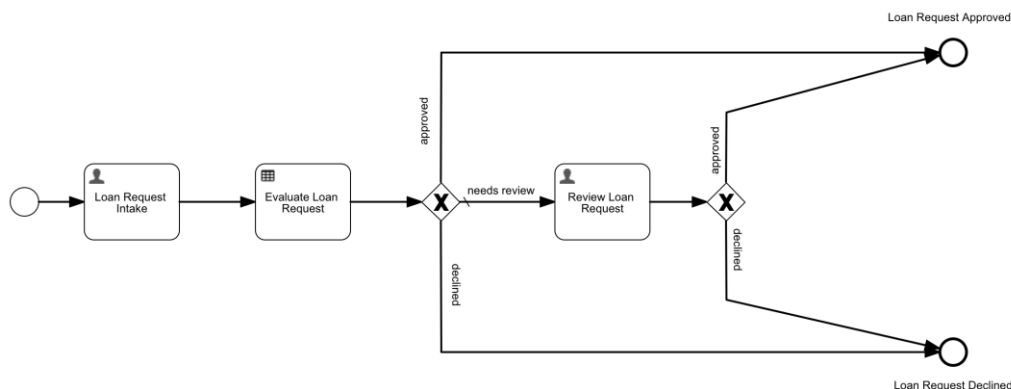


Decision Service

In the previous exercise we created the process 'Loan Request Approval' that used the outcome of a DMN decision table. We will reuse this process but in this part we will create a DMN decision service that consists of multiple DMN decisions with decision tables.

The `Decision` task will execute the DMN decision service instead of DMN decision table. The process will act on the outcome of the decision service.

The process 'Loan Request Approval'



We will modify the following parts of the process;

- Add an input field to the `Loan Request Intake` Form
- Create a DMN decision service that will be executed by the `Evaluate Loan Request` Decision Task

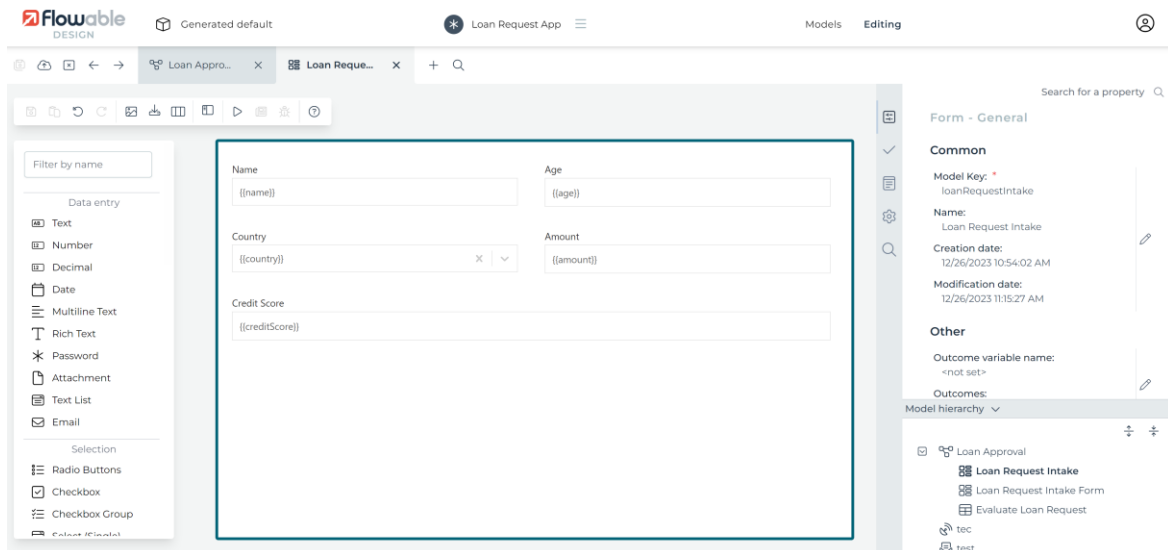
The additional field in the `Loan Request Intake` Form will be used in one of the decisions in the decision service. In the new DMN decision service an additional decision table will be executed (in addition to the existing table). The result of both tables will be used to evaluate a new DMN decision. The result of this decision will be the result of the decision service and made available to the process.

Step 1: Modify the 'Loan Request Intake Form'

In Flowable Design choose the workspace that holds the `Loan Request` App and select it. Then from the App select the `Loan Request Intake` form.

In the Form Designer, we will add the following field;

- type: 'Number', name: *Credit Score*, id: *creditScore*



The form is done and is saved by selecting the *Save* button in the toolbar. After the form is saved, navigate back to the app by selecting the *Close* button in the toolbar.

Step 2: Create the DMN decision service

A DMN decision service has two sections; the upper part; the *output decisions* section and the lower part; the *encapsulated decisions* section. The results of the decisions that are part of the *encapsulated decisions* section can be used in other decision service decisions but are not part of the output of the decision service. The results of the decisions that are part of the *output decisions* section compose the result of the decision service.

The new decision service will consist of 3 decisions with decision tables;

- 2 encapsulated decisions;
- a decision using the (already existing) `Evaluate Loan Request` decision table
- a decision with a 'Evaluate Credit Score' decision table
- 1 output decision;
- a decision with a 'Evaluate Loan Eligibility' decision table

The 'Evaluate Credit Score' decision table will evaluate the *credit score* and result in a *credit rating*. Both the credit rating and the result of the `Evaluate Loan Request` decision table will be used as inputs for the `Evaluate Loan Eligibility` decision table. This decision table will 'override' the *approvalState* for specific *credit scores*.

Step 2A: Modify the `Evaluate Loan Request` decision table

The existing decision table `Evaluate Loan Request` will not be an output decision and thus will not be used as the result of the decision service. For clarity we will rename the output of this decision table.

Select the `Evaluate Loan Request` decision table in the `Loan Request App`.

The DMN Decision Table Editor will be opened.

Modify the column label and variable name of the output by selecting the `Approval State` column header and choosing `Edit column`.

- Column label: `Pre Approval State`, Variable name: `preApprovalState`.

Edit output

×

Label

Pre Approval State

Variable name *

preApprovalState

Variable type *

String

Allowed values (optional)

APPROVED

DECLINED

REVIEW

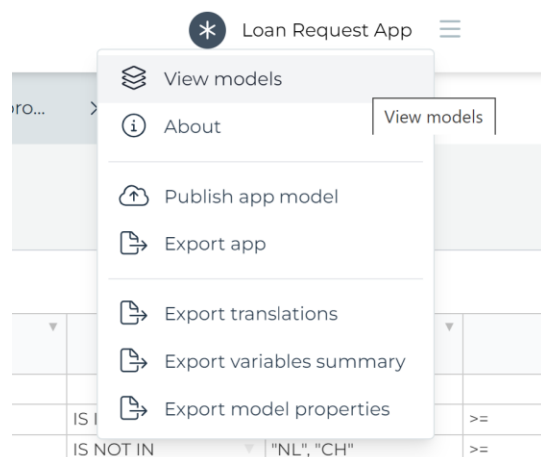
Add custom property (+)

Cancel

Save

Please note that since we're using the variable `'approvalState'` in the conditional expressions `${approvalState == 'APPROVED'}` and `${approvalState == 'APPROVED'}` of the `sequenceFlow` in the `'Loan Approval App'`, we have to change it to `${preApprovalState == 'APPROVED'}` and `${preApprovalState == 'APPROVED'}`.

Save the changes by selecting the `Save` button. Then save the decision table by selecting the `Save` button in the toolbar. After that close the editor and return to the App by selecting `View models` from the `Actions` menu.



Step 2B: Create the 'Evaluate Loan Request Decision Service' model

Once back to the Loan Request App click the Create button and select Decision service for the model type. Name it Evaluate Loan Request Decision Service and give it the key evaluateLoanRequestDecisionService.

Open or create a new model

CreateImportInclude

Model Type *

Decision service

Name *

Evaluate Loan Request Decision Ser

Key *

evaluateLoanRequestDecisionServic

Palette type

Flowable Work CMMN

Tags

Select...

Description

B *I* {}

Template

Select...

You can create a new model by choosing the type of model and giving it a name. Its key can be auto-generated from its name or you can specify one yourself. You also have the option of importing a model by uploading a file of the correct format.

For models that are designed with a palette and canvas, the palette type can be chosen when multiple palettes are installed in the system. This palette determines which Flowable product the model will be publishable to.

Models can also be tagged for easier querying later on and can get a free-form description to provide more details about it.

Cancel

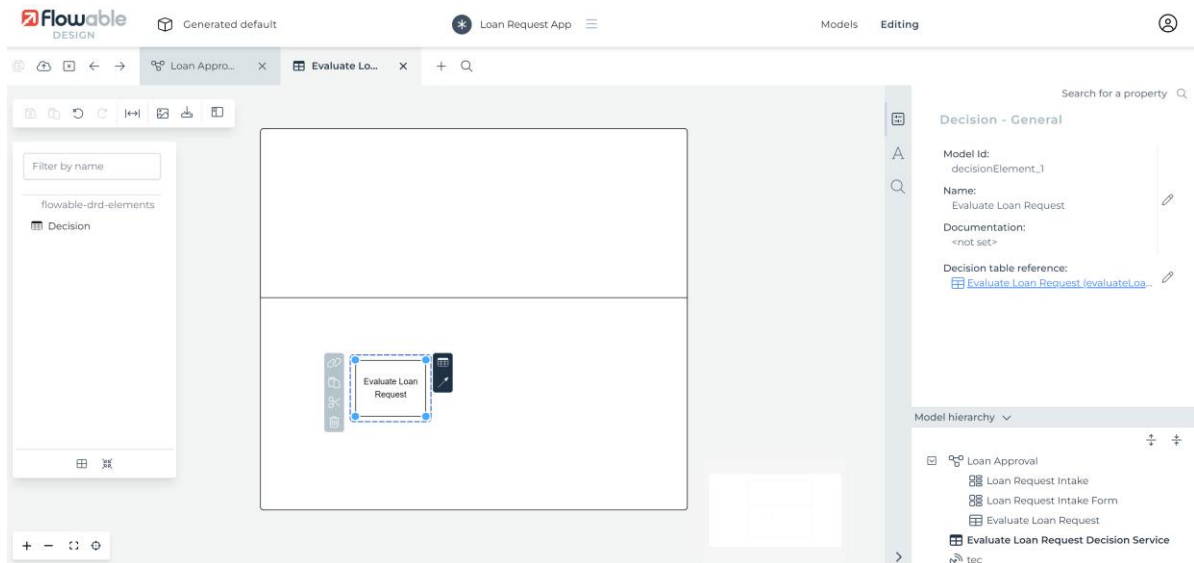
Create

Finally, select the Create button.

Step 2C: Model the 'Evaluate Loan Request Decision Service'

The DMN Decision Service Editor is automatically opened after creating the decision service.

Start by creating an *encapsulated decision* by dragging the *Decision* element to the lower part of the decision service.



Select the `Evaluate Loan Request` as the `Decision table reference`. This is done by selecting the decision then selecting `Decision table reference`, and then in the resulting popup click the link to an existing one link and choosing the `Evaluate Loan Request` decision table.

Click the `Finish` button and provide '`Evaluate Loan Request`' as the name of the decision.

Step 2D: Create the `Evaluate Credit Score` decision table

Add another *encapsulated decision* by dragging the *Decision* element to the lower part of the decision service.

Provide '`Evaluate Credit Score`' as the name of the decision.

Create a new *decision table* by selecting `Decision table reference` and then in the resulting popup providing a Name and Key.

Provide the following info;

- Name: `Evaluate Credit Score`, Key: `evaluateCreditScore`

Create the decision table by selecting the `Create` button followed by the `Finish` button.

After the DMN Decision Table Editor is opened create the following decision table.

Inputs;

- Column label: *Credit Score*, Variable name: *creditScore*, Variable type: *number*

Outputs;

- Column label: *Credit Rating*, Variable name: *creditRating*, Variable type: *string*, Output values; *BAD*, *FAIR*, and *EXCELLENT*

Rules;

1. Credit Score: < 500 / Credit Rating: BAD
2. Credit Score: < 600 / Credit Rating: FAIR
3. Credit Score: >= 700 / Credit Rating: EXCELLENT

Hit Policy: U

Credit Score		Credit Rating
number		string
<	500	BAD
<	600	FAIR
>=	700	EXCELLENT

For the hit policy choose 'UNIQUE' to determine that the result of the decision table is then and only then valid, when one rule is valid.

Step 2E: Create the Evaluate Loan Eligibility decision table

Back to the Evaluate Loan Request Decision Service add an *output decision* by dragging the *Decision* element to the upper part of the decision service.

Provide 'Evaluate Loan Eligibility' as the name of the decision.

Create a new *decision table* by selecting *Decision table reference* and then in the resulting popup providing a Name and Key.

Provide the following info;

- Name: Evaluate Loan Eligibility, Key: evaluateLoanEligibility

Create the decision table by selecting the *Create* button followed by the *Finish* button.

After the DMN Decision Table Editor is opened create the following decision table.

Inputs;

- Column label: *Pre Approval State*, Variable name: *preApprovalState*, Variable type: *string*
- Column label: *Credit Rating*, Variable name: *creditRating*, Variable type: *string*
-

Outputs;

- Column label: *Approval Rating*, Variable name: *approvalRating*, Variable type: *string*, Output values; *DECLINED*, *REVIEW*, and *APPROVED*

Rules;

1. Pre Approval State: == DECLINED / Credit Rating: == EXCELLENT/ Approval State: REVIEW
2. Pre Approval State: == DECLINED / Credit Rating: != EXCELLENT/ Approval State: DECLINED
3. Pre Approval State: == REVIEW / Credit Rating: == FAIR/ Approval State: DECLINED
4. Pre Approval State: == REVIEW / Credit Rating: != FAIR/ Approval State: REVIEW
5. Pre Approval State: == APPROVED / Credit Rating: == BAD/ Approval State: REVIEW
6. Pre Approval State: == APPROVED / Credit Rating: != BAD/ Approval State: APPROVED

Hit Policy: U

Pre Approval State <small>string</small>		Credit Rating <small>string</small>		Approval Rating <small>string</small>
==	DECLINED	==	EXCELLENT	REVIEW
==	DECLINED	!=	EXCELLENT	DECLINED
==	REVIEW	==	FAIR	APPROVED
==	REVIEW	!=	FAIR	REVIEW
==	APPROVED	==	BAD	REVIEW
==	APPROVED	!=	BAD	APPROVED

For the hit policy choose 'UNIQUE' to determine that the result of the decision table is then and only then valid, when one rule is valid.

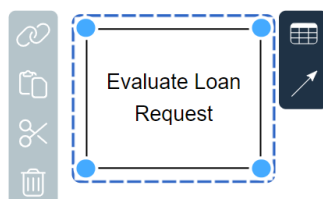
Save the decision table and select `View models` from the App's `Action` menu.

Step 2F: Provide the Information Requirements

Open the decision service editor for the `Evaluate Loan Request Decision Service`.

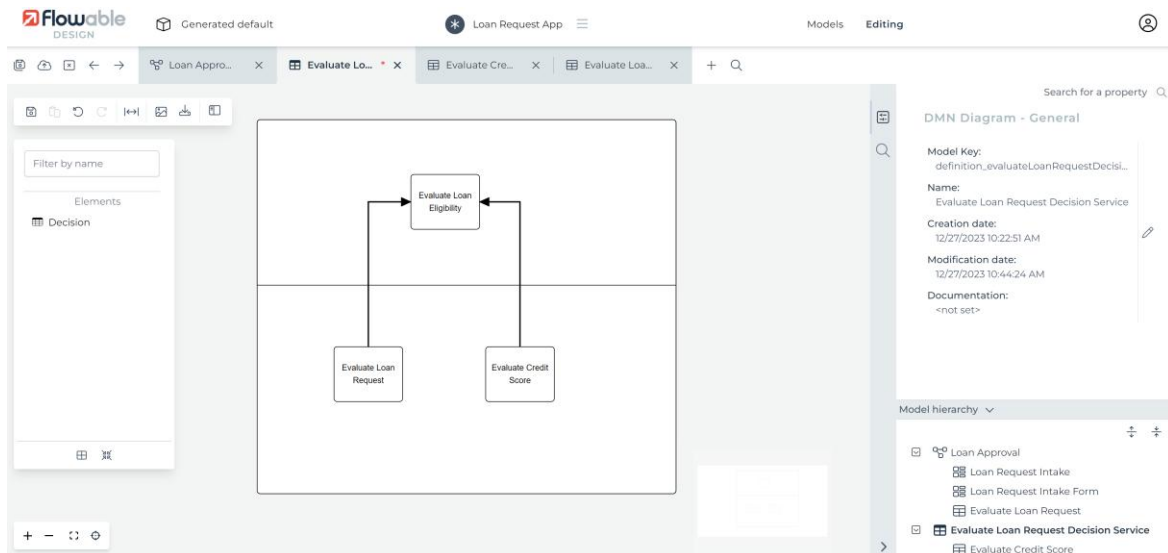
In order to specify what decision results can be used in other decisions we have to provide what decision is an *Information Requirement* of another decision.

Select the `Evaluate Loan Request` decision and select the `arrows` icon on the right-hand side of the selected decision.



Drag the `arrows` icon to the `Evaluate Loan Eligibility` decision.

Do the same for the `Evaluate Credit Score` decision.



After this the decision service is ready and can be saved and closed.

Decision service: Deploy the App

To execute the process, and its decision service we need to redeploy the App containing the updated artifacts.

Navigate to the `Loan Request App` and deploy the App by selecting the `Publish app` model from the App's `Action` menu. Confirm by selecting the `Publish` button in the resulting popup.

App publishing

You are publishing the app:

Loan Request App (loanRequestApp)

Deployment target

default (http://localhost:8080/flowable-work/app-api)

Define new revision

☐

i

You can publish an app selecting a deployment target. Note that this app will be versioned and the workflow app will be updated if it already exists. In addition you can also decide to create a new revision with state of the app that is going to be published. The revision key needs to be unique across all revisions for an app.

Cancel

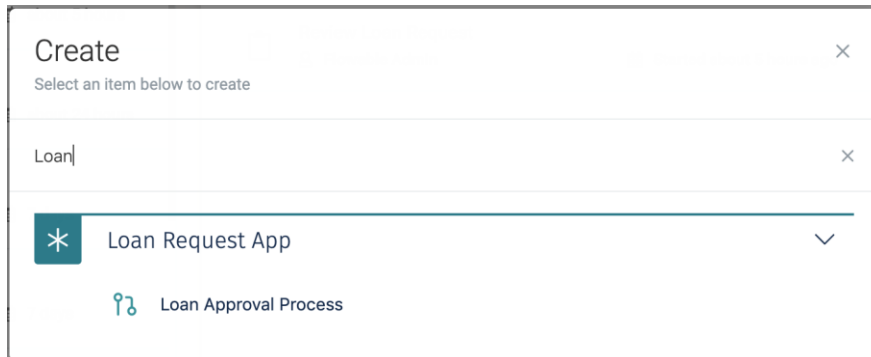
Publish

Decision service: Execute the Process

Flowable Work is used to demonstrate the process and two different scenarios are showing the various potential outcomes of the decision service.

Scenario 1

In Flowable Engage select **Work>Create new** in the left menu. Select the **Loan Request Approval Process** from the **Loan Request App**.



Select **Continue**.

A process instance is started and the process execution halts at the first step; the **Loan Request Intake user task**.

Select the task in the **Open tasks** list.

The form is presented. In this first scenario, enter the following data:

name: Requester Three

age: 20

country: The Netherlands

amount: 200.000

credit score: 800

Task

Loan Request Intake

Loan Approval

Created: less than a minute ago

Assignee: Flowable Admin

Due: No due date

Complete

Save

Task

Comments

People

Subtasks

Documents

History

Name

Requestor Three

Age

20

Country

The Netherlands

Amount

100.000

Credit Score

800

With a lower credit score than 700 the request would in this case be *DECLINED*. But because of the *credit rating* EXCELLENT the request was marked for *REVIEW*.

Task

Loan Request Intake

Loan Approval

Created: less than a minute ago

Assignee: [Flowable Admin](#)

Due: No due date

Complete

Save

Task

Comments

People

Subtasks

Documents

History

Name

Requestor Three

Age

20

Country

The Netherlands

Amount

100.000

Credit Score

800