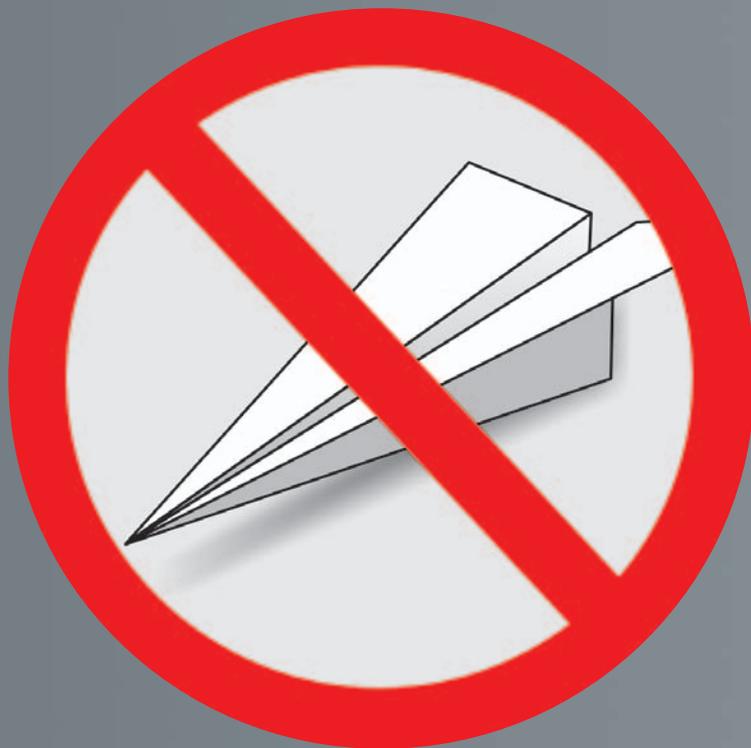




<AutomationML/>

The Glue for Seamless
Automation Engineering



Get rid of the paper interface!



Data Format for Seamless Automation Engineering

The companies Daimler, ABB, KUKA and Siemens together with NetAllied and Zühlke as well as the Fraunhofer IITB and the Universities of Karlsruhe and Magdeburg, jointly define and standardize the Automation Markup Language (AutomationML®) as an open intermediate format for the Digital Factory.*

The project vision is, that AutomationML will close the gaps:

- Between production design and shopfloor,
- Through interoperability between tools,
- For all phases of the engineering process,
- Based on one lossless and scalable data format,
- As open standard with high market acceptance,

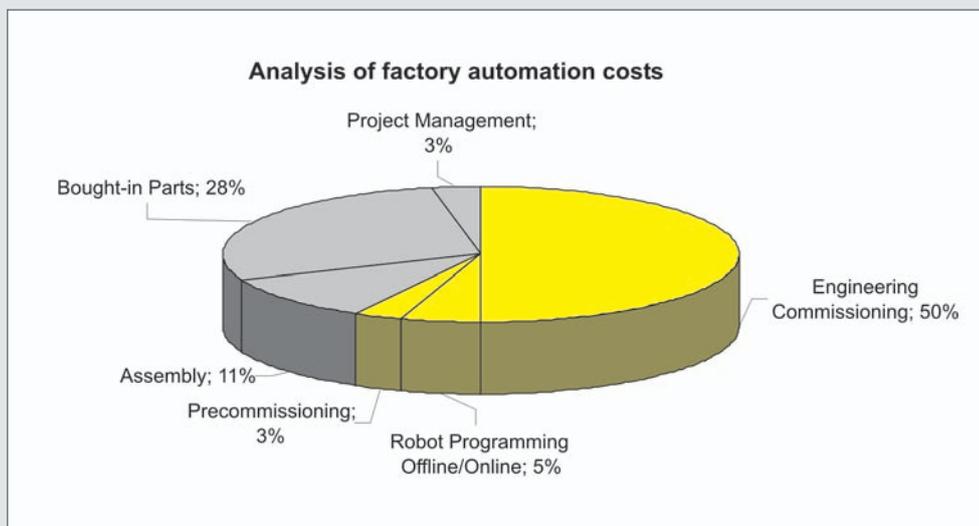
I.e. AutomationML will become the glue for seamless automation engineering.

To establish a lossless workflow over the whole engineering process based on common content, AutomationML supports complete digital models of mechanics, electrics and logics (software).

Starting with factory layouts, templates, and rough sequences, this content will be developed step by step during the engineering, hence AutomationML needs to cover basic descriptions up to complete controls.

For mechatronical product representation and 3D content as well as for control, standardized and accepted data formats already exist. The project evaluates these formats and reuses them as far as possible in AutomationML.

Productive usage of AutomationML to combine well established tools has proven the feasibility of this approach; first products supporting AutomationML are available.



* AutomationML® is a registered trademark



Seamless Automation Engineering is Possible!

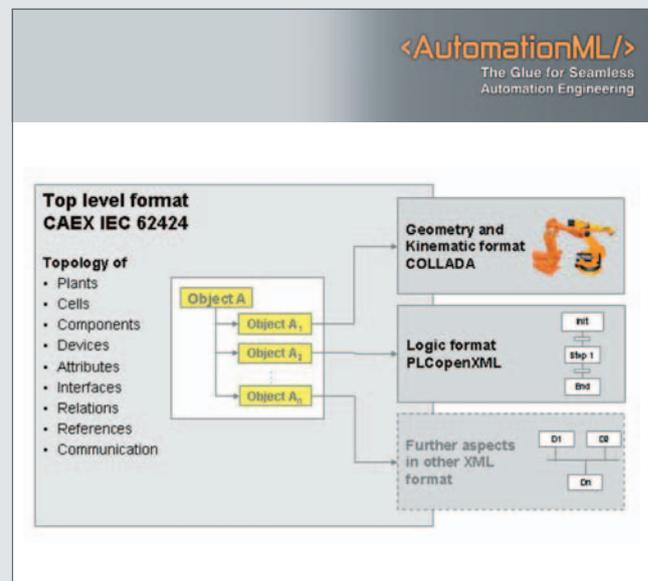
Regarding automation control and robotics efforts, 60% of costs are due to engineering. Up to now, optimization strategies addressed the bought-in parts well; a wide area to increase efficiency is still in engineering, for example:

- Today factory layouts are manually redrawn in another tool for line planning,
- Companies suffer from heterogeneous CAD tool landscapes,
- Sequences are developed with office tools, but not re-used for PLC programming,
- Manufacturing Execution Systems have to be engineered manually instead of importing data from Digital Factory tools.

AutomationML as open intermediate format improves automation engineering with better and more flexible collaboration; it allows earlier simulation and quality assurance. Each single aspect itself leads to higher data and planning quality and reduced costs. As a long-term goal, a complete virtual commissioning will be achievable combining and simulating CAD and process data.

The basis for seamless automation engineering has improved significantly in the past years. Available performance in standard PC hardware and solutions in other industries do not leave room for missing links in seamless engineering anymore.

Fundamental concepts as re-use, continuous data engineering during the whole life-cycle, but also the display in different levels of detail are well established in other industries.



Typical objects in plant automation comprise information about topology, geometry, kinematics and logics:

- Topology: properties and relations of objects in their hierarchical structure,
- Geometry: graphical attributes and 3D information,
- Kinematics: connections and dependencies among objects to support motion planning,
- Logics: sequences of actions, internal behavior of objects and I/O connections.

Well established, reliable, manufacturer independent standards for each aspect are available. They do not need to be reinvented. For cost effectiveness and protection of investments, AutomationML incorporates them!



Saving Money along the Engineering Chain

Any industry project is about earning money. Investments in the development of AutomationML thus serve clear business cases.

One of the industry's core problems is the immense diversity of heterogeneous tool landscapes. As a consequence, highest value comes when data are exchangeable among tools in a standardized way. AutomationML supports data exchange along the engineering chain:

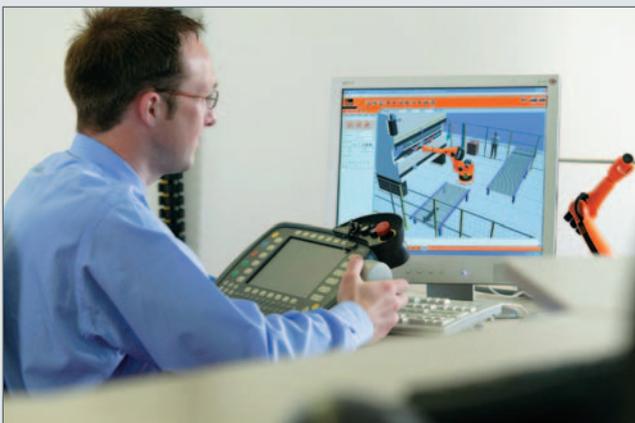
- Exchange of 3D models among CAD and simulation tools in different levels of detail,
- Exchange of complete virtual manufacturing cells among different simulation tools,
- Transition of sequence descriptions from mechanical design engineer to electrical and PLC engineering,
- Transition of kinematic data and motion paths from robot simulation systems to robot,
- Manufacturing process data between layout and CAD/CAE tools,
- Transition from CAD systems to documentation systems,
- Import of engineering data as parameters for Manufacturing Execution Systems.



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Companies already save money by utilizing AutomationML instead of hand-copying engineering data. They make use of the so-called Conditioner Pipeline Framework software, developed and distributed by NetAllied: proprietary data are converted into AutomationML, conditioned - e.g. massive data reduction or conversion from boundary representation to tessellated data format - and then saved to the desired format.

Other companies announced the full integration of AutomationML in their tools. Siemens, KUKA and ABB are the first to implement AutomationML in their tools; others already use AutomationML or parts of it as input format.



KUKA Sim 2.1, © KUKA Roboter GmbH



Close the Gaps in Your Tool Chain - Join AutomationML!

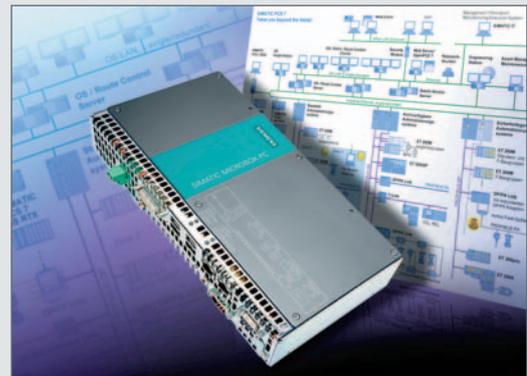
You need to engineer your own manufacturing or process industry plants; or you need to engineer these plants for your customers?

You provide plant components and are asked for providing an electronic description of them?

Your tools solve certain engineering aspects in an outstanding manner; but you have to spend much effort to integrate them into your customers' different tool chains?

AutomationML already helps in many use cases. However probably not yet in yours? You can make AutomationML to support your application easily!

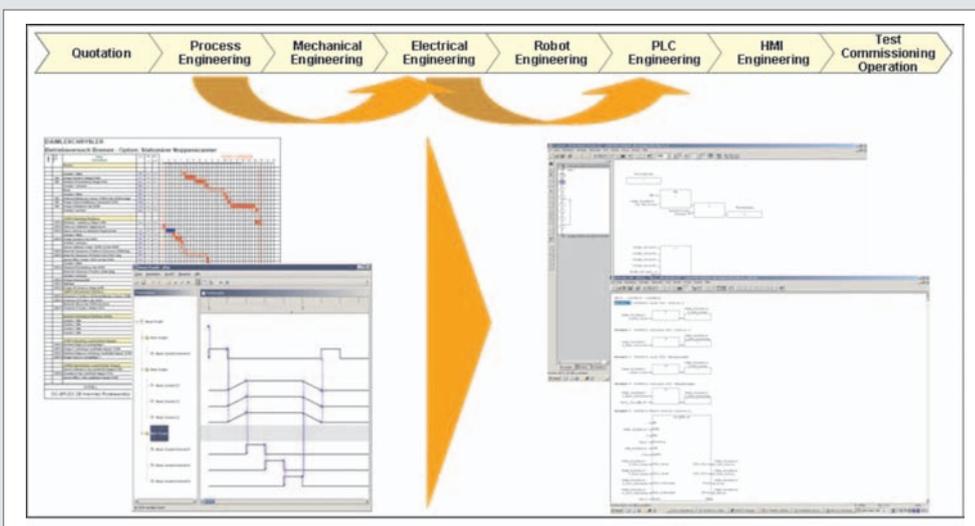
AutomationML is an open standard. Every company has free access to released specifications and furthermore can join AutomationML to bring in his ideas for further features. Whenever enough interested parties come together, AutomationML opens a new working group to specify and drive the standardization of that part. Only your participation is needed to help you solve your tasks.



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Of course you can also join AutomationML without participating in working groups, if you are mainly interested in using specifications ahead of your competition.

Just visit www.automationml.org for your membership application.





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