

TRACEABILITY STUDIO

As a capability for SES ENGINEERING Studio or Stand-Alone



A SMARTER WAY TO TRACE AMONG ENGINEERING ITEMS

ABOUT

The **TRACEABILITY Studio** is a specialized product of **SES ENGINEERING Studio** (SES), fully devoted to the **semantic traceability of any engineering item produced along the System Life Cycle**. It can either work inside SES ENGINEERING Studio as a capability or as a Stand-Alone product

TRACEABILITY Studio enables full, agnostic, and semantic traceability among workproducts even if they provide from different tools and different tool vendors. In essence, any workproduct (item, object...) managed by any of the tools suitable for connectivity within the **SES ENGINEERING Studio** can be traced with the help of the **TRACEABILITY Studio**.

Therefore, what about a smooth way to establish traces between meaningful elements in a PDF (let's say, regulation, customer needs...) and requirements in a Requirement Management tool such as Polarion, Codebeamer, DOORS, DNG... What if you want to continue with traces to FMEA or risks in Excel; then from your requirements in the RMS of your preference and architecture in a MBSE tool such as Cameo, Capella, Sparx EA...

Reduce the burden in connecting tools in a heterogeneous ecosystem, remove the need to import and export. **TRACEABILITY Studio** allows you, based on the connectivity capability of the **SES ENGINEERING Studio**, to trace items in all those sources and many more with just the click of a button.



QUALITY

Increase the value of a professional traceability tool compared with basic (and static) matrices in a spreadsheet.



TIME

Uses the **SMART** algorithms of **TRACEABILITY Studio** to facilitate the labor of the engineers using automatic traceability suggestions.



MONEY

TRACEABILITY Studio can connect to multiple tools and file formats, thus reducing the need to change your current set of tools to enable heterogeneous traces.

MANAGING TRACEABILITY WITH AN AGNOSTIC PERSPECTIVE

SES ENGINEERING Studio provides a framework for managing traceability links between multiple types of engineering items, tools, and file formats (requirements tools, conceptual modeling tools, physical modeling tools, source code, MS Office...). Current Systems Engineering practice implies almost always managing complex ecosystems of tools, in many cases from different vendors. This traceability capability represents the core of our Interoperability HUB, implementing the concept of SSoT – Synchronized Source of Truth.

TRACEABILITY MANAGEMENT IN AN EASY WAY

Once a traceability module is created between two sources of information, individual traces can be created with the click of a button. No need to open the source tools, add strange symbols, learn regular expressions... Just select a source item and a target item, and click to establish the trace.

TAILORING TRACEABILITY WITHIN THE ENGINEERING STUDIO

SES ENGINEERING Studio is designed to solve the classical traceability problems within a Systems Engineering-oriented organization. However, in those cases where the existing “out-of-the-box” functionality provided with the tool does not fully fit with an organization's needs, SES ENGINEERING Studio can be seamlessly tailored and adapted to those needs: custom types of traces, custom reports, custom suggestions of traces, and custom connectors to other tools or file formats.

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FUNCTIONAL DESCRIPTION OF THE TRACEABILITY MANAGEMENT CAPABILITY

The **TRACEABILITY Management Capability for SES ENGINEERING Studio** connects to a vast number of Systems Engineering tools (**Requirements Management Systems, Modelling tools, ALM/PLMs...**) either through a native connector or by parsing any kind of serialized file (XML, plain text...). Connection to other sources like **Microsoft Word or Excel** is also implemented, thus maximizing the number of elements that can be managed and traced.

A **Traceability project** includes any number of traceability modules. A **traceability module** represents a bi-directional connection between two sources, together with specific types of links. Even if the **most common types of links are already included** out-of-the-box (derives, verifies, satisfies...), the link types can be easily **customized** by the user at any moment.

Creating a new trace cannot be easier. Once a traceability module is opened, the items from both **the source and target containers, are shown on the screen** (regardless of the source). Select the source and target of the trace, select the type of trace, and the trace is created effortlessly. No need to open different tools, include manually the IDs of the traced elements, learn regular expressions... **The click of a button is enough to create a new trace.**

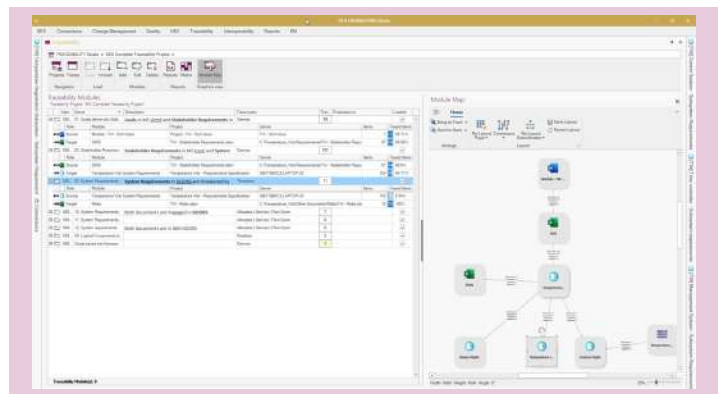
The links handled by SES ENGINEERING Studio are managed outside of the source applications and therefore do not affect the normal operation of the original tools in their native environment. Thus, your sources will remain identified and connected in the SES ENGINEERING Studio, which also allows for the **identification of suspect traces** when any of the traced items are modified or even removed.

SES ENGINEERING Studio includes a semantic discovery function to **identify possible missing traces among different types of elements**. Natural Language Processing and Artificial Intelligence are working together to identify those missing traces. This mechanism can be easily tailored using several different discovery methods, that might take different parameters. For advanced users, a programming environment is also available.

Summing up, SES ENGINEERING Studio is a scalable, flexible, and customizable tool, allowing **users to customize connectors** to new types of sources, **customized MS Word reports**, and **customized functions to retrieve links from external sources**.

TRACEABILITY PROJECTS, MODULES AND LINKS

The **TRACEABILITY Studio** organizes traceability using three types of entities: **traceability projects, traceability modules**, and eventually **links**. A traceability project defines a framework for managing traceability. A module defines traceability between two defined sources of information, for example, between a requirements module in IBM DOORS and a conceptual model in Cameo or Capella. Finally, the traceability module is populated with trace links, of different types, that point to the selected items of both sources of information.



MANAGE TRACEABILITY DYNAMICS: SUSPECT TRACES

SES ENGINEERING Studio supports the notion of **suspect links**. In principle, a suspect link identifies controlled changes that occurred between linked engineering items after they were connected. In that case, SES ENGINEERING Studio labels the link as suspect (inconsistent) and allows the engineer to resolve the link by either recovering or removing it. Descriptive comments can be included in the recover/remove operation thus allowing to keep track of the evidence along the life cycle.

THE INTEROPERABILITY HUB

The **Interoperability HUB** implements the notion of a **Synchronized Source of Truth (SSoT)**. As soon as a new tool or source is added to the hub, traces among all the other connected tools and this new tool are feasible, thus avoiding the need for unproductive point-to-point connectors.

Even if the traces are stored in the hub, not in the source tools, any change in the source tool is immediately highlighted in **SES ENGINEERING Studio**, and the eventual traces shall be reported as suspicious.

SUGGESTED LINKS – FINDS MISSING LINKS FOR YOU

SES ENGINEERING Studio supports the discovery of candidate links, providing engineers with means to define trace links based on her/his criteria. This feature is based on a semantic similarity search tool, capable of analyzing the name of the model elements and the meaning of textual descriptions like in requirements, test cases, risk definitions... In other cases, more semantic trace links can be suggested automatically by running semantic algorithms that use additional information like

Product Breakdown Structures, Functional Breakdown Structures, allocation of properties or other models elements. SES ENGINEERING Studio provides some of these algorithms out-of-the-box and allows custom algorithms to be added afterward.



CUSTOM REPORTS

Traces created in the **SES ENGINEERING Studio** can be involved in different types of reports. Firstly, traces can be included in any of your custom reports for the different data sources involved in the trace (requirements, models...). Additionally, specific traceability reports can be also generated, either using any of the default reports that come with the tool out-of-the-box, or making use of the easy-to-use reporting system to fully tailor your reports.

SMART TRACEABILITY

SES ENGINEERING Studio includes several tools based on **Natural Language Processing** and **Artificial Intelligence** tools, not only to suggest new traces but also to discriminate changes in the traced items so that only semantically relevant changes are warned as suspicious links.

TRACEABILITY CAPABILITIES WITHIN THE ECOSYSTEM OF THE SES ENGINEERING STUDIO

SES ENGINEERING Studio is a Software tool designed to manage the System of interest's life cycle by integrating and interoperating the complete **ecosystem of tools** involved in its concept, development, production, utilization, support, and retirement. By becoming the Integration Hub, SES provides full **technical management support** (**Configuration management, Traceability management, Conflict management, Quality management, Information management, Knowledge management, PLE, etc.**) to a wide list of connectable tools allowing smart **interoperability** among them and complete **life cycle support**. The combination of **connectivity** to existing tools, **interoperability** among them, **technical management digitalization** for whatever connection, **ontologies**, a repository for **synchronizing the sources of truth**, and the possibility to define **life cycle models**, provides a powerful system life cycle management solution with a strong REUSE approach.

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