Binding between OPC UA and Web of Things
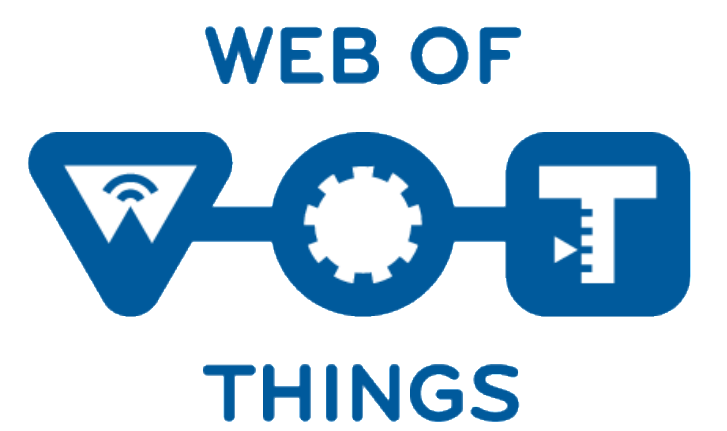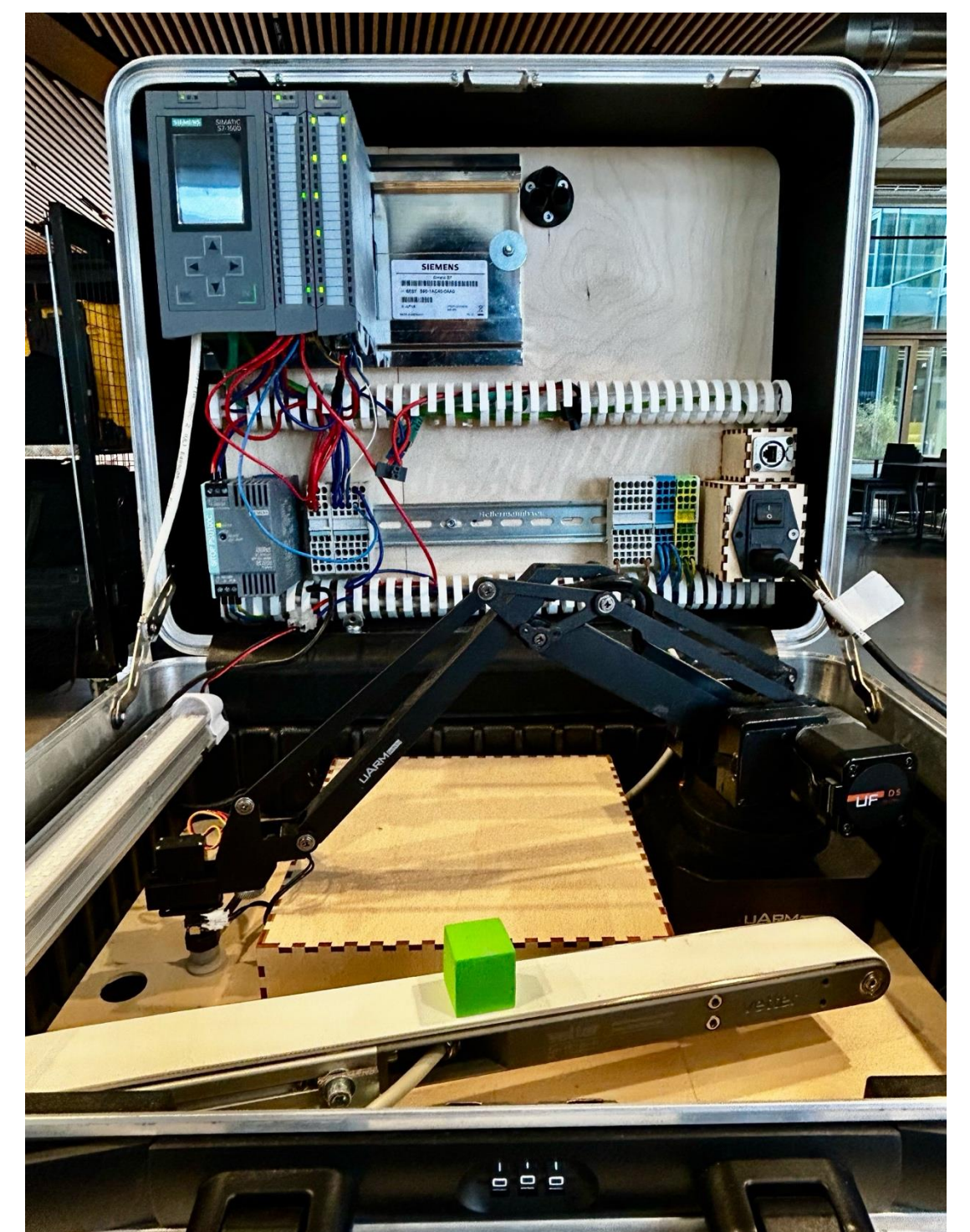
Motivation:

- OPC UA nodeset of a machine is complex with thousands of datapoints.
- Many of the datapoints may not be required for application development.
- Expose simple interface of the machine on the IT layer.
- Simplify IoT application development by providing easy access to OPC UA endpoint through Thing Description.
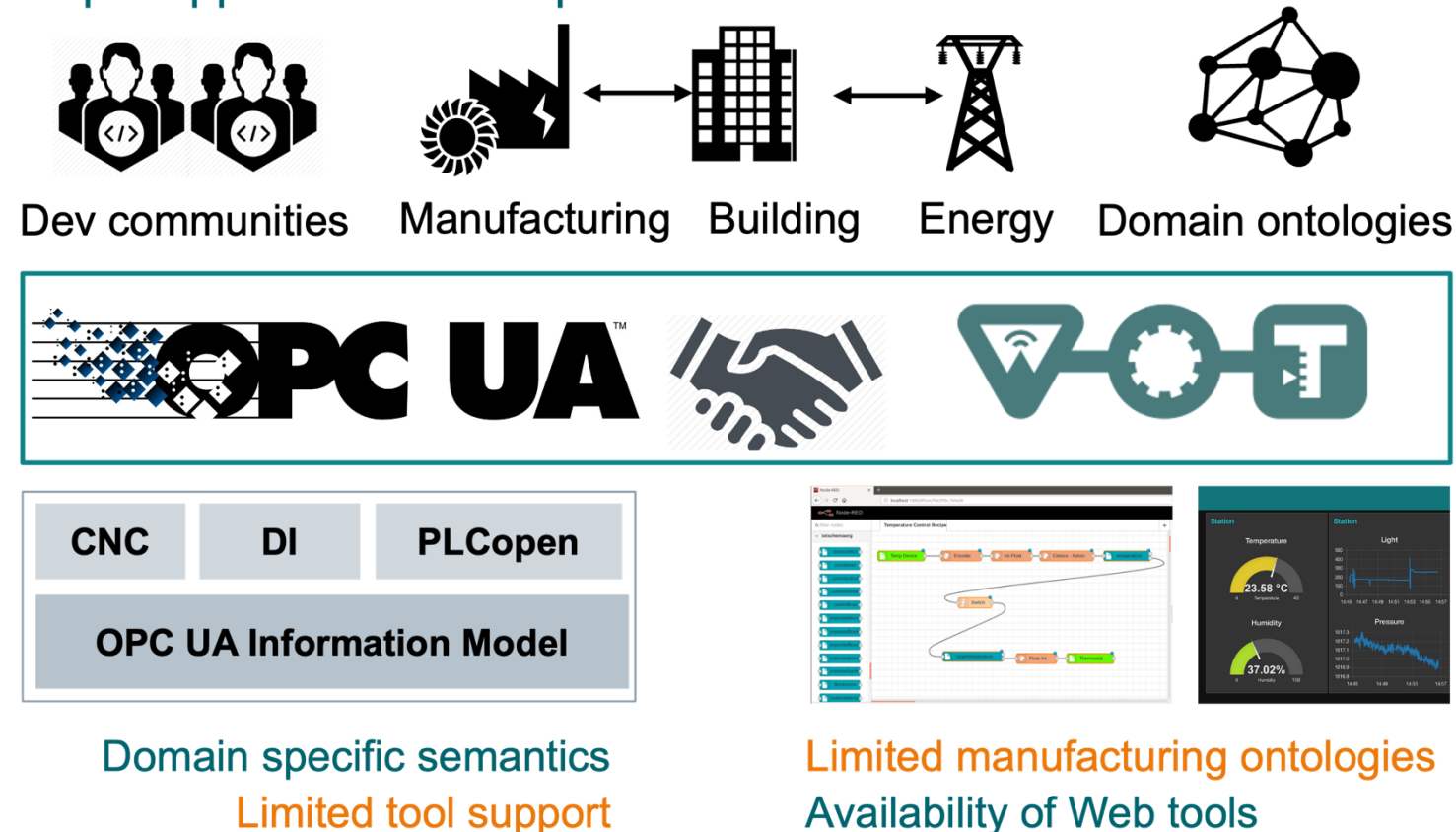- Accelarate IT/OT data integration
- Simplify onboarding on OPC UA assets

Demo setup

What can be seen:

- Read data and write on the OPC server through WoT TD
- Mapping between OPC UA info. model and WoT TD
- Represent OPC UA data points in WoT TD terms
- OPC UA WoT protocol binding
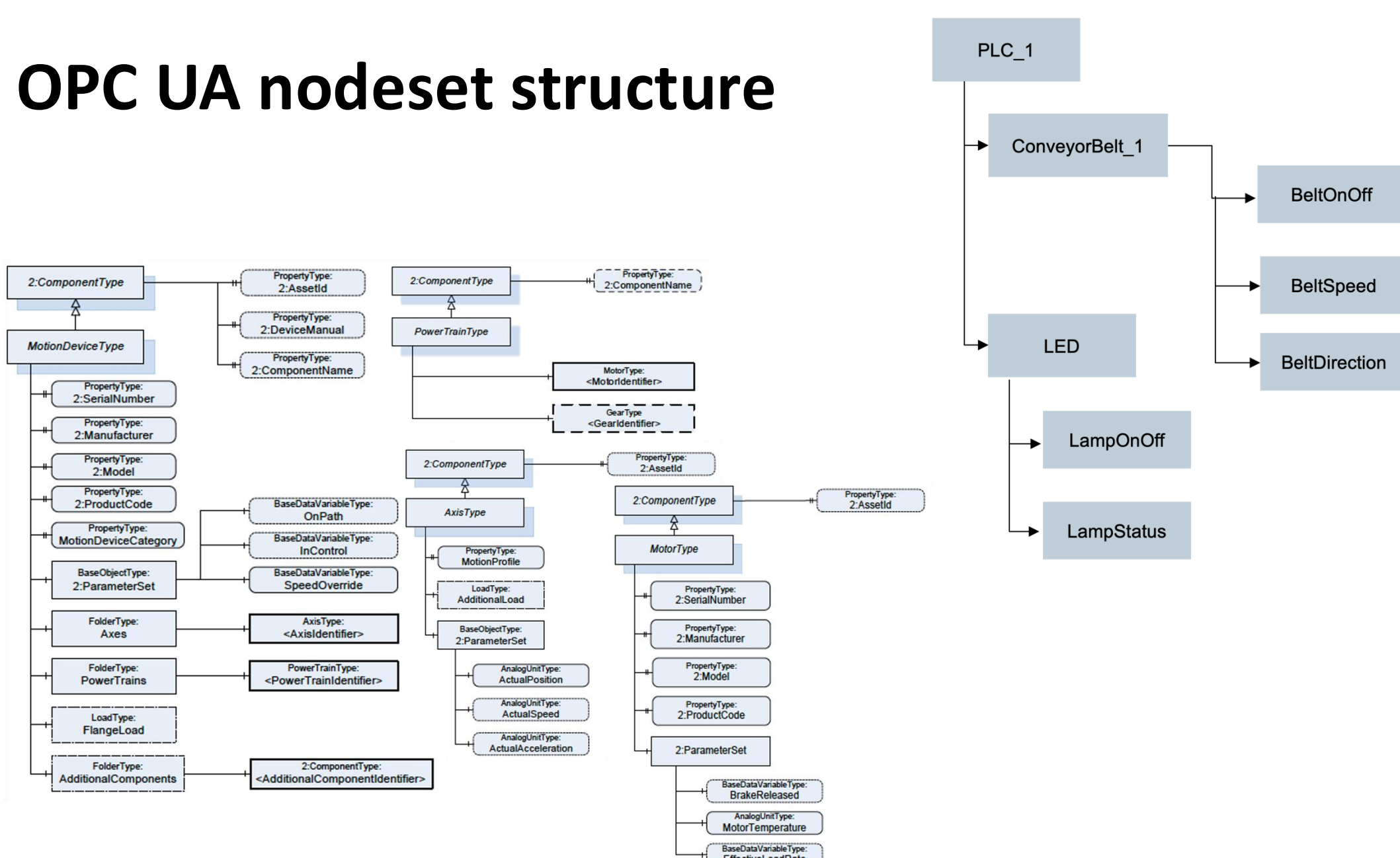- Real deployment on Siemens SIMATIC S7 1500 PLC

Rapid application development with:

Dev communities   Manufacturing   Building   Energy   Domain ontologies

OPC UA

CNC	DI	PLCopen
OPC UA Information Model		

Domain specific semantics — Limited manufacturing ontologies
Limited tool support — Availability of Web tools

OPC UA nodeset structure

WoT TD Structure


```
1    {
2        "@context": [
3            "https://www.w3.org/2019/wot/td/v1",
4            {
5                "opc": "http://opcfoundation.org/UA/",
6                "iec61360": "https://webstore.iec.ch/publication/5381",
7                "eclass": "https://www.eclasscontent.com/owl/v11.1"
8                "@language": "en"
9            }
10       ],
11       "id": "urn:siemens:demo:case:lamp",
12       "title": "Demo Lamp Case",
13       "@type": "eclass:IRDI_0173-1#01-ADP410#010",
14       "securityDefinitions": {
15           "nosec_sc": {
16               "scheme": "nosec"
17           }
18       },
19       "security": "nosec_sc",
20       "base": "opc.tcp://192.168.120.237:4840/",
21       "properties": {
22           "lampOnOff": {
23               "title": "Set lamp status",
24               "description": "True=Lamp is on; False=Lamp is off",
25               "eclass:IRDI_0173-1#01-ADN292#009": {
26                   "eclass:IRDI_0173-1#02-AAC314#002": "K"
27               },
28               "writeOnly": true,
29               "type": "boolean",
30               "@type": [
31                   "opc:Boolean",
32                   "iec61360:BooleanType"
33               ],
```