Decision Service - Cylinder Calculation

Decision Service

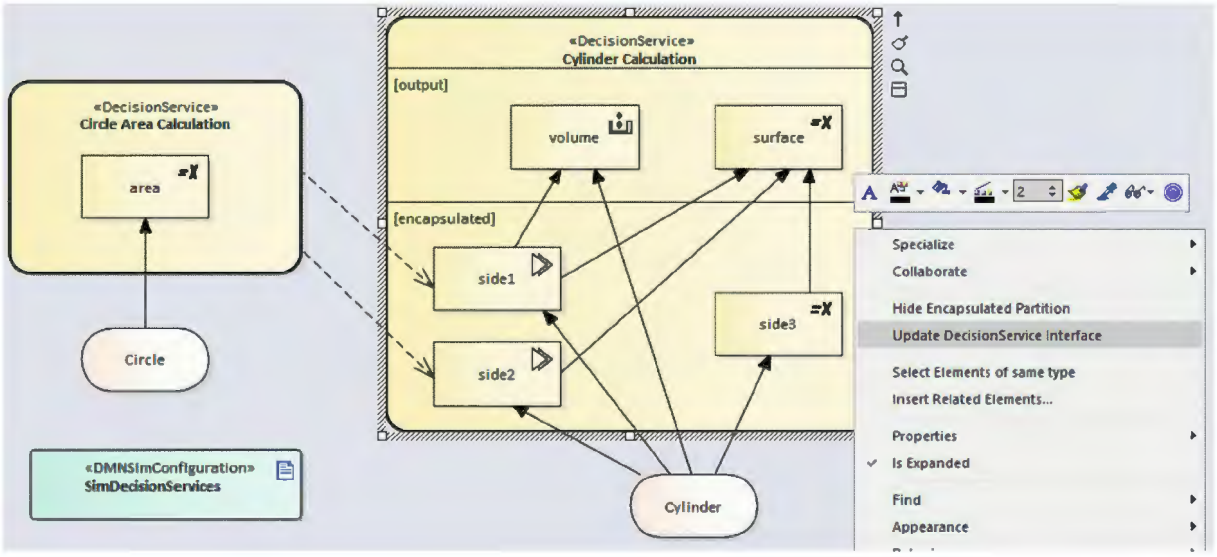
In this example, we will demonstrate modeling, configuration and simulation for DMN Decision Service element.

A decision service defines reusable logic within the decision model.

- The decision service *Circle Area Calculation* takes one input data *Circle* and exposes one decision *area*.
- The decision service Cylinder Calculation takes one input data *Cylinder* and exposes two decisions *volume* and *surface*. Decisions *side1*, *side2* and *side3* are required by the output decisions and are encapsulated in the decision service element.

The output and encapsulated compartments of the decision service can be toggled by the context menu.

IMPORTANT 1: When the interface (input data, input decision, output decision) or implementation (encapsulated decision) of a decision service changed, use the context menu "Update DecisionService interface" to update the decision service.

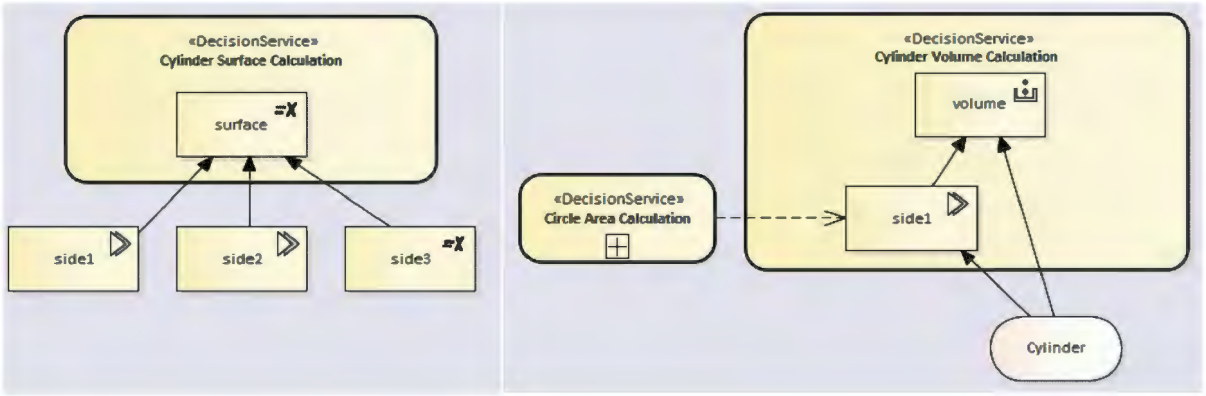


Decision Service Overlay

According to the DMN 1.2 specification, "*Decision services are defined as overlays and therefore do not encapsulate the decisions within them.*" This means multiple decision services may be created on the same decision model to expose different interface.

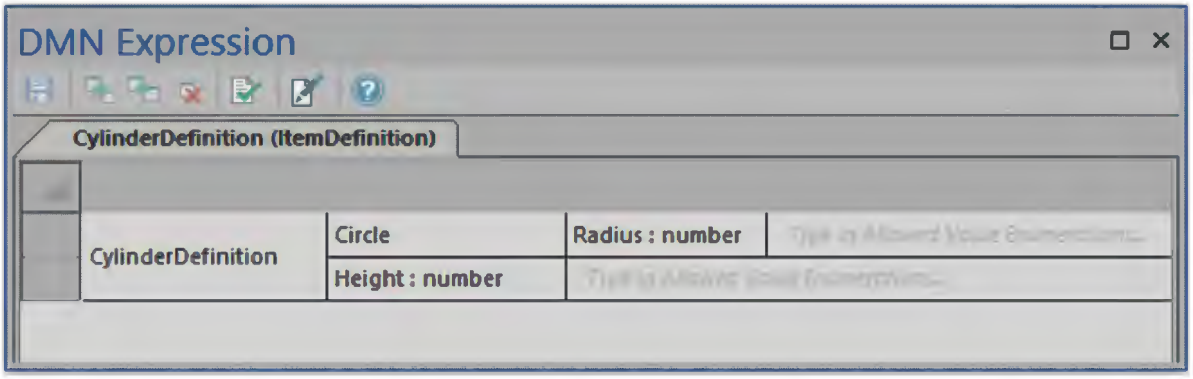
The following 2 diagrams shows 2 decision services that may co-exist with the above *Cylinder Calculation* in the model.

In other words, decisions does not stay nested inside the decision service element in the project browser. They are reference relationship.

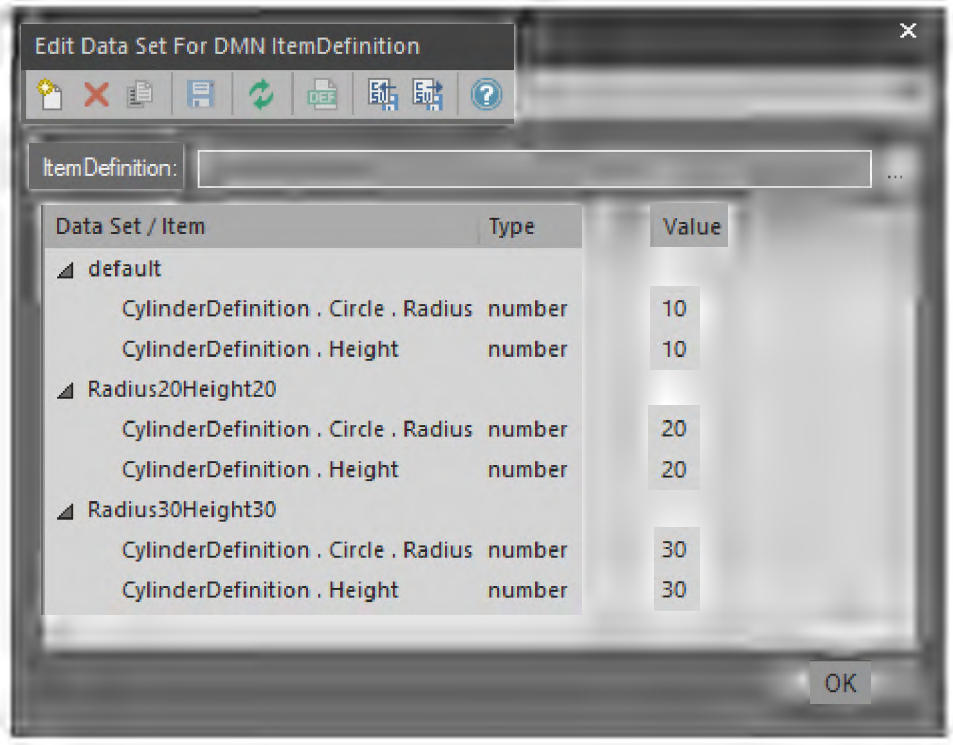


Item Definition & Data Sets

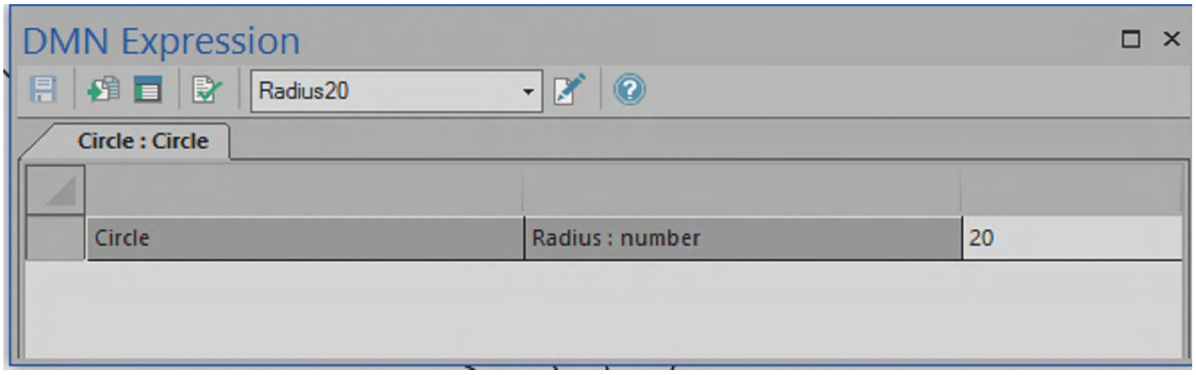
In this example, a composite Item Definition element *CylinderDefinition* is created with two children: *Circle* and *Height*; *Circle* is a composition element with a child *Radius*.



Multiple Data Sets can be defined for an Item Definition, click "Edit Data Set" button on the toolbar to open the dialog for creating/deleting/duplicating data sets. These named data sets will be used as input candidates for input decision, input data, invocation binding value or Business Knowledge Model's simulation arguments.



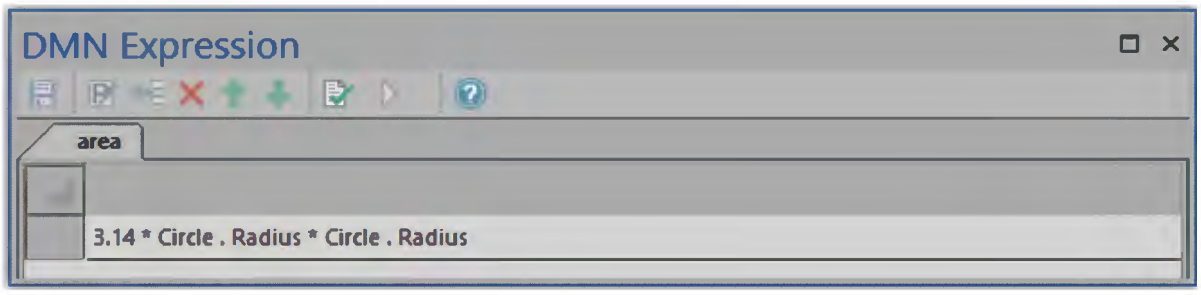
For example, an Input Data *Circle* typed to Item Definition *Circle* may choose "Radius20" (Defined in ItemDefinition *Circle*) as default data set.



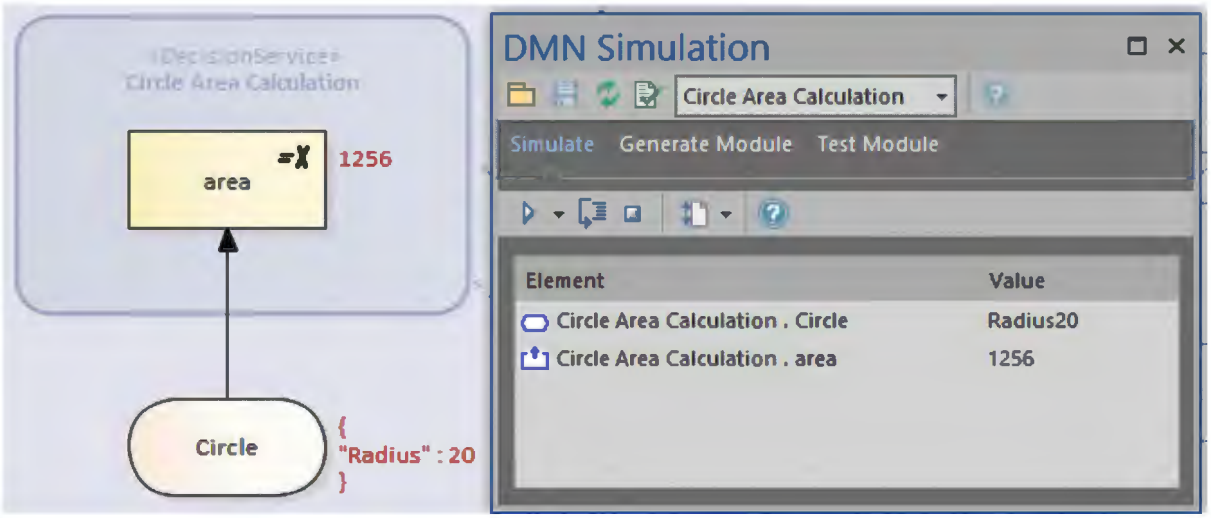
Decision Service: Circle Area Calculation

This is a simple decision service with only one input data *Circle* and one output (also the only encapsulated) decision *area*.

With the help of intellisense support for literal expression editor, we composed "3.14 * Circle . Radius * Circle . Radius" as the expression for decision *area*.



Double click the SimDecisionServices artifact and choose "Circle Area Calculation" in the combobox, run the simulation and you will get the following result.

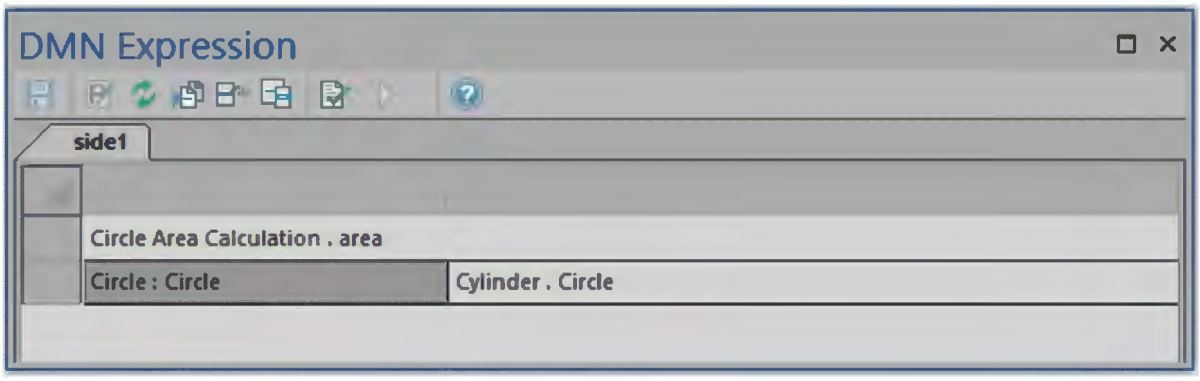


In the next example, you will see how this decision service is reused as an invocable element call by a decision in another decision service.

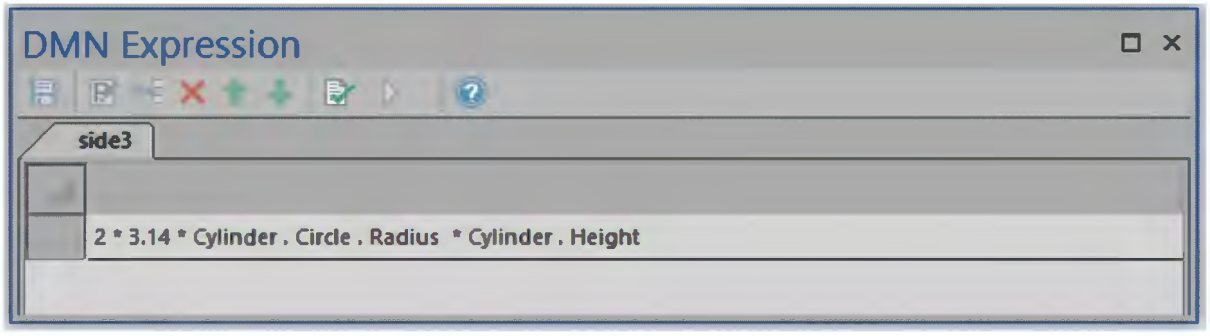
Decision Service: Cylinder Calculation

This decision service has one input data *Cylinder* and two output decision *volume* and *surface.*

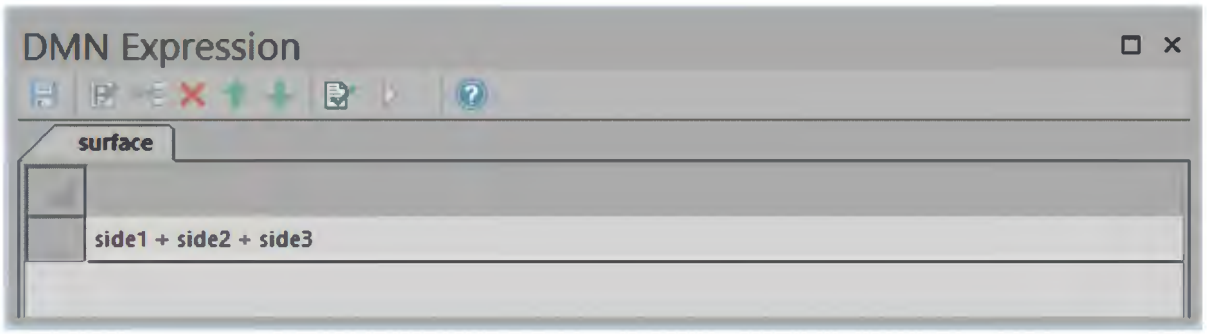
Decisions *side1* and *side2* are both invocations calling decision service *Circle Area Calculation* by binding "Cylinder . Circle" to the input data "Circle" of the invoked decision service.



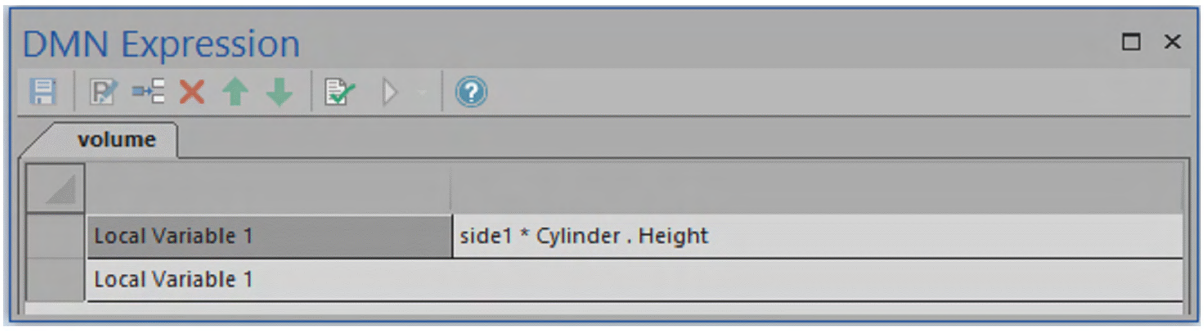
Decision *side3* is a literal expression composed by the editor with the help of intellisense.



Decision *surface* is a simple literal expression adding up the 3 sides together.



Decision *volume* is a boxed context to demonstrate the variety ways of modeling an expression.

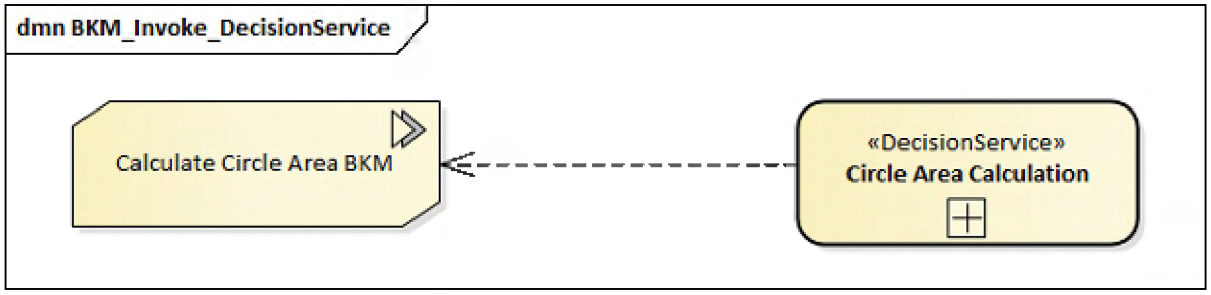


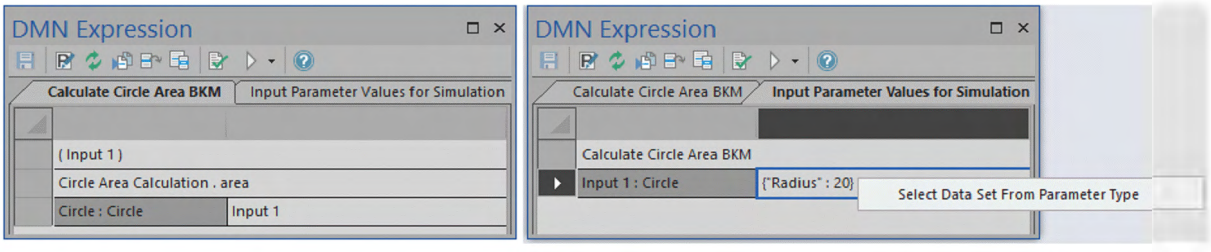
Decision Service Invoked by Business Knowledge Model

A Knowledge Requirement connector may be created leaving from a Decision Service and entering a Decision or Business Knowledge Model. A decision service can be shown as expanded or collapsed on the diagram.

In this example, the *Calculate Circle Area BKM* invoked decision service *Circle Area Calculation* by binding its parameter *Input 1* to the input data *Circle*. Here the parameter Input 1 is typed to Item Definition *Circle*.

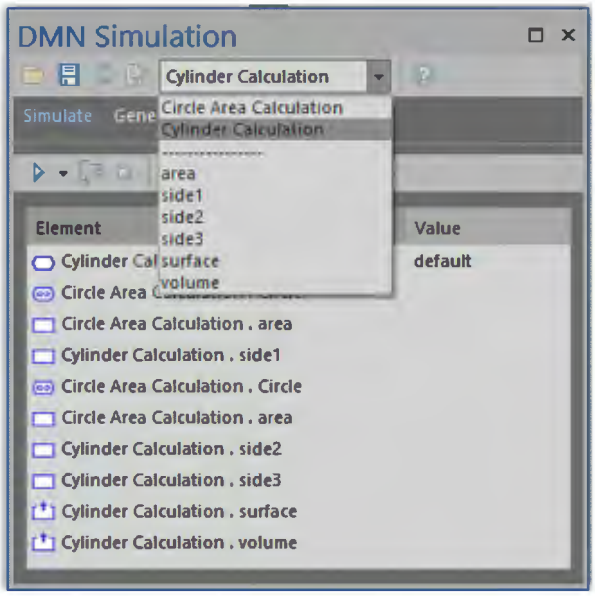
As normal Business Knowledge Model, this BKM also support "Test Lab Simulation", you can either manually input the argument for primitive type or compose a JSON string by using the "Select Data Set From Parameter Type" context menu command, which will open the Item Definition's data set dialog for selection.

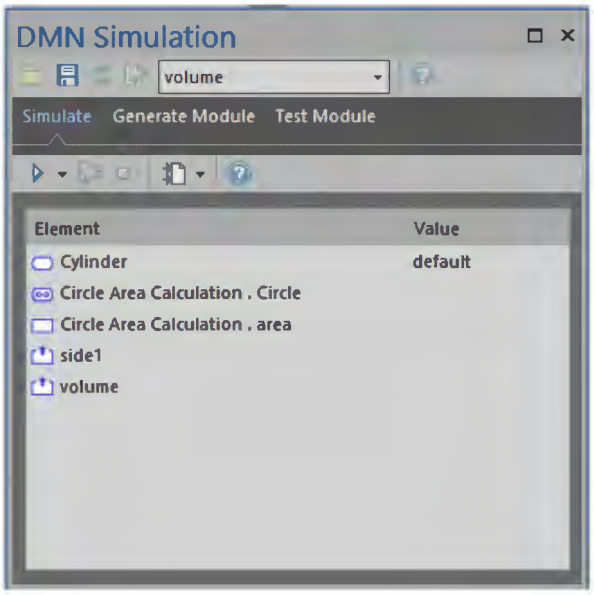




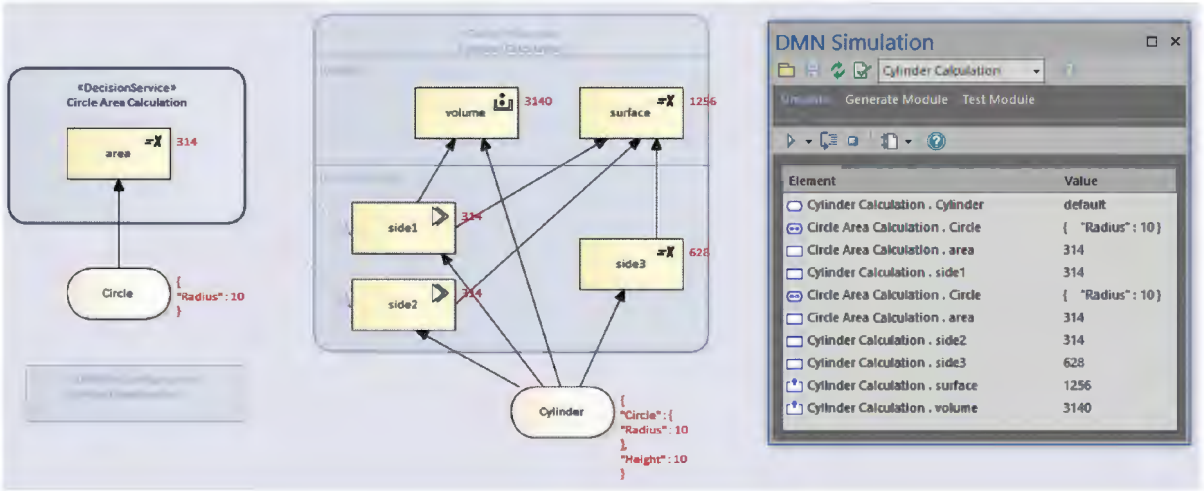
Decision Service Simulation

Double click the DMNSimConfiguration artifact, the decision services and each individual decision will be filled in the combo box. Based on the selection of the target decision service or decision, the execution plan will be created in the list.





Click the "Run" button on the toolbox, the runtime result will be retrieved and showing both in the list and on the diagram.



From the above example, you can see that "Circle Area Calculation . Circle" and "Circle Area Calculation . area" appear twice in the execution list, because both *side1* and *side2* invoke *Circle Area Calculation*. Click the "Step" button on the tool bar, you will see a step by step execution.

In the following example, we selected a decision *volume* as the target decision.

- The decision side2, side3 and surface are not in the execution list because they are not required if we want to evaluate decision *volume*.

- Click the "step" button on the toolbar, when the execution stepped into *Circle Area Calculation*, the invocation decision *side1* will show "Evaluating..." on the diagram until the execution stepped out and the result value is carried back to the invocation.