Files\IBM\SPSS\Collaboration and Deployment Services\4.2\help\en\DecisionManagement\ClaimsManagment\userhelp*).
- ▶ To switch to the screen reader-friendly format double-click the batch file *format-for-screen-readers.bat* to run it.

To switch back to the default format run the batch file *restore-default-format.bat*.

Sharing streams between IBM SPSS Decision Management and IBM SPSS Modeler

Models and projects created in IBM® SPSS® Decision Management are saved as stream files, and can be modified and used in IBM® SPSS® Modeler if available. For example, you may want to create a model or project stream using IBM® SPSS® Modeler Advantage or another SPSS Decision Management application, then customize the stream in SPSS Modeler before deploying through SPSS Decision Management. Alternatively, streams created in SPSS Modeler can be opened in SPSS Decision Management, provided deployment settings have been specified as described below.

Opening streams in IBM SPSS Decision Management

When opening streams in SPSS Decision Management or IBM SPSS Modeler Advantage:

- If deployment type is not specified (none), the stream can be opened but only the Data tab is available.
- If deployment type is Scoring Only, the Score tab may also be available, provided the scoring branch starts with a single data source node of a type supported by IBM SPSS Modeler Advantage or SPSS Decision Management (no merged data sets).
- If deployment type is Model Refresh, the Modeling tab may also be available, provided the modeling branch starts with a single data source node of a type supported by IBM SPSS Modeler Advantage or SPSS Decision Management, and the selected modeling node is either an automated modeling node (supported for automated modeling) or a Decision List node (supported for interactive model building). In addition, a Type node must be present that defines the target field as well as other information used in modeling.

Specifying deployment settings in IBM SPSS Modeler

In SPSS Modeler, deployment settings are specified in the Stream Properties dialog box, as follows:

- ▶ From the SPSS Modeler menus, choose:
Tools > Stream Properties > Deployment
- ▶ From the Deployment type list, choose Scoring Only or Model Refresh as appropriate.
- ▶ Select a Scoring node, Modeling node, and Model node as needed.

Select Check to confirm that all required options have been specified, or select Store to store the stream in IBM® SPSS® Collaboration and Deployment Services Repository.

For streams created in IBM SPSS Modeler Advantage or SPSS Decision Management, deployment information is set automatically.

Tips for using IBM SPSS Modeler streams in IBM SPSS Decision Management

- It may be easier to create streams using IBM SPSS Modeler Advantage or SPSS Decision Management and then modify in SPSS Modeler, rather than building from scratch using SPSS Modeler. Streams created in this manner will be structured in a manner that allows them to be fully functional in SPSS Decision Management.
- For all streams created in IBM SPSS Modeler Advantage, supernodes are included at certain locations within the branch that can be customized by an expert user. It is strongly recommended that any customizations or additions to the stream be added within these supernodes to ensure they are preserved in the stream and recognized by IBM SPSS Modeler Advantage.
- Any local rules nodes containing an expression rule immediately downstream of each source node will have their fields included in the Expression Manager. Note that local rules can only be created within SPSS Decision Management or IBM SPSS Modeler Advantage and not by SPSS Modeler.
- If there is a Partition node upstream of the modeling node (and downstream of the Type node) then Automatically partition data to enable model evaluation on build data source for evaluation and testing is enabled in IBM SPSS Modeler Advantage, and the check box state is set depending on whether the partition node is enabled or not.
- If there is an Automated Data Preparation (ADP) node downstream of the Type node, then Automatically clean up and prepare data for reliable model building is enabled and the check box state is set depending on whether the ADP node is enabled or not.
- If Rule or Select nodes are present upstream of the modeling node, these are used to populate the Specify selections to use section.
- If stream parameters have been defined (Parameters tab in the Stream Properties dialog box), a Parameters link will be displayed on the Modeling and Score tabs in IBM SPSS Modeler Advantage. The user can click this link to specify these values.

Launching IBM SPSS Modeler Advantage from IBM SPSS Modeler

From the SPSS Modeler splash screen, you can choose to create a model with IBM SPSS Modeler Advantage.

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