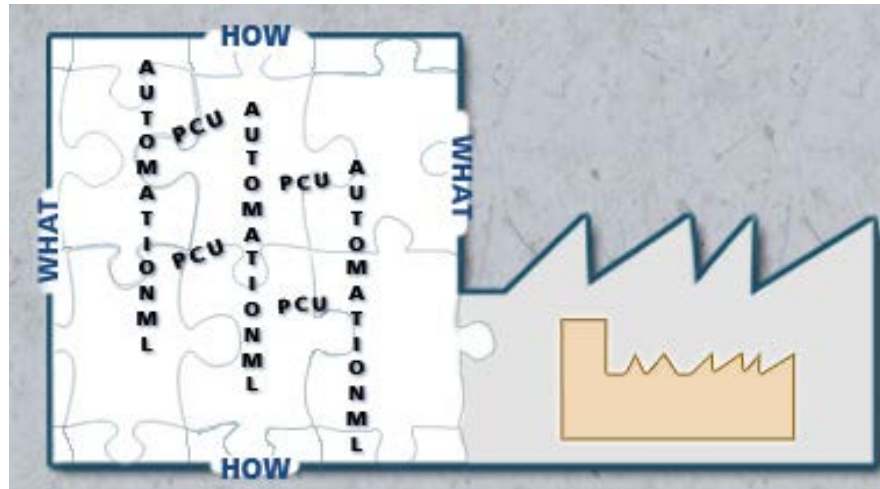


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# OPC UA and AutomationML – collaboration partners for one common goal: Industry 4.0

Miriam Schleipen, Robert Henssen, Mathias Damm, Arndt Lüder, Nicole Schmidt, Olaf Sauer, Stefan Hoppe

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# Agenda

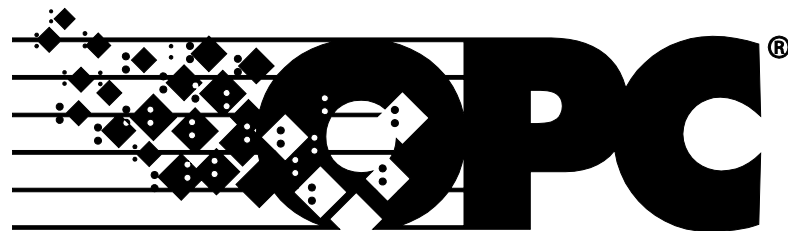
1. Motivation & Goal
2. Entry points into the AutomationML model in OPC UA
3. General transformation rules
4. Examples
5. Summary & Outlook

# What?

# <AutomationML/>

Semantic description of production plant



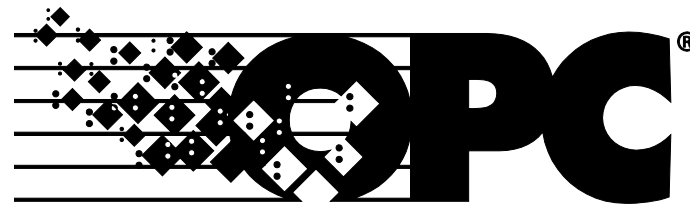


F O U N D A T I O N

Communication and management of  
data models including security

# How?





F O U N D A T I O N

Communication and management of  
data models including security

How?



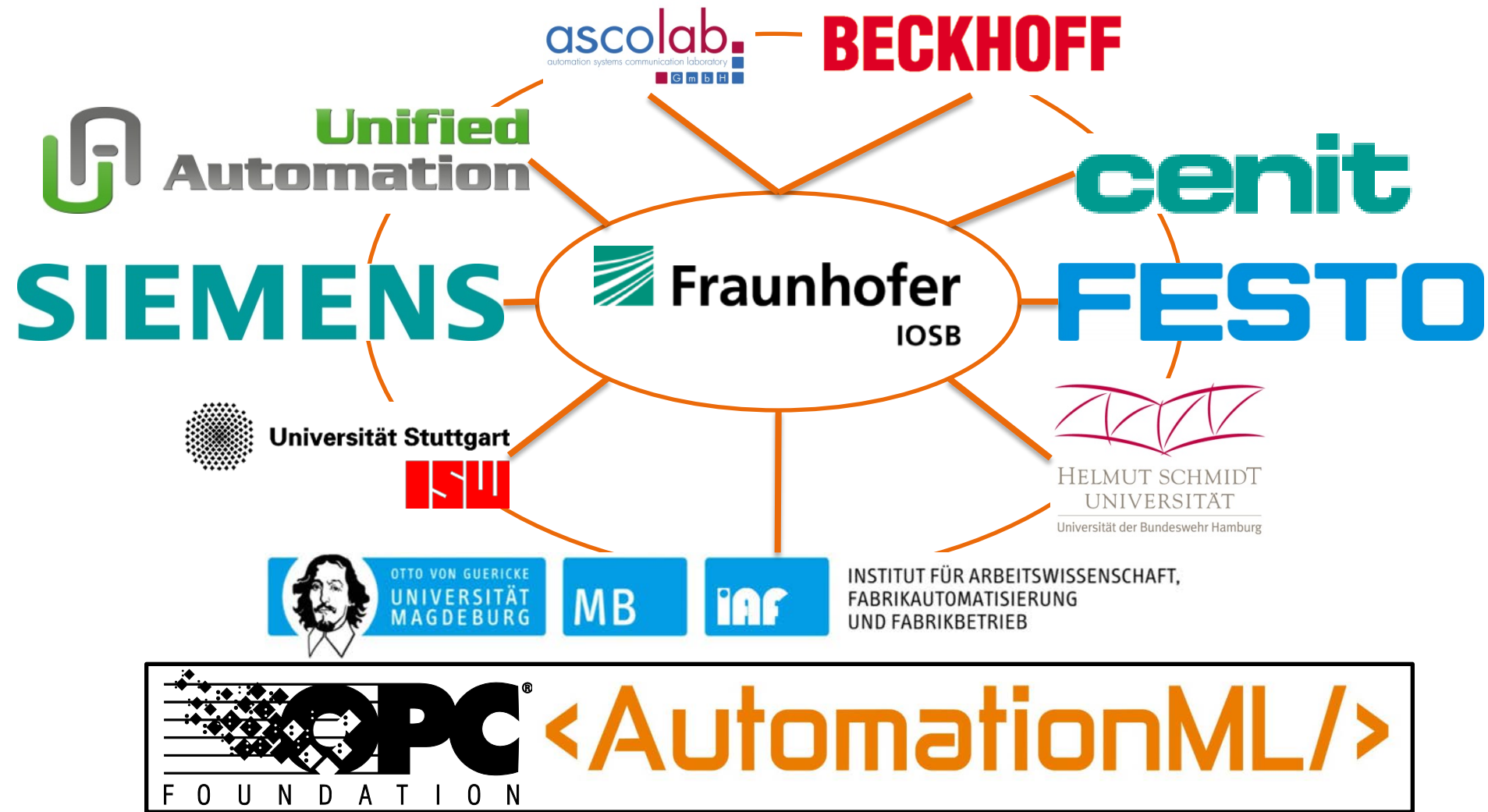
What?

<AutomationML/>

Semantic description of production plant

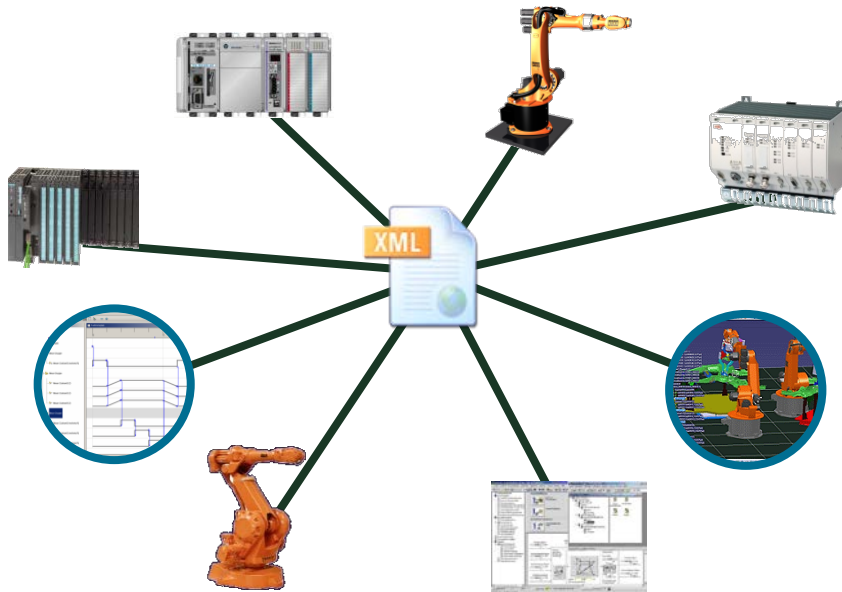


# Current members

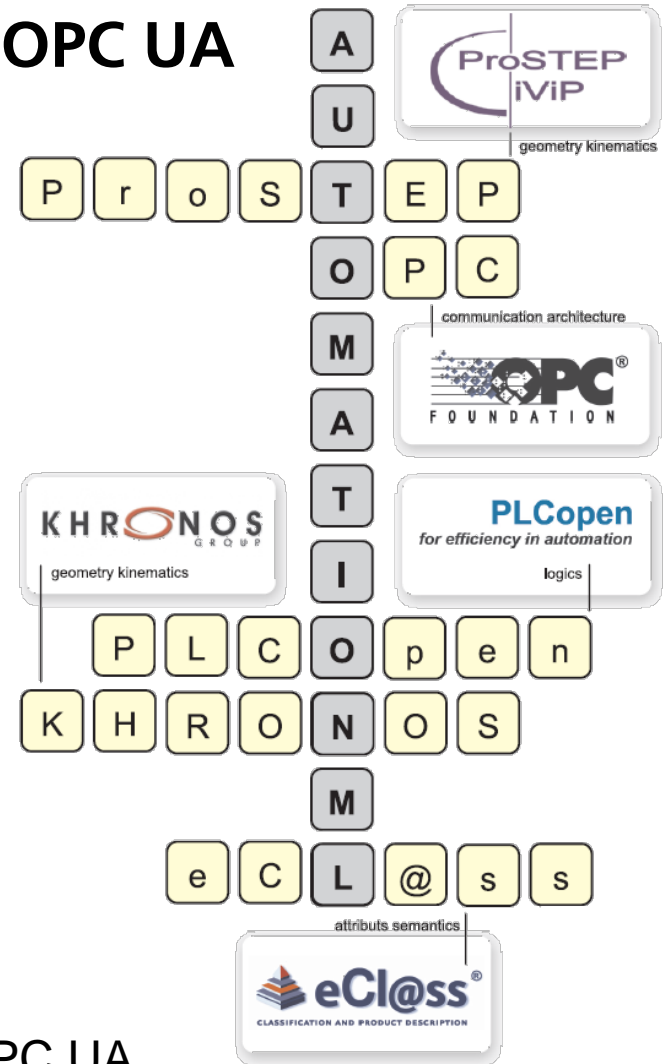


# Common goal of AutomationML & OPC UA

- Lossless and semantically unique exchange of engineering data along the tool chain within the engineering of production systems



- → Companion standard AutomationML for OPC UA
- → Modelling of OPC UA engineering/configuration data in AutomationML



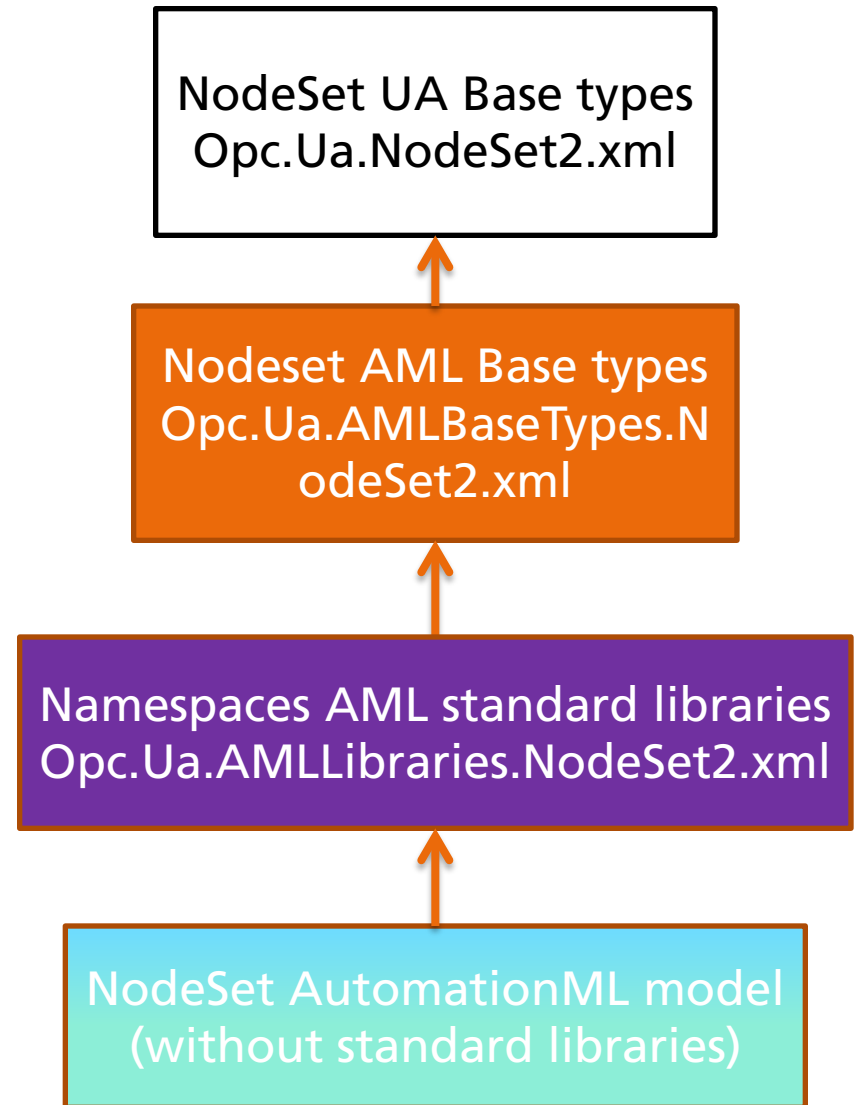
# Views and hierarchical organization

- Different views on data
  - Entry points for AutomationML related users
  - Entry points for OPC UA related user
- Nodes are organized in different nodesets for
  - standard types,
  - AML organizational elements,
  - AML standard libraries,
  - and the actual AML example/file



# NodeSet hierarchy

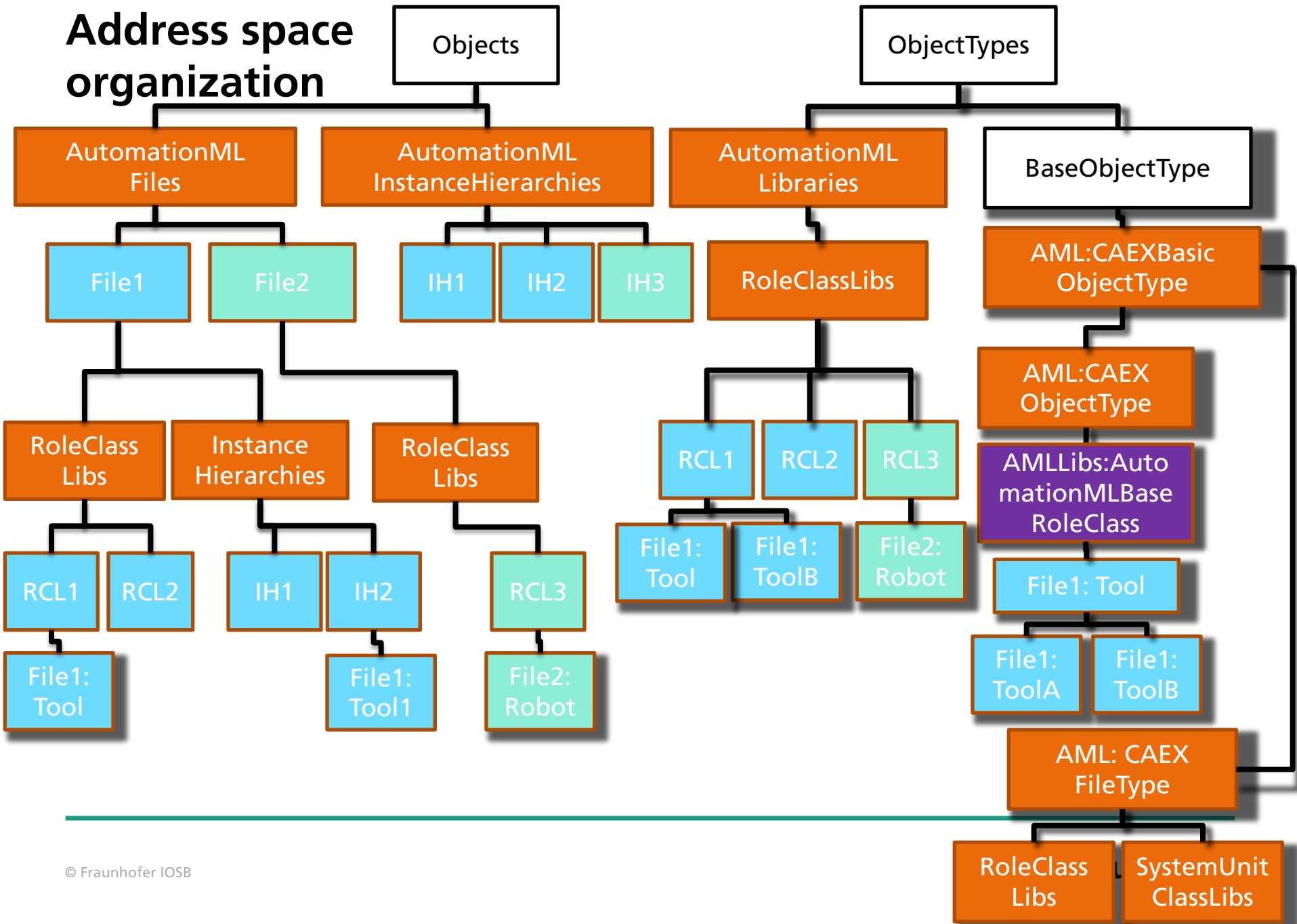
- Each box is an individual namespace
- Do not import list of known libraries
- Namespace AutomationML base types (AML)
- Namespace AutomationML libraries (AMLLibs)
- Namespace AutomationML examples (Filename of each example)



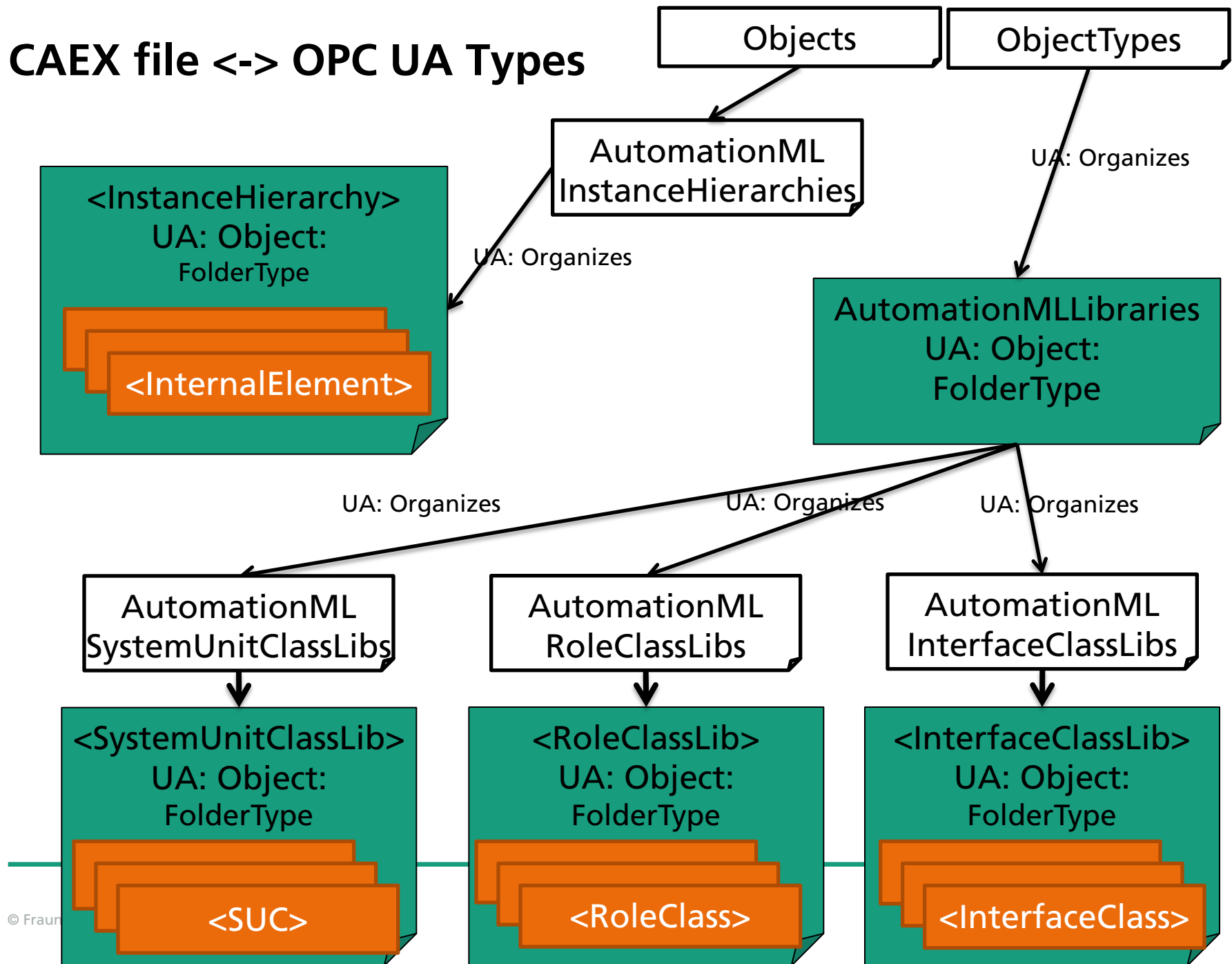
# Views on AML data in OPC UA

- Global instance view (classical UA view)
  - AutomationMLInstanceHierarchies, below the node Objects
- File view (direct AML view/representation)
  - AML:RoleClassLibs/SystemUnitClassLibs/InterfaceClassLibs (BrowseName), FolderType (HasTypeDefinition), RefTypeID = Organizes [aus File-Nodeset], HasComponent Reference, below the node Objects/AMLFiles/File\_xyz
  - AML:InstanceHierarchies (BrowseName), FolderType (HasTypeDefinition), RefTypeID = Organizes [aus File-Nodeset], HasComponent Reference, below the node Objects/AutomationMLFiles/File\_xyz
- Global library view (classical UA view)
  - AML:RoleClassLibs/SystemUnitClassLibs/InterfaceClassLibs (BrowseName), FolderType (HasTypeDefinition), RefTypeID = Organizes (NodeID different from NodeID of file view) [from AutomationML-Nodeset, fixed NodeID], below the node ObjectTypes/AutomationMLLibraries
- Inheritance view/type hierarchy (classical UA view, refBaseClassPath in AutomationML)
  - AML:CAEXBaseType below the node von BaseObjectType
  - Type inheritance tree is below

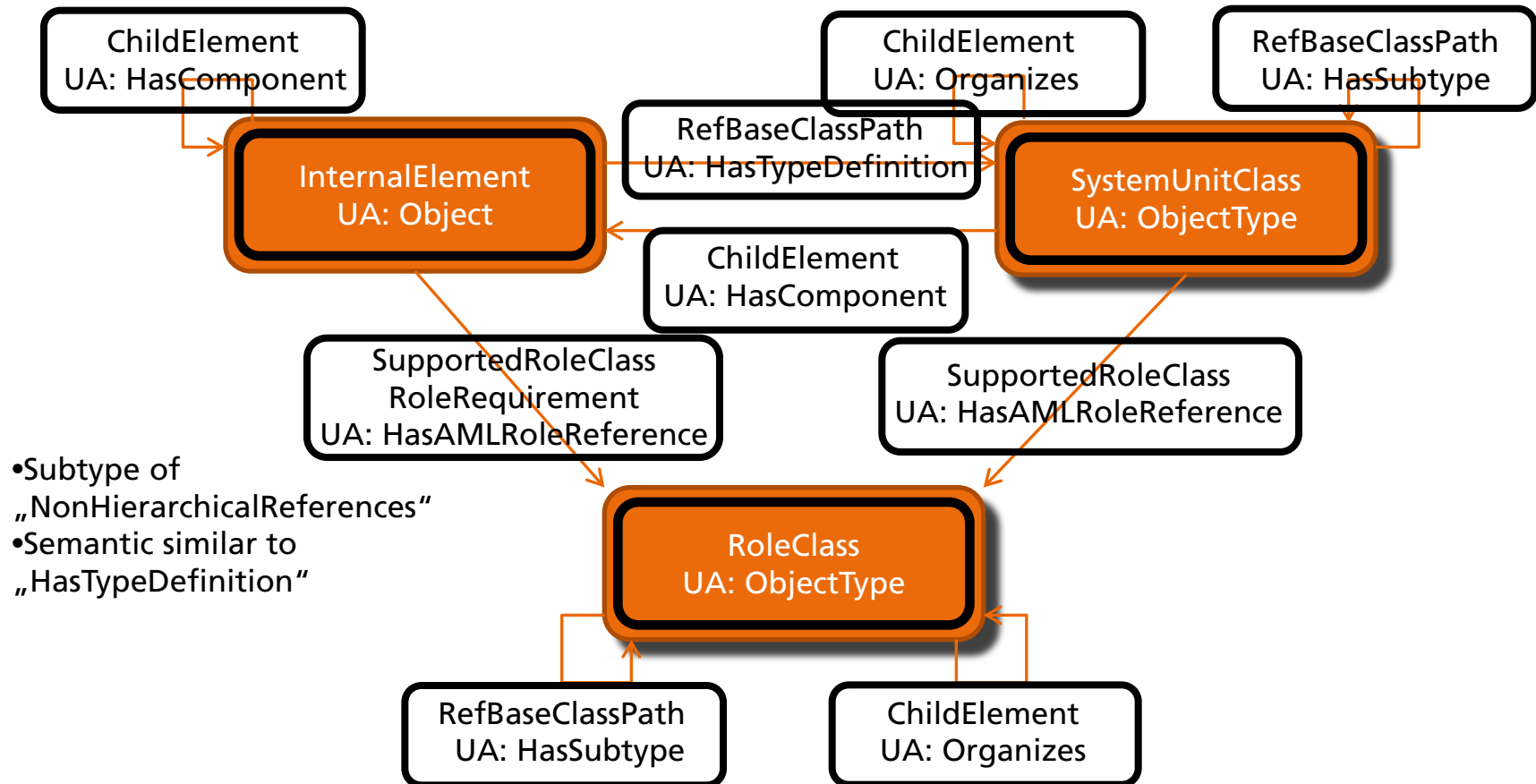
# Address space organization



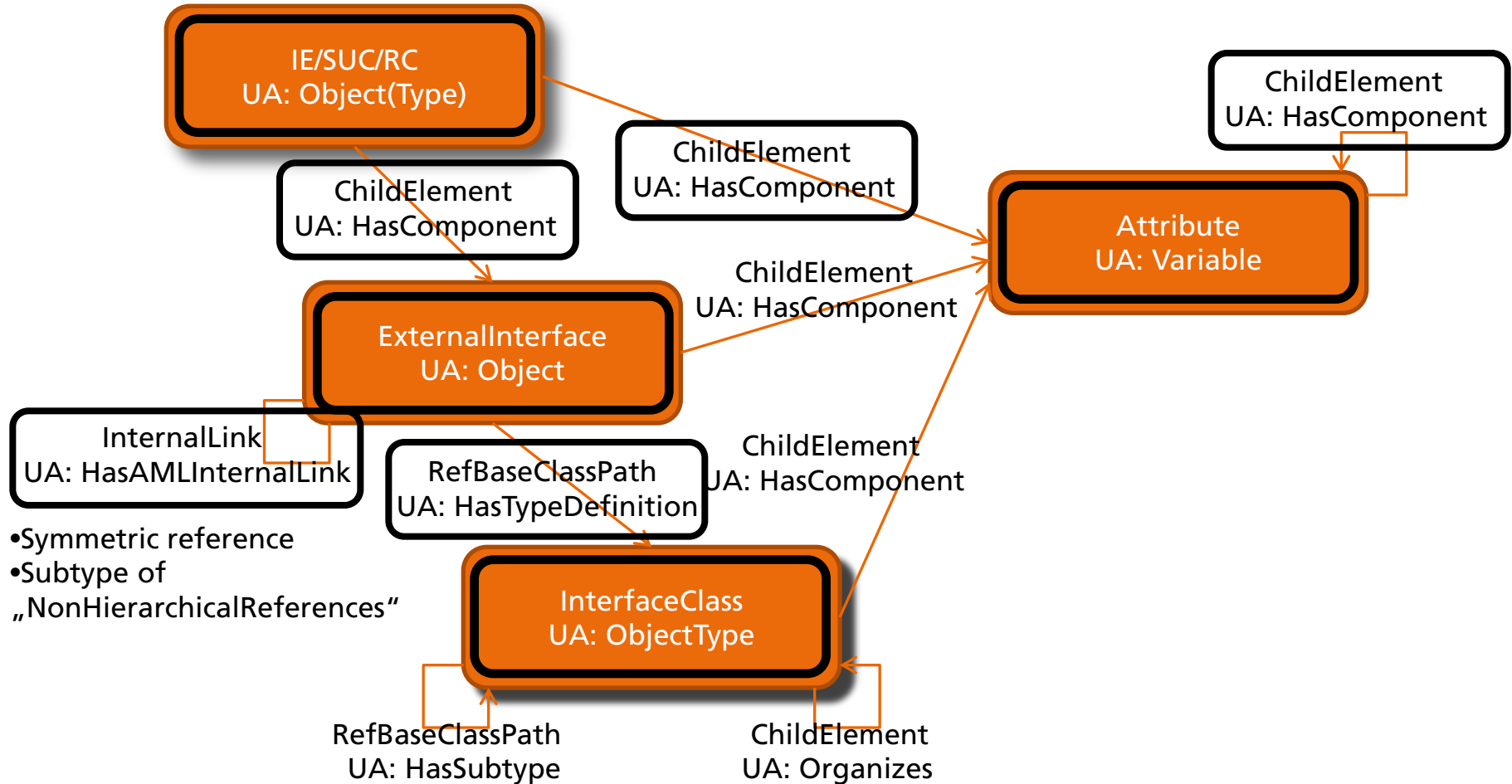
# CAEX file <-> OPC UA Types



# AML BaseElementTypes <=> OPC UA Types

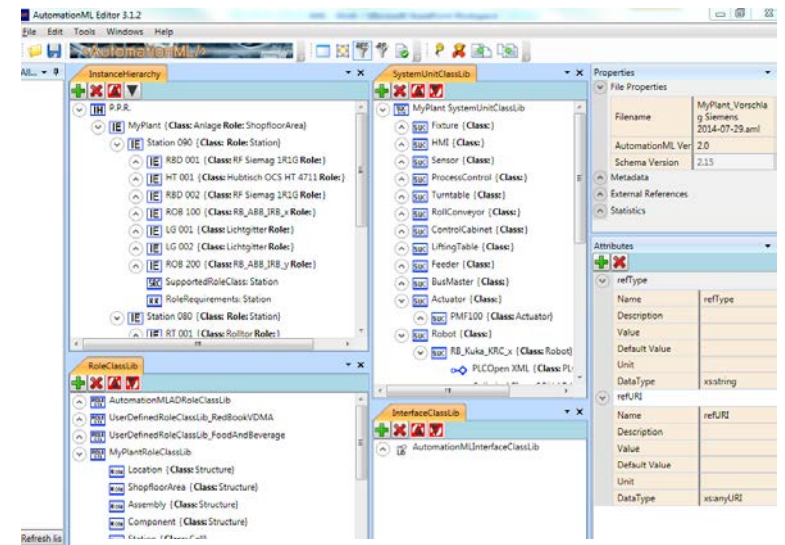
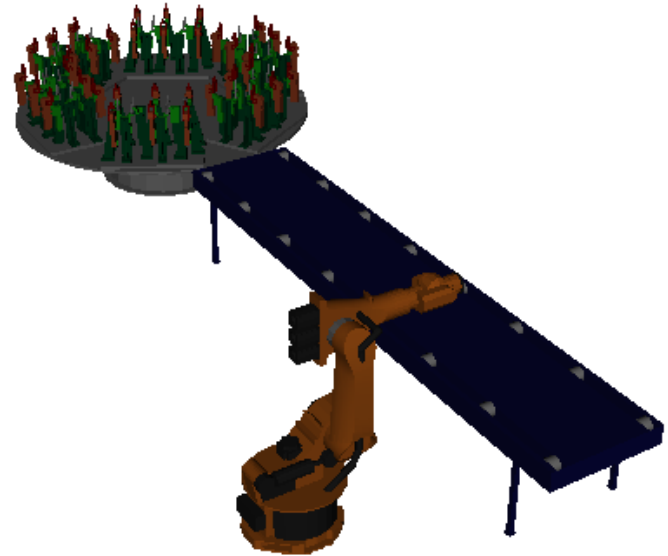
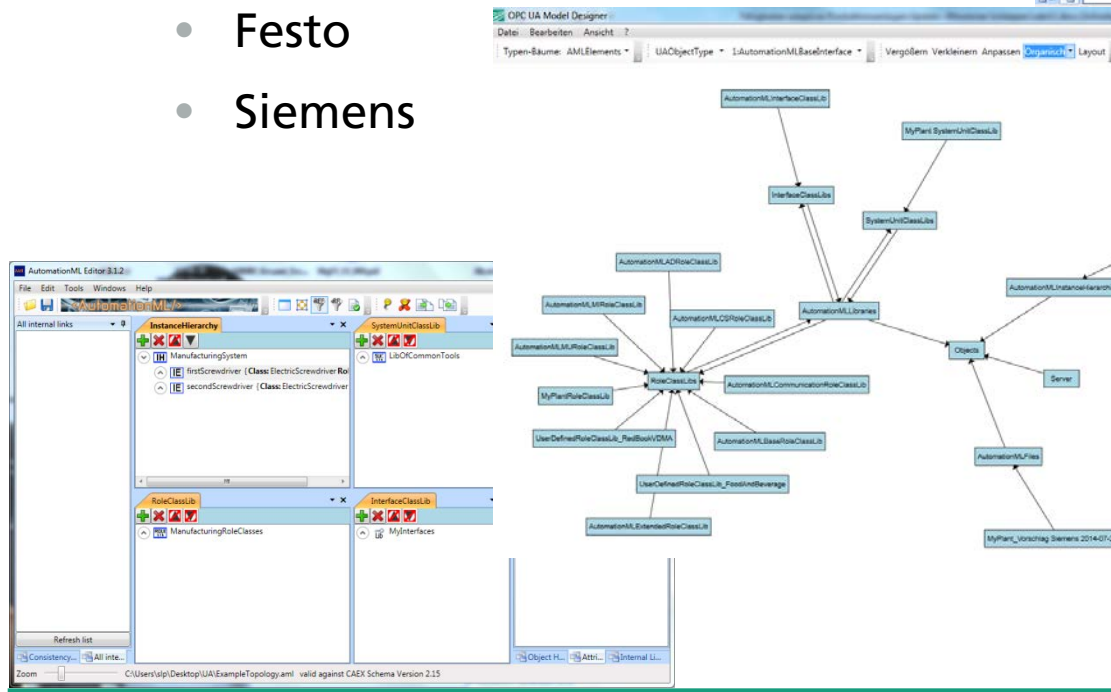


# AML Element <--> OPC UA Types



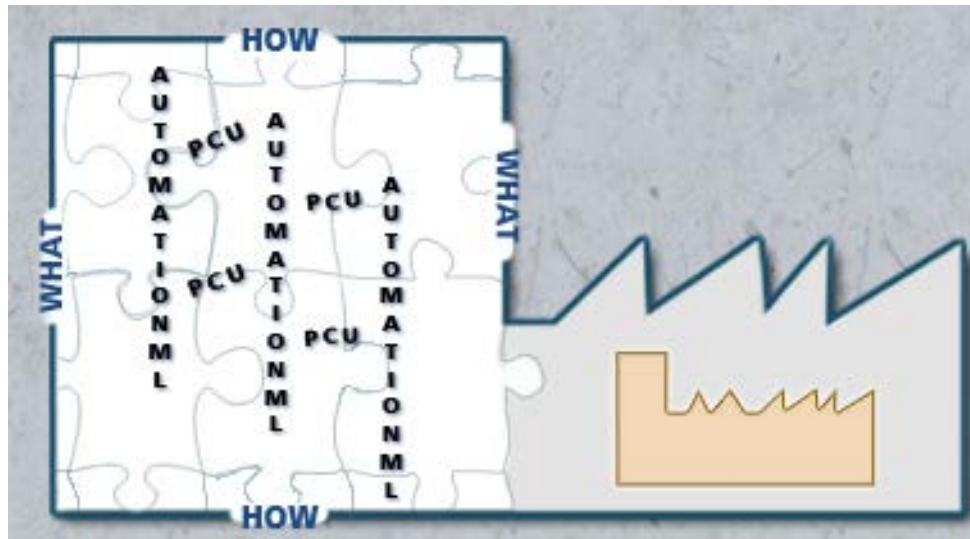
## Actual status

- Evaluation by means of examples
  - Research examples
    - ExampleTopology.aml
    - SimpleExamplePart2\_reduced.aml
  - Practice examples
    - Festo
    - Siemens



# Summary & Outlook

- Work on a companion specification AutomationML for OPC UA  
→ coming soon!
- Evaluation phase and creation of specification text parts
- Actual status via AutomationML website or  
<http://www.iosb.fraunhofer.de/?opcuaaml>
- Join us if you want!





# Thank you for the attention!



# Impressum

<http://www.iosb.fraunhofer.de/?fabrik+und+tools>

OPC UA and AutomationML –  
collaboration partners for one common goal: Industry 4.0

Blomberg, October 2014

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