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The Glue for Seamless
Automation Engineering

Application Recommendation Automation Project Configuration

Exchange of ECAD Data between EPLAN P8 and Siemens TIA Portal

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Motivation

Architecture

Demonstration

Further Activities



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Motivation

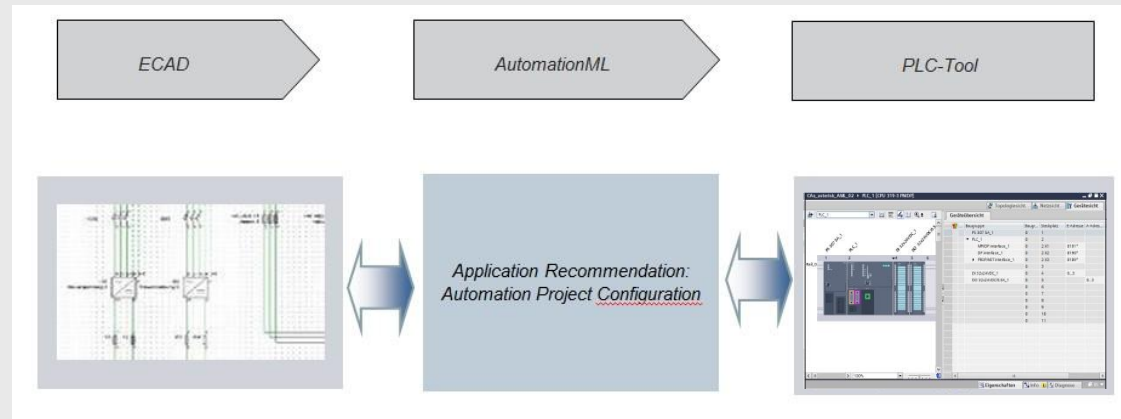
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ECAD and PLC-Tools

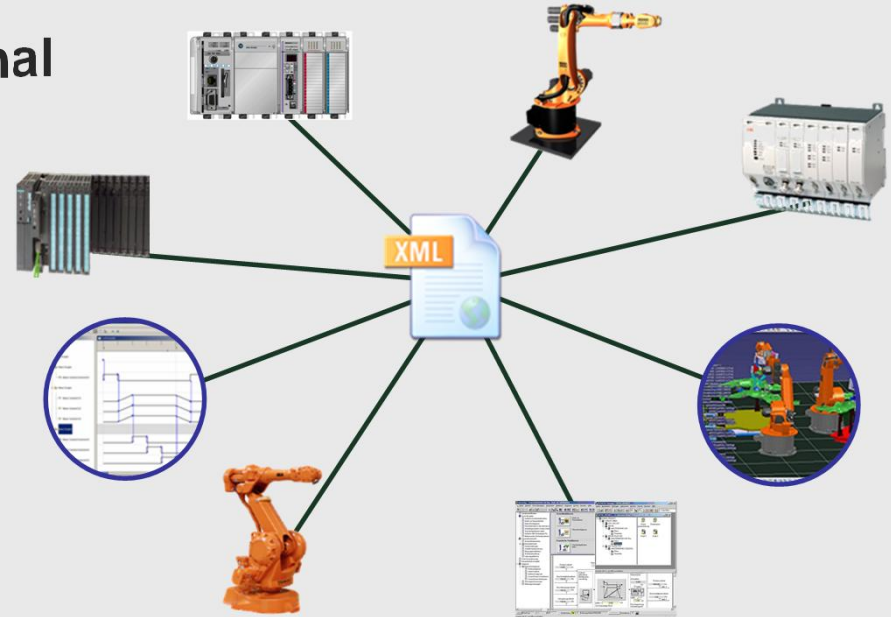
- **ECAD tools and PLC tools have different views of automation system information**
 - ECAD tools handle detailed physical information of devices applied within automation systems
 - PLC tools use a logical compilation of the automation devices
- ➔ A recommendation shall define the data exchange between ECAD and PLC-Tools



Aims of AutomationML

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- AutomationML is a XML based data format.
- AutomationML is an international standard and available free of fee (IEC 62714)
- AutomationML allows consistent data exchange along different tool chains.
- AutomationML now allows consistent data exchange between different ECAD and PLC manufacturers.



**AR APC: Application Recommendation
Automation Project Configuration**

User benefit

- Type data in only one time!
 - Efficiency > Short time to market 🕒
 - Accurate information > Avoiding mistakes €
 - Automated communication > Integrated workflow 🕒 €
 - Fast & detailed information > Change management 🕒 €



Save 🕒 & € with this (simple?) concept!



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- **AutomationML Objects are defined in RoleClassLibraries**
 - AutomationMLBaseRoleClassLib
 - Group, Facet, Port, Ressource, Product, Process, Structure, PropertySet
 - CommunicationRoleClassLib
 - Physical and Logical Devices and Connections
- **AutomationProjectConfigurationRoleClassLib**
 - Devices and DeviceItems
 - Tags, TagTables and TagFolders
 - Subnets, Nodes, IoSystems, CommunicationPorts
 - ...

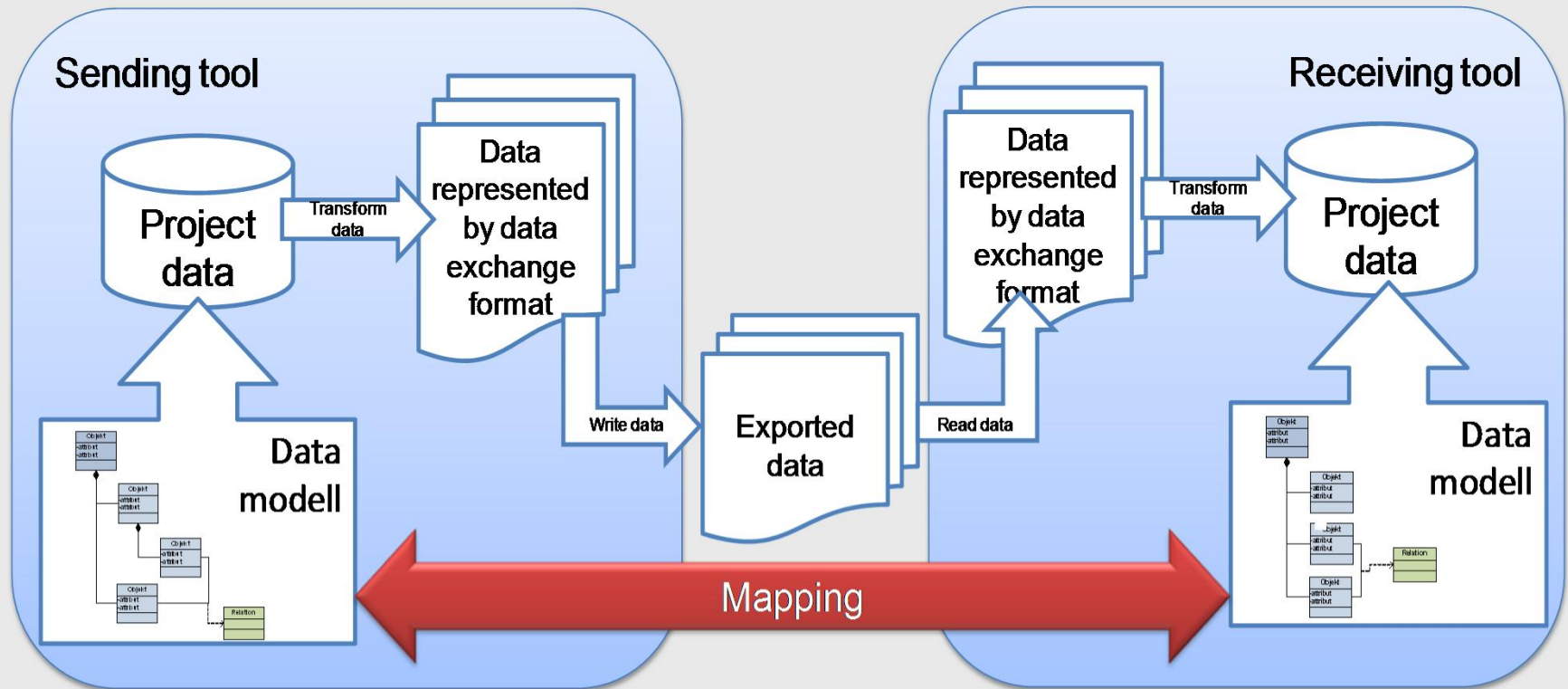


All these roles are derived from the
AutomationMLBaseRoleClassLib and
CommunicationRoleClassLib

APC – Neutral Model (1)

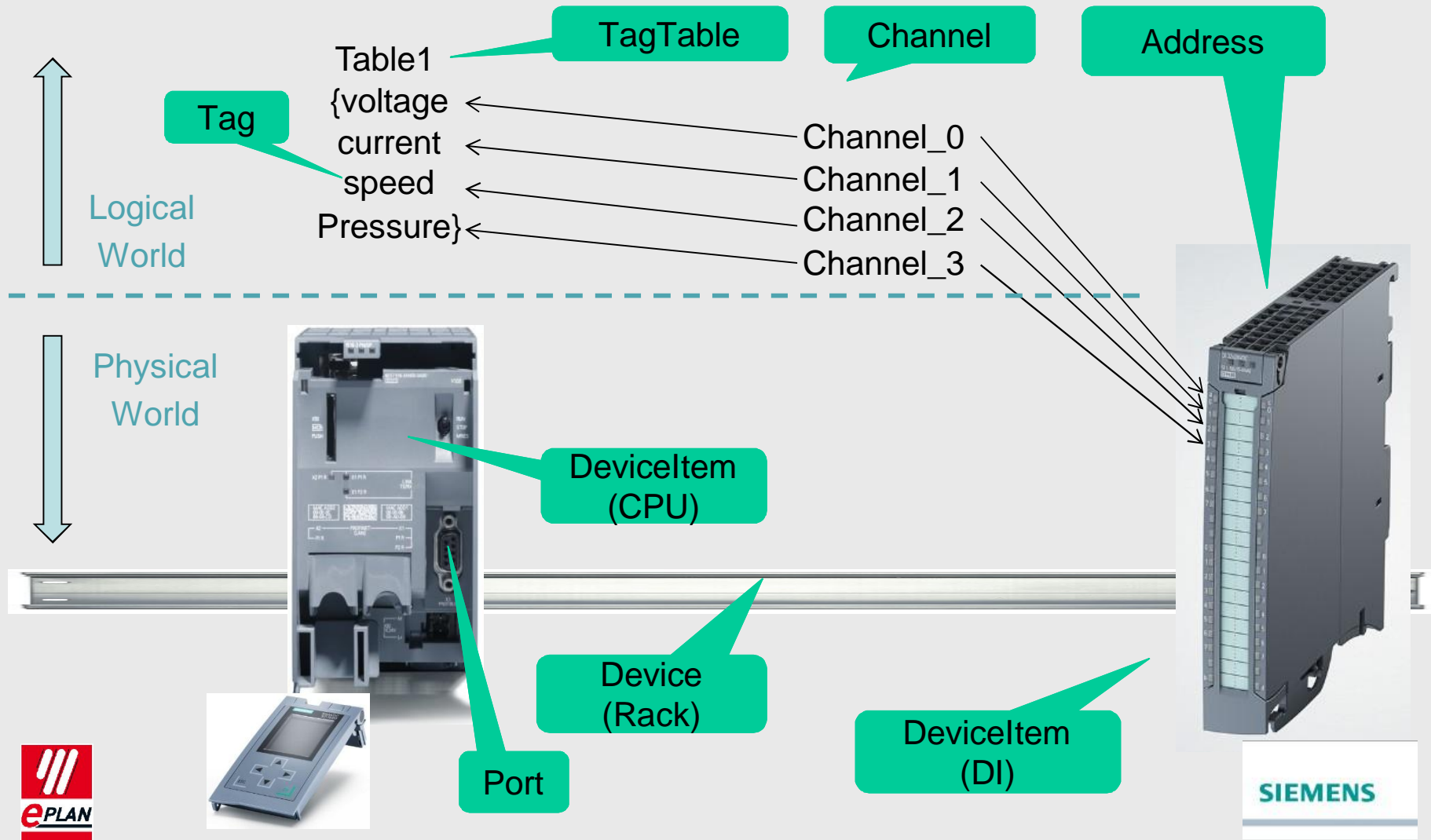
- **PLC-specific interfaces of the different PLC and ECAD manufacturers must be decoupled**
 - Independence of further development of PLC- and ECAD-Tools
 - Openess for future PLC modules
- **Using a neutral model allows**
 - Definition of PLC-Tool independent roles in AutomationML
 - Definition of PLC-specific Classes for different ECAD- and PLC-Tools / vendors in AutomationML.
 - Definition of PLC-specific InterfaceClasses in AutomationML

APC – Neutral Model (2)



- **Consideration of already existing formats of PLC manufacturers leads to these objects (abstract):**
 - **Device**
 - collection in which the individual HW objects like racks are brought together
 - **Deviceltem**
 - is aggregated by a Device and represents an object class for HW modules and submodules (CPU, I/O module, etc.)
 - **Tag**
 - represents the symbolic name of an I/O date
 - **Channel**
 - is part of an IO module and represents the process interface (e.g. digital or analogue input/output)
 - **Node**
 - specifies all the interface related networking information of a network node. (e.g. logical address, subnet mask)
- ...Please refer to AR APC for more details, attributes and the UML-model

APC Objects in a Nutshell





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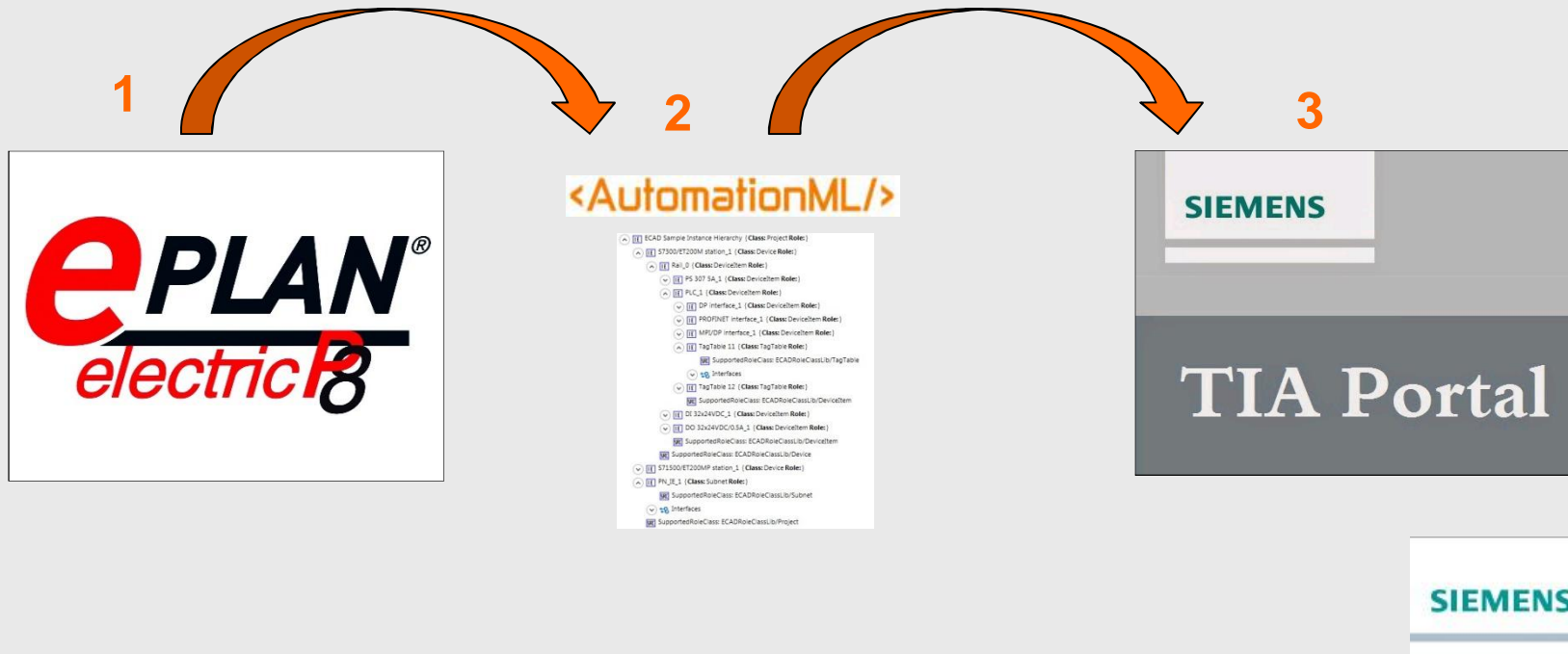
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APC Demonstration

- Live Demo in EPLAN P8 and Siemens TIA-Portal
 1. Edit an EPLAN P8 Project
 2. Export EPLAN P8 to AutomationML and show AutomationML-File
 3. Import AutomationML File into Siemens TIA-Portal and show result

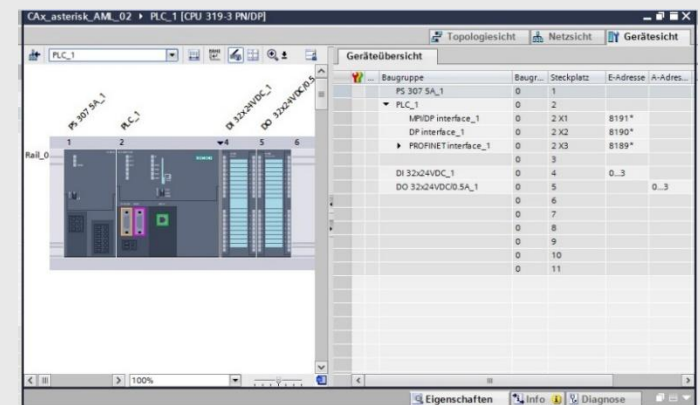
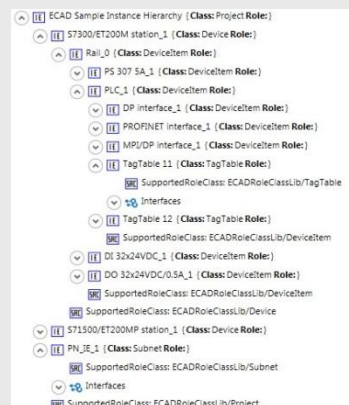
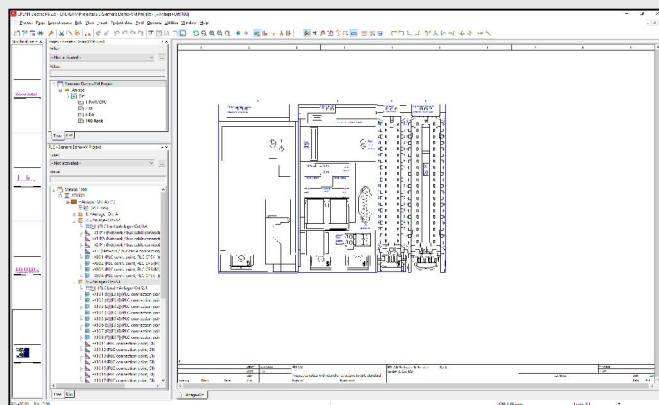


APC Demonstration Configuration

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■ Demo Configuration

- Power supply (6ES7 507-0RA00-0AB0)
- CPU 1516-3 PN/DP (6ES7 516-3AN01-0AB0)
- Digital Input (6ES7 521-1BL10-0AA0)
- Digital Output (6ES7 522-1BL00-0AB0)





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Experiences in this project

- **We needed communication**
 - Mapping of terminology / words
 - Understanding of different views / data structures
- **We did programming work in detail**
 - Define Use cases
 - Coding...
- **We found things in detail we like to have in the AR**
 - Suggestions for further versions of the AR
- **Other companies are interested in AutomationML**
 - PLC vendors
 - Customer
 - New ideas arising fast...

Further Activities

- **Extension of functionality**
 - Export from Siemens-TIA-Portal
 - Import in EPLAN P8
 - Integration of new HW components



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Thank you for your Attention

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