Connected Automation with OPC UA

Michael Lippert DC-AE/SMP23 | 9/25/2017

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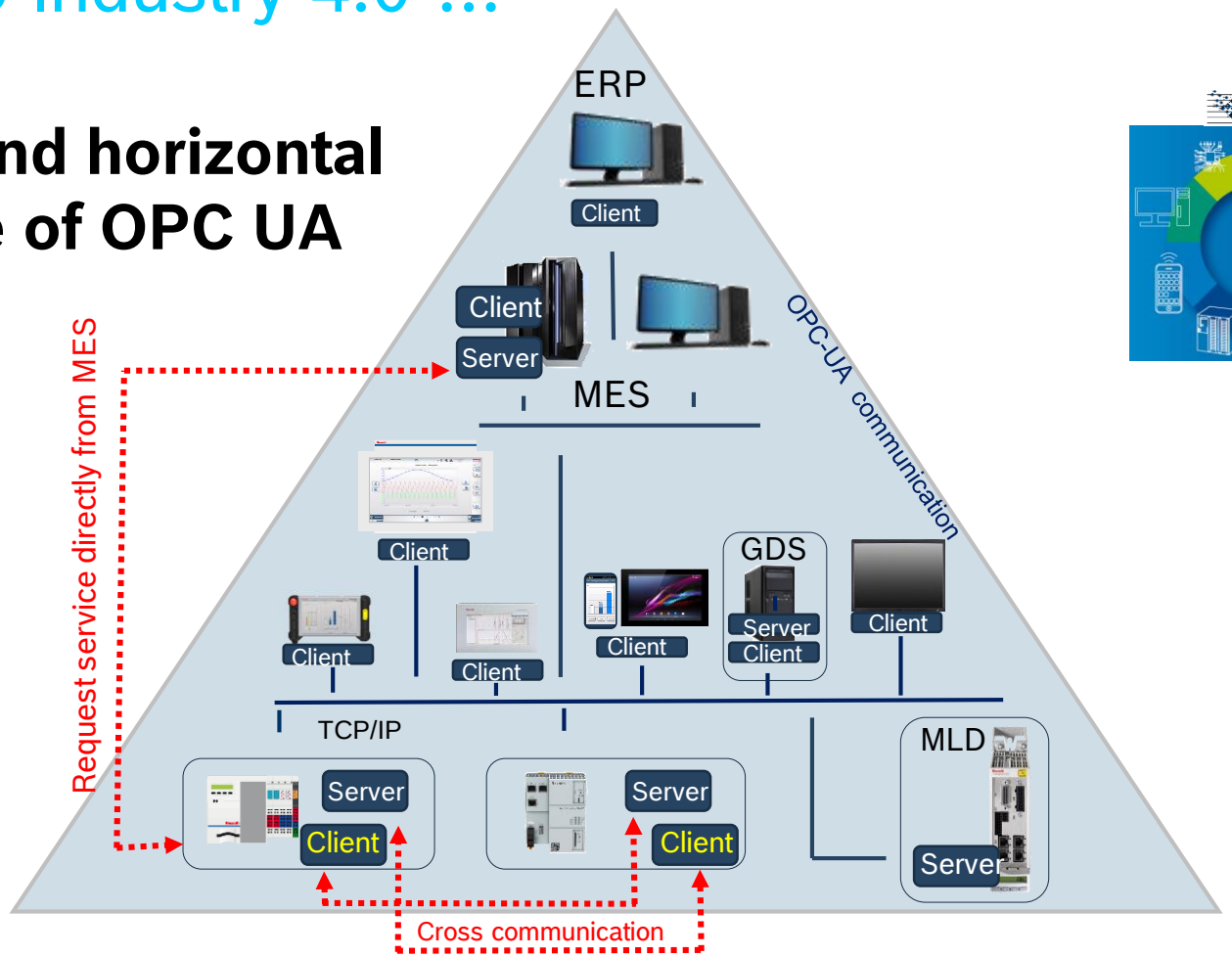
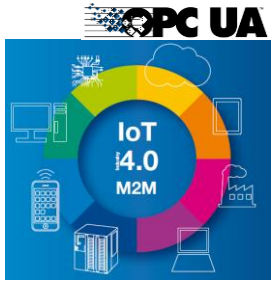
Connected Automation with OPC UA
Next steps to Industry 4.0 ...

Vertical and horizontal exchange of OPC UA data





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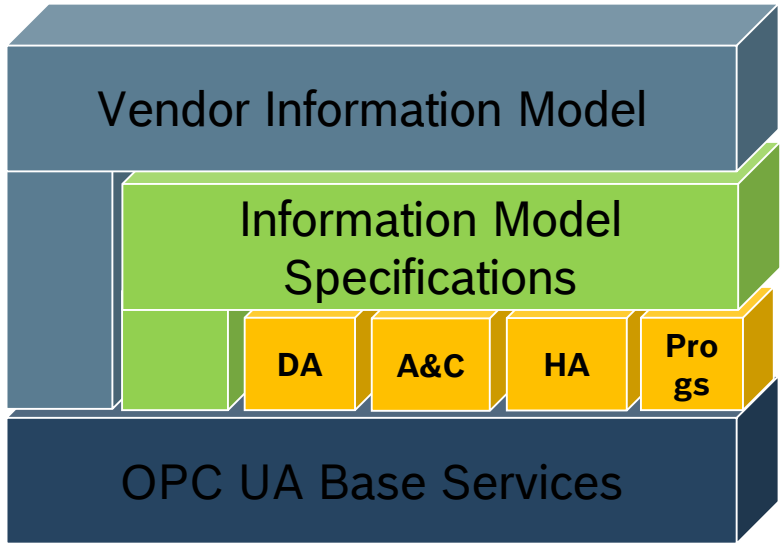
OPC UA Benefit -- Unified exchange of information



1. OPC-UA Base Information Models

Models for generally valid information are already specified by OPC-UA.

- Data Access (DA)
- Alarms and Conditions (AC)
- Historical Access (HA)
- Programs (Prg)

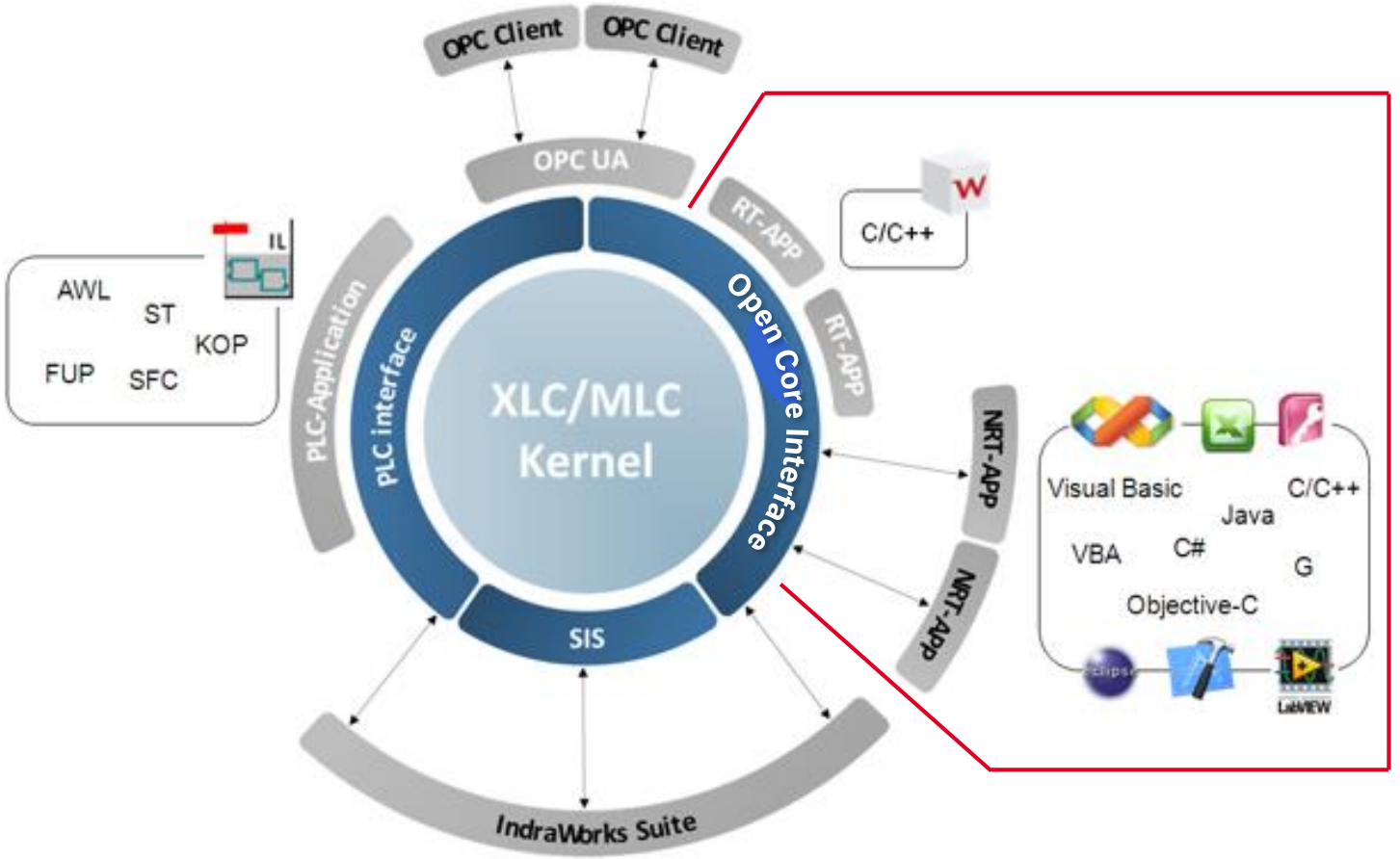
2. Technology-Specific Information Models

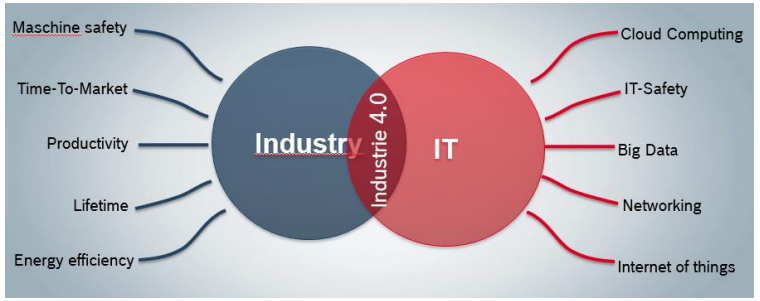
Derived from base models, other organizations are specifying their own information source, the so-called companion specifications.
e.g. PLC Open -- OPC-UA for Programmable Controllers based on IEC61131-3

3. Rexroth-Specific Information Models

Derived from base models. e.g. Axis, Robot, Parameter, Motion, Diagnosis Logbook,…

Open Core Engineering
Advanced OPC UA Functionality with Open Core Interface





The combination of OPC UA and OCI makes us ready for I4.0. It gives us the possibility to connect the Automation World and the IT World in an easy way.

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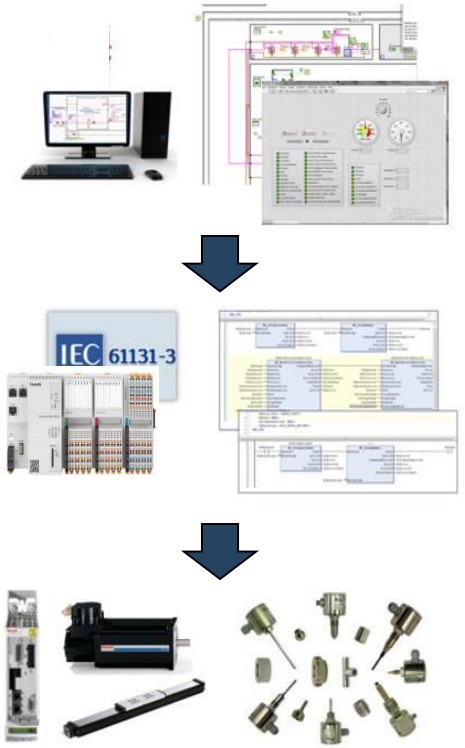
Advanced Data Access with OPC UA and Open Core Interface

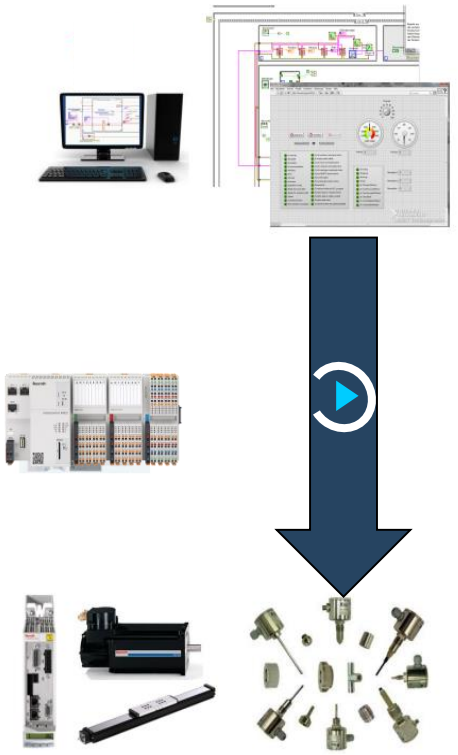


Standard Solution

- Access to PLC variables
- PLC with symbols to provide data
- PLC is interface between actor/sensor level and HMI

Future solution with OCI

- Full access to all machine data
- PLC not necessary to provide data
- Control firmware is interface between HMI and actor/sensor level



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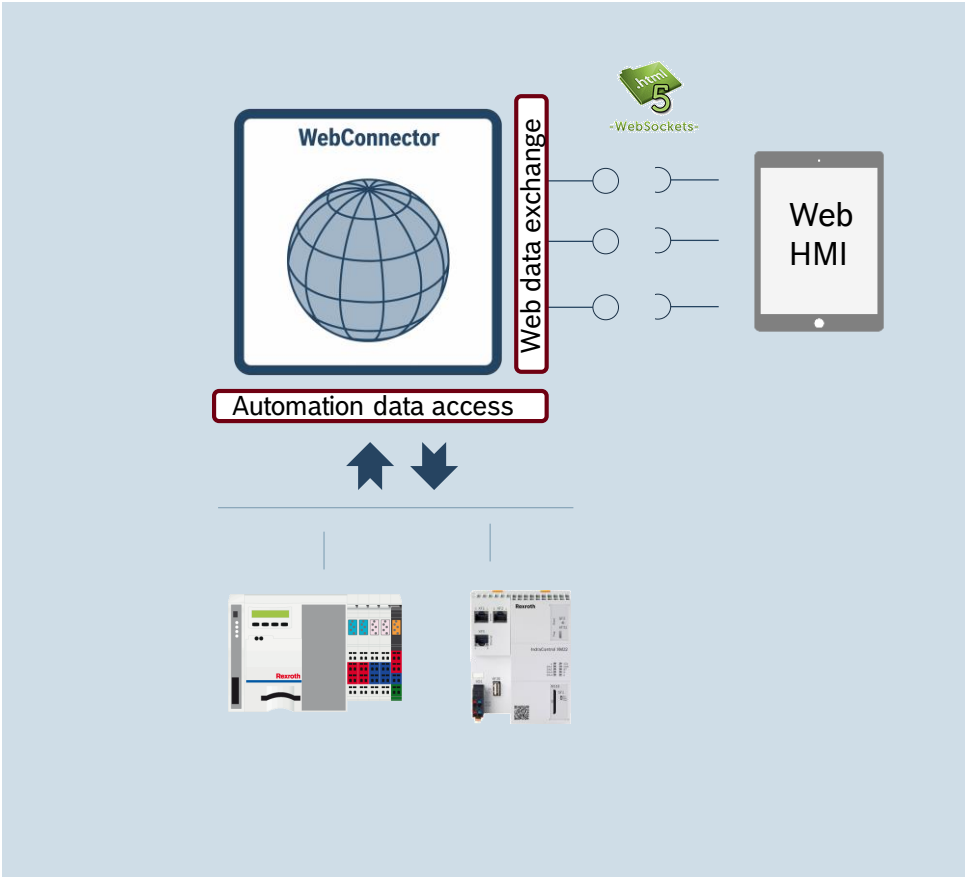
Connected Automation with OPC UA
WebConnector - Basics



- The WebConnector translates the protocols of the automation world into the language of the web world.
  - Open communication interface for web data exchange via HTML5 (Java script / WebSocket)
  - Standardized communication interface for automation data access using
    - OPC UA
    - OCI for Controls

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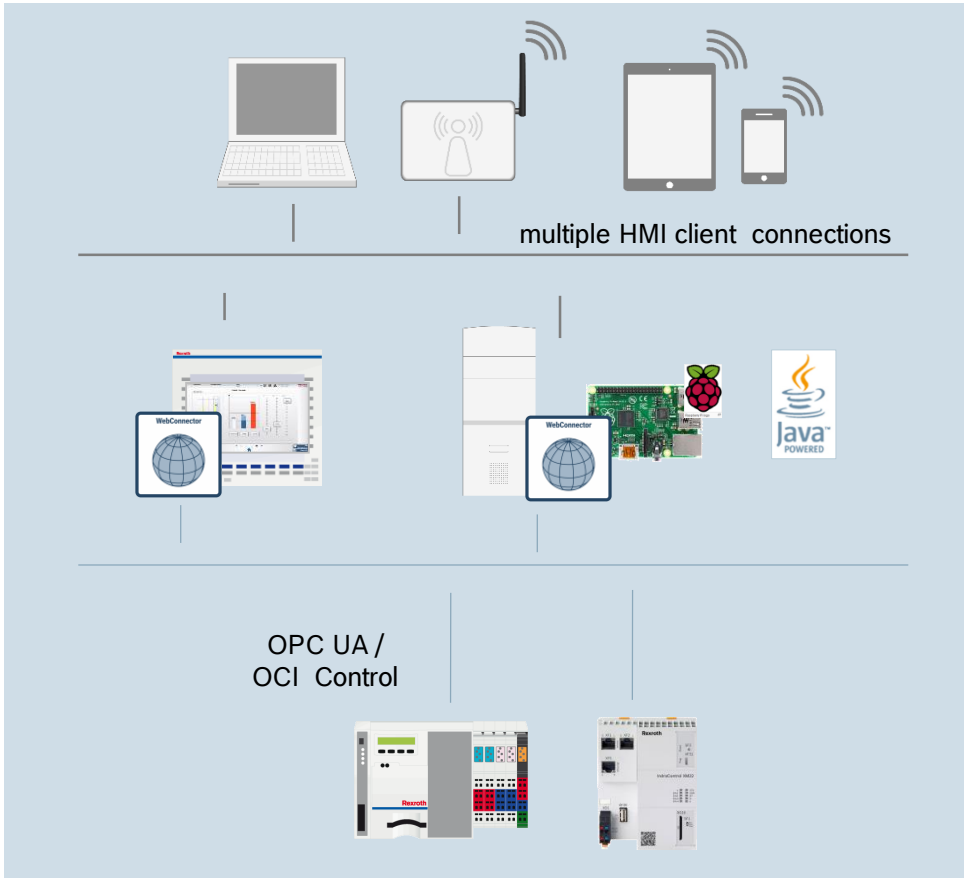
WebConnector – Customer Benefit



- Web connections to any HMI device
- Executable on all devices with “Java virtual machine”
- Data exchange with Rexroth controls using standardized protocols OPC UA and Rexroth Open Core interface (OCI).
- Ready to start and configurable via web interface
  - Diagnosis overview
  - Licensing dialog
  - Online documentation
  - Sample application
  - etc.
- WebConnector and "Java virtual machine" download
  www.boschrexroth.com/software-download

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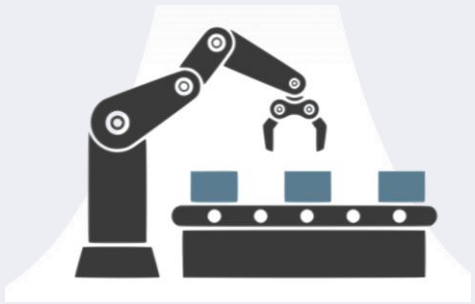
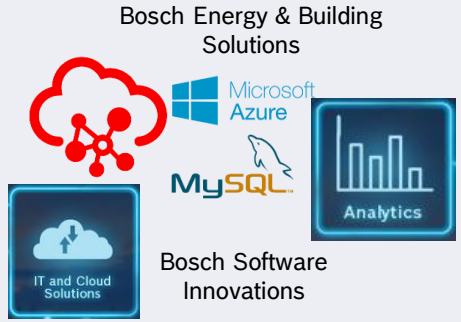
IoT Gateway Software
Basic Logic behind the IoT Gateway Software



data
information

data
information



OEM machine & brownfield application	IoT Enabler	IT systems

Data is key

Goal in the industry: Connect all machines

Connect your machine with the IoT Gateway Software

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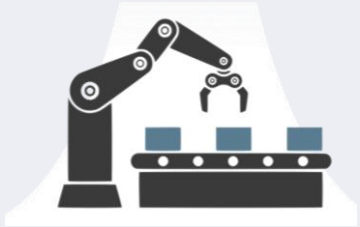
IoT Gateway Software
IoT Gateway Software „Left to Right Approach“

Machine data



and many more…

The IoT Gateway Software Basic Apps

Device apps

Get access to your machine data

Examples:

Controls, sensors, OPC, etc.

Internal apps

Play with your machine data

Examples:

Math calculations, formatter, dashboard, etc.

processing apps

Send data to your preferred system

Examples:

Microsoft Azure, Oracle IoT Cloud, MySQL, etc.

IT Systems

Microsoft Azure

Bosch Software Innovations

MySQL

Analytics

Oracle IoT Cloud

IT and Cloud Solutions

Bosch Energy & Building Solutions

and many more…

Link to IoT Gateway

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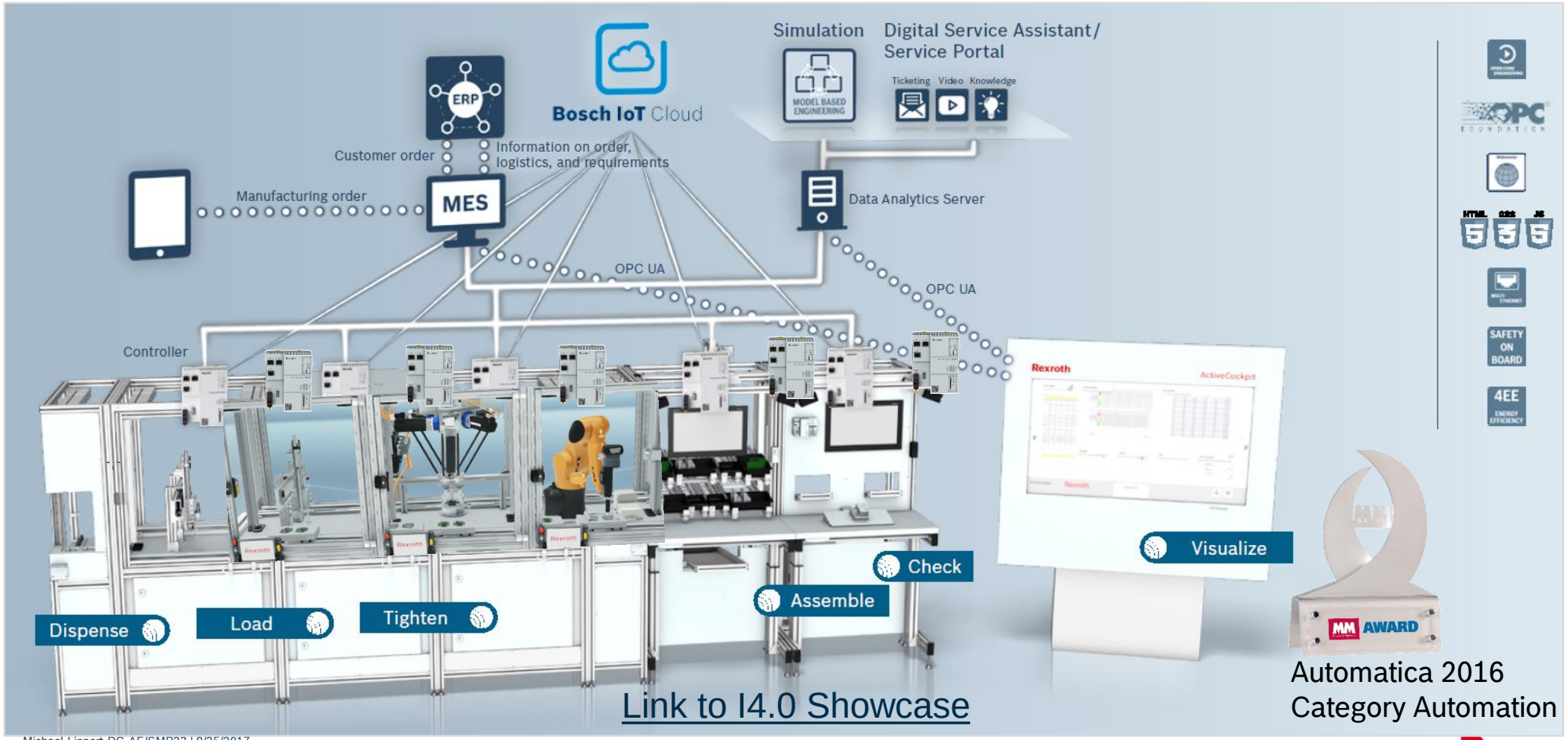
Connected Automation with OPC UA
Key Facts and Summary

- Bosch Rexroth offers one of the largest OPC UA Information Models (PLC-Objects, Motion-Objects, Robot, field bus devices, alarms & conditions, …)
- Bosch Rexroth supports the customers on the control not only on the OPC UA server, we support also OPC UA client.
- All information accessible through OCI is available in OPC UA standardized forms and will be extended continuously.
- Only Bosch Rexroth offers the possibility for the customer to go one layer deeper than OPC UA by using OCI. This enables individual and optimized solutions (real-time extensions, model-based engineering, co-simulation, HiL, etc.) without any breaks in consistency.
- Bosch Rexroth offers the **WebConnector,** which helps to create modern browser-based visualizations
- Bosch Rexroth offers with it's **IoT Gateway** a perfect possibility to make new and old machines ready for Industry 4.0 (e.g. OPC DA to OPC UA without any changes on the machine program)

Connected Automation with OPC UA
I4.0 Showcase



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Questions?

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Thank you very much for your attention

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