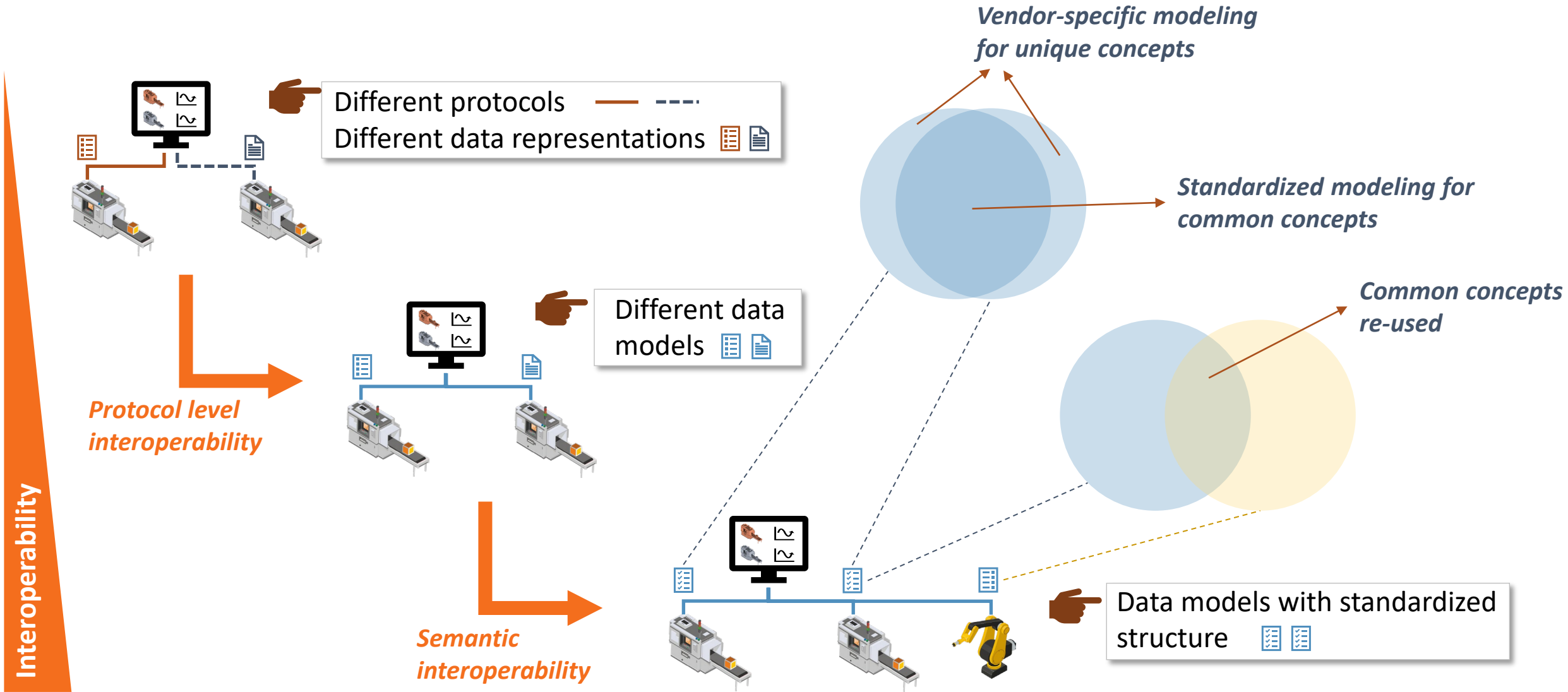# OPC UA Companion Specifications
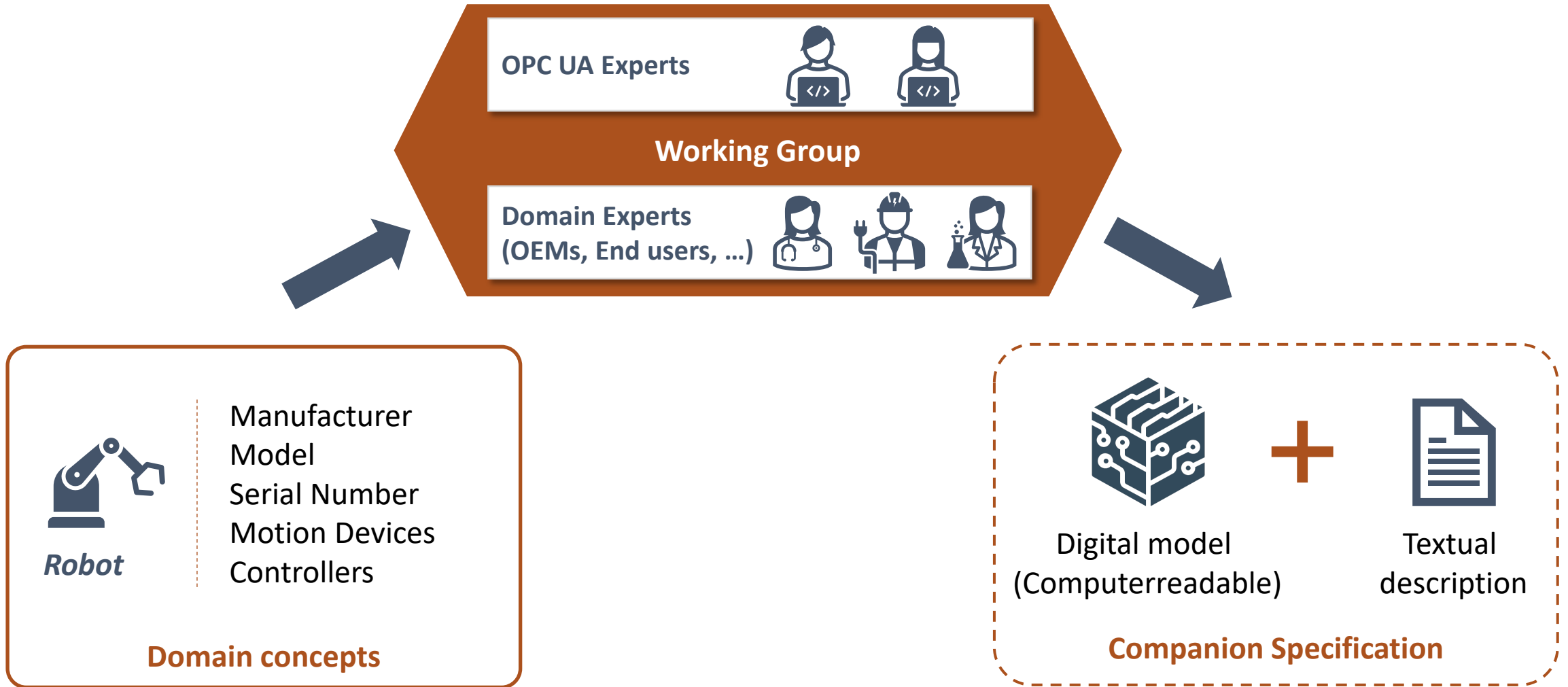
Fahad Golra, Agileo Automation
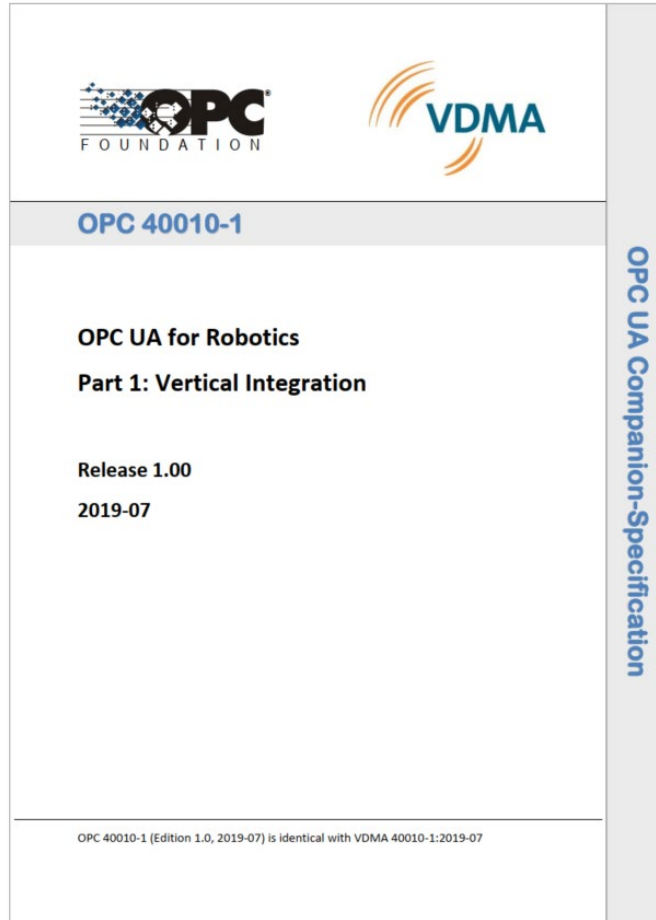
Multiple levels of interoperability

Different protocols
Different data representations

Vendor-specific modeling for unique concepts

Standardized modeling for common concepts

Protocol level interoperability

Different data models

Common concepts re-used

Semantic interoperability

Data models with standardized structure

Interoperability

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Development of a CS

OPC UA Experts

Working Group

Domain Experts
(OEMs, End users, ...)

Robot

Manufacturer
Model
Serial Number
Motion Devices
Controllers

Domain concepts

Digital model
(Computerreadable) **+** Textual
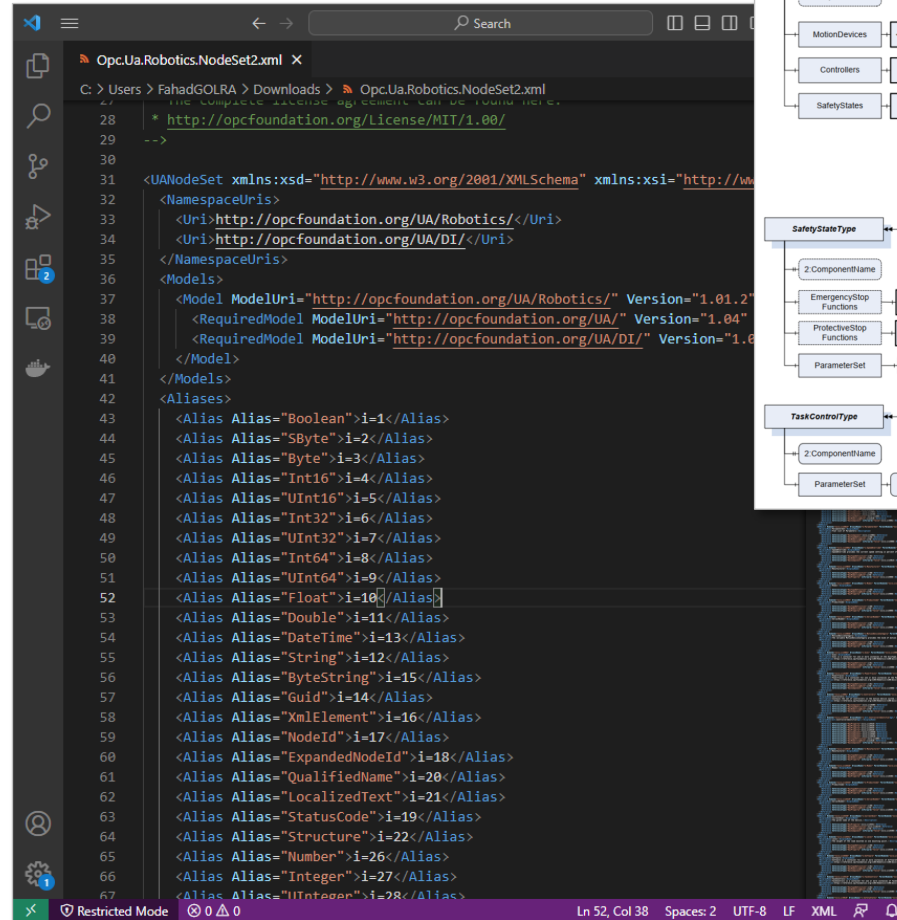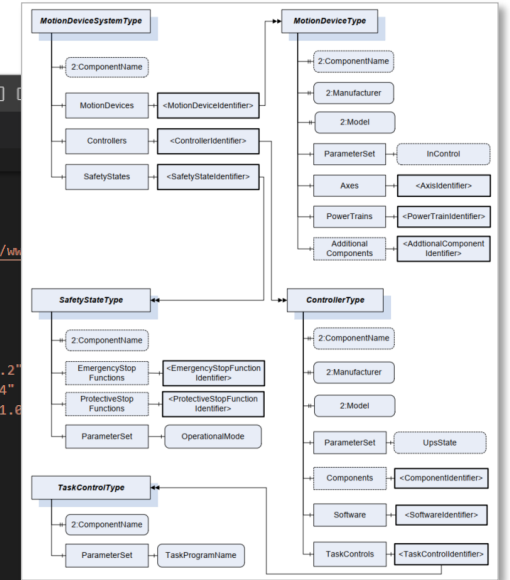description

Companion Specification

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CS Example – Robotics

Textual specifications

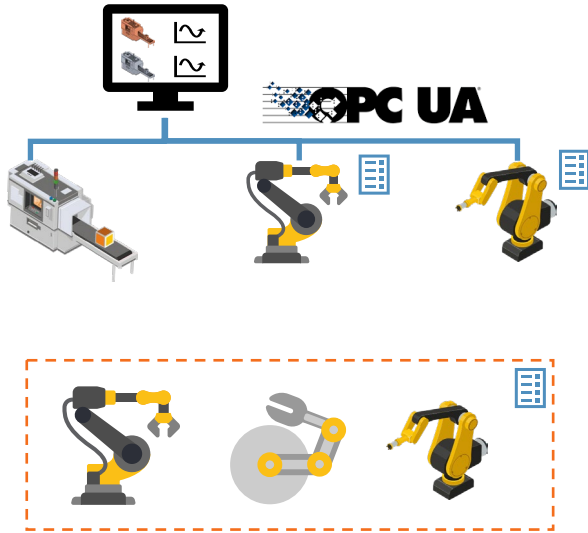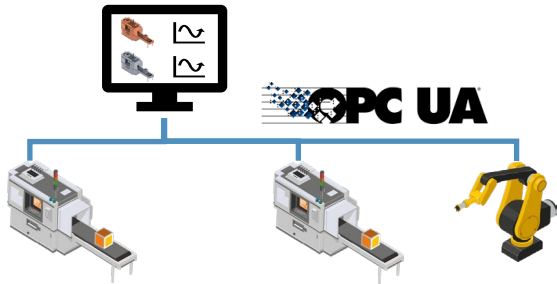Digital model in nodeset file (XML)

Graphical Notation

Interoperability with OPC UA

Companion specifications at multiple levels

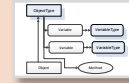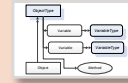**OPC UA communication network**

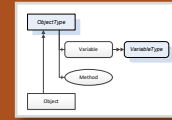| Enterprise & Cloud	Asset Management	ISA-95 Job Control	Cloud Library API Definition
Industrial Automation	Process Automation Devices – PADIM	OPC UA for PackML	OPC UA for DEXPI P&ID
Devices, tools & Equipment	OPC UA for Robotics	OPC UA for Weighing Tech.	OPC UA for CNC Systems
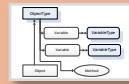
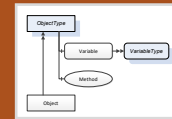**OPC Unified Architecture** — Data Access | Alarms & conditions | Information modeling (Objects/Types, Variables, ...)

OPC Unified Architecture — Data Access | Alarms & conditions | Information modeling (Objects/Types, Variables, ...)

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Working Groups

- 71 different working groups
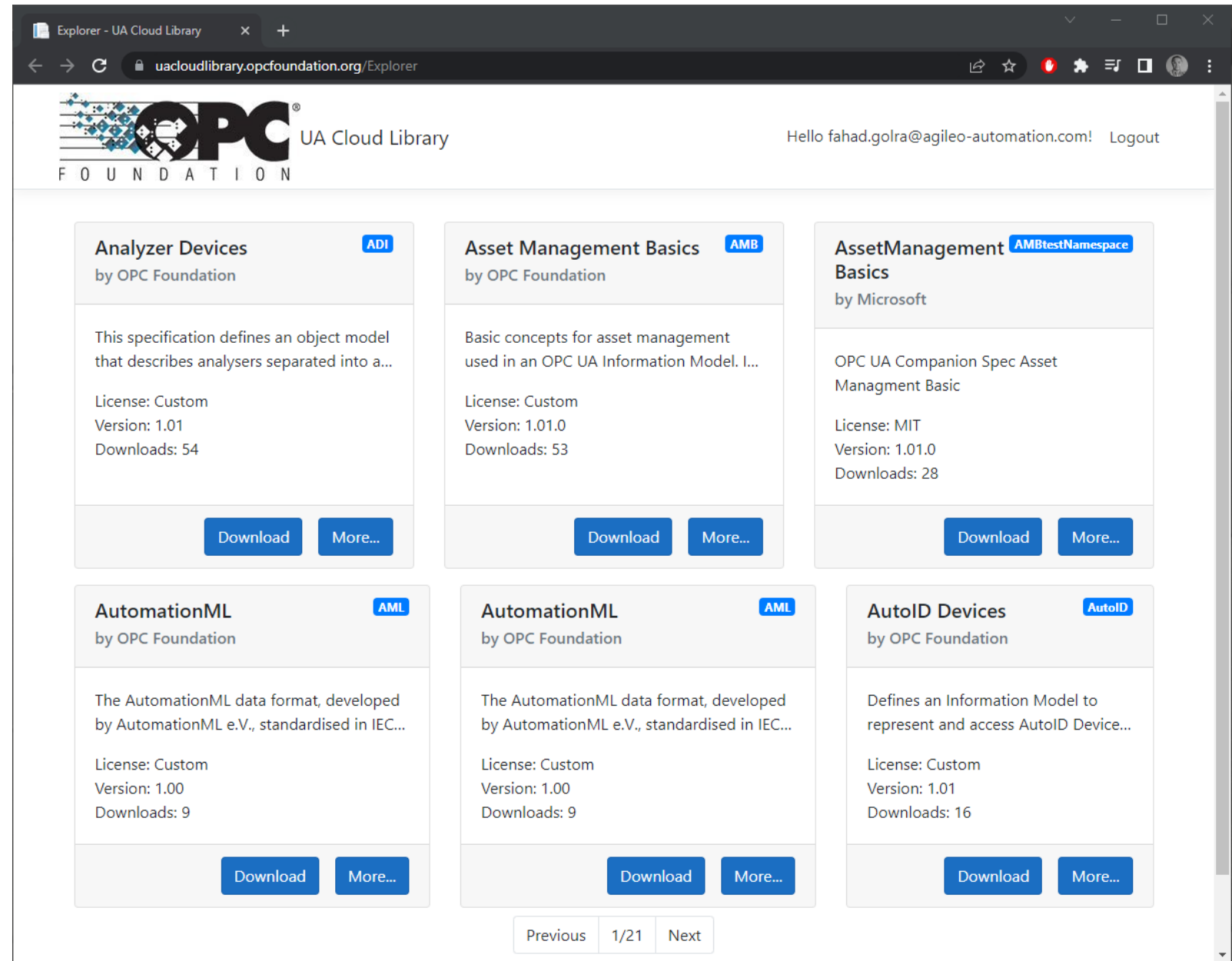
  - Joint -> 58

  - Internal -> 17

  - External -> 1

www.opcfoundation.org -> About -> Working Groups -> List of Working Groups

UA Cloud Library
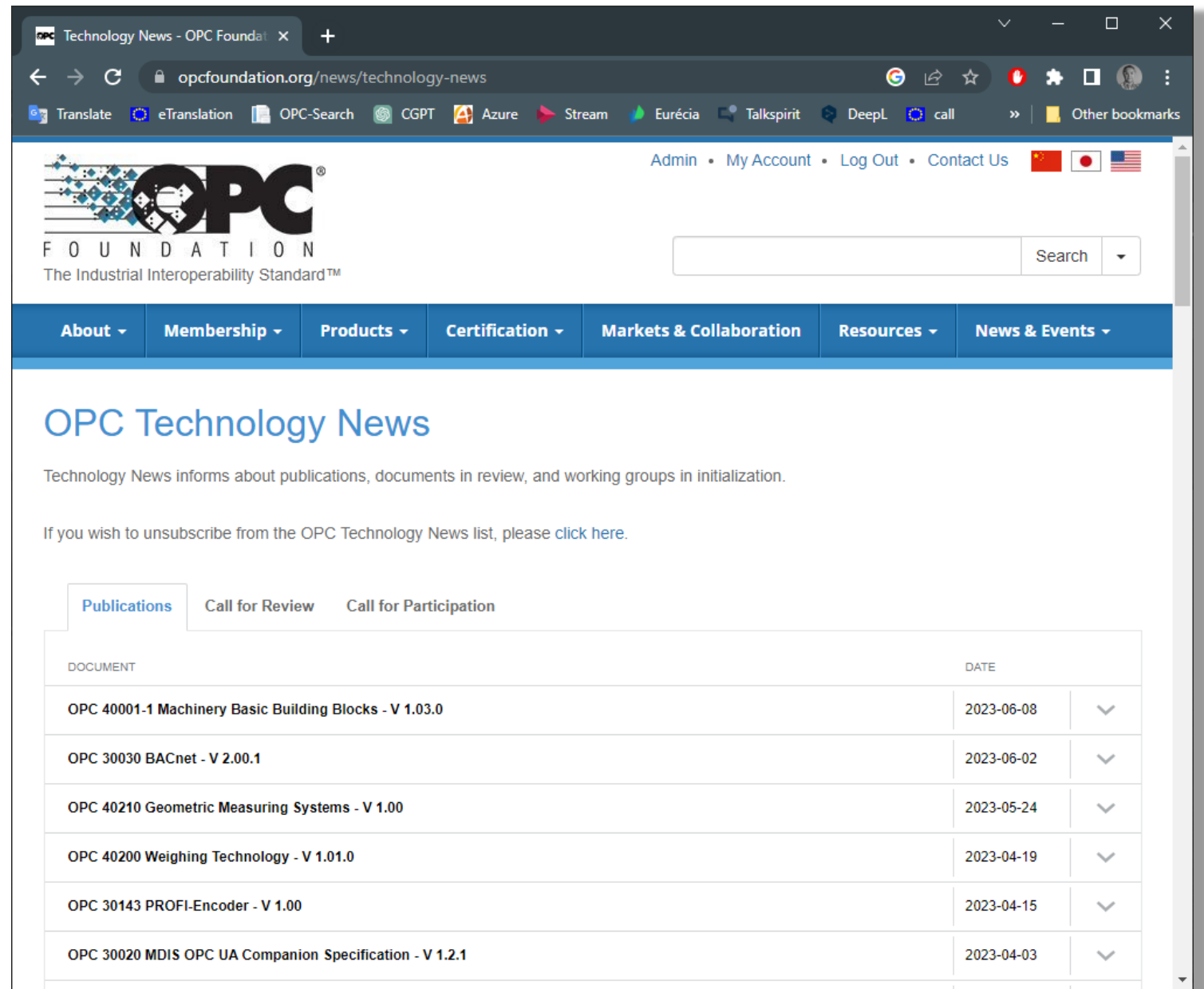
- A *query-able* online store of OPC UA CS information models.

- 126 OPC UA Information Models for the companion specifications available

- UA Cloud Library Explorer

- GraphQL Editor

https://uacloudlibrary.opcfoundation.org

Technology News

- Updates about the latest versions of CS
  - Subscription to the technology updates

- Call for review
  - Review the companion specifications before their release.

- Call for participation
  - Join the working groups

Spread of OPC UA Companion Specifications

Manufacturing mechanics

40001 - Machinery
40010 - Robotics - Vertical Integration
40020 - Cranes&Hoists - MotionDevicesSystemBase
40077 - PlasticsRubber – IM Machines to MES
40079 - PlasticsRubber – IM Machines to Robot
40082 - PlasticsRubber - Peripheral Devices
40083 - PlasticsRubber - General Types
40084 - PlasticsRubber - Extrusion
40086 - PlasticsRubber - Material Supply Systems
40100 - Machine Vision
40200 - Weighing Technology
40223 - Pumps and Vacuumpumps
40250 - Compressed Air Systems
40301 - Flat Glass Processing
40400 - UA for Powertrain
40444 - Textile Testing Devices
40451 - Tightening Systems
40501 - Machine Tools
40502 - CNC Systems
40540 - UA for Additive Manufacturing
40550 - Woodworking Machinery
40740 - Process Air Extraction and Filtration

Field Device Integration

30080 - FDI Specification
30090 - Field Device Tool

Field Communication

30100 - Sercos Devices
30110 - Powerlink
30120 - IO-Link Devices and IO-Link Masters
30130 - CSP+ForMachine . CCLink
30140 - PROFINET
30141 - PROFIenergy
30142 - PROFI-RemoteIO
30143 - PROFI-Encoder

Industrial Automation

30400 - Cloud Library
10020 - Analyzer Devices
30000 - PLC Model based on IEC 61131-3
30001 - PLC Client Function Blocks
30010 - AutoID Devices
30020 - MDIS OPC UA Companion Specification
30081 - Process Automation Devices - PADIM
10000-100 - Devices
10000-110 - Asset Management Basics
10000-120 - XML DataType Mapping
10000-200 - Industrial Automation - Basics
10000-210 - IA- Relative Spatial Location

Consumer Industries

30060 - Tobacco Machinery
30200 - Commercial Kitchen Equipment

Enterprise, Asset Management, Packaging

10030 - ISA-95 Common Object Model
10031 - ISA-95-4 Job Control
30050 - PackML - Packaging Control
30260 - Open-SCS Product Serialization
30261 - Open-SCS Job Orders
40600 - Weihenstephan Standards

Engineering Data

30040 - AutomationML
30250 - DEXPI P&ID

Energy Automation

10040 - IEC 61850 - Electrical Substation Automation

Building Automation

30030 - BACnet

Oil and Gas, Mining

40561 - Mining - Extraction
40562 - Mining - LoadingEquipment
40563 - Mining - TransportAndDumping
40564 - Mining - MineralProcessing
40565 - Mining - DevSupport
40566 - Mining - MonitoringAndSupervision
40567 - Mining - PELO Services
40569 - Mining - ACandUC

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JWGs with VDMA

OPC UA serves as basis for the Global Production Language

VDMA

- Additive Manufacturing
- Agricultural Machinery
- Air Conditioning & Ventilation
- Air Pollution Control
- Automated Guided Vehicles
- Battery Production
- Building Control and Management
- Building Materials
- Ceramic Machinery
- Cleaning Systems
- Compressors, Compressed Air and Vacuum Technology
- Construction Equipment
- Continuous Conveyors
- Cranes
- Die & Mould
- Drying Technology
- Electrical Automation
- Engines & Systems

- Fire Fighting Equipment
- Fluid Power
- Food Processing and Packaging Machinery
- Foundry Machinery
- Glass Machinery
- Hydro Power Plants
- Industrial Trucks
- Integrated Assembly Solutions
- Intralogistic Systems
- Lasers and Laser Systems for Material Processing
- Length Measurement Technology
- Lifts & Escalators
- Machine Tools and Manufacturing Systems
- Machine Vision
- Metallurgical Plants and Rolling Mills

- Micro Technologies
- Mining
- Photovoltaic Equipment
- Plastics & Rubber Machinery
- Power Transmission Engineering
- Precision Tools
- Printing & Paper Technology
- Process Plant & Equipment
- Productronic
- Pumps & Systems
- Refrigeration & Heat Pump Technology
- Robotics
- Security Systems
- Software & Digitalization
- Surface Technology
- Testing Technology

- Textile Care, Fabric and Leather Technology
- Textile Machinery
- Thermal Power Plants
- Thermo Process Technology
- Valves
- Waste Treatment & Recycling
- Weighing Technology
- Welding & Pressure Gas Equipment
- Wind Power Plants
- Woodworking Machinery

Legend:
- OPC UA CS released
- Release Candidate
- Joint Working Group with OPC Foundation
- OPC UA CS in work

Heiko Herden, Talk on "OPC UA Updates from VDMA", VDMA Plenary OPC UA CS, March 2023

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Thank you.

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Email: fahad.golra@agileo.com

💬 **CONTACT**