Red Hat Process Automation Manager
7.6

Getting started with business processes
Red Hat Process Automation Manager 7.6 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 7.6. 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 sample projects in Business Central that contain business assets for reference purposes. This document describes how to create a new mortgage process project, data objects, and business process to familiarize yourself with Business Central and the process designer.

You will then refer to the Mortgage_Process sample project included in Business Central to review the sample project’s business rules, decision tables, and forms. You will build and deploy the Mortgage_Process sample project and execute the project’s defined functionality.

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. SAMPLE PROJECTS AND BUSINESS ASSETS IN BUSINESS CENTRAL

Business Central contains sample projects with 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 sample code included in the Red Hat Process Automation Manager distribution.

The following sample projects are available in Business Central:

- **Mortgage_Process**: (Process automation) 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) 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) 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) Loan approval process using rule-based decision assets. Determines loan eligibility based on applicant data and qualifications.
- **Employee_Rostering**: (Business optimization) Employee rostering optimization using decision and solver assets. Assigns employees to shifts based on skills.
- **OptaCloud**: (Business optimization) Resource allocation optimization using decision and solver assets. Assigns processes to computers with limited resources.
- **Course_Scheduling**: (Business optimization) 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 SAMPLE PROJECTS AND BUSINESS ASSETS IN BUSINESS CENTRAL

You can use the sample projects in Business Central to explore 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**. If there are existing projects, you can access the samples by clicking on the **MySpace** default space and selecting **Try Samples** from the **Add Project** pull-down menu. If there are no existing projects, 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 sample projects to view the assets for that project.

5. Select each 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**, toggle the **Development Mode** option, and click **Save**. 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, click **View deployment details** in the deployment banner at the top of the screen or in the **Deploy** drop-down menu. This option directs you to the **Menu → Deploy → Execution Servers** page.
CHAPTER 3. CREATING THE MORTGAGE-PROCESS PROJECT

A project is a container for assets such as data objects, business processes, guided rules, decision tables, and forms. The project that you are creating is similar to the existing Mortgage_Process sample project in Business Central.

Procedure

1. In Business Central, go to Menu → Design → Projects. Red Hat Process Automation Manager provides a default space called MySpace, as shown in the following image. You can use the default space to create and test example projects.

   ![Figure 3.1. Default space](image)

2. Click Add Project.

3. Enter mortgage-process in the Name field.

4. Click Configure Advanced Options and modify the GAV fields with the following values:
   - Group ID: com.myspace
   - Artifact ID: mortgage-process
   - Version: 1.0.0

5. Click Add.

The Assets view of the project opens.
CHAPTER 4. CREATING USERS

You can create as many Business Central users as you require. User privileges and settings are controlled by the roles assigned to a user and the groups that a user belongs to. For this example, you must create two new users: Katy who will act as the bank’s loan manager and approver, and Bill who will act as the broker requesting the loan. For more information on creating users, see the Creating users chapter of Installing and configuring Red Hat Process Automation Manager on Red Hat JBoss EAP 7.2.

In Business Central, you can use groups and roles to control permissions for a collection of users. You can create as many groups and roles as you want but a group must have at least one user.

- For this example, the user or users working on the tasks must be assigned to one or more of the following groups and roles:
  - approver group: For the Qualify task
  - broker group: For the Correct Data and Increase Down Payment tasks
  - manager role: For the Final Approval task

Procedure

1. Click the gear icon in the upper-right corner, and click Users.

2. Click , enter Katy, click Next, and click Create.

3. Click Yes to set a password and enter Katy in both fields, and click Change.

4. Enter Bill, click Next, and click Create.

5. Click Yes to set a password and enter Bill in both fields, and click Change.

6. Click the Groups tab and click , enter approver, and click Next.

7. Select Katy from the user list, and click Add selected users.

8. Click , enter broker, and click Next.

9. Select Bill from the user list, and click Add selected users.

10. Click Users, select Katy, and click Edit → Roles → Add roles.

11. Select manager, click Add to selected roles, and click Save.

12. Click the Groups tab and click Add to groups.

13. Select approver and kie-server, and click Add to selected groups.

14. Click Save.

15. Select Bill from the user list, click Edit → Roles → Add roles.
16. Select user, and click Add to selected roles

17. Click the Groups tab, select kie-server, and click Add to selected groups

18. Click Save.
CHAPTER 5. CREATING 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.

The mortgage process project uses the following data objects:

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

5.1. CREATING THE APPLICANT DATA OBJECT

Follow these steps to create the 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 on the MySpace default space.
2. Click **Menu → Design → Projects** and click **mortgage-process**.
3. Click **Add Asset** and select **Data Object**.
4. Enter **Applicant** in the **Data Object** field of the **Create new Data Object** window.
5. Select **com.myspace.mortgage_process** from the **Package** pull-down menu and click **Ok**.
6. Enter **Applicant** in the **Label** field of the 'Applicant'- general properties section.
7. Click **+add field** and input the following Applicant data object values. Click Create and continue after each addition. For the last addition, click Create.

<table>
<thead>
<tr>
<th>Applicant.java - Data Objects</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Overview</th>
<th>Source</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Applicant (Applicant)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier</td>
<td>Label</td>
<td>Type</td>
</tr>
<tr>
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<td>Address</td>
<td>String</td>
</tr>
<tr>
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<td>Annual income</td>
<td>Integer</td>
</tr>
<tr>
<td>creditrating</td>
<td>Credit Rating</td>
<td>Integer</td>
</tr>
<tr>
<td>name</td>
<td>Name</td>
<td>String</td>
</tr>
<tr>
<td>ssn</td>
<td>SSN</td>
<td>Integer</td>
</tr>
</tbody>
</table>

8. Click **Save**.

5.2. CREATING THE PROPERTY DATA OBJECT
Follow these steps to create the **Property** data object, which contains information about the property details, such as the property age and price.

**Procedure**

1. In Business Central, click on the **MySpace** default space.
2. Click **Menu → Design → Projects** and click **mortgage-process**.
3. Click **Add Asset** and select **Data Object**.
4. Enter **Property** in the **Data Object** field of the **Create new Data Object** window.
5. Select **com.myspace.mortgage_process** from the **Package** pull-down menu and click **Ok**.
6. Enter **Property** in the **Label** field of the '**Property**'- **general properties** section.
7. Click **+add field** and input the following **Property** data object values. Click **Create and continue** after each addition. For the last addition, click **Create**.

![Property (Property) table]

8. Click **Save**.

### 5.3. CREATING THE VALIDATIONERRORDO DATA OBJECT

Follow these steps to create the **ValidationErrorResponseDO** data object, which specifies the cause of an application error.

**Procedure**

1. In Business Central, click on the **MySpace** default space.
2. Click **Menu → Design → Projects** and click **mortgage-process**.
3. Click **Add Asset** and select **Data Object**.
4. Enter **ValidationErrorResponseDO** in the **Data Object** field of the **Create new Data Object** window.
5. Select **com.myspace.mortgage_process** from the **Package** pull-down menu and click **Ok**.
6. Enter **ValidationErrorResponseDO** in the **Label** field of the '**ValidationErrorResponseDO**'- **general properties** section.
7. Click **+add field** and input the following **ValidationErrorResponseDO** data object values. Click **Create and continue** after each addition. For the last addition, click **Create**.
8. Click **Save**.

### 5.4. CREATING THE APPLICATION DATA OBJECT

Follow these steps to create the **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 on the **MySpace** default space.

2. Click **Menu → Design → Projects** and click **mortgage-process**.

3. Click **Add Asset** and select **Data Object**.

4. Enter **Application** in the **Data Object** field of the **Create new Data Object** window.

5. Select **com.myspace.mortgage_process** from the **Package** pull-down menu and click **Ok**.

6. Enter **Application** in the **Label** field of the 'Application'- general properties section.

7. Click **+add field** and input the following **Application** data object values. Click **Create and continue** after each addition. For the last addition, click **Create**.

8. Click **Save**.
CHAPTER 6. BUSINESS PROCESSES 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.

![Diagram of MortgageApprovalProcess](image.png)

6.1. CREATING THE BUSINESS PROCESS

The following procedures guide you through the creation of tasks, connections, and gateways that make up the MortgageApprovalProcess 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_process`
     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_process`. 
4. Click Ok. The diagram editor opens.

5. In the upper-right corner, click the Properties icon.


7. Enter the following values:
   - Name: application
   - Data Type: Application [com.myspace.mortgage_process]

6.1.1. 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.

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.

![Node Panel](image)

**Procedure**

1. Drag a start event node on to the canvas.

2. 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.

3. 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.

4. Configure the business rule task:
   a. Click the business rules task.
   b. If the Properties panel is not open, in the upper-right corner click the Properties icon.
   c. In the Properties panel, enter Validation in the Name field.
d. Expand **Implementation/Execution**, select **New** from the **Rule Flow Group** menu, and input **validation**.

e. In the **On Exit Action** field, enter the following Java expression:

   ```java
   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:

<table>
<thead>
<tr>
<th>Data Inputs and Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td><code>application</code></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data Outputs and Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td><code>application</code></td>
</tr>
</tbody>
</table>

5. Above the canvas, click **Save** to confirm your changes.

### 6.1.2 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. Drag the new task below the exclusive gateway as shown below.

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

d. If the **Properties** panel is not open, in the upper-right corner click the **Properties** icon.

e. In the **Properties** panel, enter **Retract Validation** in the **Name** field.

f. Expand **Implementation/Execution**, select **New** from the **Rule Flow Group** menu, and input **error**.

3. Configure the connection between the exclusive gateway and the business rule task:

a. Click the connection.

b. If the **Properties** panel is not open, in the upper-right corner click the **Properties** icon.

c. In the **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 **Validation>ErrorDO()** 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. Drag the new task below the **Validation** task as shown below.
   c. Hover over the **Task** icon of the task and click the **Convert into User** icon.
   d. Click on the new user task and in the **Properties** panel, enter **Correct Data** in the **Name** field.
   e. Expand **Implementation/Execution** and enter **CorrectData** in the **Task Name** field.
f. Select **New** from the **Groups** menu, and input **broker**.

g. Click next to **Assignments**.

h. In the **Correct Data Data I/O** window, click **Add** and create the following assignments:

```
Correct Data Data I/O

Data Inputs and Assignments

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>application</td>
<td>Application [com1]</td>
<td>application</td>
</tr>
</tbody>
</table>

Data Outputs and Assignments

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>application</td>
<td>Application [com1]</td>
<td>application</td>
</tr>
</tbody>
</table>
```

i. Above the canvas, click **Save** to confirm your changes.

5. Click on the **Correct Data** user task, then click the **Create sequence Flow** icon and drag it back to the first exclusive gateway. Your workflow should look similar to the following diagram:

![Diagram](image)

### 6.1.3. Calculating the mortgage

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

**Procedure**
1. Return to the second exclusive gateway and create an outgoing connection to a new business rule task.

2. Click the created connection and in the **Properties** panel, input **Valid** in the **Name** field.
   
a. Expand **Implementation/Execution** and select **Expression** in the **Condition Expression** section.
   
b. From the list, select **drools** and enter **not ValidationErrorsDO()** in the **Condition Expression** field.

3. Click the new business rule task and in the **Properties** panel, input **Mortgage Calculation** in the **Name** field.

   a. Expand **Implementation/Execution**, select **New** from the **Rule Flow Group** menu, and input **mortgagecalculation**.
4. Expand Data Assignments and click next to Assignments.

5. In the Mortgage Calculation Data I/O window, click Add to create the following assignments and click Save.

![Mortgage Calculation Data I/O](image)

6. Click an empty space on the canvas, scroll down, expand Process Data, and click next to Process Variables. Enter the following values:
   - **Name**: inlimit
   - **Date Type**: Boolean

7. Create an outgoing connection from the Mortgage Calculation task to a new user task.

8. Click the user task, enter Qualify in the Name field.
9. Expand **Implementation/Execution** and enter **Qualify** in the **Task Name** field.

10. Select **New** from the **Groups** menu, and input **approver**.

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

```
Qualify Data I/O

Data Inputs and Assignments

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>application</td>
<td>Application [com.i]</td>
<td>application</td>
</tr>
</tbody>
</table>

Data Outputs and Assignments

<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>inlimit</td>
<td>Boolean</td>
<td>inlimit</td>
</tr>
</tbody>
</table>
```

12. Above the canvas, click **Save** to confirm your changes.

13. Click on the **Qualify** user task, click on the **Create parallel** menu icon, and convert it to an exclusive gateway.

14. Drag the new exclusive gateway below the **Qualify** user task.

15. Create an outgoing connection from the exclusive gateway and connect it to a new user task.

16. Click the connection and input **In Limit** in the **Name** field of the **Properties** panel.

17. Expand **Implementation/Execution** and select **Condition** in the **Condition Expression** section.

18. Select **inlimit** from the **Process Variable** drop-down menu and select **Is true** from the **Condition** drop-down menu.
19. Click the user task, enter **Final Approval** in the **Name** field.

20. Expand **Implementation/Execution** and enter **FinalApproval** in the **Task Name** field.

21. Select **New** from the **Groups** menu, and input **manager**.

22. Click next to **Assignments**. In the **Final Approval Data I/O** window, click **Add** to create the following assignments:
23. Above the canvas, click **Save** to confirm your changes.

### 6.1.4. 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. Click on the **Final Approval** user task and select **Create End** from the user task quick menu.

2. Move the end event below the **Final Approval** user task.
3. 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.
4. Click the connection and input **Not in Limit** in the **Name** field of the **Properties** panel.

5. Expand **Implementation/Execution** and select **Condition** in the **Condition Expression** section.

6. Select **inlimit** from the **Process Variable** drop-down menu and select **Is false** from the **Condition** drop-down menu.

7. 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
8. Click the new user task and in the Properties panel, input Increase Down Payment in the Name field.

9. Expand Implementation/Execution and enter IncreaseDownPayment in the Task Name field.

10. Select New from the Groups menu, and input broker.

11. Click next to Assignments. In the Increase Down Payment Data I/O window, click Add to create the following assignments:

```
<table>
<thead>
<tr>
<th>Name</th>
<th>Data Type</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>application</td>
<td>Application [com.m]</td>
<td>application</td>
</tr>
<tr>
<td>incdownpayment</td>
<td>Boolean</td>
<td>incdownpayment</td>
</tr>
</tbody>
</table>
```

12. Above the canvas, click Save to confirm your changes.

13. Click on the Increase Down Payment user task, click on the Create parallel menu icon, and convert it to an exclusive gateway.

14. Drag the new exclusive gateway below the Increase Down Payment user task.

15. Create an outgoing connection from the exclusive gateway to an end event.
16. Click the connection and input **Down payment not increased** in the **Name** field of the **Properties** panel.

17. Expand **Implementation/Execution** and select **Expression** in the **Condition Expression** section.

18. Input **return !incdownpayment**; and select **java** from the drop-down menu.

19. Create an outgoing connection from the exclusive gateway and connect it to the first exclusive gateway.

20. Click the connection and input **Down payment increased** in the **Name** field of the **Properties** panel.

21. Expand **Implementation/Execution** and select **Expression** in the **Condition Expression** section.

22. Input **return incdownpayment**; and select **java** from the drop-down menu.

23. Above the canvas, click **Save** to confirm your changes and save the entire business process.

---

**Figure 6.1. Final version of the business process**
CHAPTER 7. 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.

7.1. VIEWING THE MORTGAGE_PROCESS BUSINESS RULES

The goal of this chapter is to introduce you to the predefined business rules for the Mortgage_Process project. For this tutorial, you do not create and define the business rules. Instead, review the WHEN and THEN rules that are already defined in the Mortgage_Process sample project’s preconfigured business rules. For information about creating guided business rules, see Designing a decision service using guided rules.

7.1.1. 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. From the asset list, click the right arrow to view the second page of the asset list and click the Validate Down Payment guided rule.

3. Review the Validate Down Payment guided rule’s WHEN and THEN conditions and values.

7.1.2. 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. From the asset list, click the right arrow to view the second page of the asset list and click the RetractValidationErr guided rule.

3. Review the RetractValidationErr guided rule’s WHEN and THEN conditions and values.

![Guided Rules Table](image)
CHAPTER 8. 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.

8.1. 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 7.1, “Viewing the Mortgage_Process business rules”.

Procedure

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

2. Scroll down and click the MortgageDecisionTable Guided Decision Tables asset.

<table>
<thead>
<tr>
<th>#</th>
<th>Description</th>
<th>ruleflow-group</th>
<th>Applicant Annual Income</th>
<th>Property</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Greater</td>
<td>Less_or_equal</td>
</tr>
<tr>
<td>1</td>
<td>mortgagecalculation</td>
<td>100000</td>
<td>200000</td>
<td>300000</td>
</tr>
<tr>
<td>2</td>
<td>mortgagecalculation</td>
<td>50000</td>
<td>99999</td>
<td>100000</td>
</tr>
</tbody>
</table>
CHAPTER 9. FORMS IN BUSINESS CENTRAL

A form is a layout definition for a page, defined as HTML, that is displayed as a dialog window to the user during process and task instantiation. Task forms acquire data from a user for both the process and task instance execution, whereas process forms take input and output from process variables.

The input is then mapped to the task using the data input assignment, which you can use inside of a task. When the task is completed, the data is mapped as a data output assignment to provide the data to the parent process instance.

9.1. VIEWING THE MORTGAGE_PROCESS FORMS

The goal of this chapter is to introduce you to the Mortgage_Process sample project’s predefined forms which are used for collecting user data for the mortgage application business process. For this tutorial, you do not create and modify the Mortgage_Process forms. Instead, review the predefined sample forms. For information about creating forms, see Designing business processes in Business Central.

Procedure

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

2. From the asset list, click the right arrow to view the second page of the asset list and select the Applicant form.
   The Applicant form is shown below:


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

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

   ![Form Modeler [Application] view](image)

7. Click the X icon in the upper-right corner to close the editor.
CHAPTER 10. DEPLOYING THE MORTGAGEAPPROVALPROCESS PROCESS APPLICATION

The following chapter instructs you how to build and deploy a new instance of the MortgageProcess 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 redploy 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 review project deployment details, click View deployment details in the deployment banner at the top of the screen or in the Deploy drop-down menu. This option directs you to the Menu → Deploy → Execution Servers page.
CHAPTER 11. EXECUTING THE MORTGAGE_APPROVAL_PROCESS 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 users working on the tasks are members of the following groups and roles:
  - approver group: For the Qualify task
  - broker group: For the Correct Data and Increase Down Payment tasks
  - manager role: For the Final Approval task

Procedure

1. Log in to Red Hat Process Automation Manager as Bill (the broker) and click Menu → Manage → Process Definitions.

2. Click the three vertical dots in the Actions column and select Start to start 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

3. Click Submit to start a new process instance. After starting the process instance, the Instance Details view opens.

4. 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.
5. Log out of Business Central and log back in as Katy.

6. Click **Menu → Track → Task Inbox**. This takes you to the **Qualify** form.

7. Click the three vertical dots in the **Actions** column and select and click **Claim**. The Qualify task **Status** is now **Reserved**.

8. Click the **Qualify** task row to open and review the task information. Click **Claim** and then **Start** at the bottom of the form.
   The application form is now active for approval or denial.

9. To approve the application, select **Is mortgage application in limit?** and click **Complete**.

10. In the **Task Inbox**, click anywhere in the **Final Approval** row to open the **Final Approval** task.

11. In the **Final Approval** row, click the three vertical dots in the **Actions** column and click **Claim**.

12. Click anywhere in the **Final Approval** row to open the **Final Approval** task. Click **Start** at the bottom of the form.

13. Note that the **Inlimit** check box is selected to reflect that that application is ready for final approval. Click **Complete**.

**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 12. 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 on the completed process instance.

5. 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**

6. 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.

12.1. 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.

12.1.1. 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.

### 12.1.2. 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.
CHAPTER 13. ADDITIONAL RESOURCES

- *Designing business processes in Business Central*
APPENDIX A. VERSIONING INFORMATION

Documentation last updated on Friday, May 22, 2020.