Avola Decision entry for DM Community Challenge

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The Challenge: Decision Table for Vacation Days Calculation

The Challenge for January stated a request for a decision table representing the following logic:

> The number of vacation days depends on age and years of service.
>
> Every employee receives at least 22 days.
> Additional days are provided according to the following criteria:
>
> 1) Only employees younger than 18 or at least 60 years, or employees with at least 30 years of service will receive 5 extra days.
>
> 2) Employees with at least 30 years of service and also employees of age 60 or more, receive 3 extra days, on top of possible additional days already given.
>
> 3) If an employee has at least 15 but less than 30 years of service, 2 extra days are given. These 2 days are also provided for employees of age 45 or more. These 2 extra days can not be combined with the 5 extra days.

When considering this piece of regulation, the following fact types define this decision:

- For an employee, their age and years of service as conditions;
- For an employee contract, the number of vacation days as a conclusion.

All three of these fact types are defined as timespans, the first two in years, the last one in days. In order to keep the solution focused on the requested decision table, the condition fact type age and years of services are considered base facts, instead of using an employee's date of birth, contract start date and the current date as base facts for deriving age and years of service.

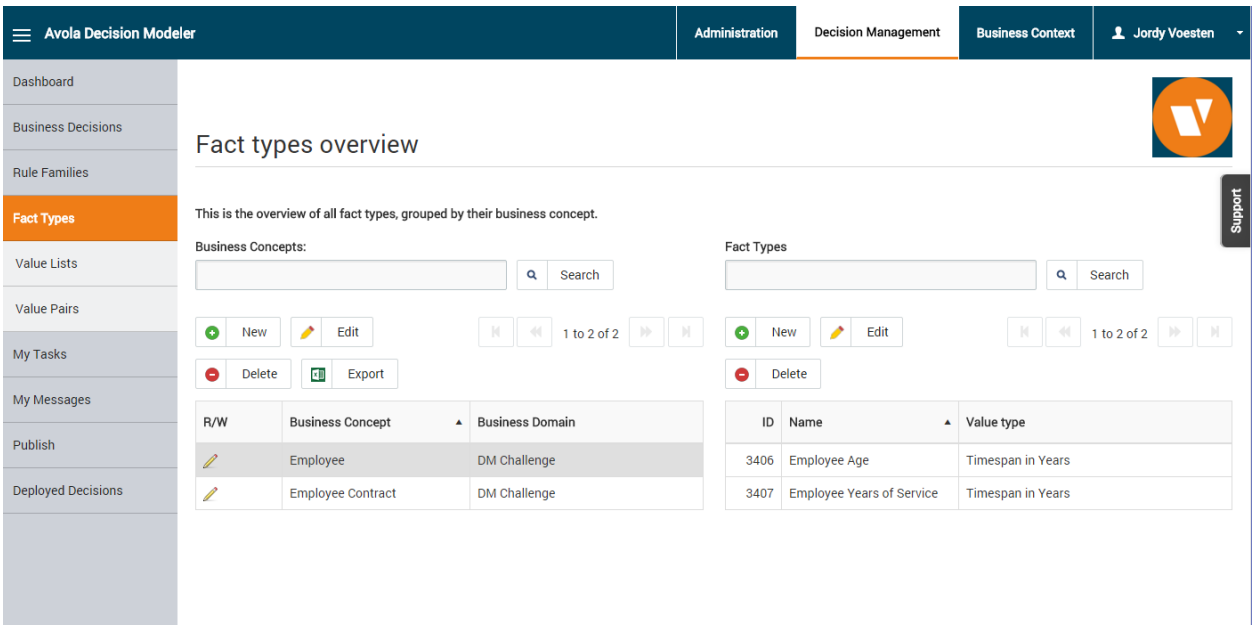


Figure 1: fact types

Explanation of the model

When considering the rules in the example, they can be modelled in a number of ways. Each rule can be modelled separately, or the rules can be analysed as a whole and also implemented as such. For example, when looking at the combined ruleset, one can see that when an employee reaches the age of 60 or over, their years of service become irrelevant for the outcome of the decision. The same can be said for when an employee has 30 years of service or more. The third combination comes from the (assumed) fact that a person cannot have 15 years of service or more when he or she is under the age of 18.

In the decision table used in this solution, combining the described rules was chosen to end up with the simplest decision table possible. The table uses the hit policy *any* and can have more than one conclusion as long as these conclusions are the same, leading to one answer for the decision.

This leads to the following decision table:

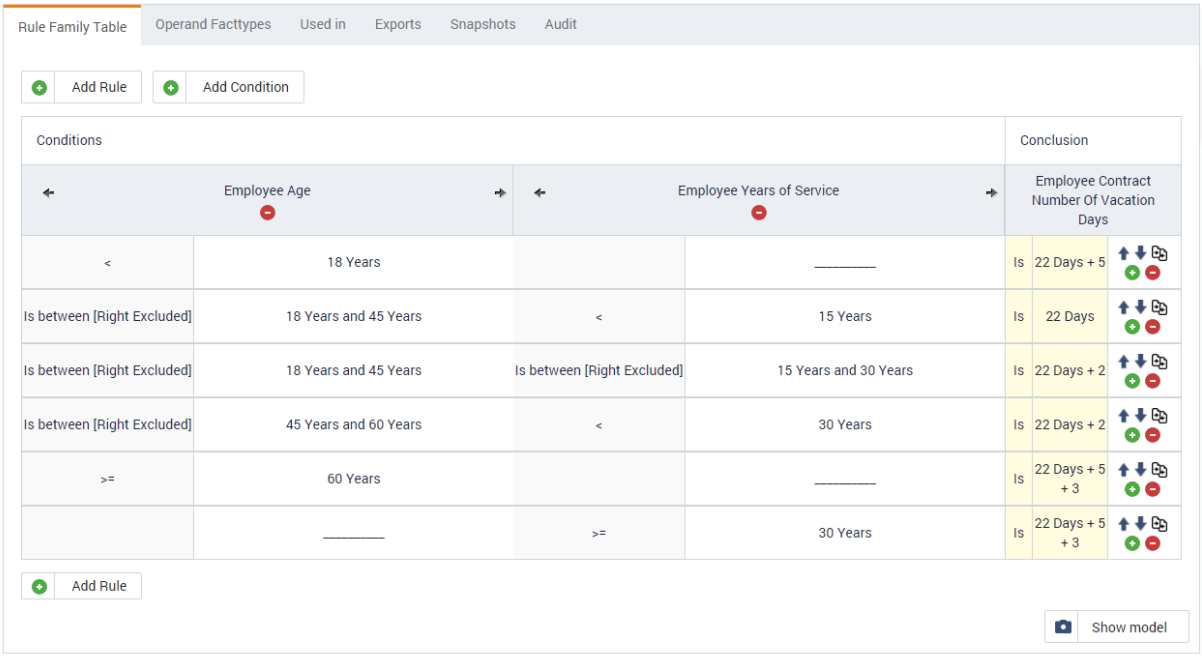


Figure 2: decision table

Example of testing the automated decision

In order to test the table in the Avola Decision platform it must then be used as a business decision and deployed to the cloud service. It can then be tested using individual test scenario's or by using a batch of test cases with their expected conclusions.

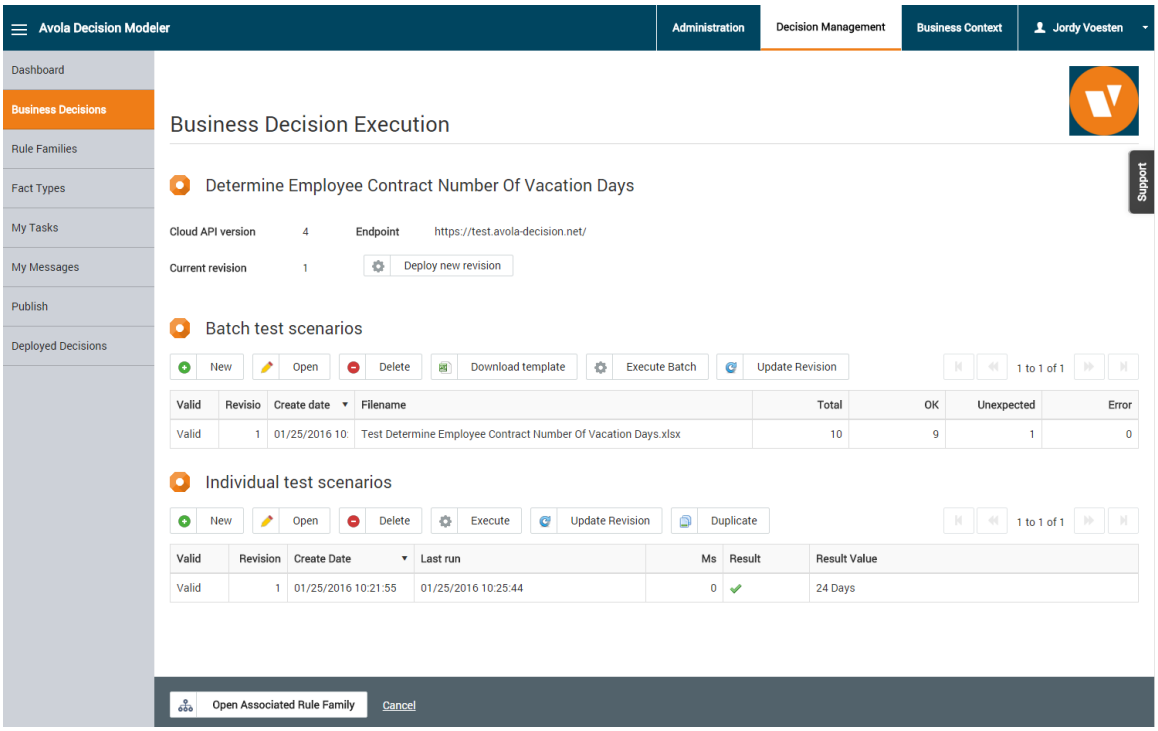


Figure 3: test overview

The individual test scenario shows us information on when the test case was executed, what the input values for the decision were and ends with a trace of the execution showing which row was hit in the decision table using the input values.

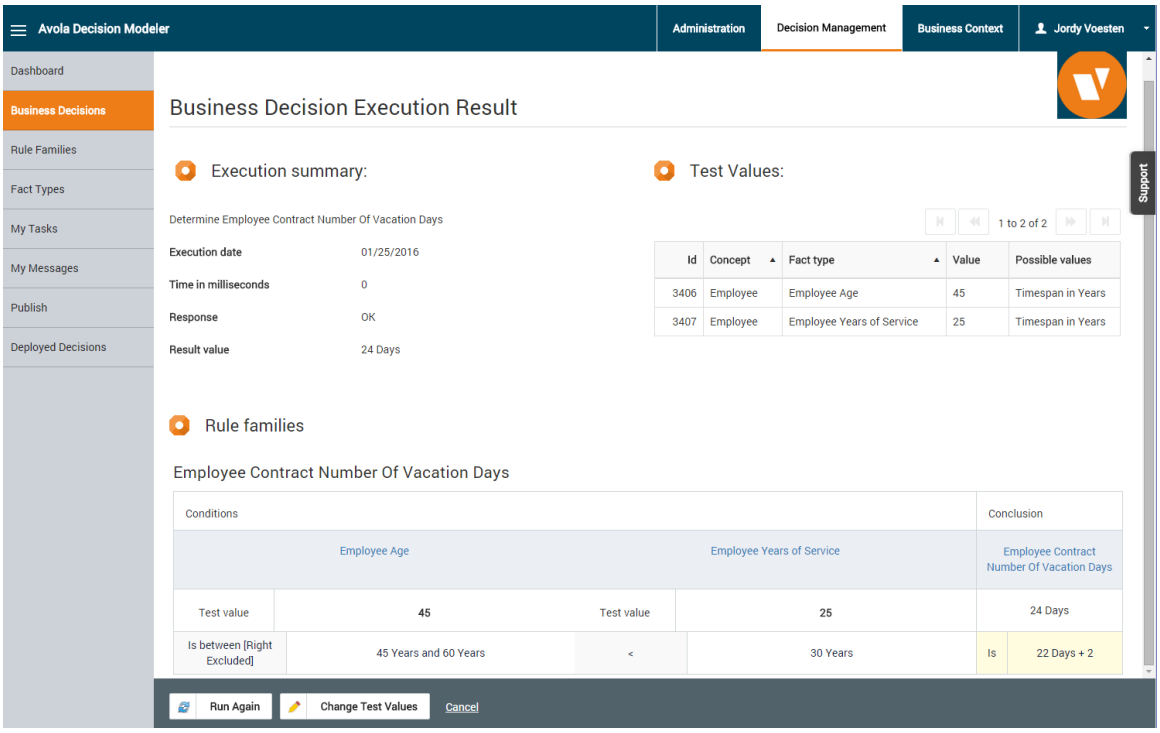
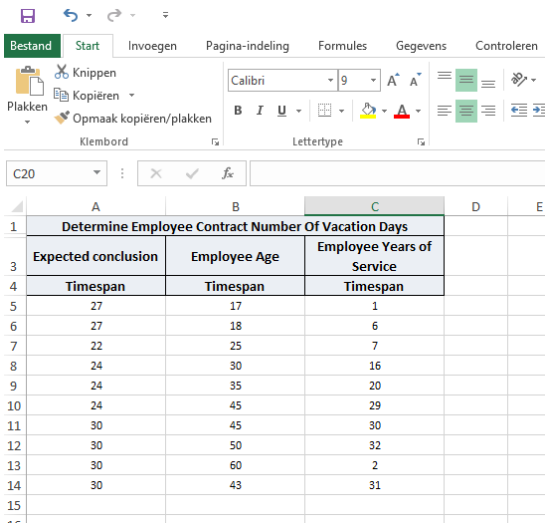


Figure 4: individual test case

When executing a set of test cases in batch (Figure 5), we check them against their expected conclusions and notice the second case tells us there is a difference between the expected conclusion and the actual decision result (Figure 6). When going back to the decision table it is easy to see that the expected conclusion was wrong and the decision outcome was correct.



	A	B	C	D	E
1	Determine Employee Contract Number Of Vacation Days				
3	Expected conclusion	Employee Age	Employee Years of Service		
4	Timespan	Timespan	Timespan		
5	27	17	1		
6	27	18	6		
7	22	25	7		
8	24	30	16		
9	24	35	20		
10	24	45	29		
11	30	45	30		
12	30	50	32		
13	30	60	2		
14	30	43	31		
15					

Figure 5: excel batch test scenarios

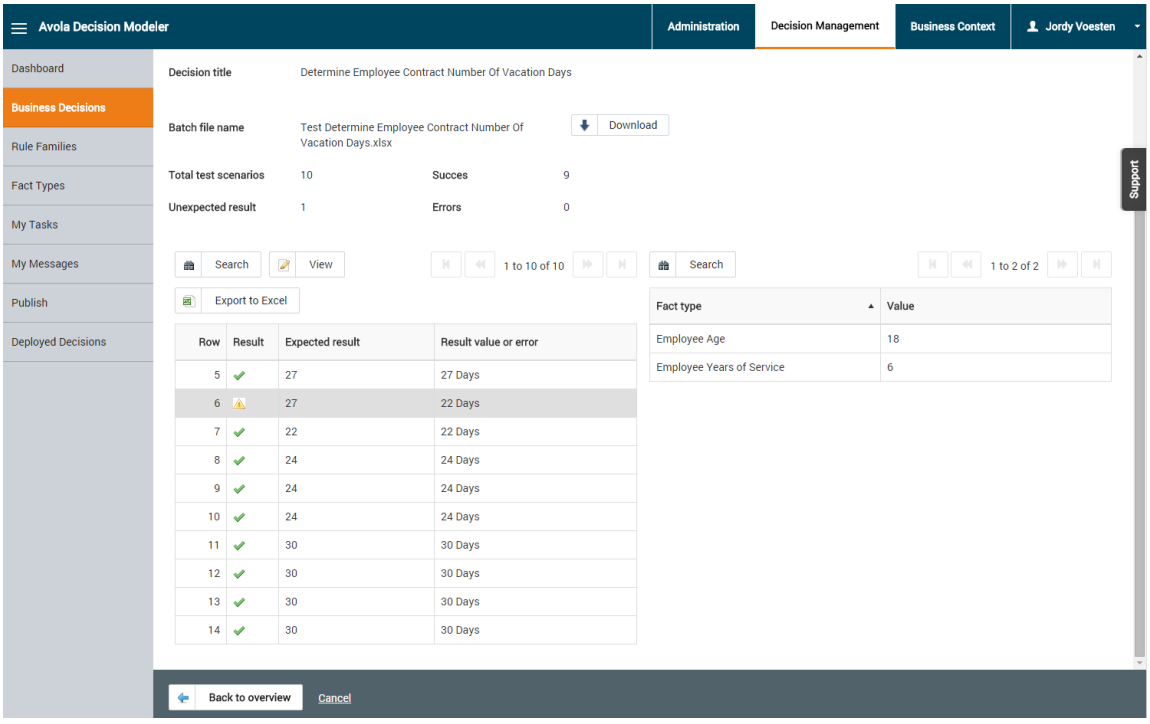


Figure 6: batch test outcome