Creating and displaying derived properties

You need to create derived properties to display the information indirectly related to an element. A property whose values are calculated is called a derived property.

You can create, edit, or delete derived properties in the:

- Element Specification window
- Table

You can manage derived properties using the **Expression** dialog.

To create a new derived property

1. Open the **Expression** dialog by doing one of the following:
    - In the selected element's Specification window, select the **Traceability** property group and click the **Create** button.
    - In the table toolbar, click **Show Columns** and select **New Derived Property**.
2. In the **Expression** dialog, specify the name and expression for the derived property.
3. Click **OK**.

ⓘ If you want to create a derived property with a result other than an element, you must manually change the derived property type.

To edit a derived property

1. Do one of the following:
    - In the selected element Specification window, select the **Traceability** property group, select a derived property you want to edit, and click the **Edit** button.
    - In the active table, right-click the derived property column heading and select **Edit Derived Property**.
2. In the **Expression** dialog make changes and click **OK**.

To remove a derived property

1. Do one of the following:

- In the selected element Specification window, select the **Traceability** property group, choose the derived property you want to remove, and click the **Delete** button.
- In the active table, right-click the derived property column heading and select **Remove Derived Property**.

While working with your models, sometimes in the same diagram or table, you need to see information that is not directly related to an element. You can display that information in the following ways:

- In the Note
- In the table (as a new column)

To display derived properties on a Note shape

1. Create a Note for the selected element or select an existing one.
2. Do one of the following:
    - Select a Note and click the **Edit Element Properties** smart manipulator. The **Compartment Edit** dialog opens.
    - Right-click the Note shape and select **Edit Compartment**. The **Compartment Edit** dialog opens. Choose the **Element Properties** tab.
3. In the **Hidden** list, move the properties you want to display on a Note shape to the **Selected** list by doing one of the following:

    - Select one or more properties and click the **>** or **>>** button.
    - Double-click to select properties one by one.
4. Click **OK**.
   Selected derived properties are displayed in the Note.

To display derived properties in a table

1. On the table toolbar, click the **Show Columns** button and select **Select Columns**.
2. In the opened **Select Columns** dialog, select the properties you want to display.
3. Click **OK**, when you are done.

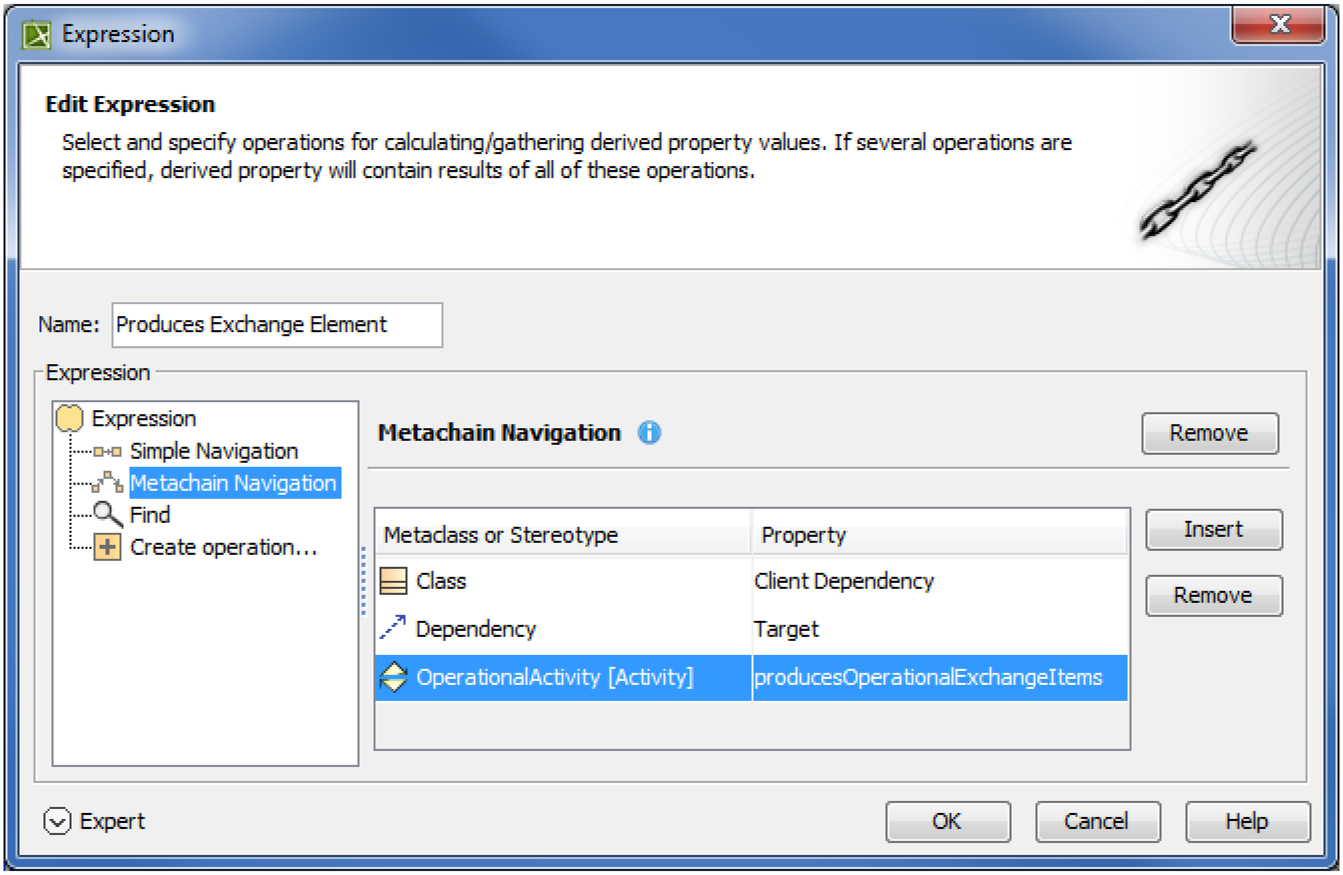
Case Study

Let's say, we need to show *Warning Order* and *Medical Condition* exchange elements produced and consumed by the performer *Search Node*. Exchange elements are information indirectly related to the *Search Node* element.

We will analyze the OV-2 diagram from the DoDAF sample project.

First, we will show the exchange elements produced by the *Search Node*.

Let's create the **Produces Exchange Element** derived property for the Operational Performer *Search Node*. Open the *Search Node* Specification window, and in the **Traceability** property group, click the **Create** button. In the **Expression** dialog, select the **Metachain Navigation** property group. Then specify the derived property name and the meta chain expression as shown in the following figure.



Expression

Edit Expression

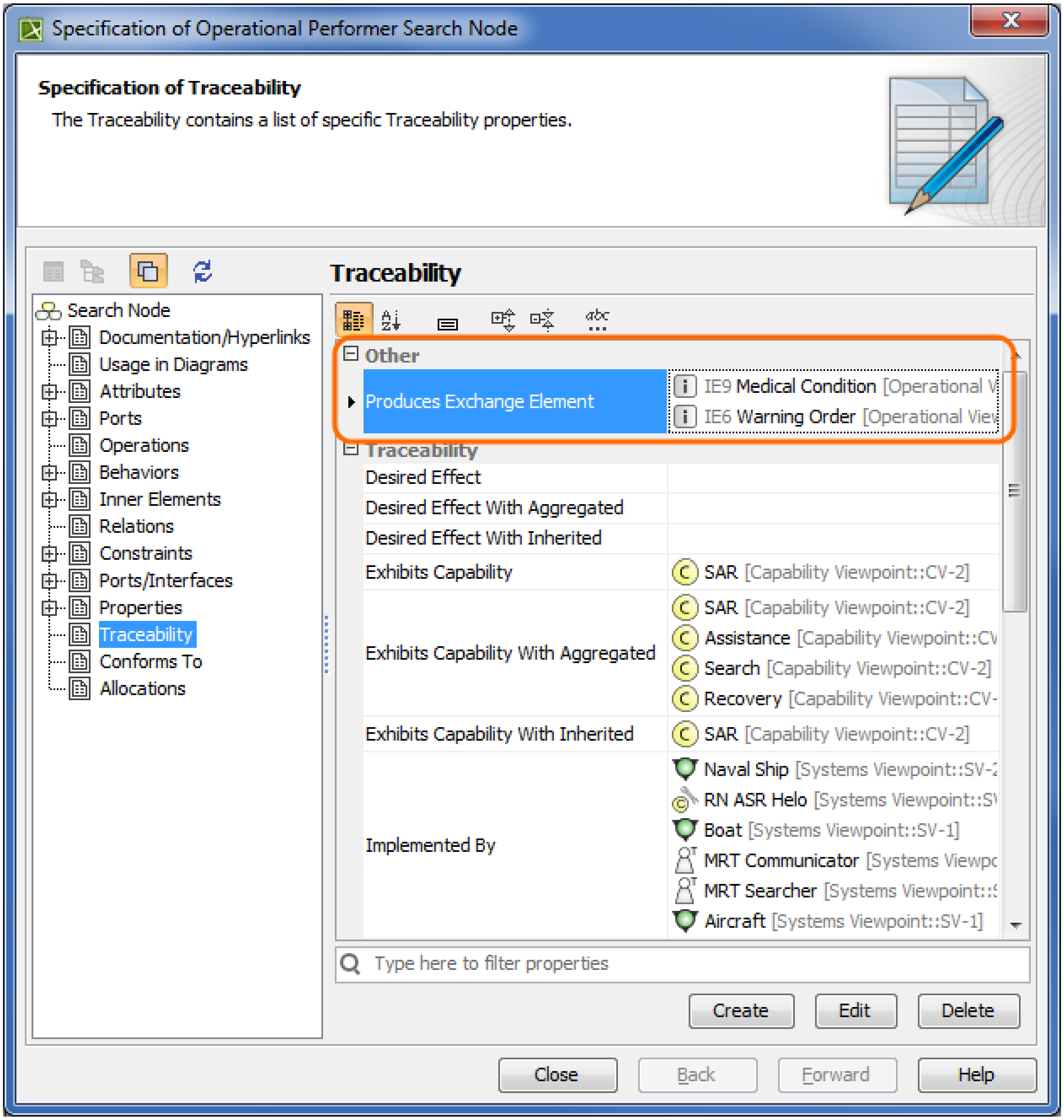
Select and specify operations for calculating/gathering derived property values. If several operations are specified, derived property will contain results of all of these operations.

Name: Produces Exchange Element

Metachain Navigation

Metaclass or Stereotype	Property
Class	Client Dependency
Dependency	Target
OperationalActivity [Activity]	producesOperationalExchangeItems

The following figure shows that a new subgroup named **Other** is created in the Operational Performer Specification window. Our created **Produces Exchange Element** derived property is placed under this subgroup. The **Produces Exchange Element** derived property has Warning Order and Medical Condition exchange elements as its values.



Specification of Operational Performer Search Node

Specification of Traceability

The Traceability contains a list of specific Traceability properties.

- Search Node
  - Documentation/Hyperlinks
  - Usage in Diagrams
  - Attributes
  - Ports
  - Operations
  - Behaviors
  - Inner Elements
  - Relations
  - Constraints
  - Ports/Interfaces
  - Properties
  - Traceability
  - Conforms To
  - Allocations

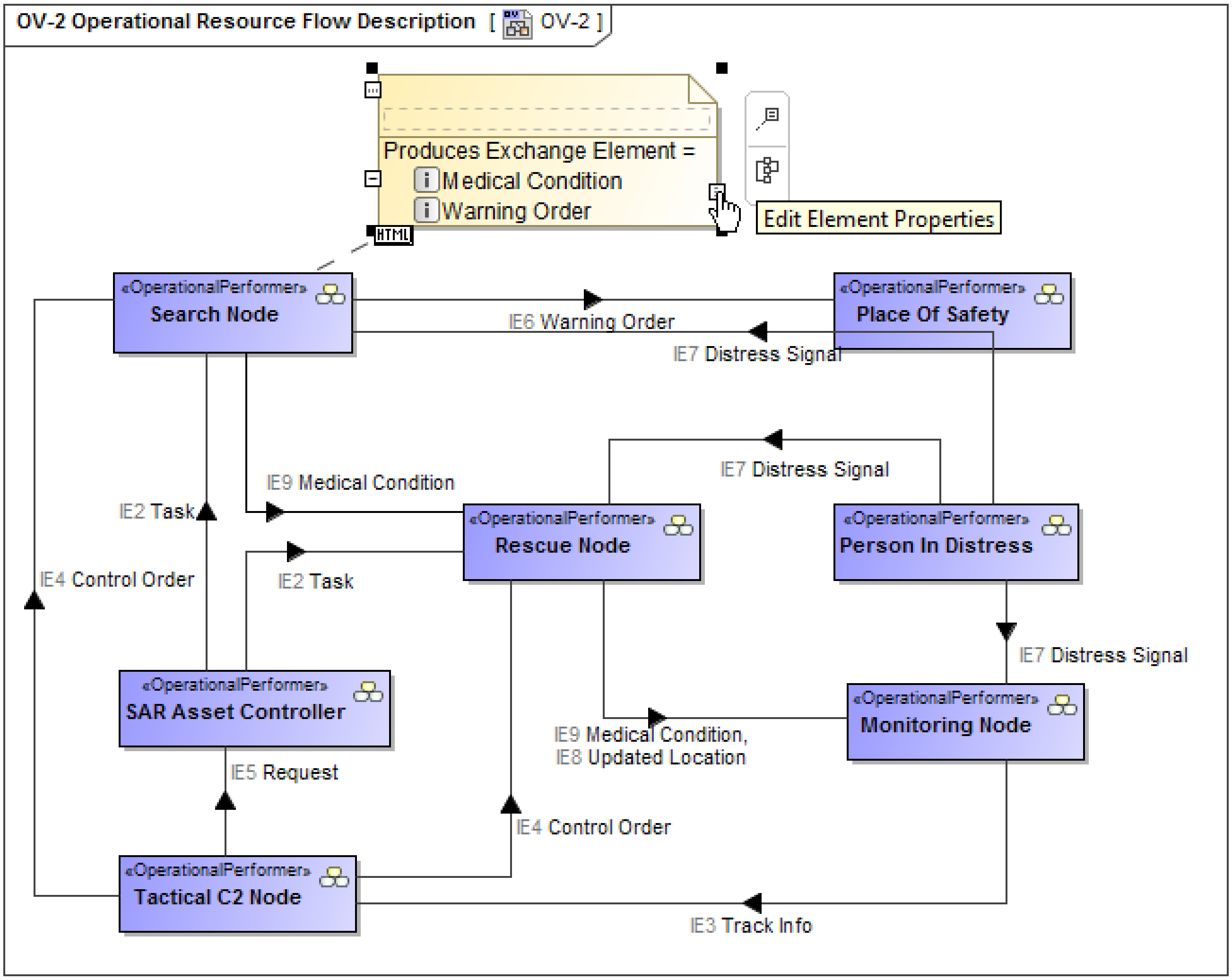
Traceability

Other	
Produces Exchange Element	IE9 Medical Condition [Operational V IE6 Warning Order [Operational View
Traceability	
Desired Effect	
Desired Effect With Aggregated	
Desired Effect With Inherited	
Exhibits Capability	SAR [Capability Viewpoint::CV-2]
Exhibits Capability With Aggregated	SAR [Capability Viewpoint::CV-2] Assistance [Capability Viewpoint::CV Search [Capability Viewpoint::CV-2] Recovery [Capability Viewpoint::CV-
Exhibits Capability With Inherited	SAR [Capability Viewpoint::CV-2]
Implemented By	Naval Ship [Systems Viewpoint::SV-1 RN ASR Helo [Systems Viewpoint::SV Boat [Systems Viewpoint::SV-1] MRT Communicator [Systems Viewpo MRT Searcher [Systems Viewpoint::S Aircraft [Systems Viewpoint::SV-1]

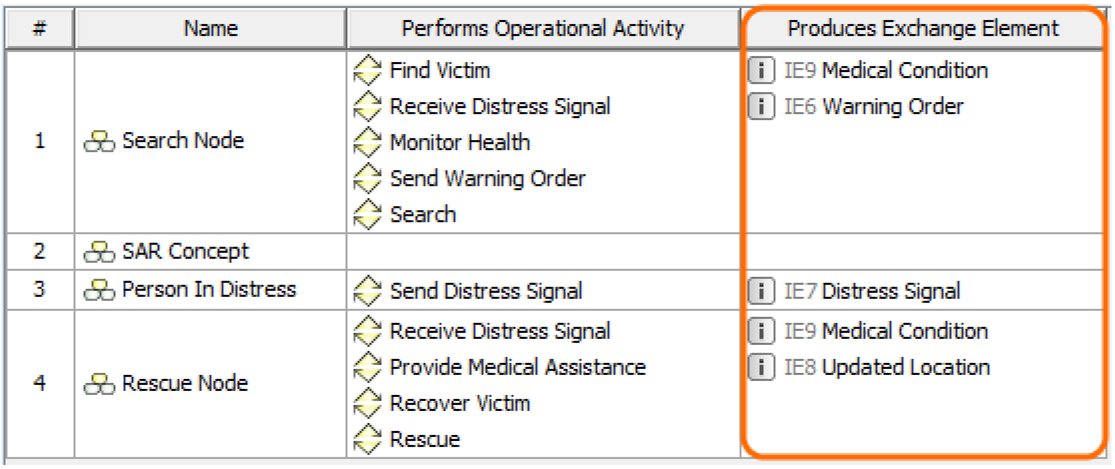
Next, we need to display values of the **Produces Exchange Element** derived property for the Operational Performer *Search Node* in the OV-2 diagram.

ⓘ A derived property is applicable to an element type, not the specific element. In this particular example, our created derived properties are applicable to all Operational Performers, not only to *Search Node*.

We can use a Note element wherein we can display information indirectly related to the Search Node. Let’s create a Note and connect it to the Operational Performer *Search Node*. Then click **Edit Element Properties**. In the **Compartment Edit** dialog, select the **Element Properties** tab. From the properties list, select to display the Produces Exchange Element property. After clicking the **OK** button, Warning Order and Medical Condition exchange elements are displayed in the Note.

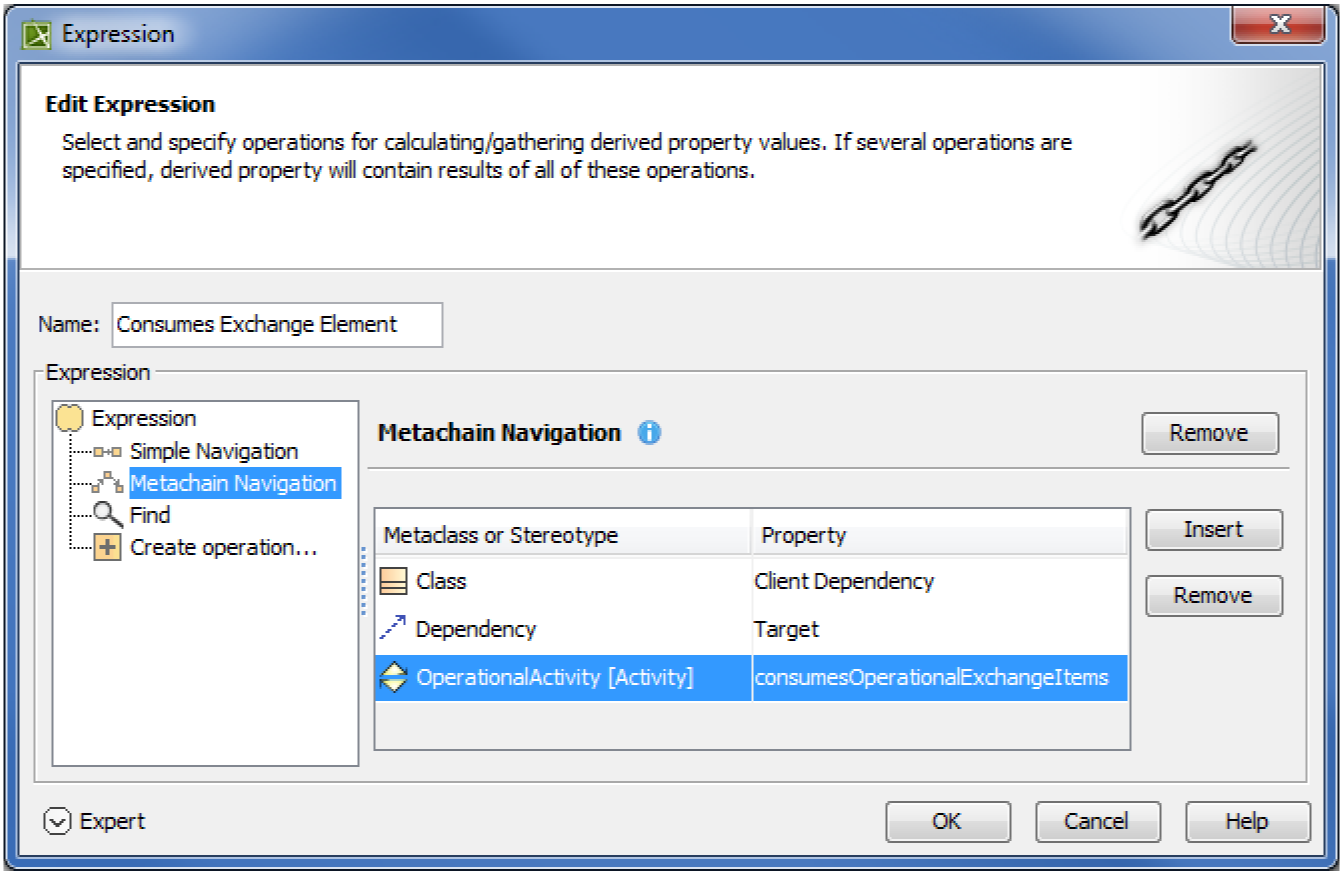


Now, let's create a generic table wherein we can also display information indirectly related to the *Search Node* as well as to other Operational Performers. For that purpose, we select Operational Performer as an **Element Type** and add existing Operational Performers to the table. Then we select which information to display as new columns. Previously created **Produces Exchange Element** derived property can be added as a new column through the **Show Columns** menu.



#	Name	Performs Operational Activity	Produces Exchange Element
1	Search Node	Find Victim Receive Distress Signal Monitor Health Send Warning Order Search	IE9 Medical Condition IE6 Warning Order
2	SAR Concept		
3	Person In Distress	Send Distress Signal	IE7 Distress Signal
4	Rescue Node	Receive Distress Signal Provide Medical Assistance Recover Victim Rescue	IE9 Medical Condition IE8 Updated Location

Now, let's create a new derived property directly in the generic table. This property will show which exchange elements are consumed by the performer element. We can do that using the same **Expression** dialog and doing the same actions as described previously. The following figure is an example of the **Consumes Exchange Element** derived property expression.



Expression

Edit Expression

Select and specify operations for calculating/gathering derived property values. If several operations are specified, derived property will contain results of all of these operations.

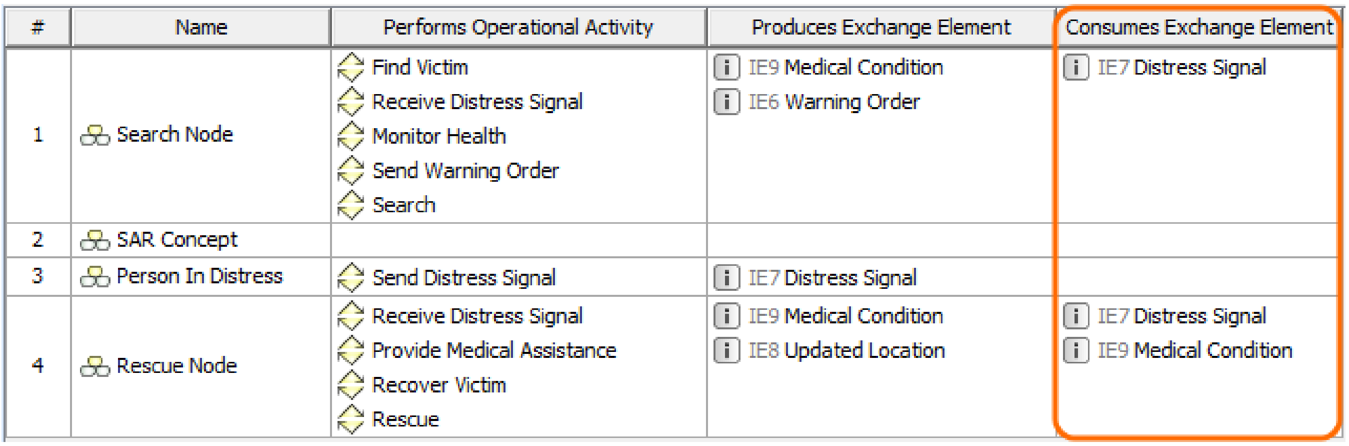
Name: Consumes Exchange Element

Expression

Metachain Navigation

Metaclass or Stereotype	Property
Class	Client Dependency
Dependency	Target
OperationalActivity [Activity]	consumesOperationalExchangeItems

When the expression is specified, the newly created derived property is displayed as a new column.



#	Name	Performs Operational Activity	Produces Exchange Element	Consumes Exchange Element
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2	SAR Concept			
3	Person In Distress	Send Distress Signal	IE7 Distress Signal	
4	Rescue Node	Receive Distress Signal Provide Medical Assistance Recover Victim Rescue	IE9 Medical Condition IE8 Updated Location	IE7 Distress Signal IE9 Medical Condition