Decision With BKM

The *Decision With BKM* pattern demonstrates how a decision 'requires' its inputs from structural Input Data and binds the value from the Input Data to a Business Knowledge Model (BKM). The BKM will evaluate a result and assign it to the decision.
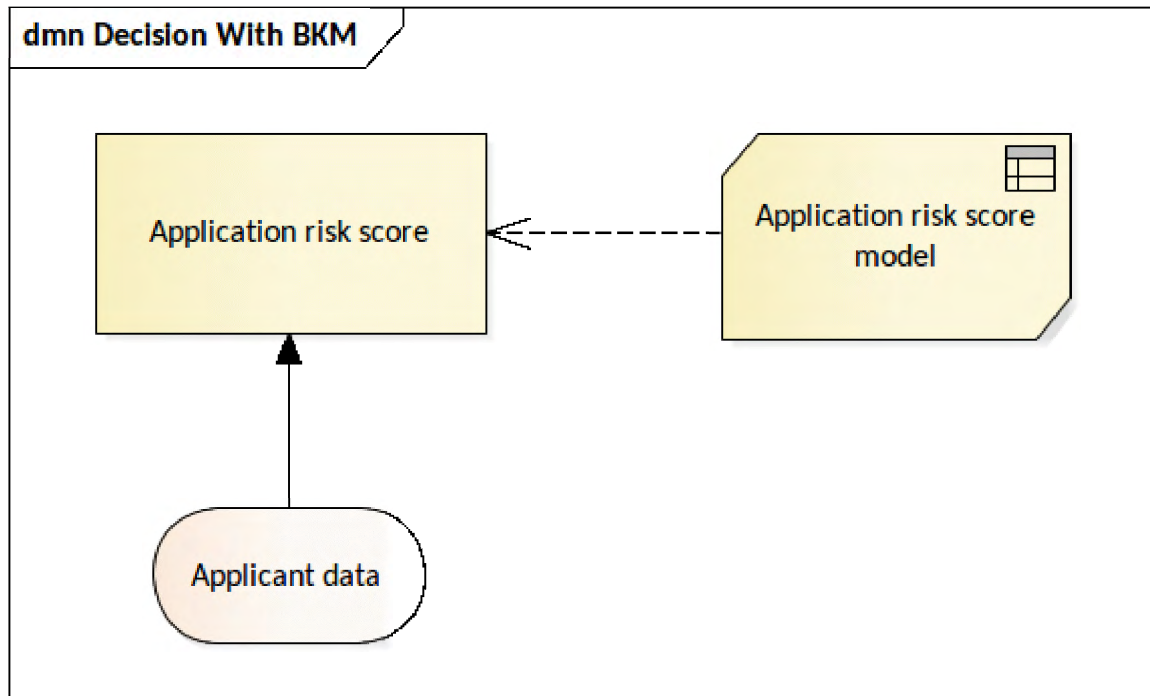

Figure 1. A decision 'requires' Input Data and Invokes a BKM

Business Knowledge Model

In this example, we create a Business Knowledge Model *Application risk score model*, which is implemented as a Decision Table. The BKM defines three parameters *Age*, *Marital Status*, *Employment Status* and returns the accumulated (hit policy 'C+') score as the output *Partial score*.

DMN Expression

Application risk score model | **Input Parameter Values for Simulation**

(Age, Marital Status, Employment Status)

C+	Age	Marital Status	Employment Status	Partial score
	[18..120]	S,M	UNEMPLOYED,EMPLOYED,S...	
1	[18..21]	-	-	32
2	[22..25]	-	-	35
3	[26..35]	-	-	40
4	[36..49]	-	-	43
5	>=50	-	-	48
6		S	-	25
7		M	-	45
8			UNEMPLOYED	15
9	-		STUDENT	18
10		-	EMPLOYED	45
11			SELF-EMPLOYED	36

Testing BKM

Before integrating the BKM into a decision hierarchy, it is good practice to test the BKM by providing some values. Activate the page *Input Parameter Values for Simulation* and provide values for the parameters:

DMN Expression

Application risk score model | **Input Parameter Values for Simulation**

Application risk score model . Partial score

Age	40
Marital Status	"M"
Employment Status	E

"EMPLOYED"

"SELF-EMPLOYED"

"STUDENT"

"UNEMPLOYED"

Validate and Run. The simulation will be shown in the Expression View. The runtime value for the Input/Output Clause will be shown and the matching rule will be highlighted.

Information Requirement & Knowledge Requirement

The Decision Application risk score is implemented as an Invocation, binding values from Input data to the called BKM's parameters. We need to draw an Information Requirement connector from 'Input Data' to 'Decision', and draw a Knowledge Requirement connector from 'BKM' to 'Decision'.
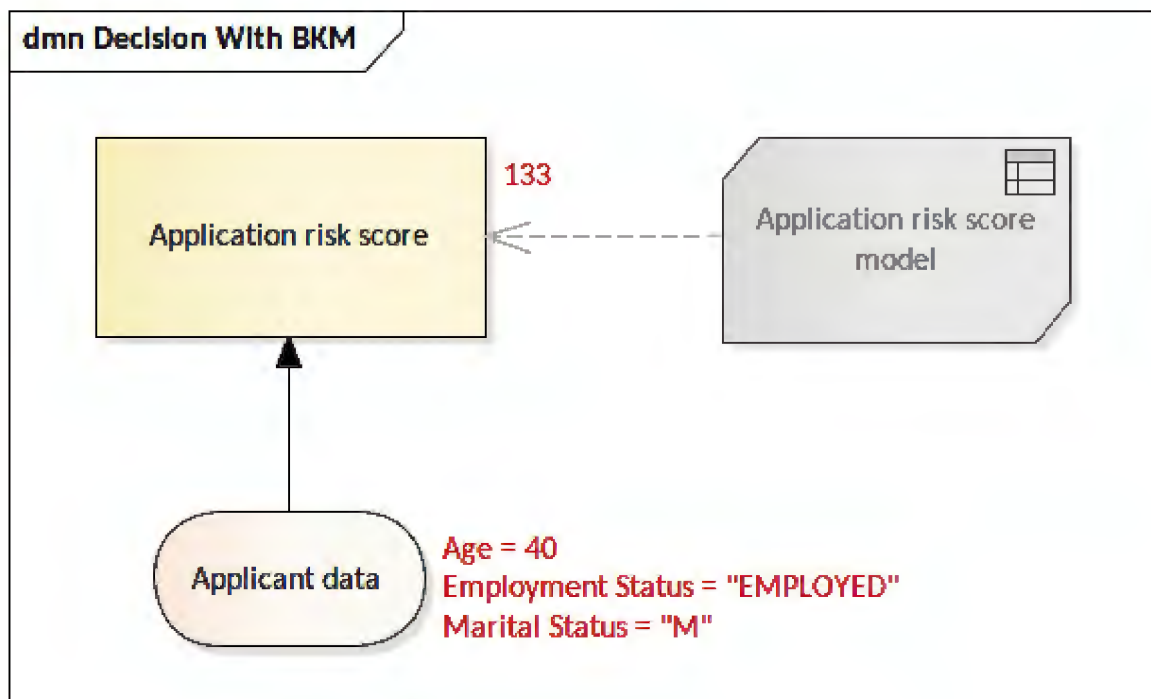

Simulation

Create a *DMNSimConfiguration* element on the diagram, and double-click to open it in the *DMN Simulation* window. Set the 'Application risk score' as the Target Decision; the required Input Data will be automatically loaded. You can specify a Data Set to simulate the model.
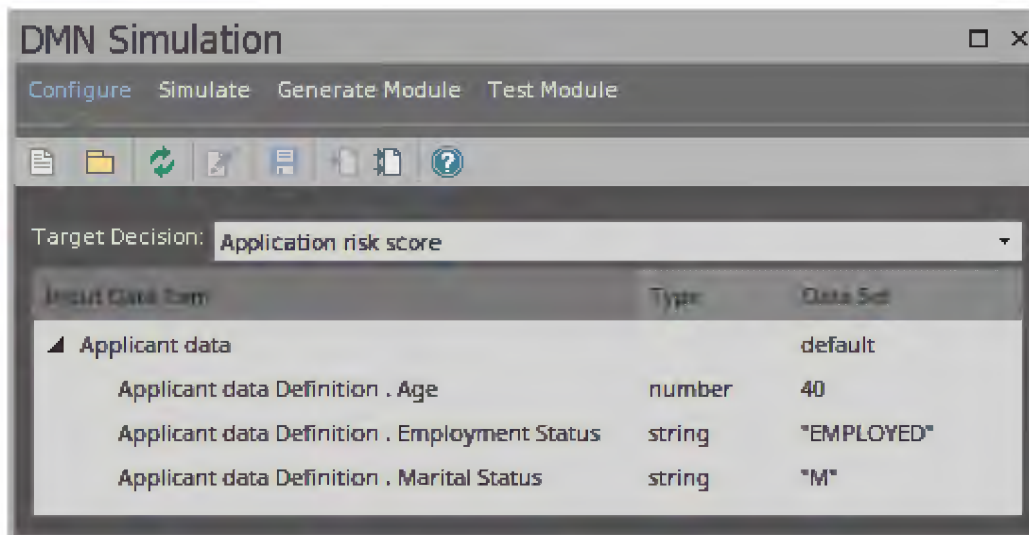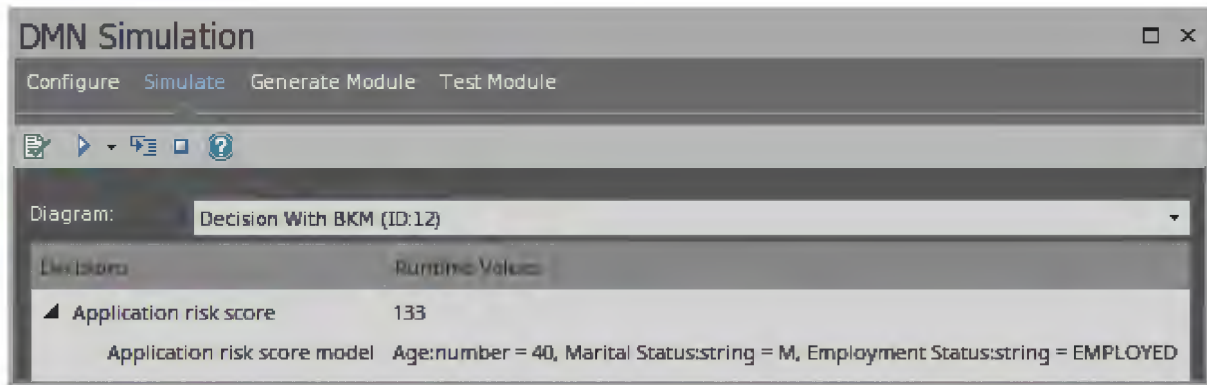
Validate and Run, the simulation result will be shown on both the diagram and the Simulation Window.

The runtime result for each decision is shown on the diagram:

The runtime simulation result is shown on the Simulation Window.

DMN Simulation

Configure Simulate Generate Module Test Module

Diagram: Decision With BKM (ID:12)

Decisions	Runtime Values
◢ Application risk score	133
Application risk score model	Age:number = 40, Marital Status:string = M, Employment Status:string = EMPLOYED

If we click on the 'Step' button, the Decision Table will show the input and output runtime values and highlight the matching rule.

DMN Expression

Application risk score model | Input Parameter Values for Simulation

(Age = 40, Marital Status = M, Employment Status = EMPLOYED)

C+	Age	Marital Status	Employment Status	Partial score
	40	☰	EMPLOYED	133
1	[18..21]	-	-	32
2	[22..25]	-	-	35
3	[26..35]	-	-	40
4	[36..49]	-	-	43
5	>=50	-	-	48
6	-	S	-	25
7	-	M	-	45
8	-	-	UNEMPLOYED	15
9	-	-	STUDENT	18
10	-	-	EMPLOYED	45
11	-	-	SELF-EMPLOYED	36