



Red Hat Process Automation Manager 7.5

Getting started with business processes

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Abstract

This document describes how to create and test an example mortgage application project in Red Hat Process Automation Manager 7.5. The procedures in this document are based on the Mortgage_Process sample project included in Business Central.

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PREFACE

As a business rules and processes developer, you can use Business Central in Red Hat Process Automation Manager to design business processes to meet specific business requirements. Red Hat Process Automation Manager provides example projects in Business Central that contain examples of business assets for reference purposes. This document describes how to create and test an example mortgage application project based on the **Mortgage_Process** sample project included in Business Central.

Prerequisites

- Red Hat JBoss Enterprise Application Platform 7.2 is installed. For details, see the [Red Hat JBoss Enterprise Application Platform 7.2 Installation Guide](#).
- Red Hat Process Automation Manager is installed and configured with Process Server. For more information, see [Installing and configuring Red Hat Process Automation Manager on Red Hat JBoss EAP 7.2](#).
- Red Hat Process Automation Manager is running and you can log in to Business Central with the **developer** role. For more information, see [Planning a Red Hat Process Automation Manager installation](#).

CHAPTER 1. OVERVIEW

Business Central enables you to automate your business processes. A business process is a diagram that describes the order in which a series of steps must be executed and consists of predefined nodes and connections. Each node represents one step in the process while the connections specify how to transition from one node to another.

For example, a bank offers a housing mortgage loan service. Using Business Central, the housing mortgage department of the bank creates a complete business process for the mortgage loan.

When a customer wants to buy a new property using credit, the following steps occur:

1. The customer contacts a broker at the bank who assists in filing for a mortgage loan.
2. The broker collects information about the property and the customer, such as the salary of the customer, social security number, the property sale price, and the requested loan amount.
3. The broker then submits a request on behalf of the customer.

Whenever a customer submits a request, a new process instance is created. This ensures consistency in the quality of evaluating each request, provides complete visibility into the status of each request, and makes the process efficient and effective.

CHAPTER 2. EXAMPLE PROJECTS AND BUSINESS ASSETS IN BUSINESS CENTRAL

Business Central contains example projects with example business assets that you can use as a reference for the rules, processes, or other assets that you create in your own Red Hat Process Automation Manager projects. Each sample project is designed differently to demonstrate process automation, decision management, or business optimization assets and logic in Red Hat Process Automation Manager.



NOTE

Red Hat does not provide support for the example code included in the Red Hat Process Automation Manager distribution.

The following example projects are available in Business Central:

- **Evaluation_Process:** (Process automation) Example evaluation process using business process assets. Evaluates employees based on performance.
- **Mortgage_Process:** (Process automation) Example loan approval process using business process and decision assets. Determines loan eligibility based on applicant data and qualifications.
- **IT_Orders:** (Process automation and case management) Example ordering case using business process and case management assets. Places an IT hardware order based on needs and approvals.
- **Traffic_Violation:** (Decision management with DMN) Example traffic violation decision service using a Decision Model and Notation (DMN) model. Determines driver penalty and suspension based on traffic violations.
- **Mortgages:** (Decision management with rules) Example loan approval process using rule-based decision assets. Determines loan eligibility based on applicant data and qualifications.
- **Employee_Rostering:** (Business optimization) Example employee rostering optimization using decision and solver assets. Assigns employees to shifts based on skills.
- **OptaCloud:** (Business optimization) Example resource allocation optimization using decision and solver assets. Assigns processes to computers with limited resources.
- **Course_Scheduling:** (Business optimization) Example course scheduling and curriculum decision process. Assigns lectures to rooms and determines a student's curriculum based on factors, such as course conflicts and class room capacity.
- **Dinner_Party:** (Business optimization) Guest seating optimization using guided decision tables. Assigns guest seating based on each guest's job type, political beliefs, and known relationships.

2.1. ACCESSING EXAMPLE PROJECTS AND BUSINESS ASSETS IN BUSINESS CENTRAL

You can use the example projects in Business Central to explore example business assets as a reference for the rules or other assets that you create in your own Red Hat Process Automation Manager projects.

Prerequisites

- Business Central is installed and running. For installation options, see [Planning a Red Hat Process Automation Manager installation](#).

Procedure

1. In Business Central, go to **Menu** → **Design** → **Projects** and click **Try Samples**.
If a project already exists, click the three vertical dots in the upper-right corner of the **Projects** page and click **Try Samples**.
2. Review the descriptions for each sample project to determine which project you want to explore. Each sample project is designed differently to demonstrate process automation, decision management, or business optimization assets and logic in Red Hat Process Automation Manager.
3. Select one or more sample projects and click **Ok** to add the projects to your space.
4. In the **Projects** page of your space, select one of the new example projects to view the example assets for that project.
5. Select each example asset to explore how the project is designed to achieve the specified goal or workflow.
6. In the upper-right corner of the project **Assets** page, click **Build** to build the sample project or **Deploy** to build the project and then deploy it to Process Server.



NOTE

You can also select the **Build & Install** option to build the project and publish the KJAR file to the configured Maven repository without deploying to a Process Server. In a development environment, you can click **Deploy** to deploy the built KJAR file to a Process Server without stopping any running instances (if applicable), or click **Redeploy** to deploy the built KJAR file and replace all instances. The next time you deploy or redeploy the built KJAR, the previous deployment unit (KIE container) is automatically updated in the same target Process Server. In a production environment, the **Redeploy** option is disabled and you can click **Deploy** only to deploy the built KJAR file to a new deployment unit (KIE container) on a Process Server.

To configure the Process Server environment mode, set the **org.kie.server.mode** system property to **org.kie.server.mode=development** or **org.kie.server.mode=production**. To configure the deployment behavior for a corresponding project in Business Central, go to project **Settings** → **General Settings** → **Version** and toggle the **Development Mode** option. By default, Process Server and all new projects in Business Central are in development mode. You cannot deploy a project with **Development Mode** turned on or with a manually added **SNAPSHOT** version suffix to a Process Server that is in production mode.

To review project deployment details (if applicable), go to **Menu** → **Deploy** → **Execution Servers**.


CHAPTER 3. OPENING THE MORTGAGE_PROCESS SAMPLE PROJECT

Using the **Mortgage_Process** sample project provides a quick way to get acclimated with Red Hat Process Automation Manager. In a production environment, you would create all of the assets by providing data that is specific to your business requirements.

Procedure

Navigate to the **Mortgage_Process** sample project to view the predefined assets.

1. In Business Central, go to **Menu → Design → Projects**.

2. Click the  icon in the upper-right corner of the screen and select **Try Samples**.

3. Select **Mortgage_Process** and click **Ok**.

The **Assets** view of the project opens.

CHAPTER 4. VIEWING THE MORTGAGE_PROCESS DATA OBJECTS

Data objects are the building blocks for the rule assets that you create. Data objects are custom data types implemented as Java classes in specified packages of your project. These custom data types determine what data your assets and your decision services are based on.

This tutorial uses the following data objects:

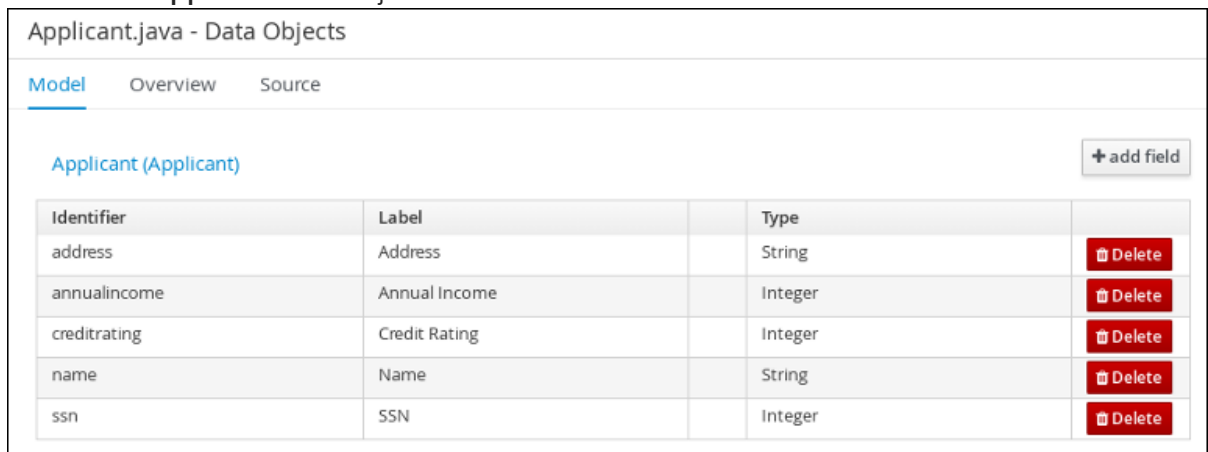
- **Applicant**
- **Application**
- **Property**
- **ValidationErrorDO**

4.1. VIEWING THE APPLICANT DATA OBJECT

Follow these steps to familiarize yourself with the predefined **Applicant** data object, which contains information about the applicant. This is the basic information required to apply for the loan in this tutorial.

Procedure

1. In Business Central, click **Menu** → **Design** → **Projects**, and click **Mortgage_Process**.
2. Enter **Applicant.java** in the project's asset search box, press Enter, and click the **Applicant** data object.
3. Review the **Applicant** data object values.



Identifier	Label	Type	
address	Address	String	Delete
annualincome	Annual Income	Integer	Delete
creditrating	Credit Rating	Integer	Delete
name	Name	String	Delete
ssn	SSN	Integer	Delete

4.2. VIEWING THE APPLICATION DATA OBJECT

Follow these steps to familiarize yourself with the predefined **Application** data object, which contains information about the mortgage details, such as the down payment and the mortgage amount.

Procedure

1. In Business Central, click **Menu** → **Design** → **Projects**, and click **Mortgage_Process**.

2. Enter **Application.java** in the project's asset search box, press Enter, and click the **Application** data object.
3. Review the **Application** data object values.

Application.java - Data Objects ▾

Model Overview Source

Application + add field

Identifier	Label	Type	
amortization	Years of amortization	Integer	Delete
applicant	Applicant	Applicant	Delete
downpayment	Down Payment	Integer	Delete
errors	Error details	Validation Error	Delete
mortgageamount	Mortgage amount	Integer	Delete
property	Property	Property	Delete

4.3. VIEWING THE PROPERTY DATA OBJECT

Follow these steps to familiarize yourself with the predefined **Property** data object, which contains information about the property details, such as the property age and price.

Procedure

1. In Business Central, click **Menu** → **Design** → **Projects**, and click **Mortgage_Process**.
2. Enter **Property.java** in the project's asset search box, press Enter, and click the **Property** data object.
3. Review the **Property** data object values.

Property.java - Data Objects ▾

Model Overview Source

Property (Property) + add field

Identifier	Label	Type	
address	Address of property	String	Delete
age	Age of property	Integer	Delete
locale	Locale	String	Delete
saleprice	Sale Price	Integer	Delete

4.4. VIEWING THE VALIDATIONERRORDO DATA OBJECT

Follow these steps to familiarize yourself with the predefined **ValidationErrorDO** data object, which specifies the cause of an application error.

Procedure

1. In Business Central, click **Menu** → **Design** → **Projects**, and click **Mortgage_Process**.
2. Enter **ValidationErrorDO.java** in the project's asset search box, press Enter, and click the **ValidationErrorDO** data object.

- Review the **ValidationErrorDO** data object values.

ValidationErrorDO.java - Data Objects ▾

[Model](#) [Overview](#) [Source](#)

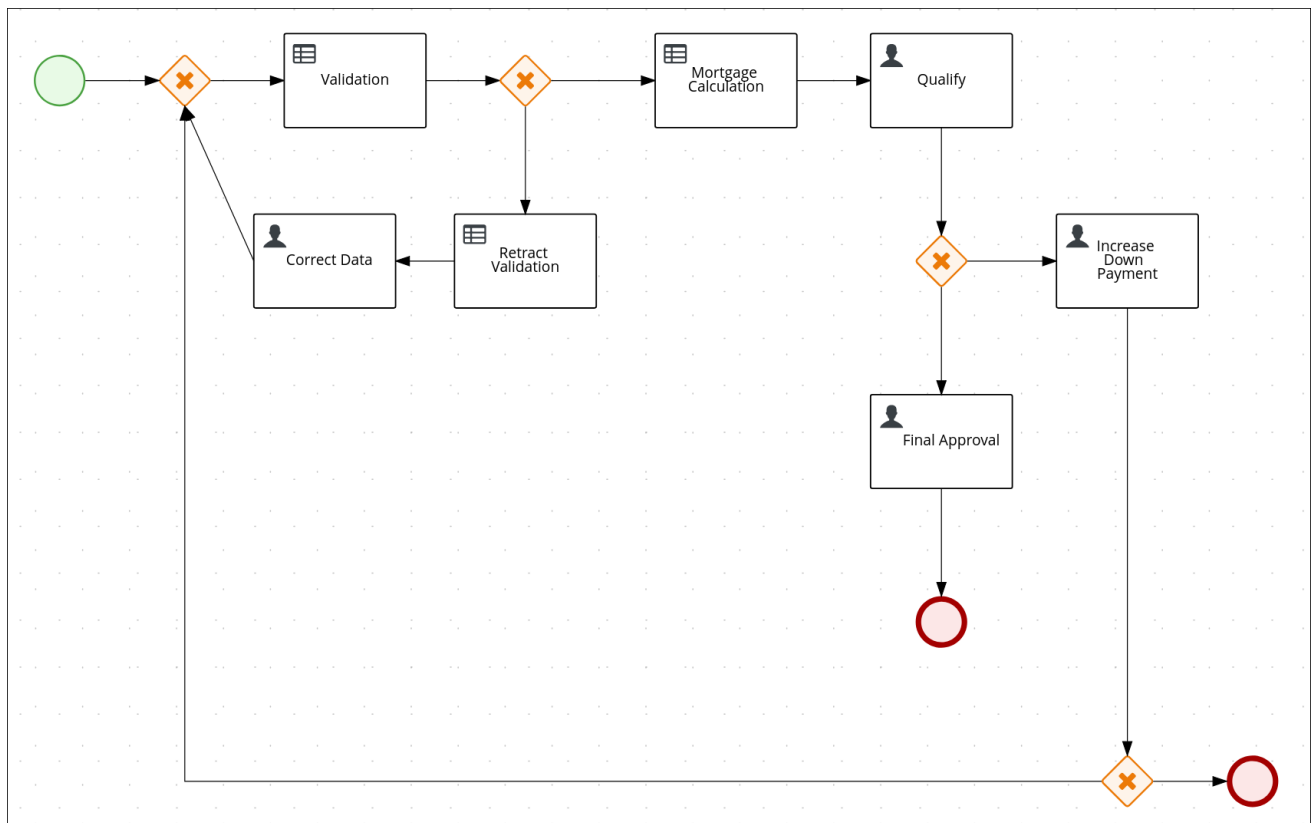
Validation Error (ValidationErrorDO) + add field

Identifier	Label	Type	
error	Error and cause	String	Delete

CHAPTER 5. MORTGAGEAPPROVALPROCESS BUSINESS PROCESS IN BUSINESS CENTRAL

A business process is a diagram that describes the order in which a series of steps must be executed using a flow chart. A business process consists of a collection of nodes that are linked to each other using connections. Each of the nodes represents one step in the overall process while the connections specify how to transition from one node to the other.

The sample **Mortgage_Process** contains the following predefined **MortgageApprovalProcess** business process.



5.1. DELETE THE EXISTING MORTGAGEAPPROVALPROCESS PROCESS APPLICATION

For this tutorial, delete the existing **MortgageApprovalProcess** business process and recreate it to gain a better understanding of creating a business process. Creating a new business process using the same name ensures that the sample project deploys and tests without error.

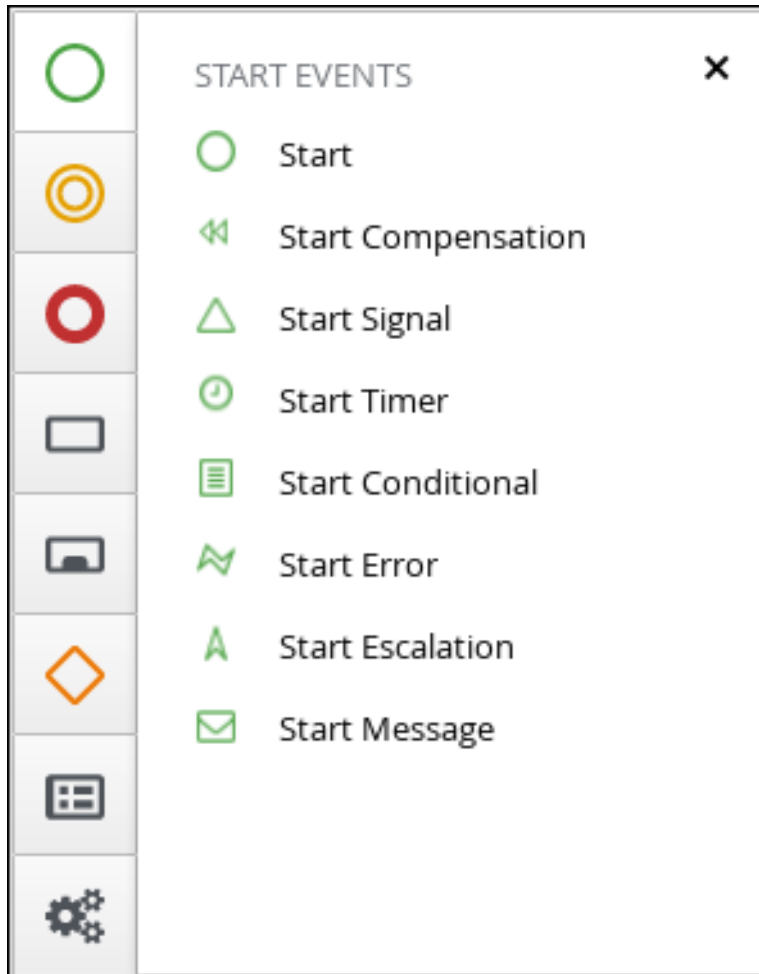
Procedure

1. In Business Central, go to **Menu → Design → Projects → Mortgage_Process**.
2. Input **MortgageApprovalProcess.bpmn** in to the project's asset search box and click **MortgageApprovalProcess**.
3. Select **Delete** from the toolbar, and click **Delete** to confirm that you want to delete this asset.

5.2. CREATING A NEW MORTGAGEAPPROVALPROCESS BUSINESS PROCESS APPLICATION

The following procedures guide you through the creation of tasks, connections, and gateways that make up the **MortgageApprovalProcess** business process.

Red Hat Process Automation Manager contains a predefined selection of node types to simplify business process creation. The predefined node panel is located on the left side of the diagram editor.





5.2.1. Creating the initial mortgage business process

The mortgage validation business process determines whether a mortgage application contains all required data. If the specified data requirements are met, the application proceeds on to the mortgage calculation business process.

Procedure

1. In Business Central, go to **Menu → Design → Projects → Mortgage_Process**.
2. Click **Add Asset → Business Process**.
3. Enter the following values:
 - **Business Process: MortgageApprovalProcess**
 - **Package:** Select **com.myspace.mortgage_app**
The **Package** specifies the location inside the existing project where the asset will be created. In this example, it is created in **com/myspace/mortgage_app**.
4. Click **Ok**. The diagram editor opens.

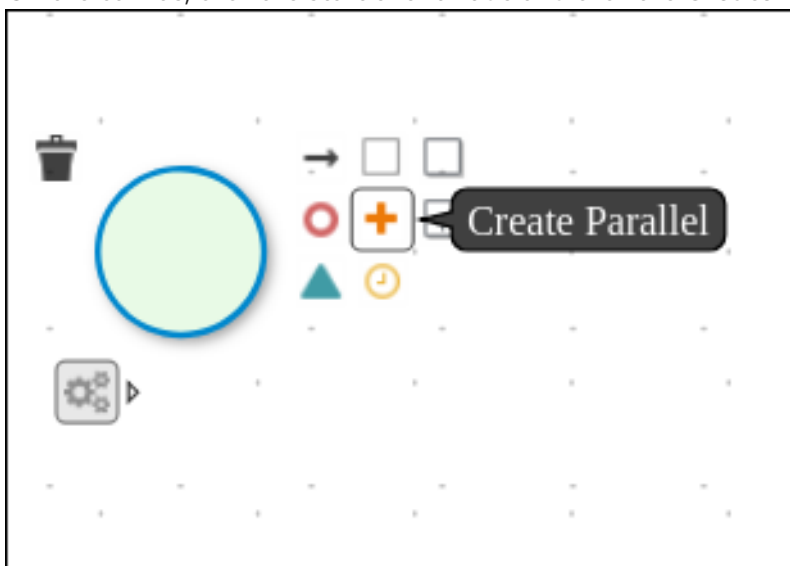
5. In the upper-right corner, click the **Diagram properties**  icon.
6. Scroll down and expand **Process Data** and click  in the **Process Variables** section.
7. Enter the following values:
 - **Name:** `application`
 - **Data Type:** `Application [com.myspace.mortgage_app]`


5.2.2. Creating outgoing connections and exclusive gateways

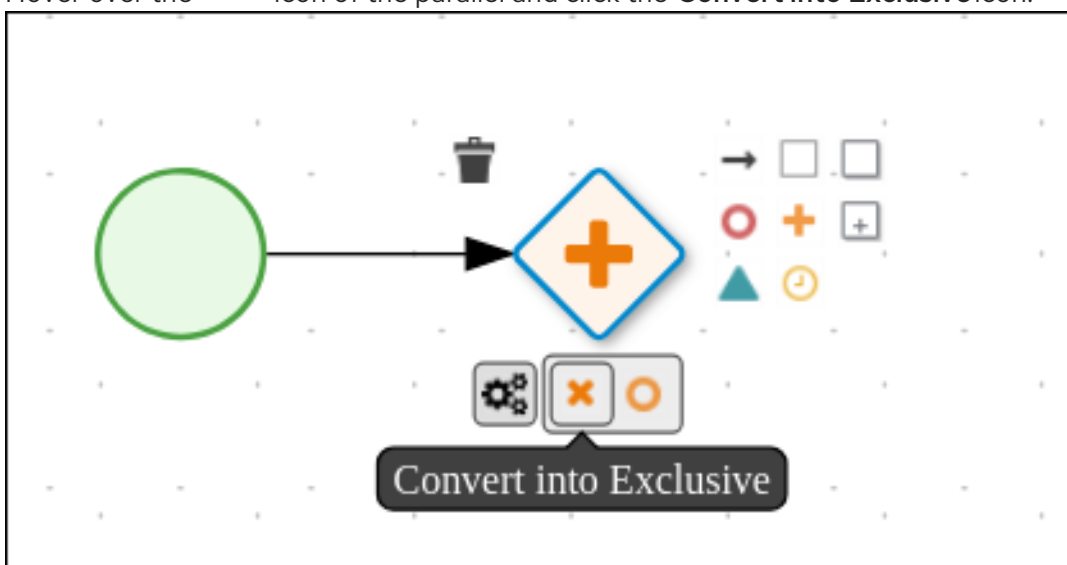
This section shows you how to create outgoing connections, exclusive gateways, and business rule tasks. Use exclusive gateways to make decisions and react to events based on the available data.

Procedure

1. Create an outgoing connection from the start event to an exclusive gateway:
 - a. On the canvas, click the start event node and click the **Create Parallel** icon.

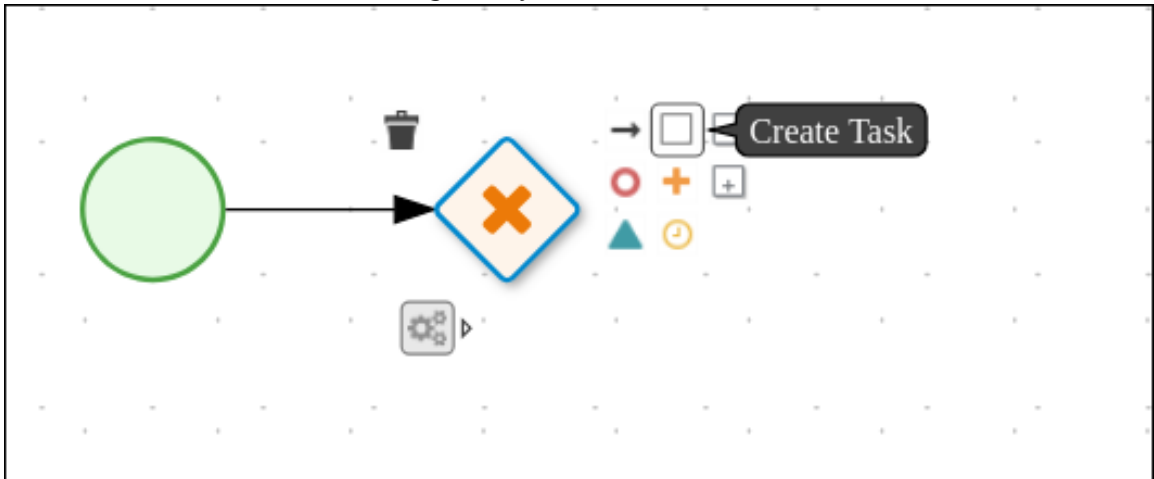



- b. Hover over the  icon of the parallel and click the **Convert into Exclusive** icon.

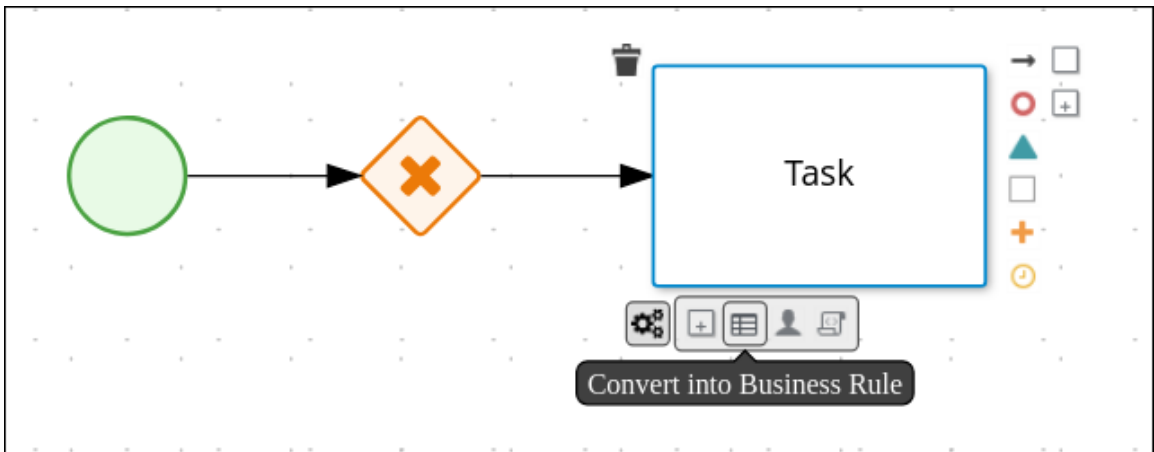


2. Create an outgoing connection from the exclusive gateway to a business rule task:


- a. On the canvas, click the exclusive gateway and click the **Create Task** icon.




- b. Hover over the  icon of the task and click the **Convert into Business Rule** icon.



3. Configure the business rule task:

- a. Click the business rules task.
- b. If the **Diagram properties** panel is not open, in the upper-right corner click the **Diagram properties**  icon.
- c. In the **Diagram properties** panel, enter **Validation** in the **Name** field.
- d. Expand **Implementation/Execution** and from the **Rule Flow Group** list select **validation**.
- e. In the **On Exit Action** field, enter the following Java expression:

```
System.out.println(application.getProperty());
```

- f. Expand **Data Assignments** and click  next to **Assignments**.
- g. In the **Validation Data I/O** window, click **Add** and create the following assignments:

Validation Data I/O
✕

Data Inputs and Assignments + Add

Name	Data Type	Source	
<input type="text" value="application"/>	Application [com.i ▼]	application ▼	✕

Data Outputs and Assignments + Add

Name	Data Type	Target	
<input type="text" value="application"/>	Application [com.i ▼]	application ▼	✕

Cancel Save

h. Click **Save**.

4. In the diagram editor, to save the changes made to the business process, click **Save** and click **Save** again to confirm your changes.

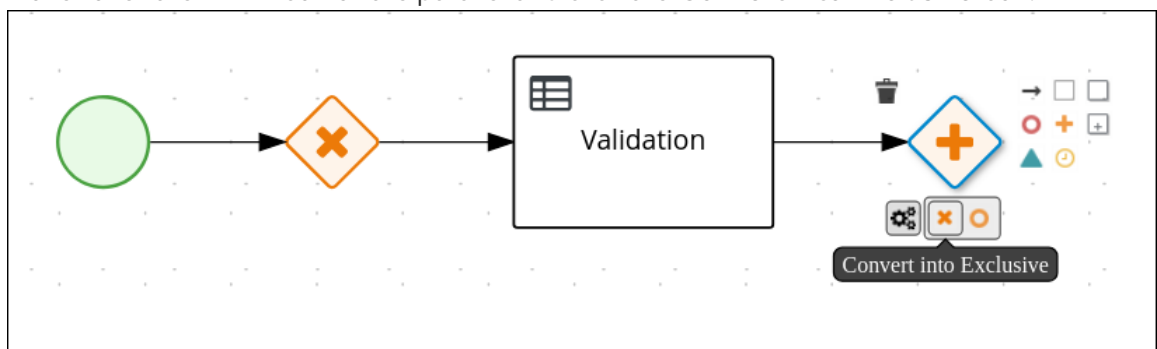
5.2.3. Defining the validation data


This section shows you how to define the validation data that determines whether the application data is correct, contains an error, or has missing information.

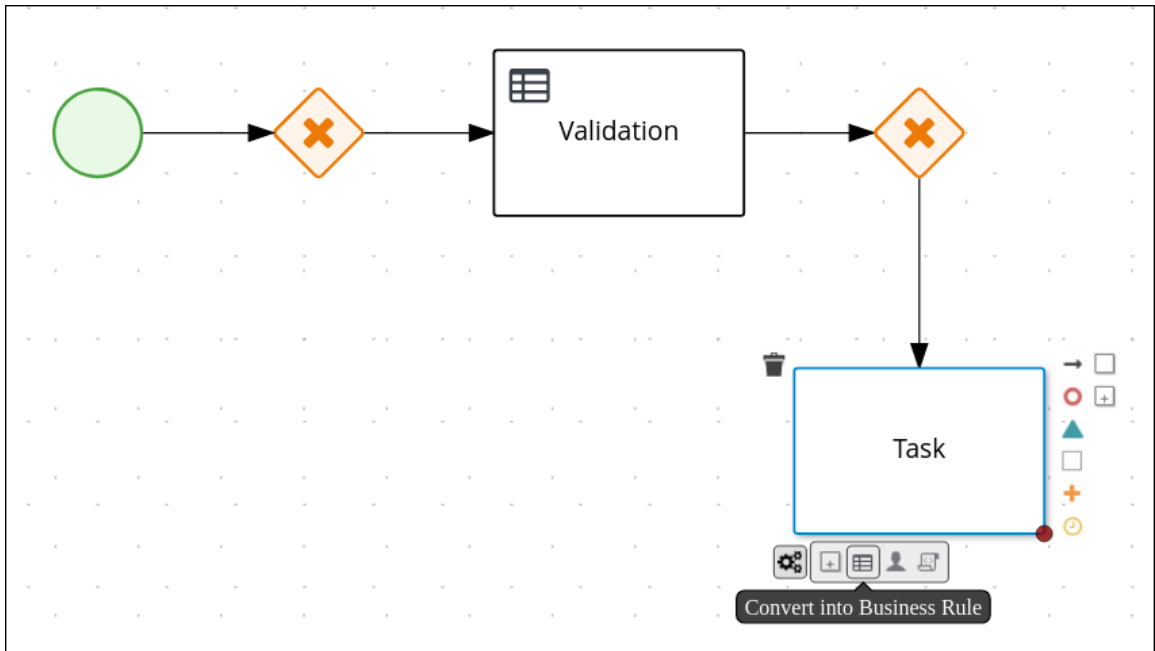
Procedure


1. Create an outgoing connection from the **Validation** task to an exclusive gateway:
 - a. Click the **Validation** task and click the **Create Parallel** icon.

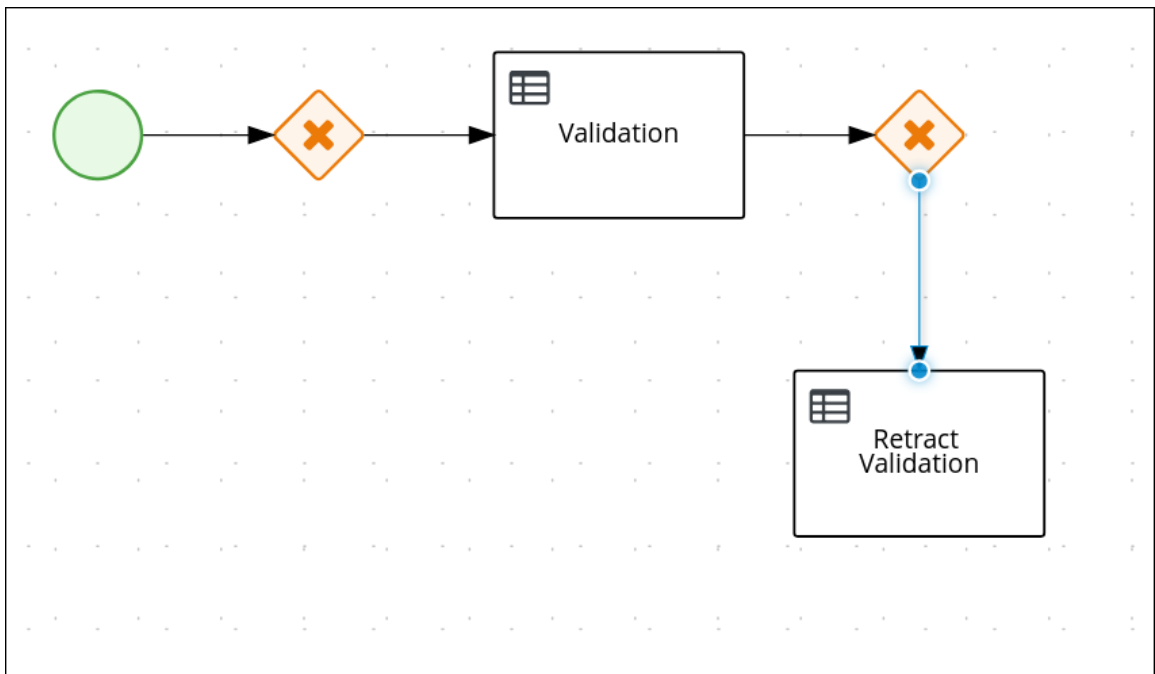
- b. Hover over the  icon of the parallel and click the **Convert into Exclusive** icon.




2. Create an outgoing connection from the exclusive gateway to a new business rule task:
 - a. Click the exclusive gateway and click the **Create Task** icon.
 - b. Hover over the  icon of the task and click the **Convert into Business Rule** icon.




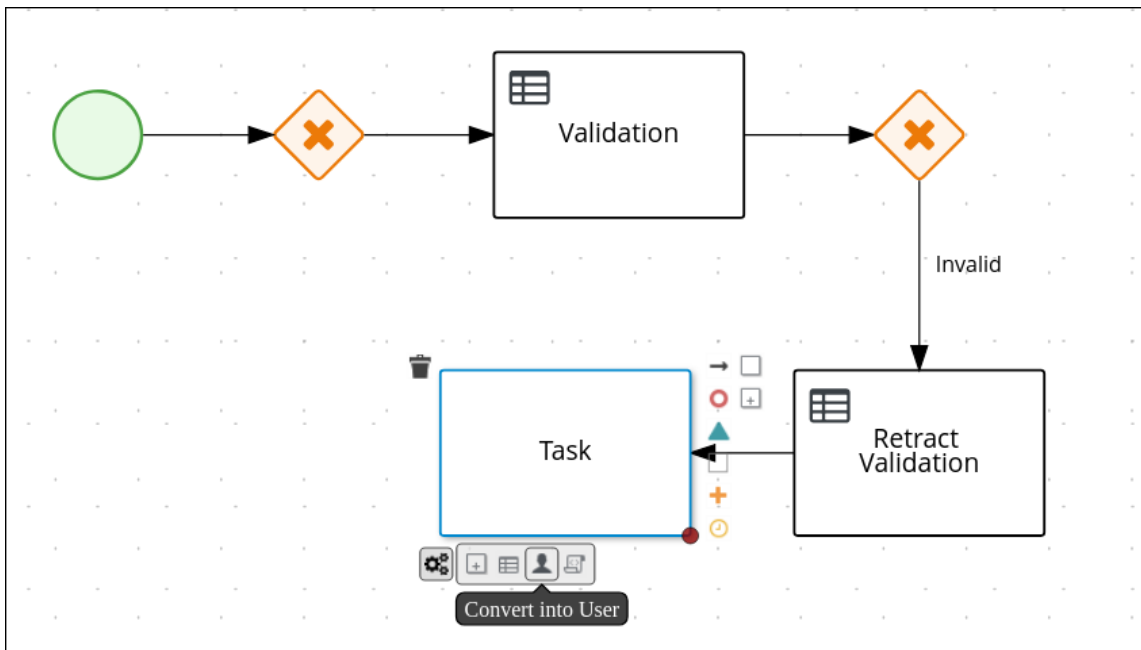
- c. If the **Diagram properties** panel is not open, in the upper-right corner click the **Diagram properties**  icon.
 - d. In the **Diagram properties** panel, enter **Retract Validation** in the **Name** field.
 - e. Expand **Implementation/Execution** and enter **error** in the **Rule Flow Group** field.
3. Configure the connection between the exclusive gateway and the business rule task:
 - a. Click the connection.





- b. If the **Diagram properties** panel is not open, in the upper-right corner click the **Diagram properties**  icon.
- c. In the **Diagram properties** panel, enter **Invalid** in the **Name** field.

- d. Expand **Implementation/Execution** and select **Expression** in the **Condition Expression** section.
 - e. From the list, select **drools** and enter **ValidationErrorDO()** in the **Condition Expression** field.
4. Create an outgoing connection from the **Retract Validation** task to a new user task:
- a. Click the **Retract Validation** task and click the **Create Task** icon.

- b. Hover over the  icon of the task and click the **Convert into User** icon.



- c. If the **Diagram properties** panel is not open, in the upper-right corner click the **Diagram properties**  icon.
- d. In the **Diagram properties** panel, enter **Correct Data** in the **Name** field.
- e. Expand **Implementation/Execution** and enter the following values:
 - **Task Name: CorrectData**
 - **Groups: broker**
- f. Click  next to **Assignments**.
- g. In the **Correct Data Data I/O** window, click **Add** and create the following assignments:

Correct Data Data I/O
✕

Data Inputs and Assignments + Add

Name	Data Type	Source	
<input type="text" value="application"/>	Application [com.i ▼]	application ▼	✕

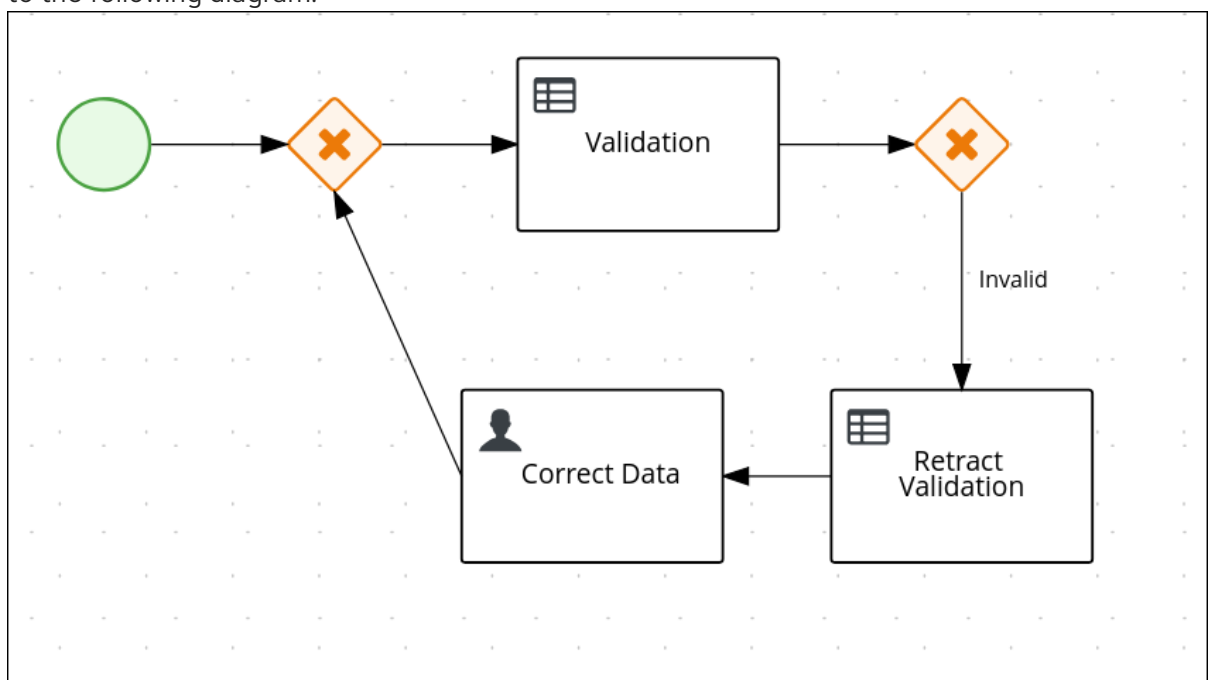
Data Outputs and Assignments + Add

Name	Data Type	Target	
<input type="text" value="application"/>	Application [com.i ▼]	application ▼	✕

Cancel Save

h. Click **Save**.

5. Connect the **Correct Data** back to the first exclusive gateway. Your workflow should look similar to the following diagram:

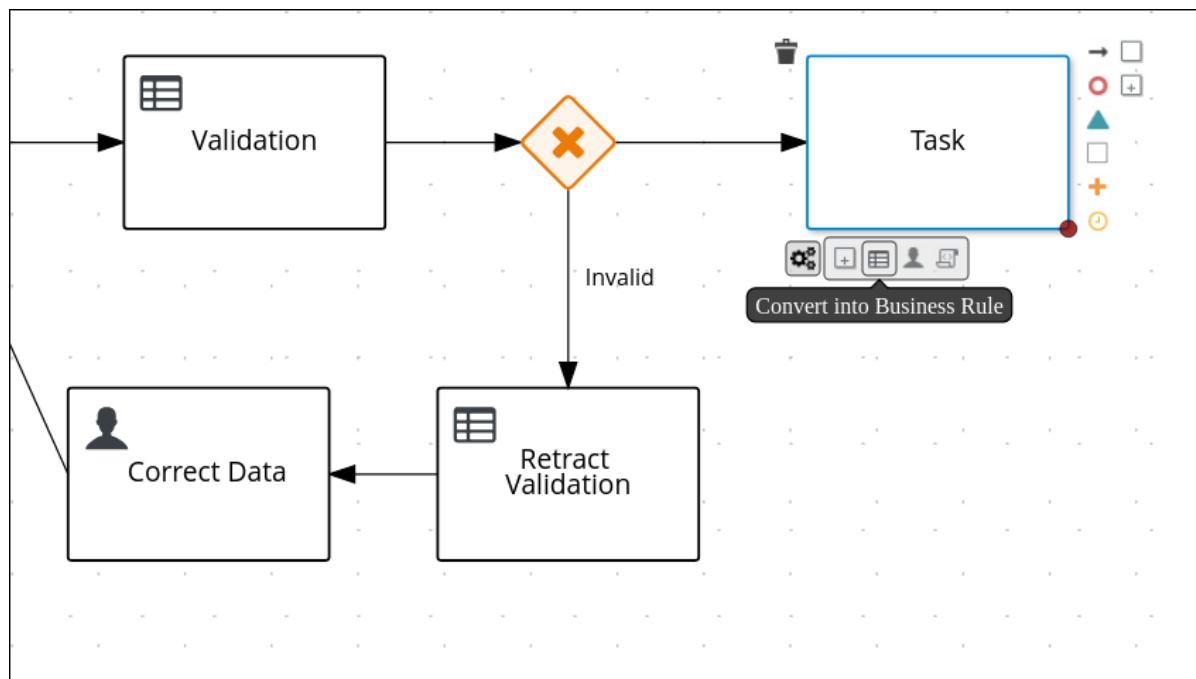



5.2.4. Calculating the mortgage

The mortgage calculation business process determines the applicant's mortgage borrowing limit.

Procedure

1. Return to the second exclusive gateway. Create an outgoing connection to a business rule task.



2. Click the created connection and in the **Diagram properties** panel, input **Valid** in the **Name** field.
3. Expand **Implementation/Execution**, select **Expression** in the **Condition Expression** section, and enter **not ValidationErrorDO()** in the drools expression field.
4. Click the created business rule task and in the **Diagram properties** panel, input **Mortgage Calculation** in the **Name** field.
5. Expand **Implementation/Execution** and select **mortgagecalculation** from the **Rule Flow Group** drop-down menu.
6. Expand **Data Assignments** and click  next to **Assignments**.
7. In the **Mortgage Calculation Data I/O** window, click **Add** to create the following assignments and click **Save**.

Mortgage Calculation Data I/O ✕


Data Inputs and Assignments + Add

Name	Data Type	Source	
<input type="text" value="application"/>	Application [com.i ▼]	application ▼	✕

Data Outputs and Assignments + Add

Name	Data Type	Target	
<input type="text" value="application"/>	Application [com.i ▼]	application ▼	✕

Cancel Save

8. Click an empty space on the canvas, scroll down, expand **Process Data**, and click  next to **Process Variables**. Enter the following values:

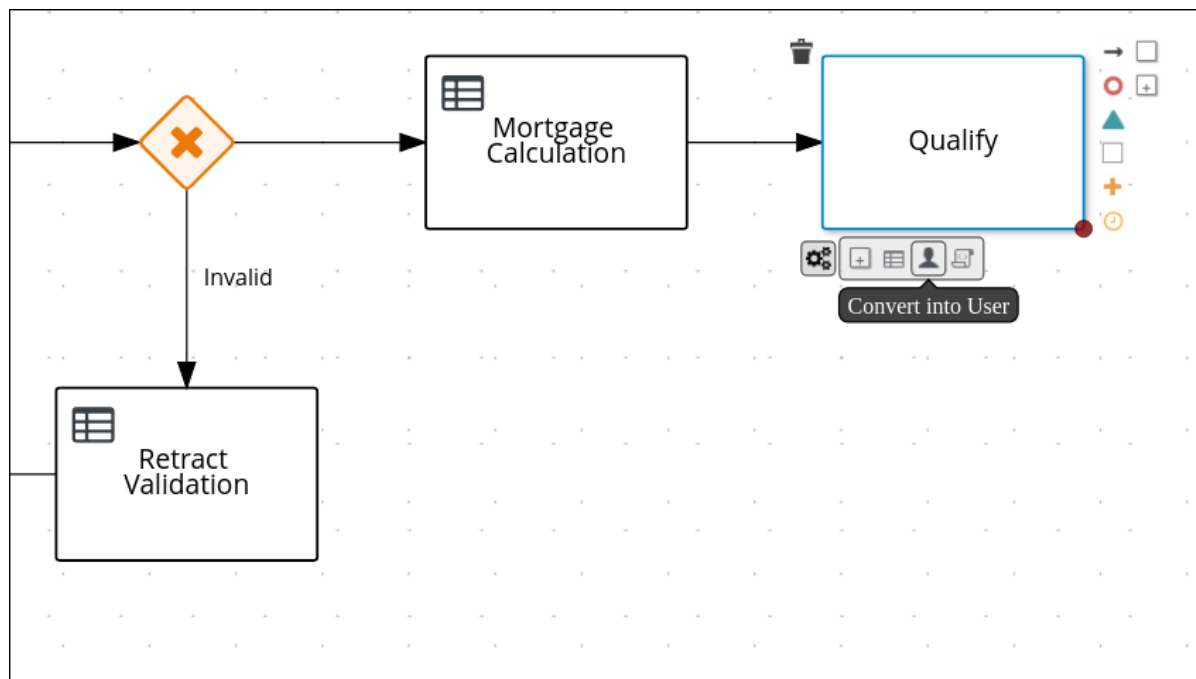
Process Data

Process Variables

Name	Data Type	
<input type="text" value="Application"/>	Application ▼	+
<input type="text" value="inlimit"/>	Boolean ▼	✕

- Name: **inlimit**
- Date Type: **Boolean**

9. Create an outgoing connection from the **Mortgage Calculation** task to a user task.



10. Click the user task, enter **Qualify** in the **Name** field, expand **Implementation/Execution**, and enter the following values:

- **Task Name: Qualify**
- **Groups: approver**

- Click  next to **Assignments**. In the **Qualify Data I/O** window, click **Add** to create the following assignments:

Qualify Data I/O x

Data Inputs and Assignments + Add

Name	Data Type	Source	
application	Application [com.i ▼]	application ▼	🗑️

Data Outputs and Assignments + Add

Name	Data Type	Target	
inlimit	Boolean ▼	inlimit ▼	🗑️

Cancel
Save


11. Click **Save**. Above the canvas, click **Save**, and **Save**, to confirm your changes.
12. Create an outgoing connection from the **Qualify** task to an exclusive gateway.
 - a. Click the **GATEWAYS** icon in the node panel.

- b. Click **Exclusive** and drag it to the right of the **Qualify** task.
13. Create an outgoing connection from the exclusive gateway and connect it to a user task.
14. Click the connection and input **In Limit** in the **Name** field of the **Diagram properties** panel.
15. Expand **Implementation/Execution** and select **Condition** in the **Condition Expression** section.
16. Select **inlimit** from the **Process Variable** drop-down menu and select **Is true** from the **Condition** drop-down menu.

The screenshot displays the Red Hat Process Automation Manager interface. On the left, a BPMN diagram is shown on a grid. It features a 'Qualify' user task (represented by a person icon) with an outgoing arrow pointing to an 'Exclusive' gateway (represented by a diamond with an orange 'X'). From the gateway, a blue arrow labeled 'In Limit' points to a 'Final Approval' user task (also with a person icon). On the right, the 'Diagram properties' panel is visible. The 'Name' field contains 'In Limit'. The 'Documentation' field is empty. The 'Implementation/Execution' section is expanded, showing a 'Priority' field. The 'Condition Expression' section has 'Condition' selected with a radio button, and 'Expression' is unselected. The 'Process Variable' dropdown menu is set to 'inlimit', and the 'Condition' dropdown menu is set to 'Is true'.

17. Click the user task, enter **Final Approval** in the **Name** field, expand **Implementation/Execution**, and enter the following values:
 - **Task Name: FinalApproval**

- Groups: **manager**

18. Click  next to **Assignments**. In the **Final Approval Data I/O** window, click **Add** to create the following assignments:

Final Approval Data I/O
✕

Data Inputs and Assignments + Add

Name	Data Type	Source	
<input type="text" value="application"/>	Application [com.i ▼	application ▼	✕
<input type="text" value="inlimit"/>	Boolean ▼	inlimit ▼	✕

Data Outputs and Assignments + Add

Cancel Save

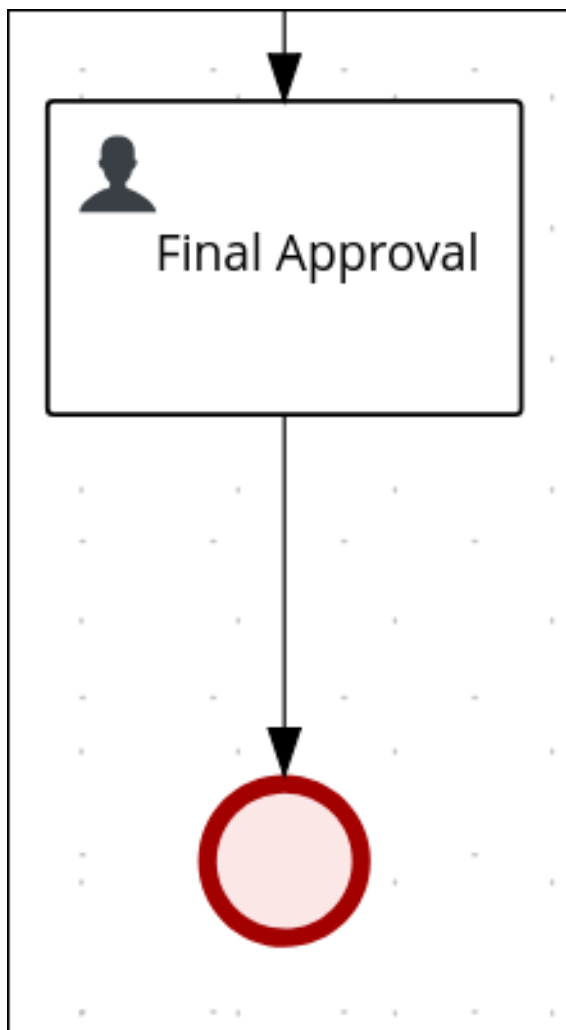
19. Click **Save**. Above the canvas, click **Save**, and **Save**, to confirm your changes.

5.2.5. Increasing the down payment

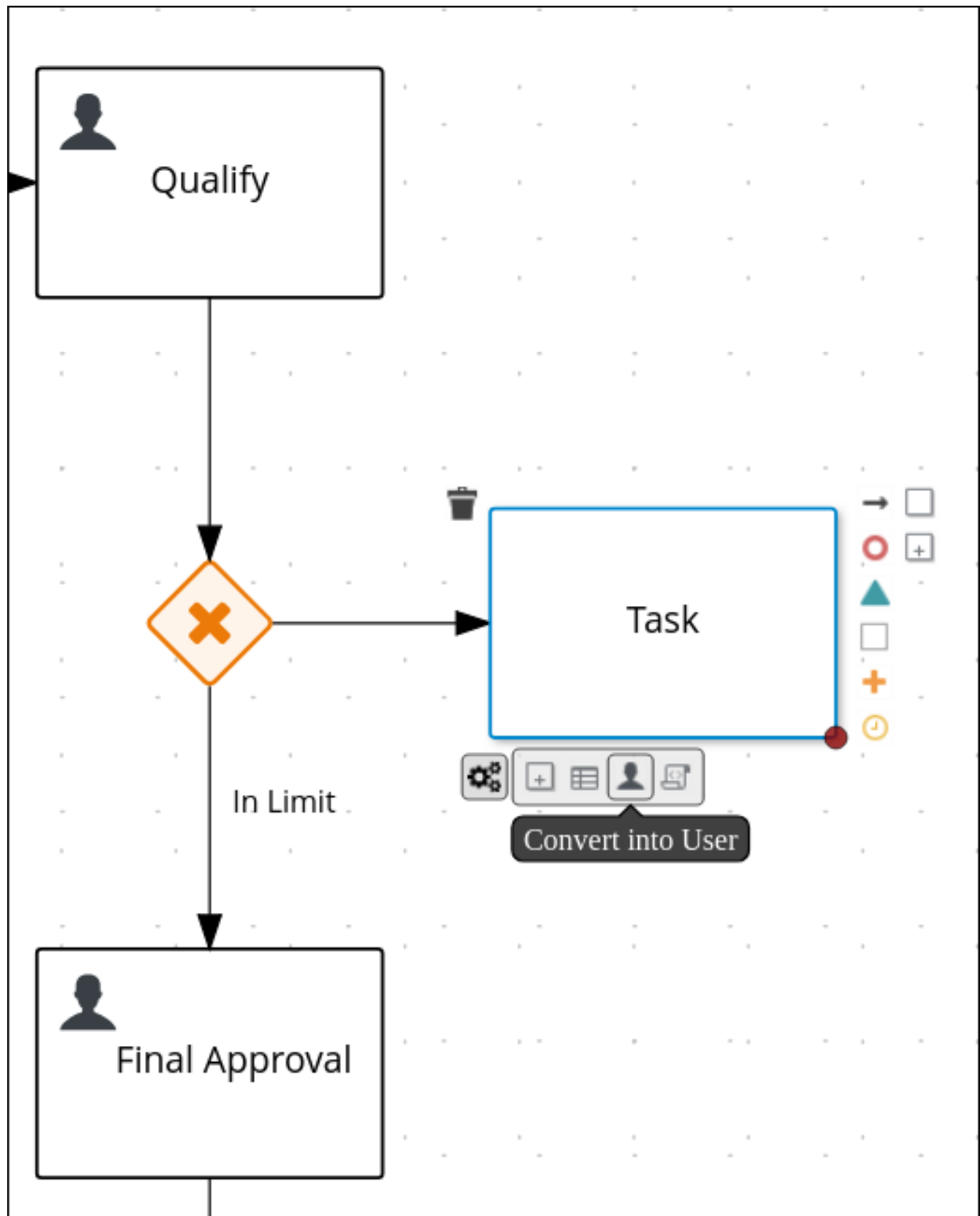
The increasing the down payment business process checks to see if the applicant qualifies for the loan by increasing their down payment. The final result is either the final loan approval, or loan denial based on the applicant's inability to increase the down payment.


Procedure

1. Create an outgoing connection from the **Final Approval** user task and connect it to an end event.



2. Return to the exclusive gateway that connects with the **Final Approval** user task. Create a second outgoing connection and connect it to a new user task.




3. Click the connection and input **Not in Limit** in the **Name** field of the **Diagram properties** panel.
4. Expand **Implementation/Execution** and select **Condition** in the **Condition Expression** section.
5. Select **inlimit** from the **Process Variable** drop-down menu and select **Is false** from the **Condition** drop-down menu.
6. Click an empty space on the canvas, scroll down, expand **Process Data**, and click  next to **Process Variables**. Enter the following values:
 - **Name: incdownpayment**

- **Data Type: Boolean**

▼ **Process Data**

Process Variables

Name	Data Type	
application	Application [com.r	+
inlimit	Boolean	🗑
incdownpayment	Boolean	🗑

7. Click the new user task and in the **Diagram properties** panel, input **Increase Down Payment** in the **Name** field.
8. Expand **Implementation/Execution** and enter the following values:
 - **Task Name: IncreaseDownPayment**
 - **Groups: broker**
 - Click  next to **Assignments**. In the **Increase Down Payment Data I/O** window, click **Add** to create the following assignments:

Increase Down Payment Data I/O ×

Data Inputs and Assignments + Add

Name	Data Type	Source	
application	Application [com.i	application	🗑

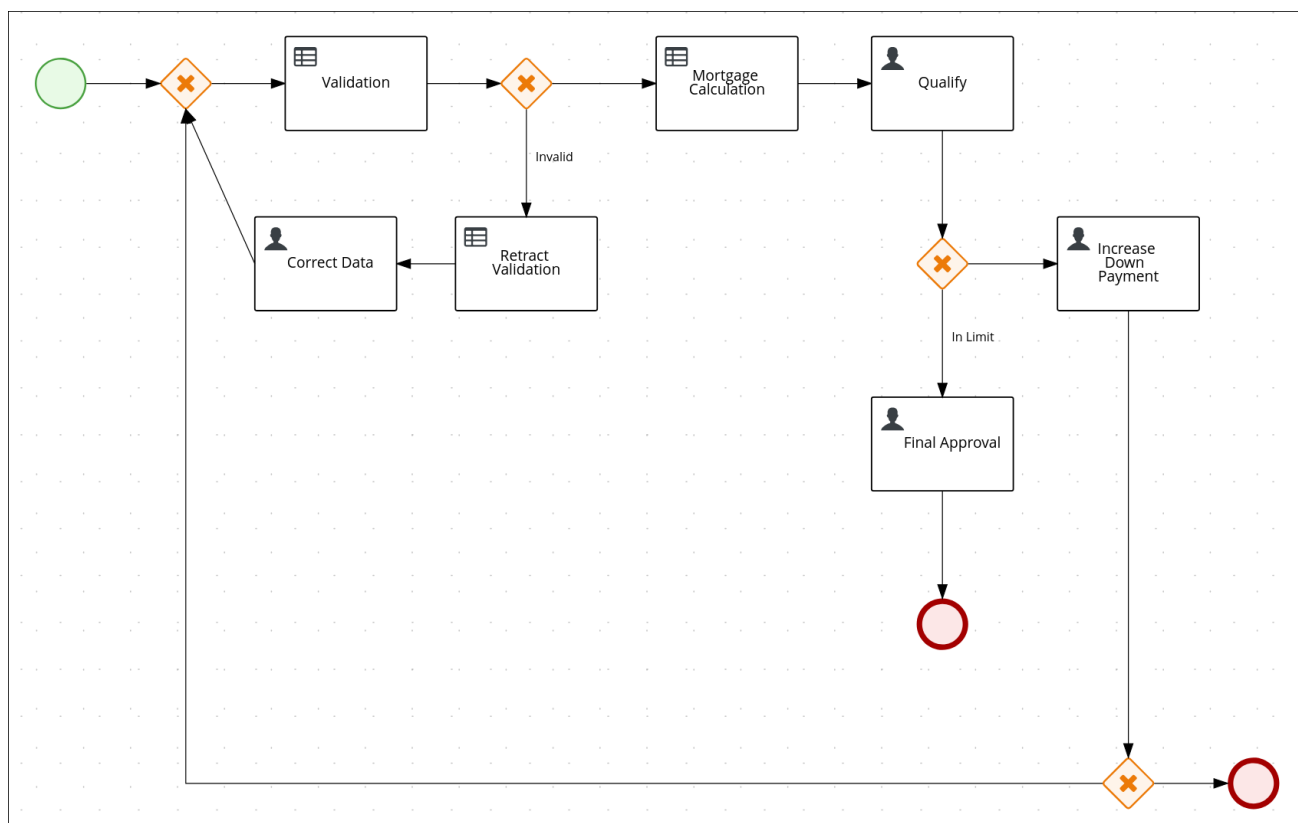
Data Outputs and Assignments + Add

Name	Data Type	Target	
incdownpayment	Boolean	incdownpayment	🗑

9. Click **Save**. Above the canvas, click **Save**, and **Save**, to confirm your changes.
10. Create an outgoing connection from the **Increase Down Payment** user task to an exclusive gateway.
11. Create an outgoing connection from the exclusive gateway to an end event.

12. Click the connection and input **Down payment not increased** in the **Name** field of the **Diagram properties** panel.
13. Expand **Implementation/Execution** and select **Condition** in the **Condition Expression** section.
14. Select **incdownpayment** from the **Process Variable** drop-down menu and select **Is false** from the **Condition** drop-down menu.
15. Create an outgoing connection from the exclusive gateway and connect it to the first exclusive gateway.
16. Click the connection and input **Down payment increased** in the **Name** field of the **Diagram properties** panel.
17. Expand **Implementation/Execution** and select **Condition** in the **Condition Expression** section.
18. Select **incdownpayment** from the **Process Variable** drop-down menu and select **Is true** from the **Condition** drop-down menu.
19. Click **Save**, and **Save**, to confirm your changes.

Figure 5.1. Final version of the business process



CHAPTER 6. GUIDED RULES

Guided rules are business rules that you create in a UI-based guided rules designer in Business Central that leads you through the rule-creation process. The guided rules designer provides fields and options for acceptable input based on the data objects for the rule being defined. The guided rules that you define are compiled into Drools Rule Language (DRL) rules as with all other rule assets.

All data objects related to a guided rule must be in the same project package as the guided rule. Assets in the same package are imported by default. After you create the necessary data objects and the guided rule, you can use the **Data Objects** tab of the guided rules designer to verify that all required data objects are listed or to import other existing data objects by adding a **New item**.

6.1. VIEWING THE MORTGAGE_PROCESS BUSINESS RULES

Follow these steps to familiarize yourself with the predefined business rules for the **Mortgage_Process** project.

Related information

Business rules are defined using the Guided Rule wizard in Red Hat Process Automation Manager. For information about creating guided business rules, see [Designing a decision service using guided rules](#).

6.1.1. Viewing the Validate Down Payment guided rule

Review the **WHEN** and **THEN** rules so that you understand how the conditions are set and used later when you run the process.

Procedure

1. Click **Menu** → **Design** → **Projects**, and click **Mortgage_Process**.
2. Click the **Validate Down Payment** guided rule.
3. Review the **Validate Down Payment** guided rule's **WHEN** and **THEN** conditions and values.

The screenshot displays the 'Validate Down Payment.rdr1 - Guided Rules' editor. At the top, there are utility buttons: Save, Delete, Rename, Copy, Validate, Download, Latest Version, and View Alerts. Below the title bar, there are tabs for 'Model', 'Overview', 'Source', and 'Data Objects'. The 'EXTENDS' dropdown is set to '- None -'. The 'WHEN' section is highlighted in light blue and contains a condition: 'There is an Application [app] with any of the following: 1. downpayment equal to 0 OR downpayment greater than or equal to [not bound] app.property.saleprice. Choose...'. The 'THEN' section is also highlighted in light blue and contains three actions: 1. Insert ValidationErrorDO [fact0]: error Down payment cannot be 0, greater than, or equal to the property sale price. 2. System.out.println('Executed Rule: ' + drools.getRule().getName()); 3. Set value of Application [app] errors fact0. At the bottom left, there is a '(show options...)' link.

6.1.2. Viewing the RetractValidationErr guided rule

Review the **WHEN** and **THEN** rules so that you understand how the conditions are set and used later when you run the process.

Procedure

1. Click **Menu** → **Design** → **Projects**, and click **Mortgage_Process**.
2. Click the **RetractValidationErr** guided rule.
3. Review the **RetractValidationErr** guided rule's **WHEN** and **THEN** conditions and values.

The screenshot shows the 'RetractValidationErr.rdr1 - Guided Rules' editor. At the top, there are tabs for 'Model', 'Overview', 'Source', and 'Data Objects'. Below the tabs, there are buttons for 'Save', 'Delete', 'Rename', 'Copy', 'Validate', 'Download', 'Latest Version', and 'View Alerts'. The main content area is divided into sections: 'EXTENDS' (set to '- None -'), 'WHEN', and 'THEN'. The 'WHEN' section contains one condition: '1. There is a ValidationErrorDO [vdo]'. The 'THEN' section contains one action: '1. delete ValidationErrorDO [vdo]'. Below the action, there are '(options)' and 'Attributes:' with two fields: 'dialect' set to 'mvel' and 'ruleflow-group' set to 'error'. On the right side of the 'WHEN' and 'THEN' sections, there are icons for adding, deleting, and moving items.

CHAPTER 7. GUIDED DECISION TABLES

Guided decision tables are a wizard-led alternative to spreadsheet decision tables for defining business rules in a tabular format. With guided decision tables, you are led by a UI-based wizard in Business Central that helps you define rule attributes, metadata, conditions, and actions based on specified data objects in your project. After you create your guided decision tables, the rules you defined are compiled into Drools Rule Language (DRL) rules as with all other rule assets.

All data objects related to a guided decision table must be in the same project package as the guided decision table. Assets in the same package are imported by default. After you create the necessary data objects and the guided decision table, you can use the **Data Objects** tab of the guided decision tables designer to verify that all required data objects are listed or to import other existing data objects by adding a **New item**.

7.1. VIEWING THE MORTGAGE DECISION TABLE

The goal of this chapter is to introduce you to the **MortgageDecisionTable** decision table. For this tutorial, you do not create and set the decision table conditions. Instead, review the values and the conditions that are already defined in the **Mortgage_Process** sample project's **MortgageDecisionTable** Guided Decision Tables asset. For information about creating decision tables, see [Designing a decision service using guided decision tables](#).

Prerequisites

- The business rules have been defined. For more information, see [Section 6.1, "Viewing the Mortgage_Process business rules"](#).

Procedure

- In Business Central, go to **Menu** → **Design** → **Projects** → **Mortgage_Process**.
- Scroll down and click the **MortgageDecisionTable** Guided Decision Tables asset.

MortgageDecisionTable								
#	Description	ruleflow-group	Applicant Annual Income		Property			application
			\$greater	\$less_or_equal	\$saleprice_less	\$age_less	\$location	Mortgage Amount
1		mortgagecalculation	100000	200000	300000	5	Urban	200000
2		mortgagecalculation	50000	99999	100000	10	Rural	100000

CHAPTER 8. GENERATING AND EDITING FORMS

The following chapter shows you how to automatically generate forms for collecting user data for your mortgage application business process. This chapter also includes information about editing forms to familiarize you with form manipulation.

Prerequisites

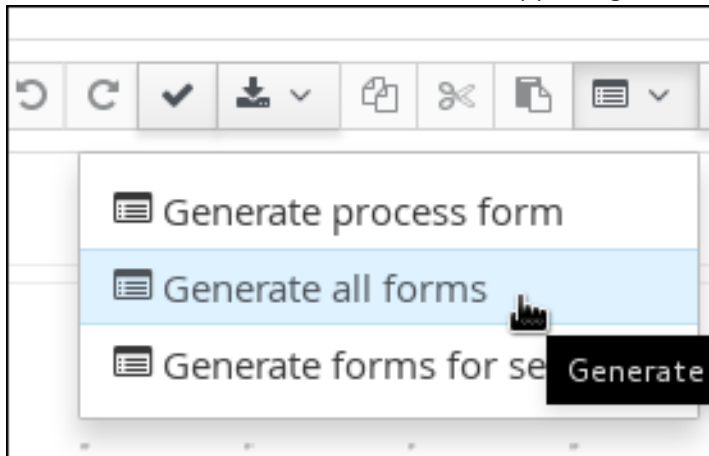
- The **MortgageApprovalProcess** business process has been created. For more information, see [Section 5.2, "Creating a new MortgageApprovalProcess business process application"](#).

8.1. AUTOMATIC FORM GENERATION

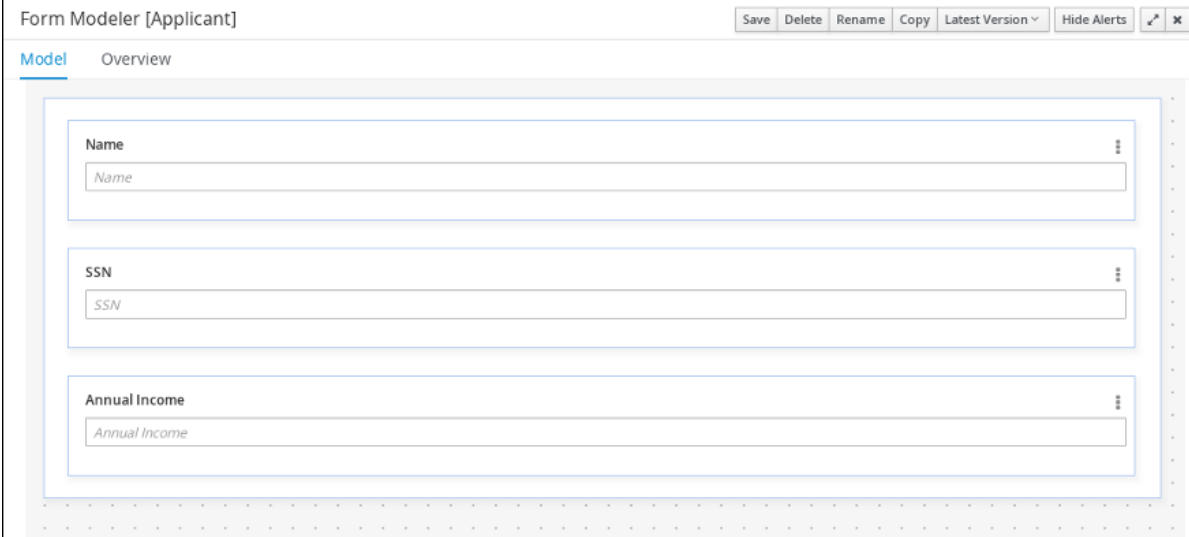
Red Hat Process Automation Manager enables you to automatically generate forms. For this business process you automatically generate the **Applicant**, **Property**, and **Application** forms.

Procedure

1. In Business Central, go to **Menu → Design → Projects → Mortgage_Process**.
2. From the asset list, select the **MortgageApprovalProcess** business process.
3. Click the **Form Generation** menu in the upper-right menu and select **Generate all forms**.



4. Click **Menu → Design → Projects → Mortgage_Process**.
5. From the asset list, select the **Applicant** form.
The **Applicant** form is shown below:

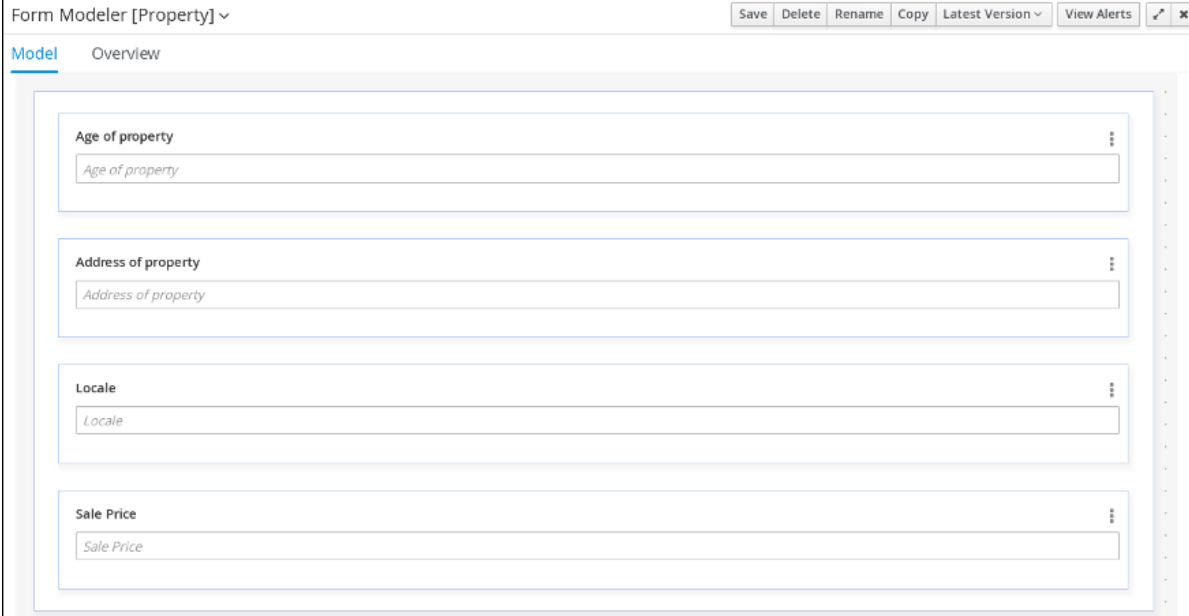


The screenshot shows the 'Form Modeler [Applicant]' window. The title bar includes buttons for 'Save', 'Delete', 'Rename', 'Copy', 'Latest Version', 'Hide Alerts', and a close button. Below the title bar are two tabs: 'Model' (selected) and 'Overview'. The main area displays a form with three input fields, each with a label and a placeholder text:

- Name**: Placeholder text is 'Name'.
- SSN**: Placeholder text is 'SSN'.
- Annual Income**: Placeholder text is 'Annual Income'.

6. Click **Menu** → **Design** → **Projects** → **Mortgage_Process**.

7. From the asset list, select the **Property** form. The **Property** form is shown below:



The screenshot shows the 'Form Modeler [Property]' window. The title bar includes buttons for 'Save', 'Delete', 'Rename', 'Copy', 'Latest Version', 'View Alerts', and a close button. Below the title bar are two tabs: 'Model' (selected) and 'Overview'. The main area displays a form with four input fields, each with a label and a placeholder text:

- Age of property**: Placeholder text is 'Age of property'.
- Address of property**: Placeholder text is 'Address of property'.
- Locale**: Placeholder text is 'Locale'.
- Sale Price**: Placeholder text is 'Sale Price'.

8. Click **Menu** → **Design** → **Projects** → **Mortgage_Process**.

9. From the asset list, select the **Application** form. The **Application** form is shown below:

Form Modeler [Application] v

Save Delete Rename Copy Latest Version View Alerts

Model Overview

Down Payment

Down Payment

Years of amortization

Years of amortization

Applicant

Name

Name

SSN

SSN

Annual Income

Annual Income

Property

Locale

Locale

Age of property

Age of property

Sale Price

Sale Price

10. Click the **X** icon in the upper-right corner to close the editor.

8.2. EDITING FORMS (OPTIONAL)

The following optional process shows you how to edit the Applicant form that you previously defined as part of this tutorial business process:

Procedure

1. In Business Central, go to **Menu → Design → Projects → Mortgage_Process**.
2. Click the **Applicant** data object form and add a new **Address** row.
 - a. Expand the **Form Controls** menu and drag the **TextBox** field in to the existing form.
 - b. Complete the form field properties for the new Address row.

Field properties

Field Type
TextBox

Label
Address

Placeholder
Adress

Max. Length
100

Required

Read Only

Validate on change field value

Help Message ⓘ

Field binding

+ Ok **Cancel**

3. Click the three vertical dots in the upper-right corner to edit or delete the row.
4. Click **Save**, and click **Save** to confirm your changes.

CHAPTER 9. DEPLOYING THE MORTGAGEAPPROVALPROCESS PROCESS APPLICATION

The following chapter instructs you how to build and deploy a new instance of the `Mortgage_Process` application in Red Hat Process Automation Manager.

Prerequisites

- Process Server is deployed and connected to Business Central.

Procedure


1. In Business Central, go to **Menu** → **Design** → **Projects** → **Mortgage_Process**.
2. Click **Deploy**.
 - If no KIE container (deployment unit) is included with the project name, a container with default values is automatically created.
 - If an older version of the project is already deployed, go to the project settings and change the project version. When finished, save the change and click **Deploy**. This deploys a new version of the same project with the latest changes in place, alongside the older version(s).



NOTE

You can also select the **Build & Install** option to build the project and publish the KJAR file to the configured Maven repository without deploying to a Process Server. In a development environment, you can click **Deploy** to deploy the built KJAR file to a Process Server without stopping any running instances (if applicable), or click **Redeploy** to deploy the built KJAR file and replace all instances. The next time you deploy or redeploy the built KJAR, the previous deployment unit (KIE container) is automatically updated in the same target Process Server. In a production environment, the **Redeploy** option is disabled and you can click **Deploy** only to deploy the built KJAR file to a new deployment unit (KIE container) on a Process Server.

To configure the Process Server environment mode, set the `org.kie.server.mode` system property to `org.kie.server.mode=development` or `org.kie.server.mode=production`. To configure the deployment behavior for a corresponding project in Business Central, go to project **Settings** → **General Settings** → **Version** and toggle the **Development Mode** option. By default, Process Server and all new projects in Business Central are in development mode. You cannot deploy a project with **Development Mode** turned on or with a manually added **SNAPSHOT** version suffix to a Process Server that is in production mode.

3. To verify the deployment, click **Menu** → **Manage** → **Process Definitions**, and click .
4. Click the three vertical dots in the **Actions** column and select **Start** to start a new instance of the process.

CHAPTER 10. EXECUTING THE MORTGAGEAPPROVALPROCESS PROCESS APPLICATION

Now that you have deployed the project, you can execute the project's defined functionality. For this tutorial you input data into a mortgage application form acting as the mortgage broker. The **MortgageApprovalProcess** business process runs and determines whether or not the applicant has offered an acceptable down payment based on the decision rules that you defined earlier. The business process either ends the rule testing or requests that the applicant increase the down payment to proceed. If the application passes the business rule testing, the bank's approver reviews the application and either approve or deny the loan.

Prerequisites

- Process Server is deployed and connected to Business Central.
- The **Mortgage_Process** application has been deployed.
- The user or users working on the tasks are members of the following groups:
 - **approver**: For the **Qualify** task
 - **broker**: For the **Correct Data** and **Increase Down Payment** tasks
 - **manager**: For the **Final Approval** task

Procedure

1. Log in to Red Hat Process Automation Manager and click **Menu → Manage → Process Definitions**.
2. Click anywhere in the **MortgageApprovalProcess** row to view the process details.
3. Click the **Diagram** tab to view the business process diagram in the editor.
4. Click **New Process Instance** to open the **Application** form and input the following values in to the form fields:
 - **Down Payment: 30000**
 - **Years of amortization 10**
 - **Name: Ivo**
 - **Annual Income: 60000**
 - **SSN: 123456789**
 - **Age of property: 8**
 - **Address of property: Brno**
 - **Locale: Rural**
 - **Property Sale Price: 50000**

5. Click **Submit** to start a new process instance. After starting the process instance, the **Instance Details** view opens.
6. Click the **Diagram** tab to view the process flow within the process diagram. The state of the process is highlighted as it moves through each task.
7. Click **Menu** → **Track** → **Task Inbox**. This takes you to the **Qualify** form.
8. As the approver, review the **Qualify** task information, click **Claim** and then **Start** to start the task, and then select **Is mortgage application in limit?** and click **Complete** to complete the task flow.
9. In the **Task Inbox**, click anywhere in the **Final Approval** row to open the **Final Approval** task.
10. Click **Claim** to claim responsibility for the task, and click **Complete** to finalize the loan approval process.



NOTE

The **Save** and **Release** buttons are only used to either pause the approval process and save the instance if you are waiting on a field value, or to release the task for another user to modify.

CHAPTER 11. MONITORING THE MORTGAGEAPPROVALPROCESS PROCESS APPLICATION

The following chapter shows how different bank employees, such as a system administrator or a knowledge worker, might use some of the monitoring capabilities to track an instance of the mortgage approval process.

Prerequisites

- Process Server is deployed and connected to Business Central.

Procedure

1. Log in to Red Hat Process Automation Manager and click **Menu → Manage → Process Instances**.
2. In the **Manage Process Instances** window, you can set filters, such as **State, Errors, Id**, and so on.
3. Select **Completed** in the **State** filter to view all completed **MortgageApprovalProcess** instances.
4. Click each of the following tabs to get a feel for what type of information is available to monitor a specific process instance:
 - **Instance Details**
 - **Process Variables**
 - **Documents**
 - **Logs**
 - **Diagram**
5. Click **Menu → Track → Process Reports**. This view contains a variety of charts that can help a senior process manager to gain an overview of all processes based on **Type, Start Date, Running Time**, and so on to assist with task reporting.

11.1. FILTERING PROCESS INSTANCES USING DEFAULT OR ADVANCED FILTERS

Business Central now provides you with default and advanced filters to help you filter and search through running process instances. You can also create custom filters using the **Advanced Filters** option.

11.1.1. Filtering process instances using default filters

Filter processes instances by attributes such as **State, Errors, Filter By, Name, Start Date**, and **Last update**.

Procedure

1. In Business Central, go to **Menu → Manage → Process Instances**.

2. On the **Manage Process Instances** page, click the filter icon on the left of the page to expand the **Filters** pane.

This pane lists the following process attributes which you can use to filter process instances:

- **State:** Filter process instances based on their state (**Active, Aborted, Completed, Pending,** and **Suspended**).
- **Errors:** Filter process instances by errors.
- **Filter By:** Filter process instances based on **Id, Initiator, Correlation Key,** or **Description** attribute.
 - i. Select the required attribute.
 - ii. Enter the search query in the text field below.
 - iii. Click **Apply**.
- **Name:** Filter process instances based on process definition name.
- **Start Date:** Filter process instances based on their creation date.
- **Last update:** Filter process instances based on their last modified date.

You can also use the **Advanced Filters** option to create custom filters in Business Central.

11.1.2. Filtering process instances using advanced filters

Use the **Advanced Filters** option to create custom process instance filters. The newly created custom filter is added to the **Saved Filters** pane, which is accessible by clicking on the star icon on the left of the **Manage Process Instances** page.

Procedure

1. In Business Central, go to **Menu → Manage → Process Instances**.
2. On the **Manage Process Instances** page, click **Advanced Filters** icon.
3. In the **Advanced Filters** pane, enter the name and description of the filter, and click **Add New**.
4. Select an attribute from the **Select column** drop-down list, for example, **processName**. The content of the drop-down changes to **processName != value1**.
5. Click the drop-down again and choose the required logical query. For the **processName** attribute, choose **equals to**.
6. Change the value of the text field to the name of the process you want to filter.



NOTE

The name must match the value defined in the business process of the project.

7. Click **Save** and the processes are filtered according to the filter definition.
8. Click the star icon to open the **Saved Filters** pane.
In the **Saved Filters** pane, you can view all the saved advanced filters.

APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Thursday, October 31, 2019.