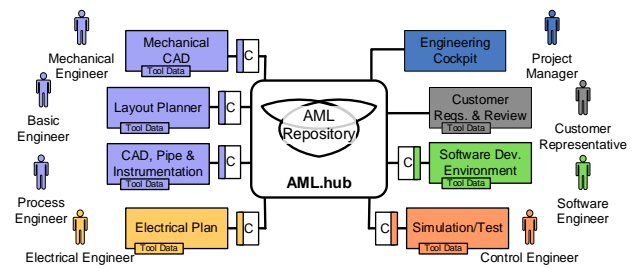# Round-Trip Engineering with the AML.hub

Exchanged engineering data will become easily accessible in tool networks using the open *AutomationML* data exchange format. The AML.hub enables efficient storing, versioning, enriching, and analysis of quality assured *AutomationML* data.

Goal

In tool networks distributed engineering of automated systems often relies on point-to-point data exchange which

- does not sufficiently enable quality and consistency management;
- complicates Round-Trip engineering;
- hampers traceability of changes across engineering disciplines.

The need for round-trip engineering arises when the similar information is available and relevant in multiple engineering domains. Therefore, data inconsistency may occur if not all related system elements are consistently updated to reflect a given change. Engineering views on the plant model are not automatically synchronized and changes between engineering operations in cross-discipline context not made visible to the engineers.

Domain experts would like to define and maintain their discipline-specific topology tree of and their tool-specific view on the automated system.

Domain experts should be supported in analyzing the impact of their operations on the system. Mechanisms regarding traceability and execution of view-specific checks facilitate minimization of defects and risks in the overall project planning and assure overall project quality.

Implementation

The **AML.hub**, developed by *logi.cals* and the *CDL-Flex* research laboratory at *TU Vienna*, systematically integrates tool networks that use the *AutomationML* standard and enables the automation of engineering processes.

The AML.hub provides the management of an integrated plant model that reflects the contributions of all involved disciplines in a structured way. It supports the definition of individual topology trees and views, which may be linked to the integrated and consistent model.

The approach facilitates efficient versioning of exchanged AML models in tool networks and of operations performed on links between various topology trees and views to improve traceability of changes across disciplines. Versioning also enables to derive the impact of changes on the integrated plant model and report differences to the engineer for improvement of awareness.

The automation of engineering processes facilitates the synchronization of views on the integrated plant model and the execution of advanced processes like test automation for quality assurance.

In a representative standard example, the cooperation partner *IAF* at the *Otto-von-Guericke University Magdeburg (Institute of ergonomics, Manufacturing Systems and Automation (IAF))* evaluated the *AML.hub*. The example shows the collaboration of three engineering disciplines, the plant planner, and the project management by using the AML.hub.
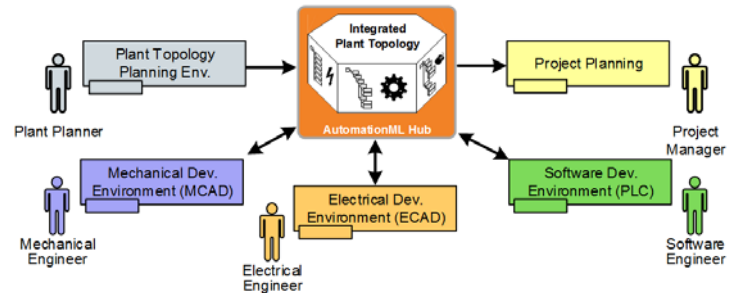
Technical Specification

- Versioning of exchanged engineering data at model level.
- Support for tool networks with the open standard *AutomationML*.
- Definition of engineering processes with the *Business Process Modelling Language (BPMN)*.
- Service-oriented architecture.

Benefits for Customers

- Definition of **discipline-specific topology trees** and **tool-specific views**.
- **Consistent views** on an integrated plant model.
- **Traceability** of engineering operations.
- **Test Automation.**
- Generated **Plant Change Reports.**
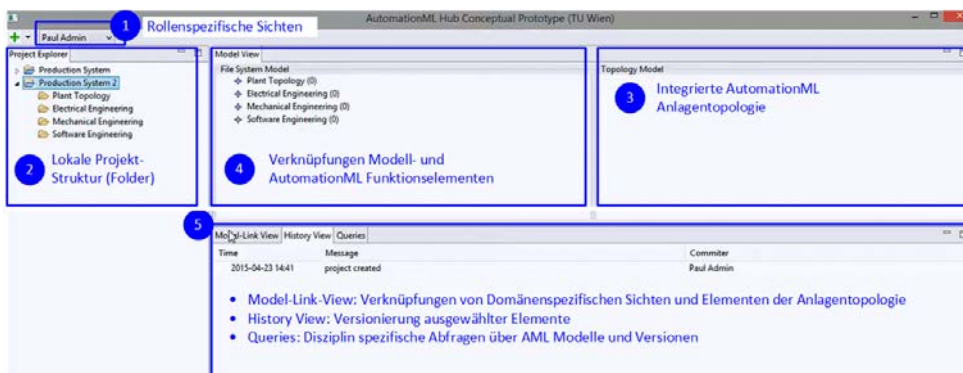
Contact:

Prof. Dr. Stefan Biffl
Head of CDL-Flex, TU Wien
stefan.biffl@tuwien.ac.at
cdl.ifs.tuwien.ac.at

Heinrich Steininger
CEO logi.cals Austria
heinrich.steininger@logicals.com
www.logicals.com