



Continuous data exchange between layout planning and simulation tools

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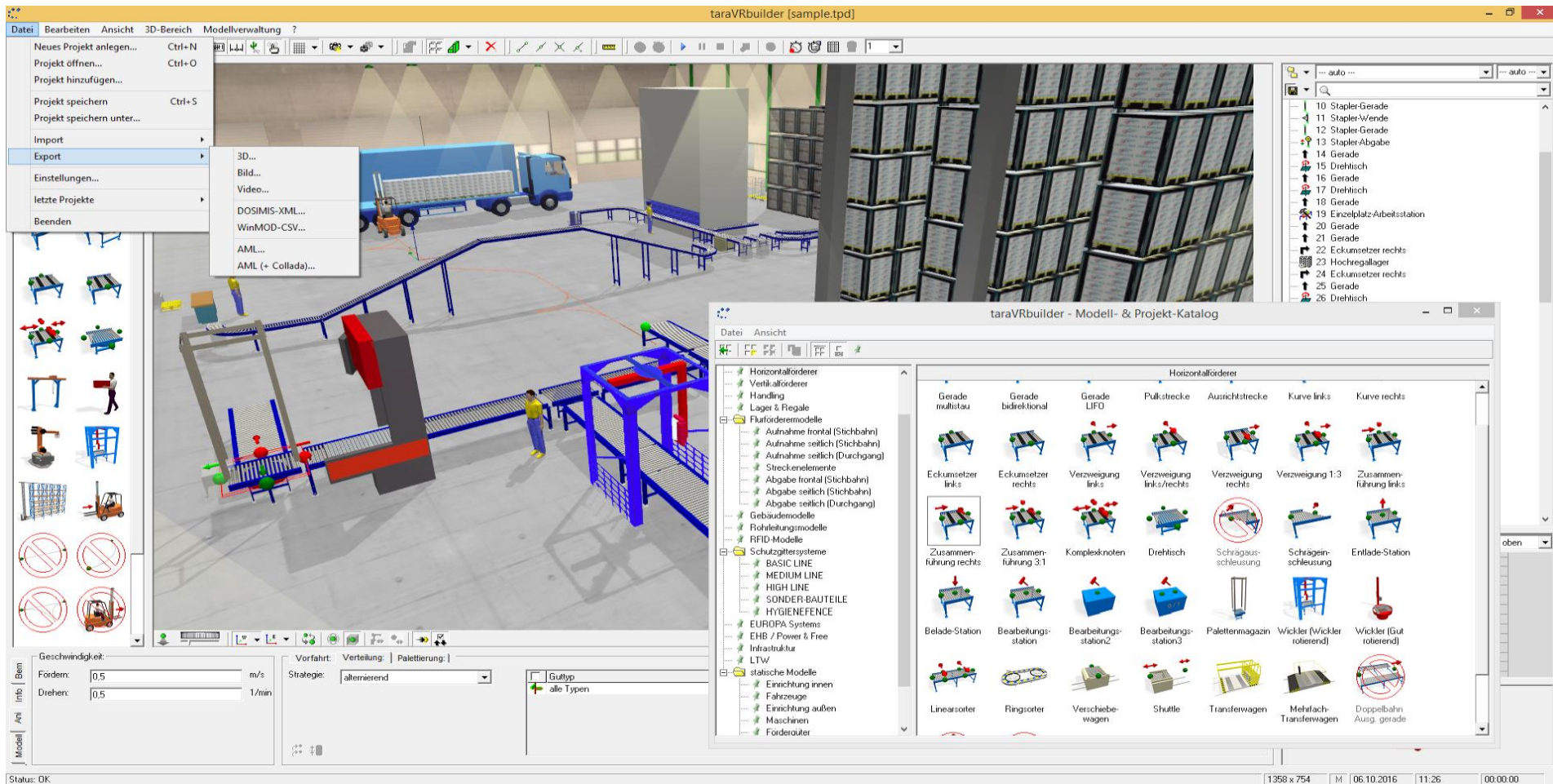
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Motivation:

- ***Desired but not yet existent*** -> A solution for the computer-aided planning of production systems, in which not only the geometric structure but also the material flow can be designed in detail, simulated, tested and executed seamlessly into operation.
- ***Problem***-> Many layout-planning tools have limited abilities on exchanging data with tools from other engineering fields/disciplines-like simulation or virtual commissioning.
- ***How?***-> A neutral data exchange format could reach across the different engineering steps. Significant time and cost savings during data acquisition and processing as well as during the model creation could be achieved.
- ***Solution***-> AutomationML can be used to achieve a consistent and non-redundant data exchange for mechatronic production components like production machines or conveyor systems as well as logical planning data such as material handling and manufacturing process definitions.

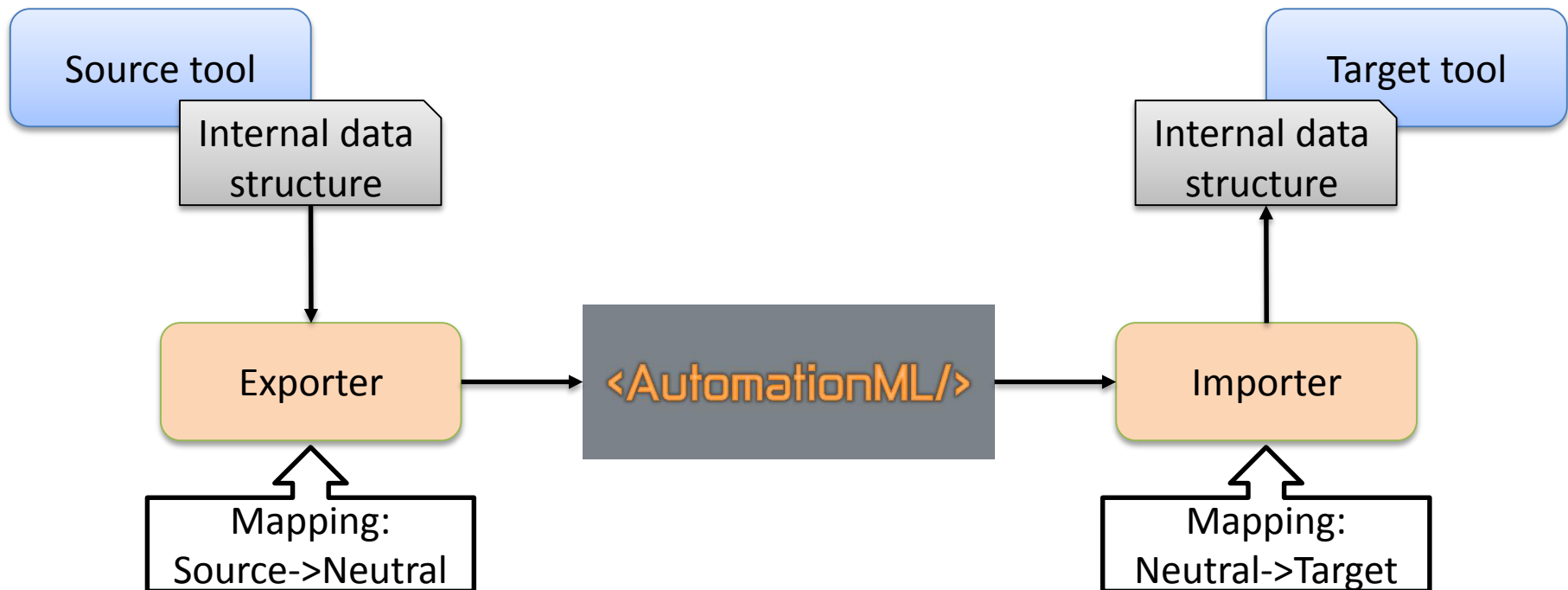
The tarakos-Software has an extensive library of material handling and logistics components consisting of 3D geometry models as well as structural and animation parameters. The intention of the ongoing development for AML support is to make this information available for further use in simulation processes.





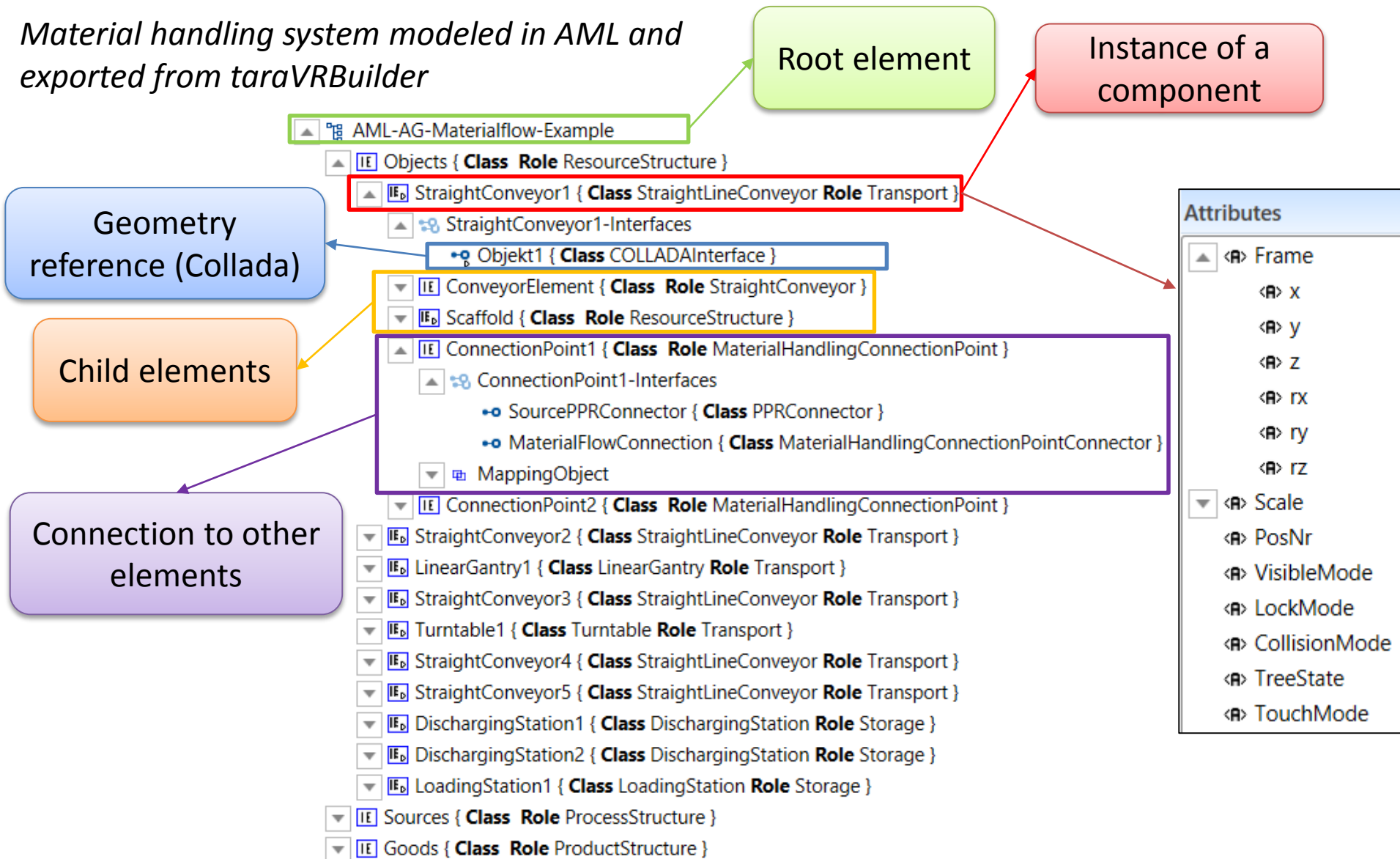
Data exchange process:

1. The exporter gets the information from source software tool.
2. The exporter transforms and writes the information in the exchange format.
3. The importer of the target software reads the information.
4. The importer transforms the neutral data into the intern data structure of the target tool.



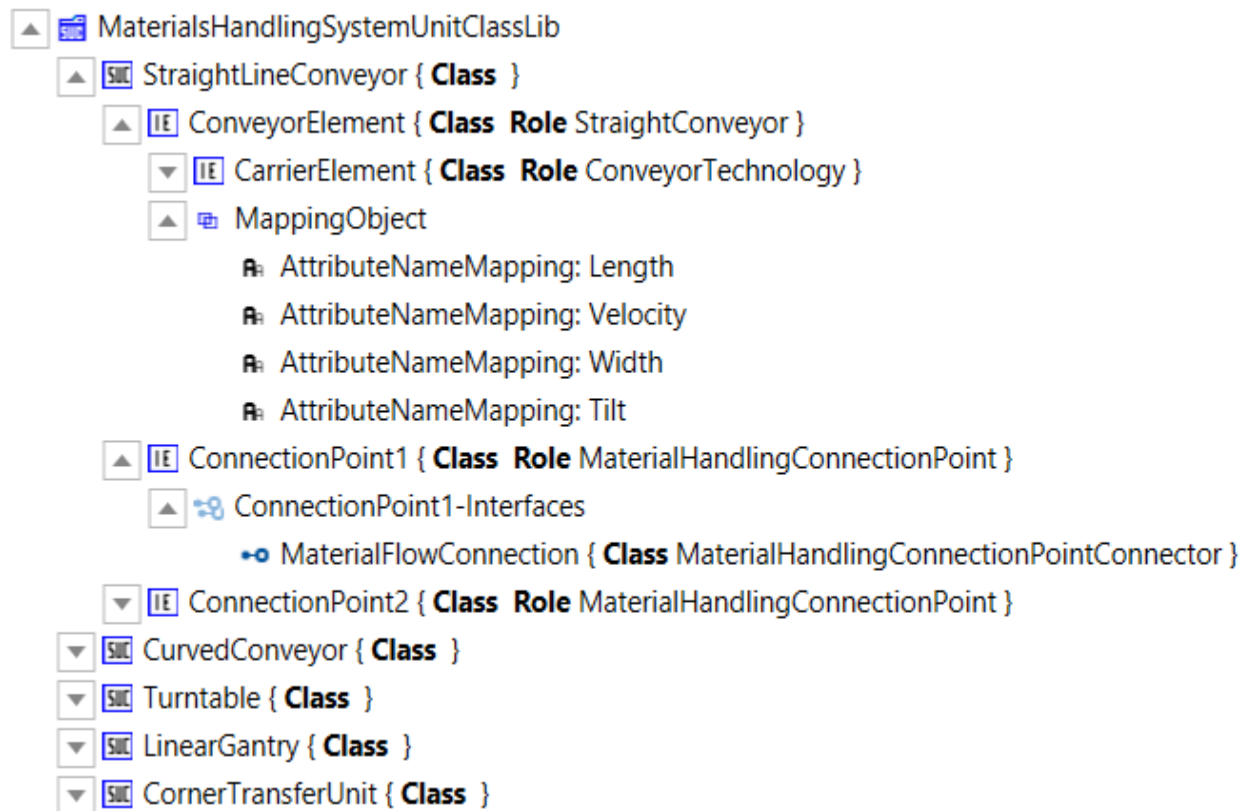


Material handling system modeled in AML and exported from taraVRBuilder





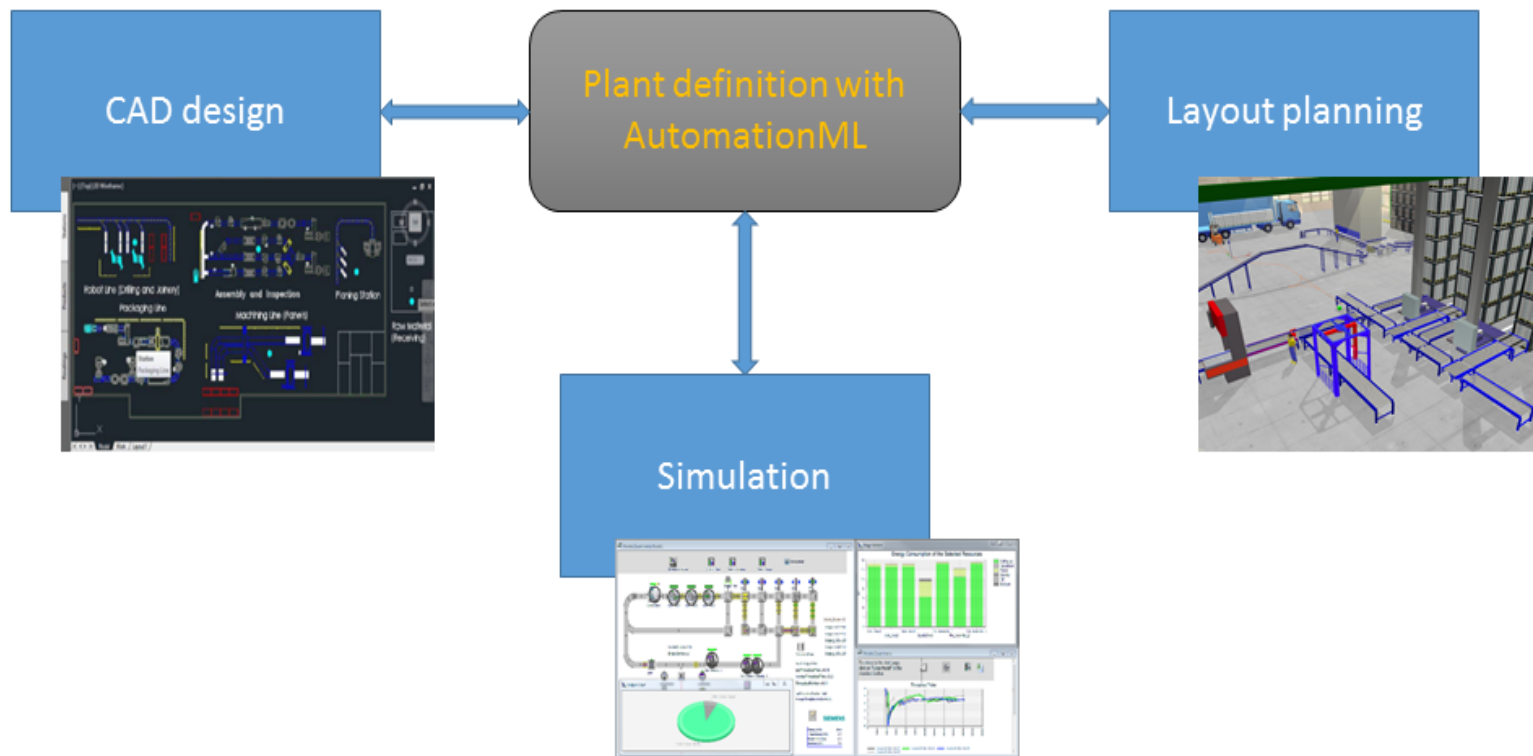
For the standardization of the components, the structure is reorganized for the standard roles; internal elements are assigned to corresponding system unit classes, and role classes and attribute/interface mappings are created. Example: StraightLineConveyor system unit class.





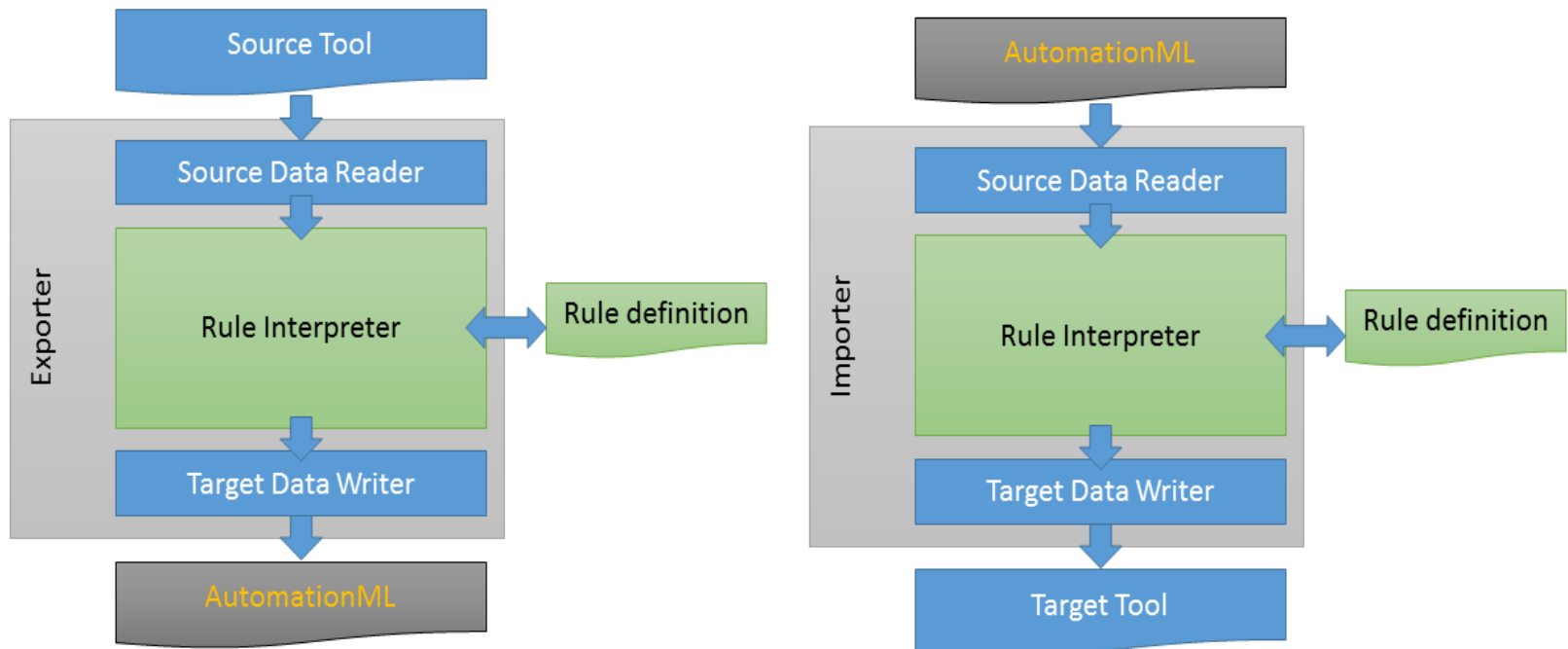
Automated data exchange between layout planning and simulation tools

The objective of the R&D project "ADEX" is the development and prototypical implementation of an automated data exchange system between visualization, design and simulation tools.





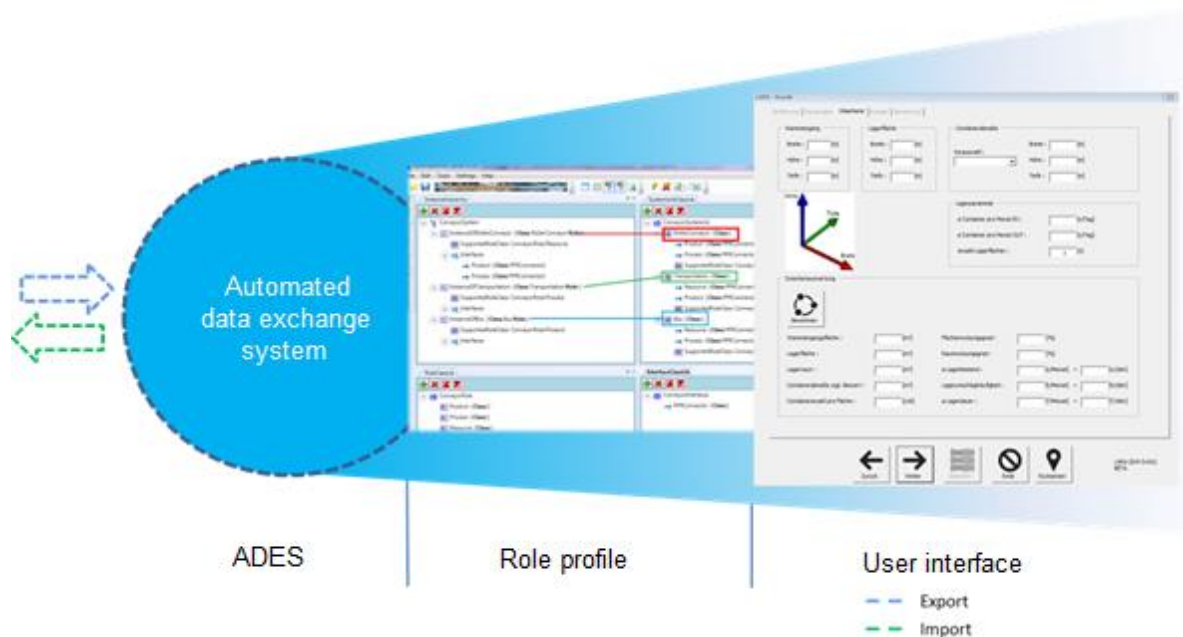
It is also aimed that the model transformation (i.e. from the intern data model to AML or the other way) is executed automatically through predefined rules and a rule interpretation component -> An automatic data exchange system (ADES) based on AML format.



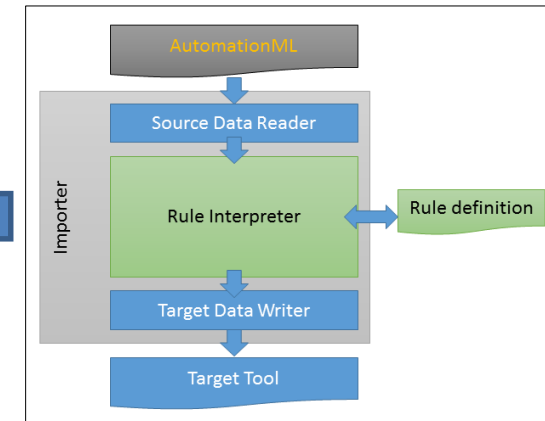
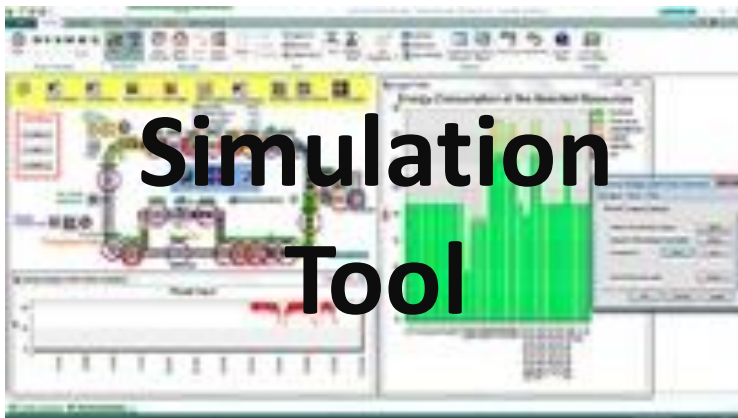
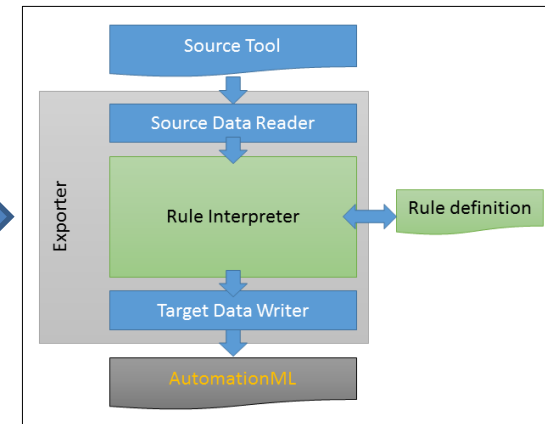
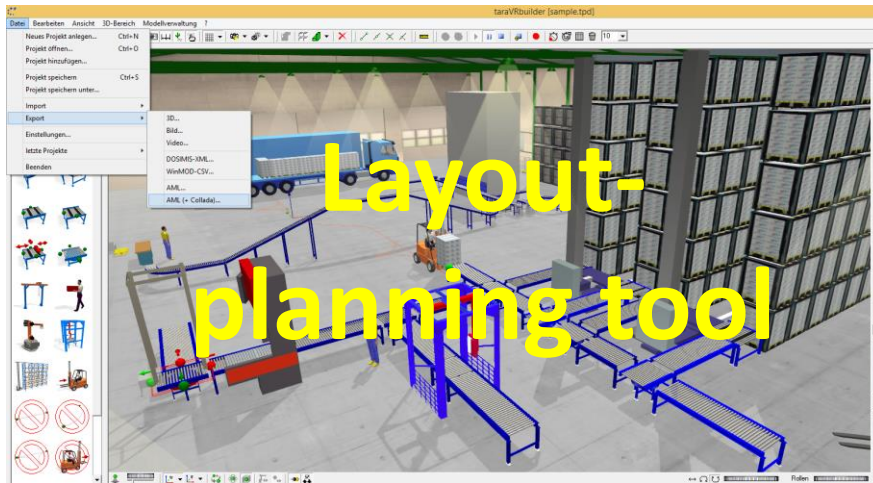


The ADES consists of several levels:

- The import and export functions, which transmit the properties and parameters of a model element into the target tool, represents the interface between the ADES and the tool.
- Within the exchange system, the element is restructured according to rule definitions and assigned to the existing or new role classes by the program environment.
- The graphical user interface displays the elements, allows the manipulation and hands them over to the target tool. If some conflicts occur during the automatically mapping of the models from different tools, this can be remedied through the user intervention with the help of a user interface via manual selection.



An exemplary data exchange process with layout planning tool as the source and simulation tool as the target





Business opportunities

Data interoperability -> a highly demanded functionality. Seen as an important criteria for investments in new software tools.

The estimated market potential is composed of:

- Licensing and support for the integration of AML interface by the end user
- Acquisition of new customers, who hesitate to make investments due to the lack of data consistency and the need for excess work concerning data exchange
- Sustainable service contracts

Target sectors are:

- Suppliers of material handling components
- Planners and contractors for material flow, logistics and production systems
- Manufacturing companies with a high degree of automation, for example, Automotive industry



Questions?
Thank you for your attention.