



Regression Testing for Properties of Evolving i^* Models

Ralf Laue

University of Applied Sciences of Zwickau, Germany

Arian Storch

it factum GmbH Munich, Germany



The screenshot shows a modeling tool interface. The main workspace displays a goal network diagram with nodes like 'Item Searching Handled', 'Attract New Costomers', 'Internet Orders Handled', 'Query', and 'Catalog Consultin'. A tooltip message reads: 'A Goal can only be decomposed using Means-Ends Links.' The right sidebar contains a 'Palette' with various goal types: Actor, Agent, Position, Role, Hardgoal, Softgoal, Task, Resource, and Dependency. The bottom console window shows the following error and warning messages:

1 error, 2 warnings, 1 other	
Description	Resource
✘ Errors (1 item)	
✘ A Goal can only be decomposed using Means-Ends Links.	Copy of 4 - SI
⚠ Warnings (2 items)	
⚠ Consider to use a softgoal for: Increase Customer Satisfaction	Copy of 4 - SI
⚠ The model is not a coherent graph!	Copy of 4 - SI
ℹ Infos (1 item)	
ℹ Number of nodes: 27	Copy of 4 - SI



The screenshot displays a software development environment. The main area shows a diagram with several nodes and edges. A central node is labeled "relevant Advise bechase" and is highlighted with a red border. Other nodes include "Select Advice theme", "relevance", "Filter Advisor", "Select Advice by user Profile Similarity", and "Select Advice by user History". Edges are labeled "Break", "Make", "Hurt", and "Help".

Below the diagram is an "Attribute View" window. It has a header with "Attribute Name" and "Value" fields, and buttons for "+", "+ All", "x", "x All", and "+ Project". Below this is a table with the following content:

Attribute	Value
PROBLEM_wrong_arc_to_goal	http://istar.rwth-aachen.de/tiki-index.php?page_ref_id=210



The screenshot displays a software development environment. The top portion shows a diagram with several nodes and relationships. A node labeled "relevant Advise beichose" is highlighted with a red border and a red 'x' icon. Other nodes include "Select Advice theme", "Select Advice by user Profile Similarity", "Select Advice by user History", "relevance", and "Filter Advise". Relationships are labeled "Break", "Make", "Hurt", and "Help".

The bottom portion shows the "Attribute View" window. It has a tabbed interface with "Tasks", "Console", "Problems", and "Attribute View" (selected). The "Attribute View" window contains a form with "Attribute Name" and "Value" input fields, and buttons for "+", "+ All", "x", "x All", and "+ Project". Below the form is a table with two columns: "Attribute" and "Value". The first row contains the text "PROBLEM_wrong_arc_to..." and a URL "http://star.rwth-aachen.de/tiki-index.php?page_ref_id=210". A tooltip "Open file" is visible over the URL.

Attribute	Value
PROBLEM_wrong_arc_to...	http://star.rwth-aachen.de/tiki-index.php?page_ref_id=210



Log in »

Log In

Log in as...

Username:

jaue

Password:

••••••••

Log in

[I forgot my password](#)

Overview

What's New

[i* Wiki Home](#)

[Case Studies](#)

[Events](#)

[i* Guides](#)

[Publications](#)

[i* Tools](#)

[Who is Who](#)

[Organizational Stuff](#)

[Forums](#)

[i* Guide > Guidelines > Level > Beginner](#)

[i* Guide > Guidelines > Type > Concept](#)



Guideline (Beginner,Concept) A Goal can only be decomposed using

Means-Ends Links.

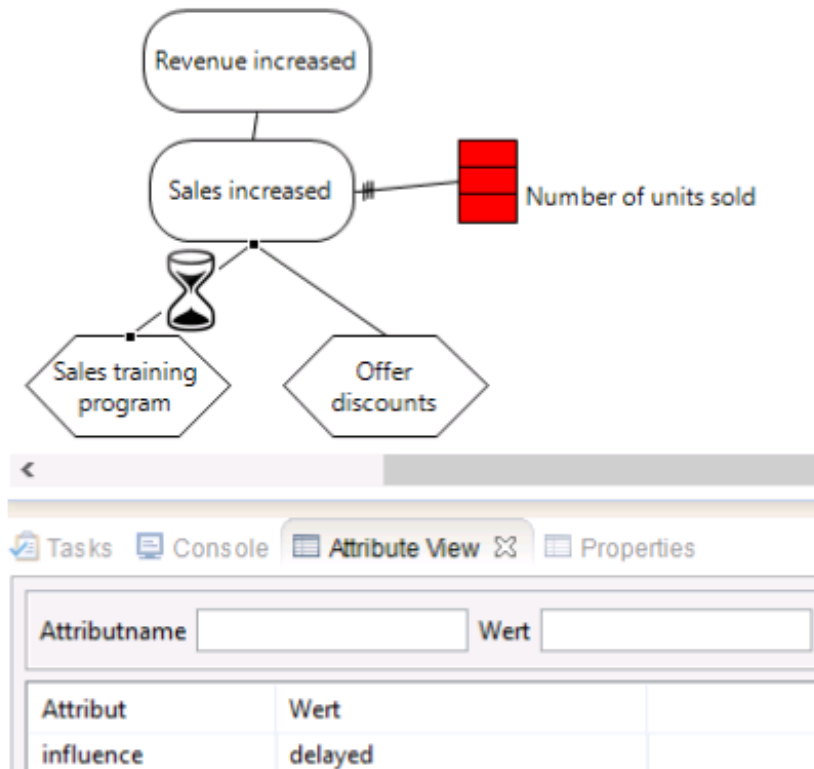
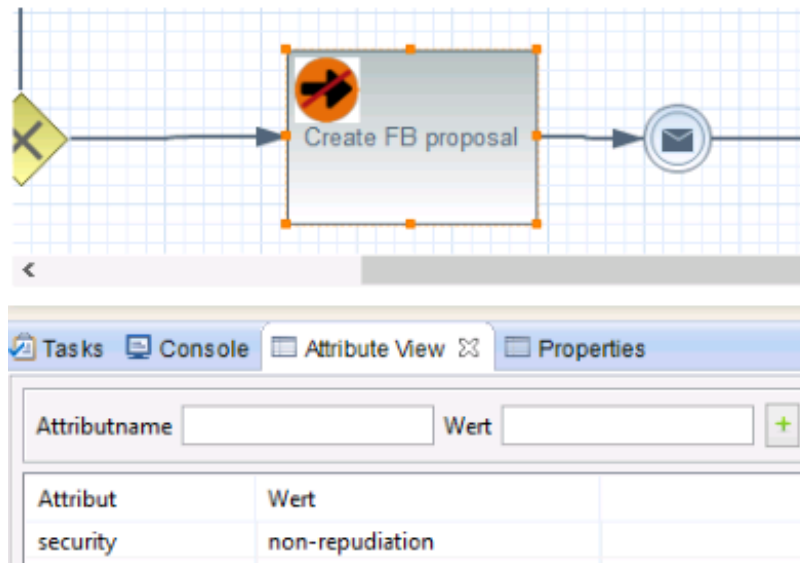


[i* Guide > Strategic Rationale \(SR\) Model > Elements/Nodes > Goals \(Hard Goals\) > Guideline \(Beginner,Concept\) A Goal can only be decomposed using Means-Ends Links.](#)

This **stable version** of the Guideline Wiki Page displays the guideline as per the i* Style of the University of Toronto. Registered users can use 'Open Version' link right at the end of the guideline statement below to access the open version of this page

Guideline (Beginner,Concept) A Goal can only be decomposed using Means-Ends Links. [Open Version](#)

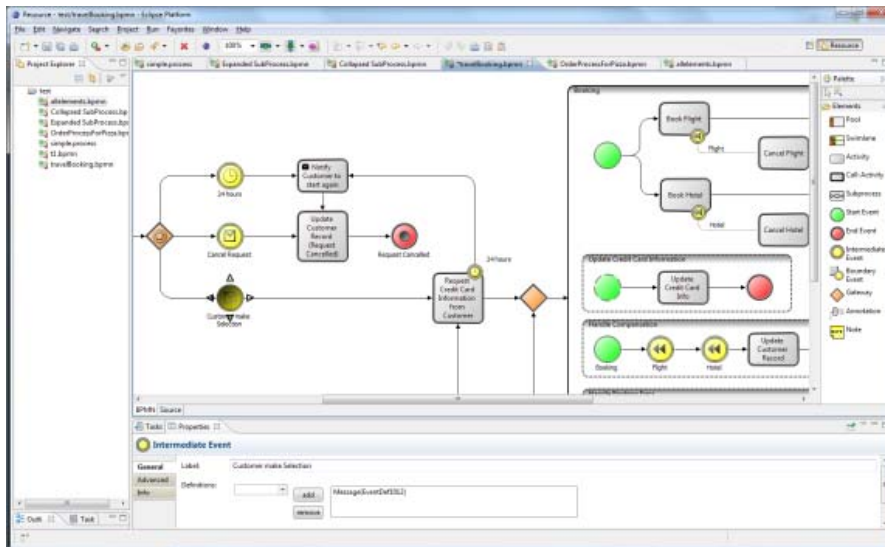
Discussion: The Means-End Link is a type of a relationship that indicates an End (Goal) and it's Means (Task), or how to achieve the Goal. Using a Means-End Link indicates that the Means fulfills the goal. This indicates that an alternative which would satisfy the goal has been discovered. Further alternatives should often be sought. Contribution Links such





adds...

- user-defined attributes
- attaching files / URLs to shapes
- adding icons to shapes
- file exports / imports
- feeding the model to external tools
- visualizing the results of these tools



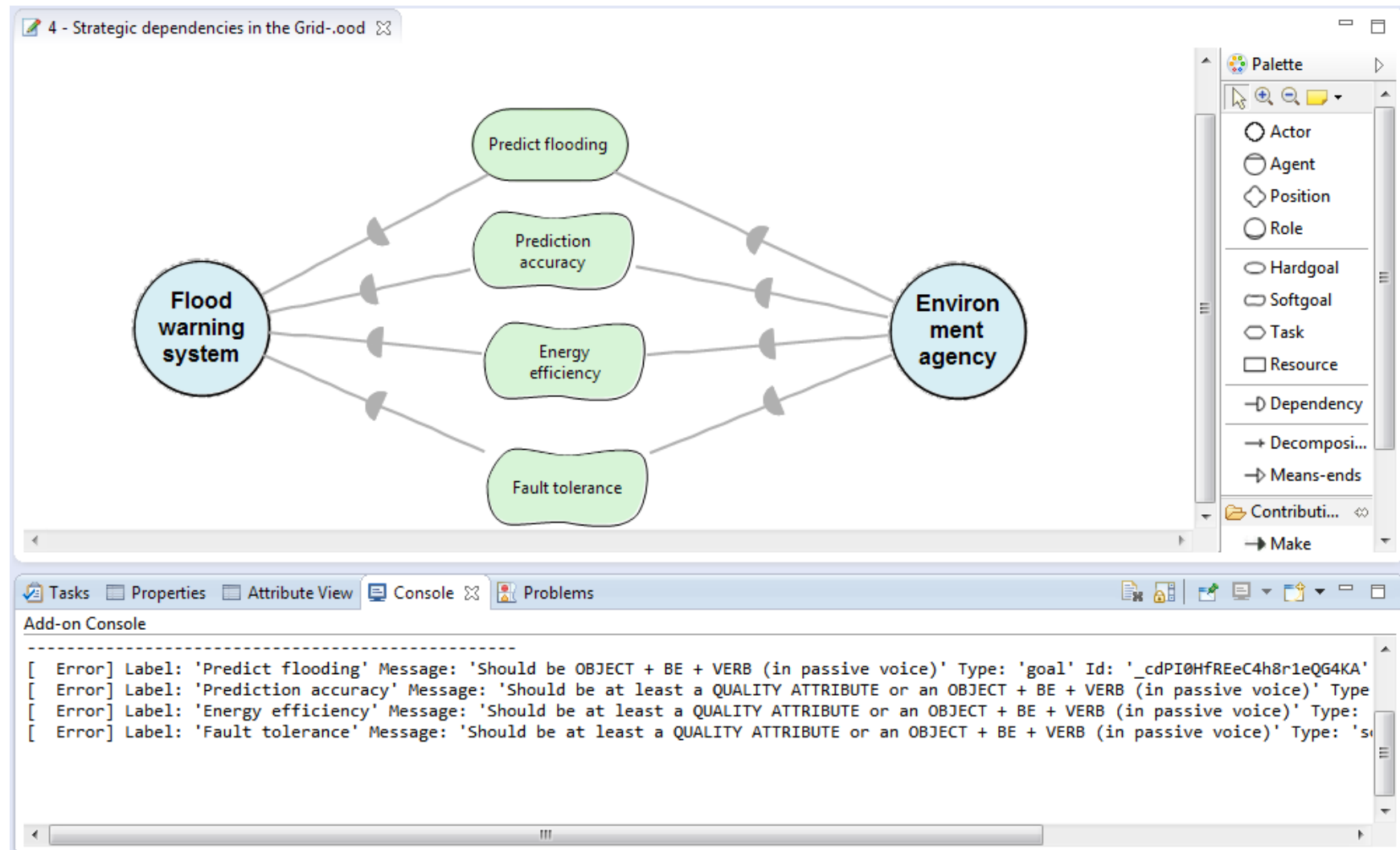
any Eclipse Modeling Tool

www.bflow.org

**WITHOUT CHANGING THE
SOURCES OF THE ORIGINAL
TOOL**



model metrics and formal soundness analysis	EPCMetrics
Project Simulation	MATLAB
Business Process Simulation	DESMO-J
Business Process Optimization	CMPL
Model Checking	UPPAAL
Label Analysis	WordNet
Pattern-Based Model Analysis	SWI-Prolog





So far...

the program analyses the model as a whole.



Regression Testing

Finished after 141,279 seconds

Runs: 80/80  Errors: 0  Failures: 0





Idea

- "Test cases" (desirable model properties) are stored together with the model.
- With each change of the model, the tests can be executed.



- How can I transfer the model into the data format expected by the validation tool?
- How can I pass the expected properties to the validation tool?
- How can I start the validation tool?
- How can I show the answers given by the validation tool in an Eclipse view?



a) XSLT Transformation

b) Mechanism Based on Templates

List of all Nodes:

```
#foreach( $shape in $shapes )
```

```
  Name: $shape.Name, Type: $shape.Type
```

```
#end
```

Velocity
Template
Engine / Java

List of all Nodes:

Name : Sell Books in Store, Type: Task

Name : Earn Money With Book Sales, Type: Goal

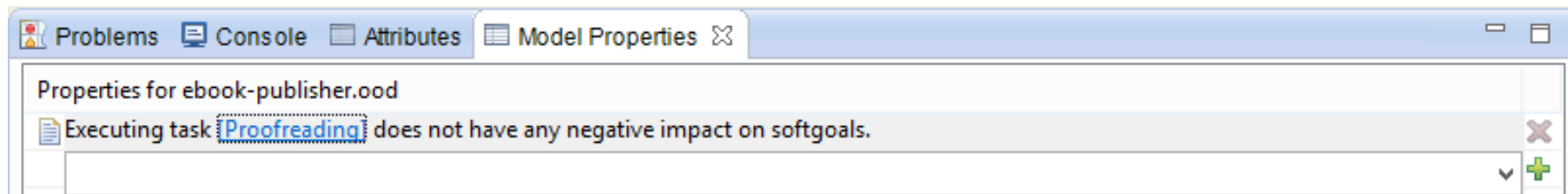
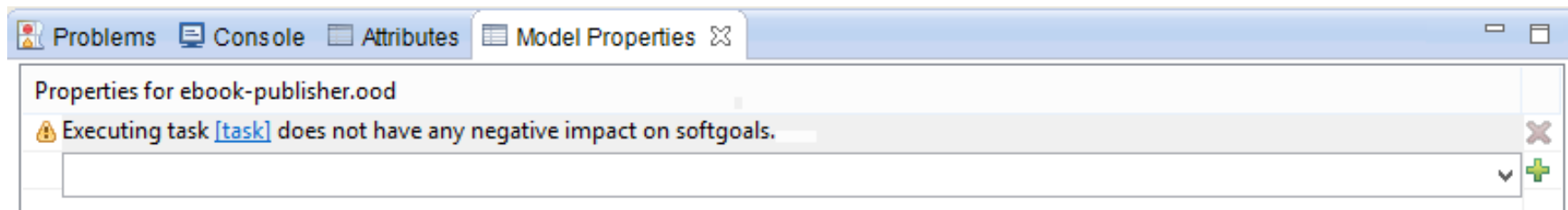
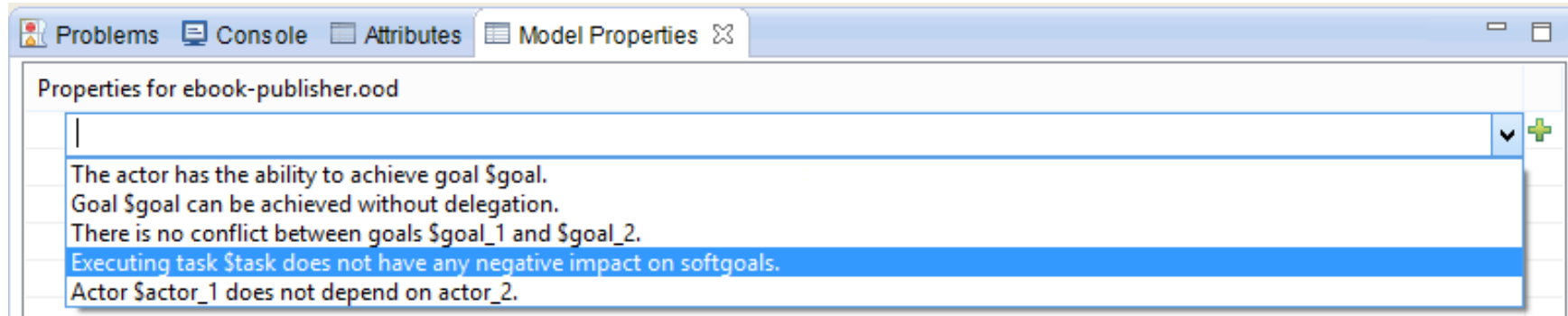
Name : Sell Books on the Internet, Type: Task



- How can I transfer the model into the data format expected by the validation tool?
- How can I pass the expected properties to the validation tool?
- How can I start the validation tool?
- How can I show the answers given by the validation tool in an Eclipse view?

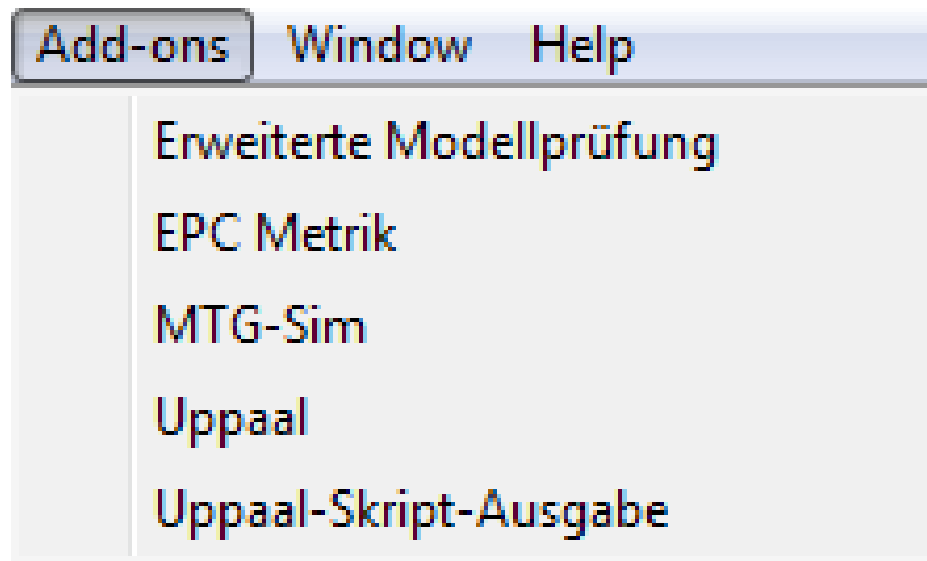


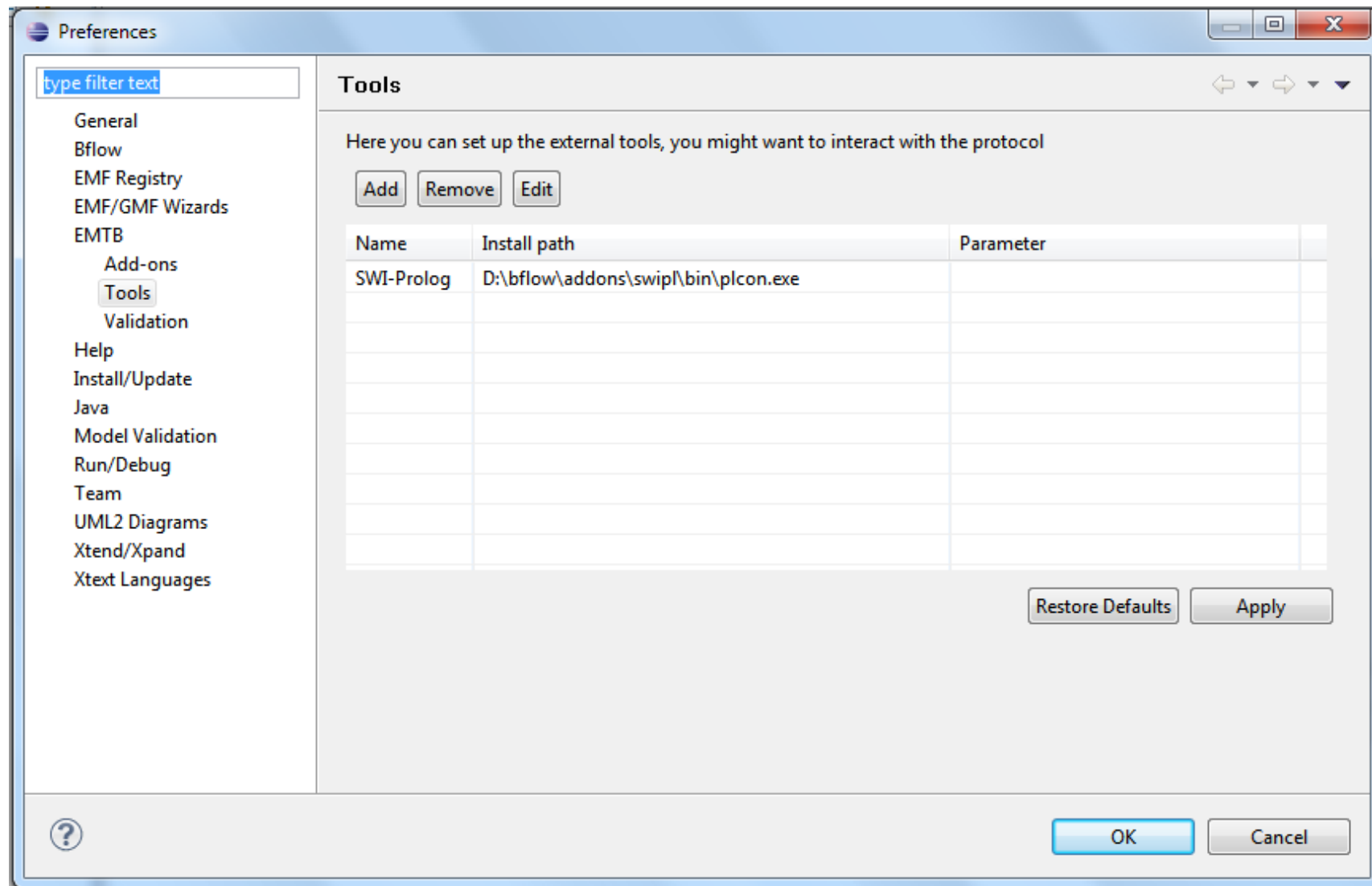
Property specification by means of templates





- How can I transfer the model into the data format expected by the validation tool?
- How can I pass the expected properties to the validation tool?
- How can I start the validation tool?
- How can I show the answers given by the validation tool in an Eclipse view?







- How can I transfer the model into the data format expected by the validation tool?
- How can I pass the expected properties to the validation tool?
- How can I start the validation tool?
- How can I show the answers given by the validation tool in an Eclipse view?

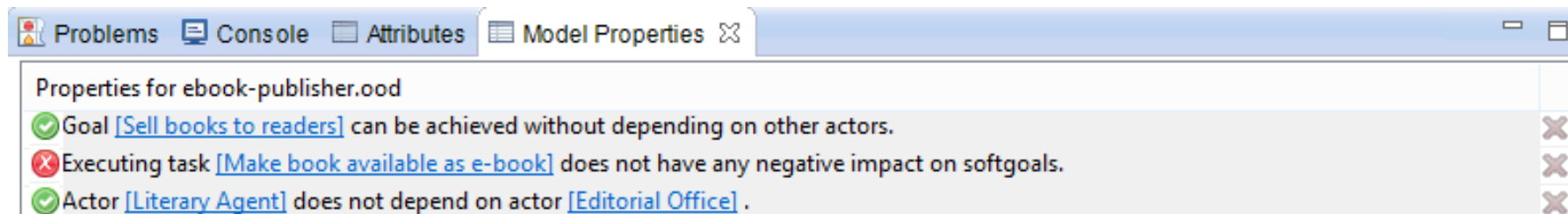


write_ok :-

```
write('addon:[PROPERTY][VERIFY][1][[]][#FS#'),nl.
```

write_no :-

```
write('addon:[PROPERTY][VERIFY][0][[]][#FS#'),nl.
```





- ☑ How can I transfer the model into the data format expected by the validation tool?
- ☑ How can I pass the expected properties to the validation tool?
- ☑ How can I start the validation tool?
- ☑ How can I show the answers given by the validation tool in an Eclipse view?

