SPES Modeling Studio - Installation and Usage Guide

Installation

For Visio 2013 and 2016: Download the file SPESMT_for_Visio_13_16.zip and unzip the package. Double-Click the file „SPESModelingTool13.vsto“ and install the Add-In for Visio 2013 and 2016. For Visio 2010: Download the file SPESMT_for_Visio_10.zip and unzip the package. Double-Click the file „SPESModelingTool10.vsto“ and install the Add-In for Visio 2010.

Requirements:

- Visio 2010, 2013 or 2016 for Windows (Other versions might work. If not, please let us know)
- NET 4.5 (Installer included in the setup file)
- An active internet connection is required for both installation and update functionality.

1. Run the version-specific VSTO-file
    a. The SPESModelingTool13.vsto installs the Visio-Add-In for the versions 2013 and 2016.
    b. The SPESModelingTool10.vsto installs the Visio-Add-In for the version 2010.
2. Run Microsoft Visio and start modelling
    a. The Add-In will download all required stencils upon start-up.
    b. The Add-In will prompt you when an update to the stencils is available.
    c. Both requires an active internet connection.

Deinstallation

1. Remove “ SPESModelingTool13”/“SPESModelingTool10“ from “Programs and Features” in the Control panel.
2. Remove the downloaded stencils in “Documents/MyShapes/SMT_[Name].vssx”.

Send Feedback / Bugreport

The Add-In contains a form to send feedback to the developers. Use the button “About” and then “Create Issue” to open up the form. The form contains three fields:

- ● Author: Information about you (e.g. your name). Optimally with contact information, such as email.
- Title: The title of the report.
- Body: The report itself.

User Interface

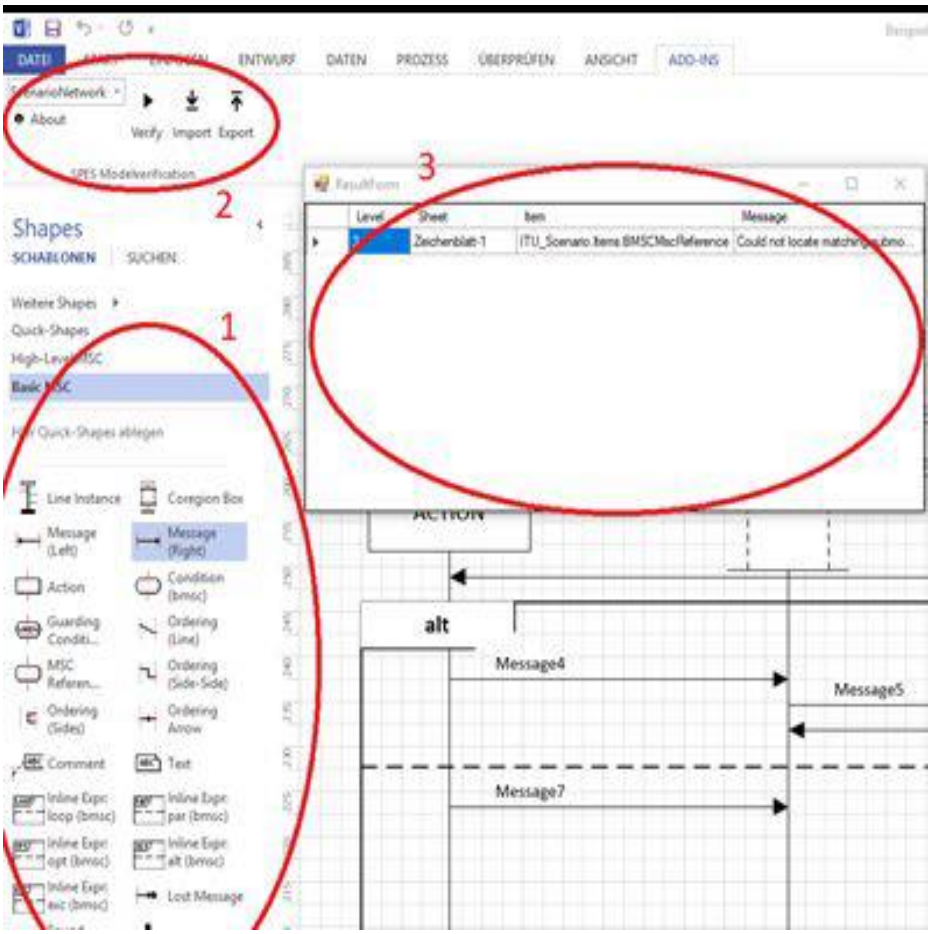

Figure 1: User interface

The user interface contains three areas:

1. The left area contains the currently loaded shapes the user can use to design his models.
2. The top area contains the Add-In functionality. Please see below for further explanations.
3. If an error occurs during model verification an additional window will pop up with information about where and which checks failed. More information further below.

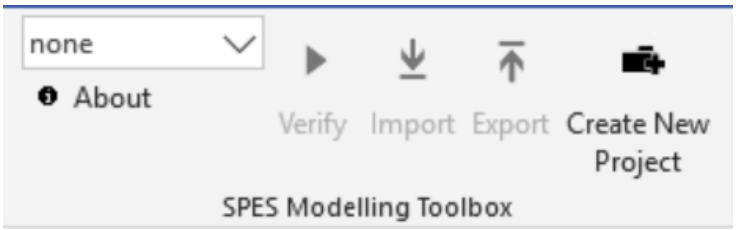

Figure 2: Add-In

The Add-In contains the following buttons:

- **Dropdown** : Select the type of models you want to model. Changing the selection will unload the current stencils and will load the stencils of the selected models. Each element in the dropdown will be referenced as “module”.
    - Only one can be used per file. If you want to model another type please use a

different visio file. This is required for the verification functionality.

- **Verify** : Checks the models for syntactical correctness. A full list of what is being checked can be found later in the document.
- **Export** : Exports the current models into an XML file.
    - The models need to be verified first.
- **Import** : Imports models from an XML file. Overrides all current models.
- Generate Submodels : Creates a new sheet from every element that links to a submodel.
- **About** : Opens up a form with information about the Add-In. It also contains a form to submit feedback.

Not every model type has implemented verification functionality yet. If it is not available the buttons are disabled (grey). Generate submodels is only available to those model types that support linked models (e.g. functional design).

The following buttons are only available for specific model types:

- **Create new Project :** Creates an empty project for the SPES-Modelling framework.
    - In the dropdown “none” needs to be selected.
- **Create new Engineering** Path : Creates new linked model-specific elements. Please see below for details.
    - Only available to “Logical Viewpoint”.
- **Complete Interface Automata** : Completes an model of type “Interface Automata” with interface descriptions. Please see below for details.
    - Only available to “Functional Design” and “Technical Viewpoint”

Functionality that is not available to a specific model type will not be visible.

Functions

global

Every module includes a set of verification checks which are checked regardless of whichmodel type you picked.

- Check if only allowed elements are placed on the sheet.
- Check if a sheet is empty.
- Check if there are any elements with duplicate text.
- Check if every connection is correct to their specifications.
- Check if every connection connects two elements.
- Check if every element that links to a submodel has a corresponding submodel.
- Check if directional models contains one start point and at least one endpoint.
- Check if all elements between start and end point are reachable via path checking.
- Check if start points only contain outgoing connections and endpoints only inbound.

There are some model specific exceptions to those rules above. Model specific checks are listed in the modules description:

none

The tab none includes the Function Create New Project. This function should be used to generate the system overview and the artifacts and viewpoints for first granularity layer. To do this, a name for the system must be entered in the dialog box and the creation of the artifacts must be confirmed. In

addition, another dialog box opens to set a folder for saving the model. Then the models are created and are referenced over hyperlinks to the model elements of the open Visio file.

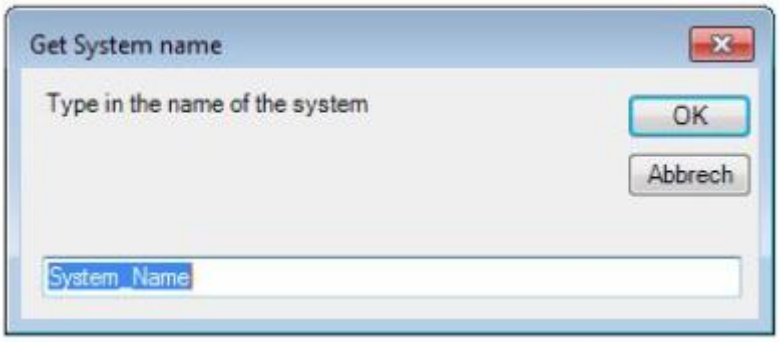

Figure 3: Create new SPES-Project

Scenario-MSC

This module implements model verification and supports linked models. Additionally it implements the following model-specific checks:

- **HMSC**: InlineExpressions count as separate models and therefore need to be complete (need to have a start point and at least one endpoint).
- Check if a guarding condition has a corresponding condition that matches the description. Both need to have a “key=value” information in their textfield (value can be empty).
- Check if a found-message has a corresponding lost-message (equal message-text and lost-message needs to chronologically appear before found-message).
- Check if all elements and paths are reachable.

Functional Design

This module implements model verification and supports linked models. Additionally it implements the following model-specific checks:

- Check if a dependency-connection only connects a function and a dependency.
- Check if all incoming and outgoing messages of a function are represented in the linked submodel.

The Complete Interface Automata function goes through all the drawing sheets in the active and visible Visio window. If the Shape "Interface" is found on a drawing sheet, the created connectors are searched for question marks and exclamation marks at the end of the label. Accordingly, the input and output nodes are inserted at the top edge of the interface.

Goal Modeling

This module implements model verification. Additionally it implements the following model-specific checks:

- Check if a dependency does not connect two intentional objects belonging to the same actor.
- Check if a connection between intentional objects does not connect elements of different actors.

Context of Knowledge

For the tab Context of Knowledge no functions are implemented.

Structural Context

The tab Structural Context includes the function Generate Submodel . The function has no need to select elements, because the opened drawing sheet is searched for the modeled shapes of the type context entity. A new drawing sheet is created for each "context entity" shape, and the boundary of the context entity is already modeled in the new created drawing sheet.

Functional Context

The tab Functional Context includes the function Generate Submodel . When modeling the functional context, the template for modeling the function steps can be opened by using the function Generate Submodel . In addition, the function creates a new drawing sheet for each "context function" shape. In the new created drawing sheets, the context of the context function is also modeled. With this function, no elements have to be selected because the context functions are automatically searched for the opened drawing sheet.

Scenario-UseCase Maps

For the tab Scenario-UseCase Maps no functions are implemented.

Structural Perspective

For the tab Structural Perspective no functions are implemented.

Functional Perspective

For the tab Functional Perspective no functions are implemented.

Behavioral Perspective

For the tab Behavioral Perspective no functions are implemented.

Logical Design

The tab Logical Design includes the function Create new Engineering Path. This function can only be executed in the "Logical Viewpoint" drawing sheet of the (sub)-systems, and the appropriate "Class" shapes must be selected. For the execution , the generated system overview file must be in the same folder. An exemplary selection is shown in the image below. Then the artifacts and viewpoints are created for each selected shape. In addition, the system overview will be supplemented with the defined subsystems in a tree hierarchy.

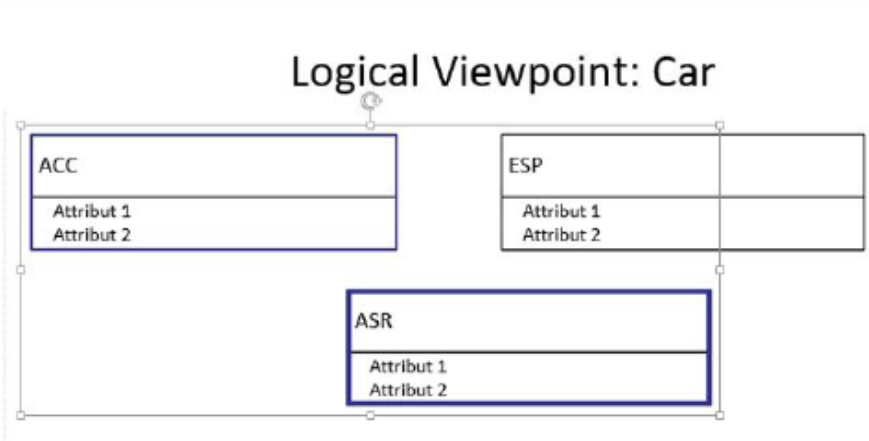

Figure 4: Logical Viewpoint

Technical Design

The tab Technical Design offers the same function Complete Interface Automata as described in the Chapter Functional Design.

Extended Function Network

Extends the functional design functions by further checks based on changes to the meta model.

It is also possible to create views for goal models and dynamicity constraint models using the Generate Submodels function.

Orthogonal Uncertainty Modeling

This tab offers a function to check on the opened drawing sheet whether possible syntactic or well-formed rules have been violated by the modeler.

Known Issues

- Visio connectors sometimes do not recognize the connected item when they are connected to Inline Expressions (Message Sequence Charts). Try to set those connections one by one and check with Verify.
- The path checking algorithm creates a tree based on traversed nodes. However, the paths do not merge, meaning that setting two variables in parallel and then sequentially checking those two after a merge will result in a false positive.
- During Create Project Visio can occasionally do random stuff (really), so please patiently wait until completion and restart the process (delete the folder before) if an error occurs.