

<AutomationML/>

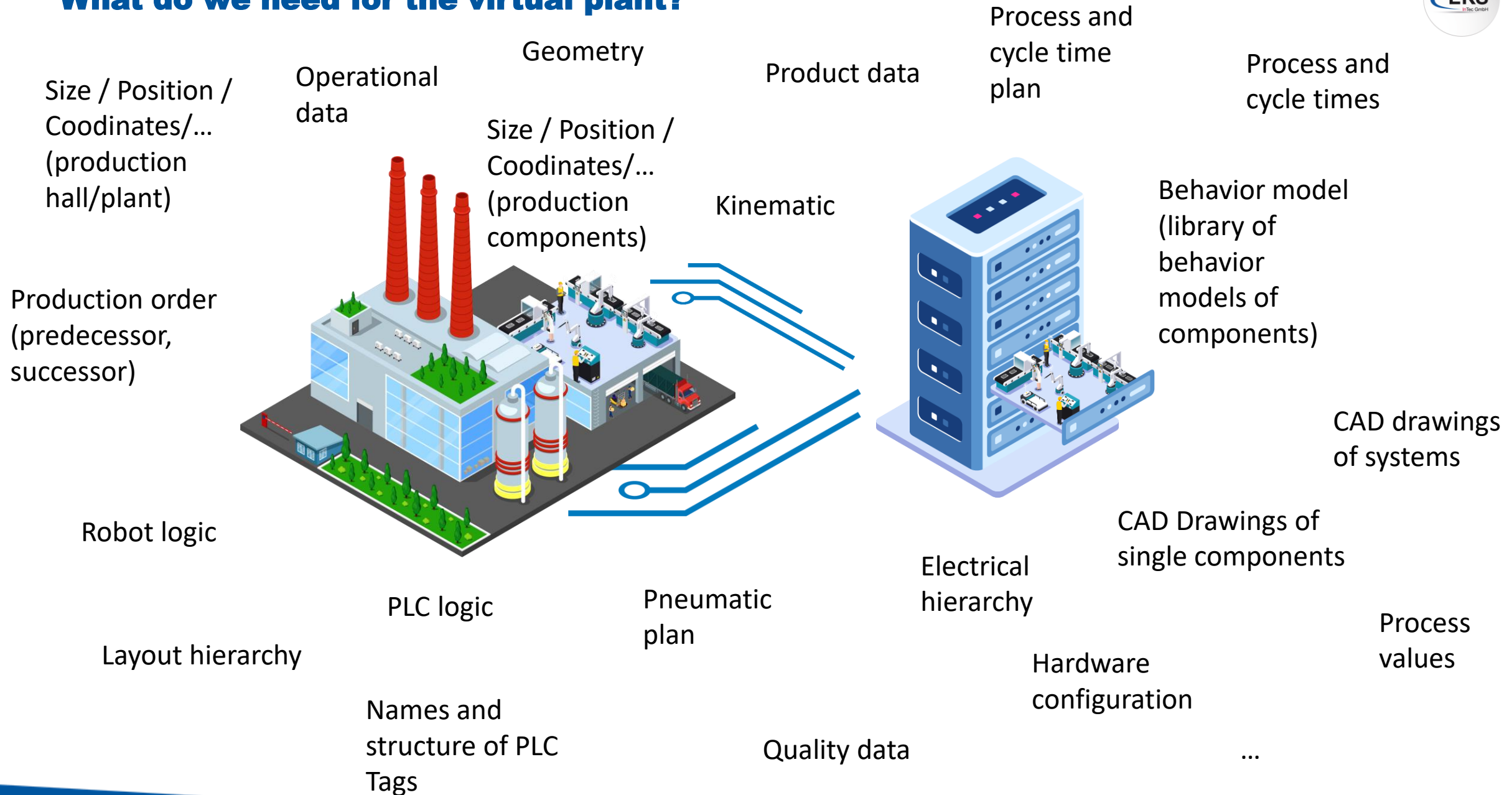


Why?



<https://www.youtube.com/watch?v=Nrzd-3Kbr9Q>

What do we need for the virtual plant?

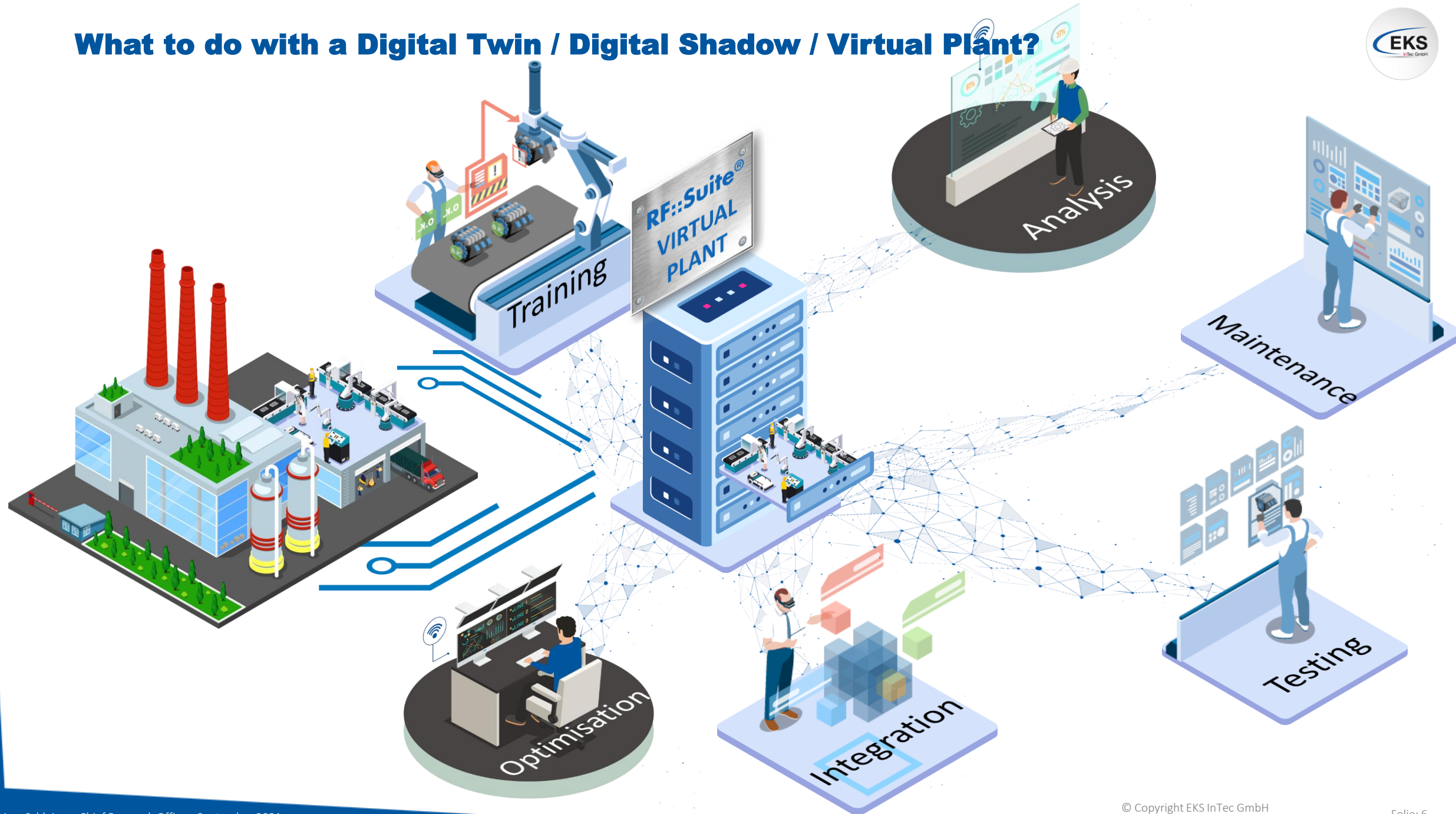


Why this combination?

- AutomationML integration in OPC UA
 - Goal: Communicate and operationalize AutomationML by means of OPC UA
 - OPC UA server includes functional view on production → information model
 - Result: AutomationML models can be exchanged via OPC UA
 - Benefit: simplify the creation of OPC UA information models based on existing AutomationML data
 - Application: re-engineering and maintenance use cases where the AutomationML model evolves over time
- OPC UA integration in AutomationML
 - Goal: Lossless exchange of OPC UA system configuration within AutomationML models
 - Result: Parameters to set up OPC UA communication between tools can be exchanged using AutomationML
 - Benefit: simplify the configuration of OPC UA client connections to an OPC UA server (reduce manual configuration effort)
 - Application: configuration of communication networks based on description of network configuration and structure (including communication components of sensors and actuators with respect to communication system parameters, network structure and wiring, quality of service, etc.)

- AutomationML integration in OPC UA
 - Information life-cycle management
 - Up-to-date description of the system as-is
 - Information exchange (e.g. asset information, quality information, diagnostic data, etc.) with MES or SCADA system for system operation
 - Communicate/Operationalize AML by means of OPC Unified Architecture
 - Lossless storage and retrieval of system engineering information for system maintenance, repair, overhaul (MRO)
 - Lossless storage and retrieval of system engineering information for manufacturing system reconfiguration
- OPC UA integration in AutomationML
 - Lossless exchange of OPC Unified Architecture system configuration
 - Mixed simulation environments
 - Manufacturing change management

What to do with a Digital Twin / Digital Shadow / Virtual Plant?

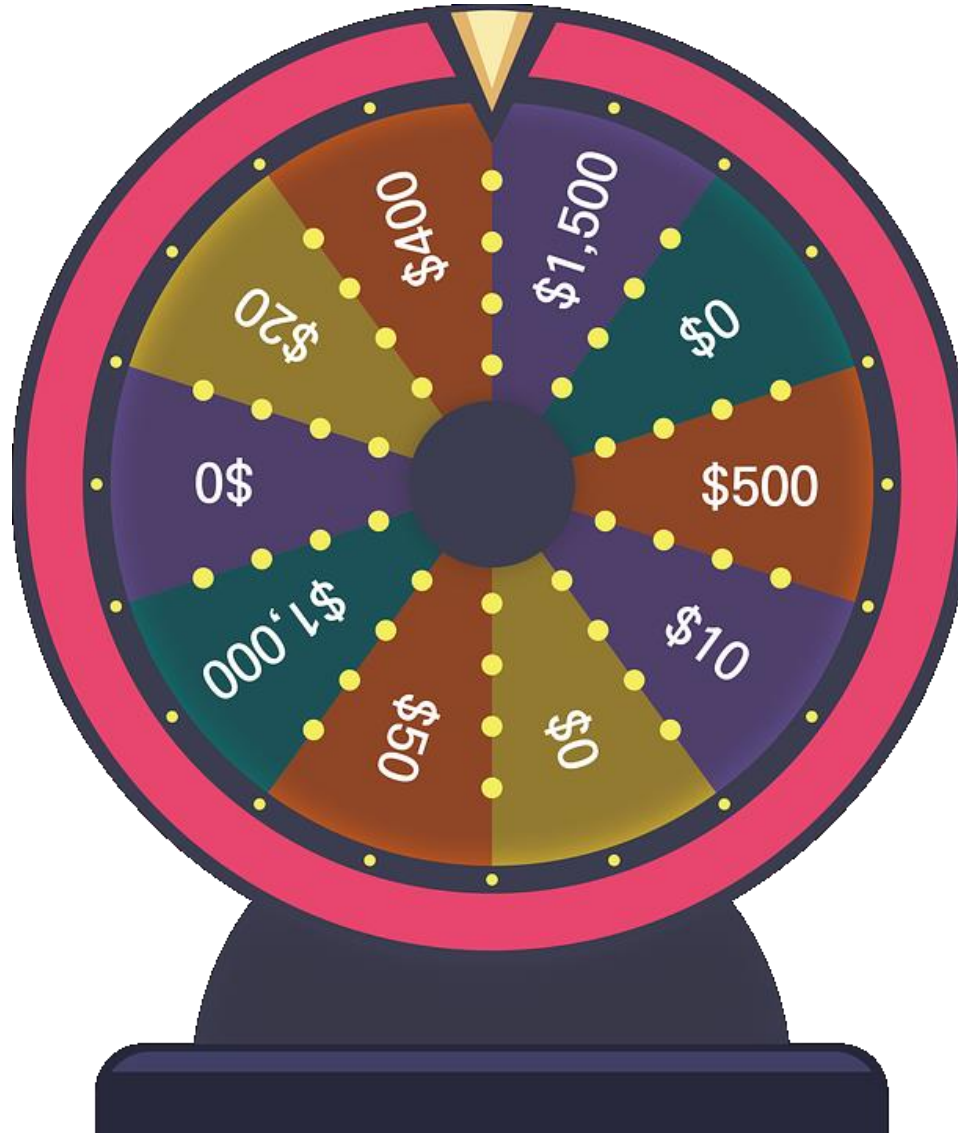
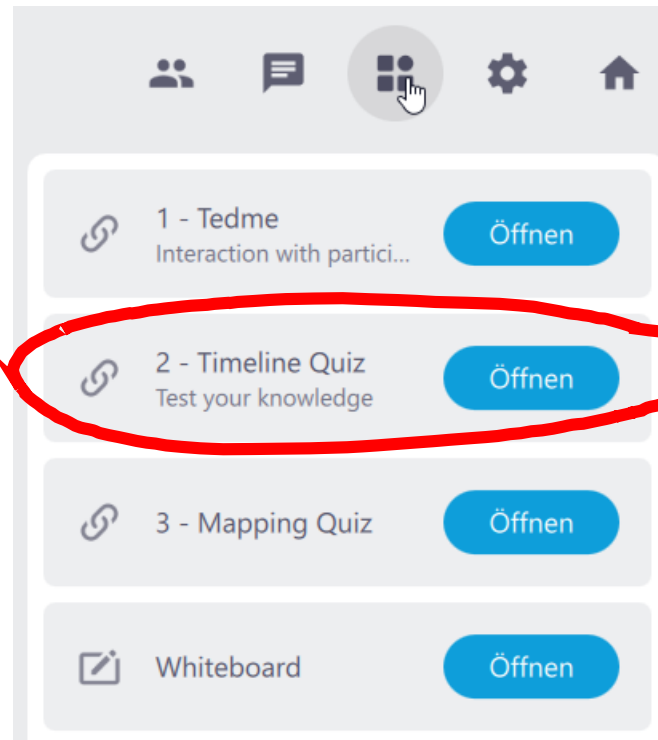


What happened so far?

- 2014: Foundation of joint working group
- February 2016: [Companion Specification „AutomationML for OPC UA“](#)
 - general explanation, mapping rules, and definition of organizing nodes and AutomationML standard libraries
- December 2016: [DIN SPEC 16592 – Combining AML and OPC Unified Architecture](#)
 - Extended mapping rules, integration of OPC UA configuration data in AutomationML, relation to other standards and specifications, and use cases for industrial application
- May 2017: [AML BPR - DataVariable](#)
 - Integration of OPC UA configuration data in AutomationML
- 2018: Start work on next version of Companion Specification
- 2020: Decision bi-directional mapping
- ... tbc

Quiz time 2

<https://learningapps.org/display?v=pv9td6fec21>



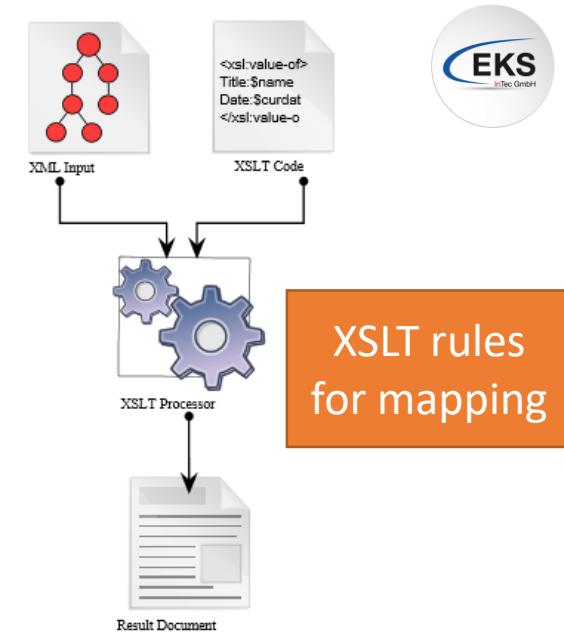
New version of companion specification

- Adaption of mapping to IEC62714-1:2018 ED2 (CAEX 3.0) ✓
- Corrections in mapping description reported by users ✓
- Extension of mapping between AML and UA
- Harmonization of OPC UA Companion Spec and DIN SPEC ✓
- Adaption of mapping to new OPC UA concepts, e.g. Interface concept
- Bi-directional mapping incl. roundtrip possibility

	AutomationML	OPC UA
	InternalElement	Object
	SystemUnitClass	ObjectType
	RoleClass	ObjectType (derived from BaseInterface)
tbc →	InterfaceClass	ObjectType
	Attribute	Variable
tbc →	ExternalInterface	Object

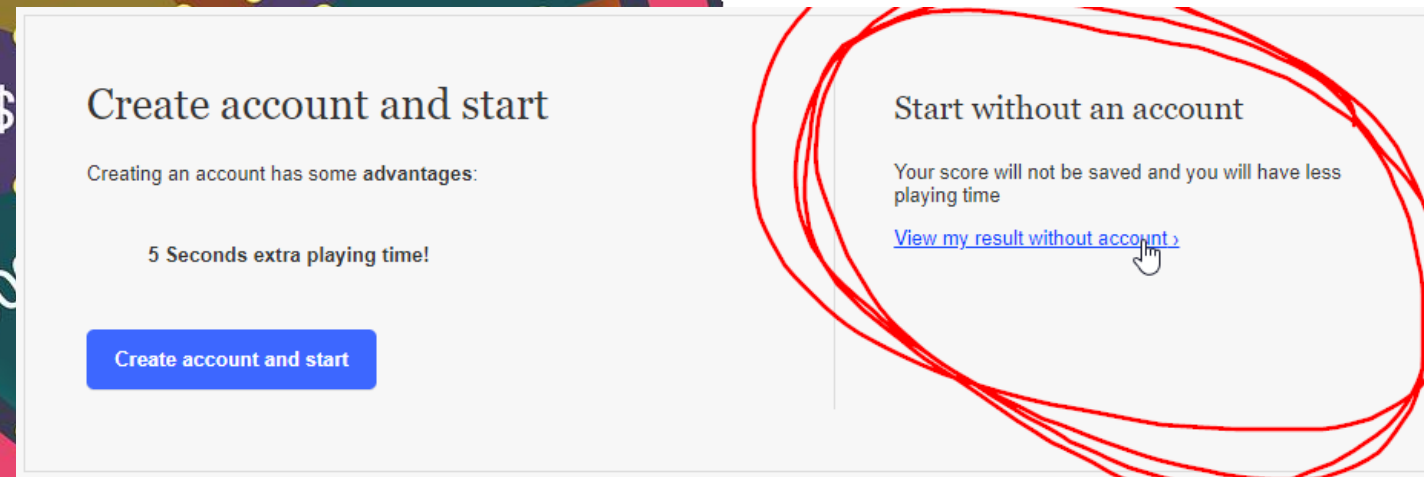
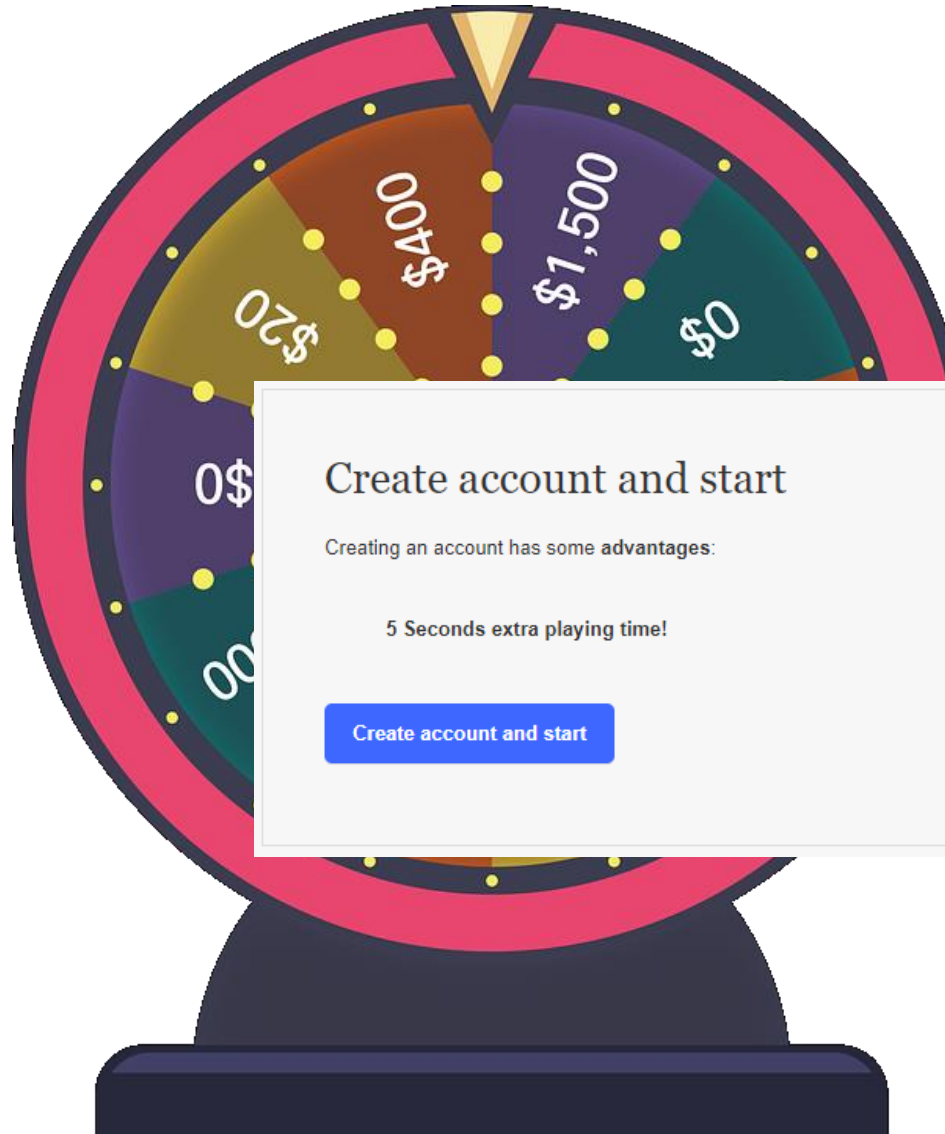
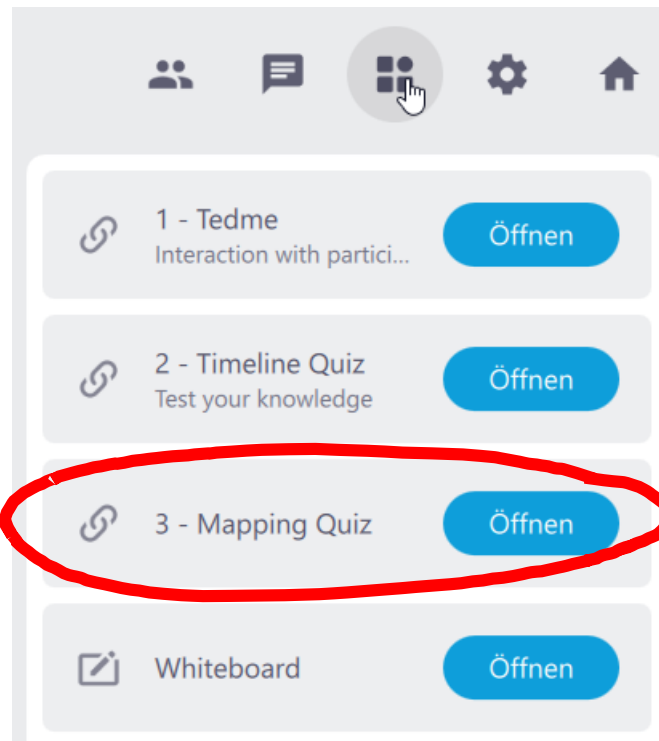
✓ OPC UA NodeID vs. AutomationML UUID

Data type mapping – Sub-working group of OPC UA Harmonization Working Group
To be published: end of 2021 ✓



Quiz time 3

<https://www.onlinequizcreator.com/amlua/quiz-477363>



Innovative Tools for the Virtual Plant



www.rf-suite.de

www.eks-intec.de



EKS InTec GmbH

Dr.-Ing. Miriam Schleipen

Chief Research Officer

miriam.schleipen@eks-intec.de

Tel. +49 (0) 151 12965307

EKS InTec GmbH
Danziger Straße 3
D-88250 Weingarten
+49(0)751 36216-0
info@eks-intec.de