Compilation of work from various stakeholders

PLATTFORM
INDUSTRIE 4.0

LNI4.0 LABS NETWORK INDUSTRIE 4.0

STANDARDIZATION COUNCIL INDUSTRIE 4.0

VDI

ZVEI: Die Elektroindustrie

ACPLT Chair of Process Control Engineering

RWTH AACHEN UNIVERSITY

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The 3rd RRI Industrial IoT International Symposium for Connected Industries, Tokyo Big Sight

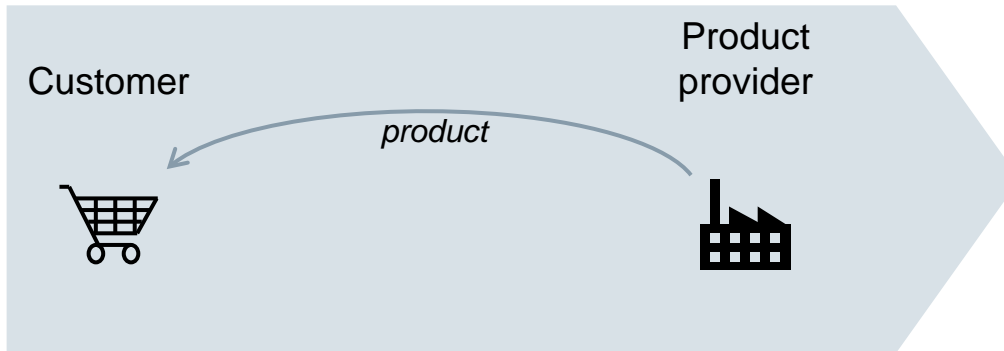# Practical application of openAAS (open Asset Administration Shell)

Ulrich Löwen, November 30th, 2017

Siemens Corporate Technology

Business Viewpoint: Application Scenario Value-Based Services
View on Industrial IoT by Plattform Industrie 4.0

Today

Tomorrow

Generic description

Customer

Product provider

product

Customer

Service provider

Platform operator

Product provider

product

usage data
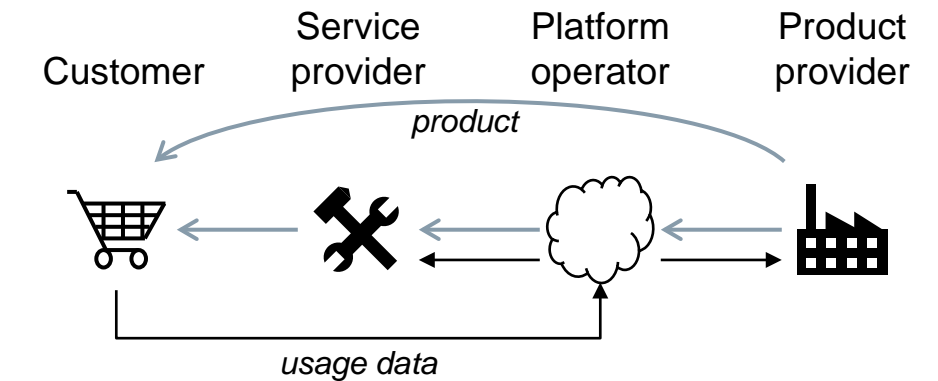
Exemplification Data-Driven Services

machine

Operator of machine

Provider of machine

machine

usage data of machine

Operator of machine

Provider of data-driven services

Operator of service platform

Provider of machine

November 2017   Practical application of openAAS (open Asset Administration Shell)
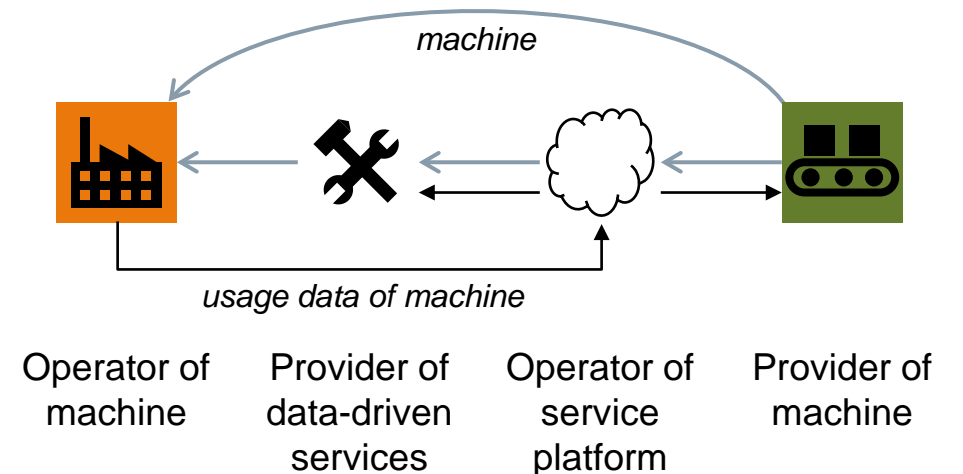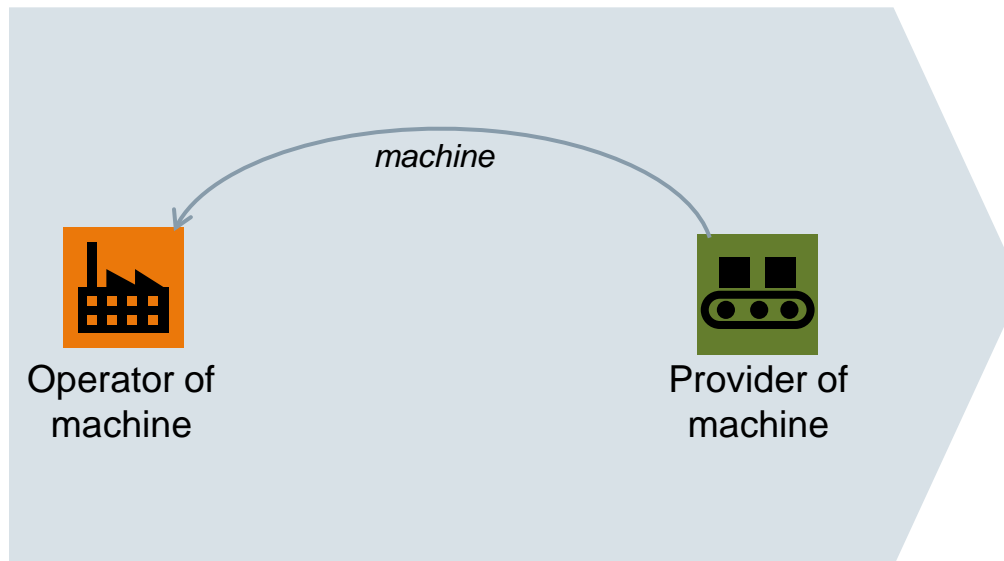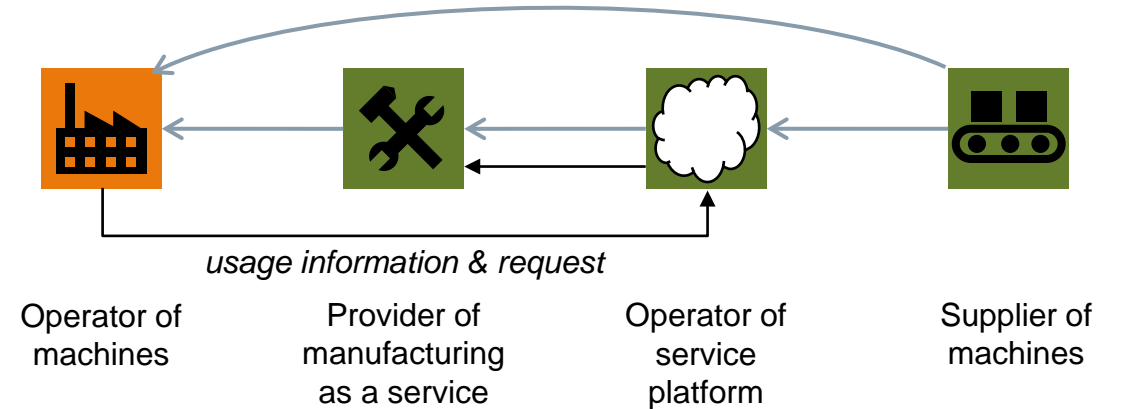
Business Viewpoint: Application Scenario Value-based Services
Variety of Different Business Setups

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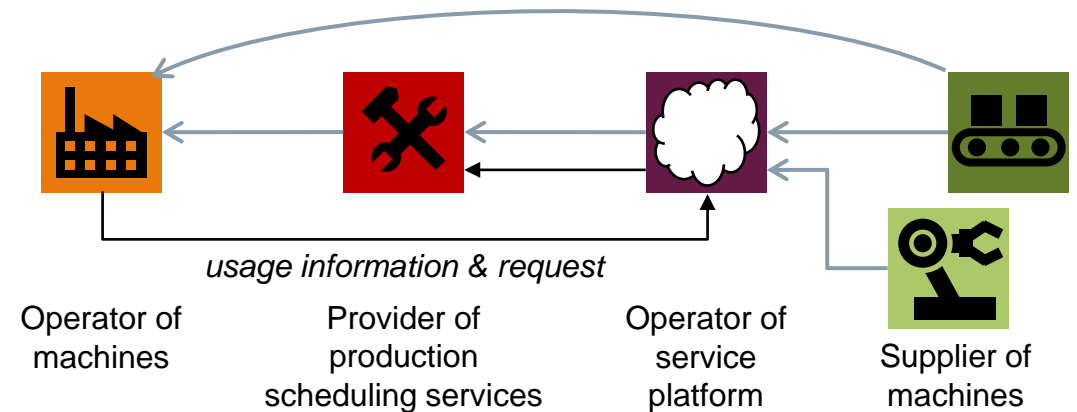
Machine & Process Optimization Services

usage information & request

Operator of machines

Provider of machine & process optimization services

Operator of service platform

Supplier of machines

Manufacturing as a Service

usage information & request

Operator of machines

Provider of manufacturing as a service

Operator of service platform

Supplier of machines

Data-driven Services

usage data of machines

Operator of machines

Provider of data-driven services

Operator of service platform
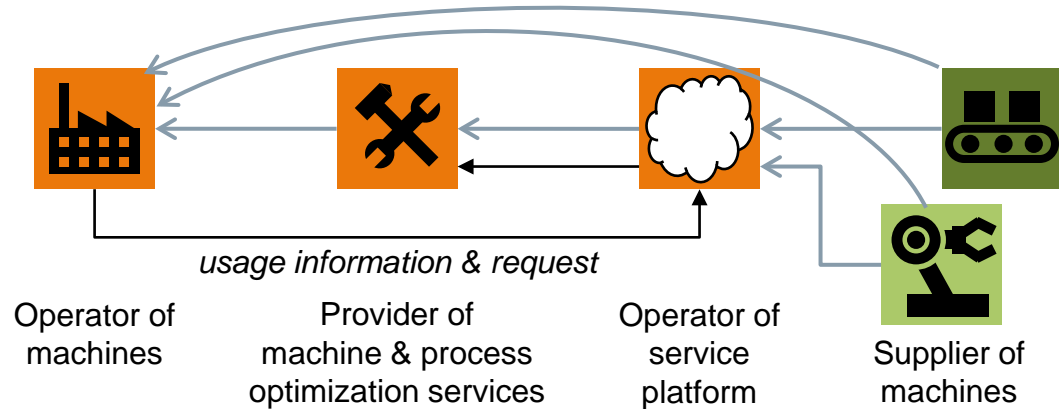
Supplier of machines

Production Scheduling Services

usage information & request

Operator of machines

Provider of production scheduling services

Operator of service platform

Supplier of machines

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Spontaneous **connection of a sensor** for recording additional information

| **Request** for specific information about the machine | **Selection** of appropriate sensor to record required information | **Connection** of sensor to communication infrastructure | **Recording** required information

Provision of recorded information | **Disconnection** of sensor from communication infrastructure |
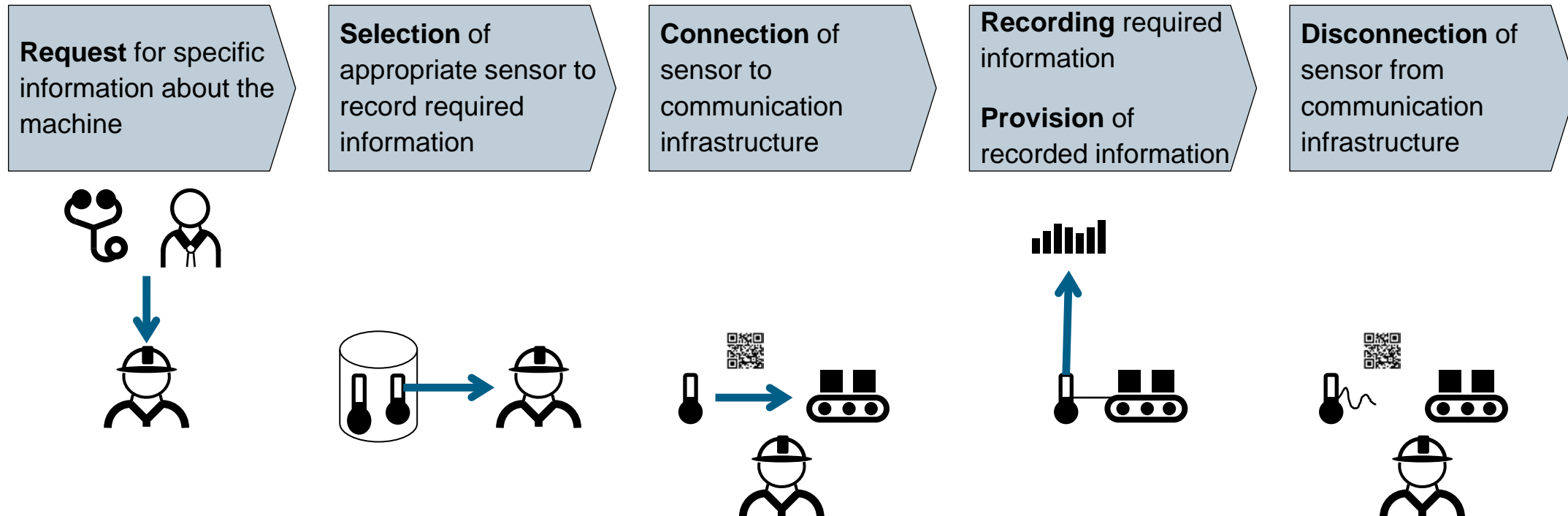
Main challenges in specifying the usage viewpoint:

- Finding the appropriate **abstraction level** for the specification
- Adequate number of **core activities** for an application scenario

Actual status: elaboration within IEC TC65 Smart Manufacturing, driven by Germany-Japan cooperation

Functional Viewpoint: Asset Administration Shell
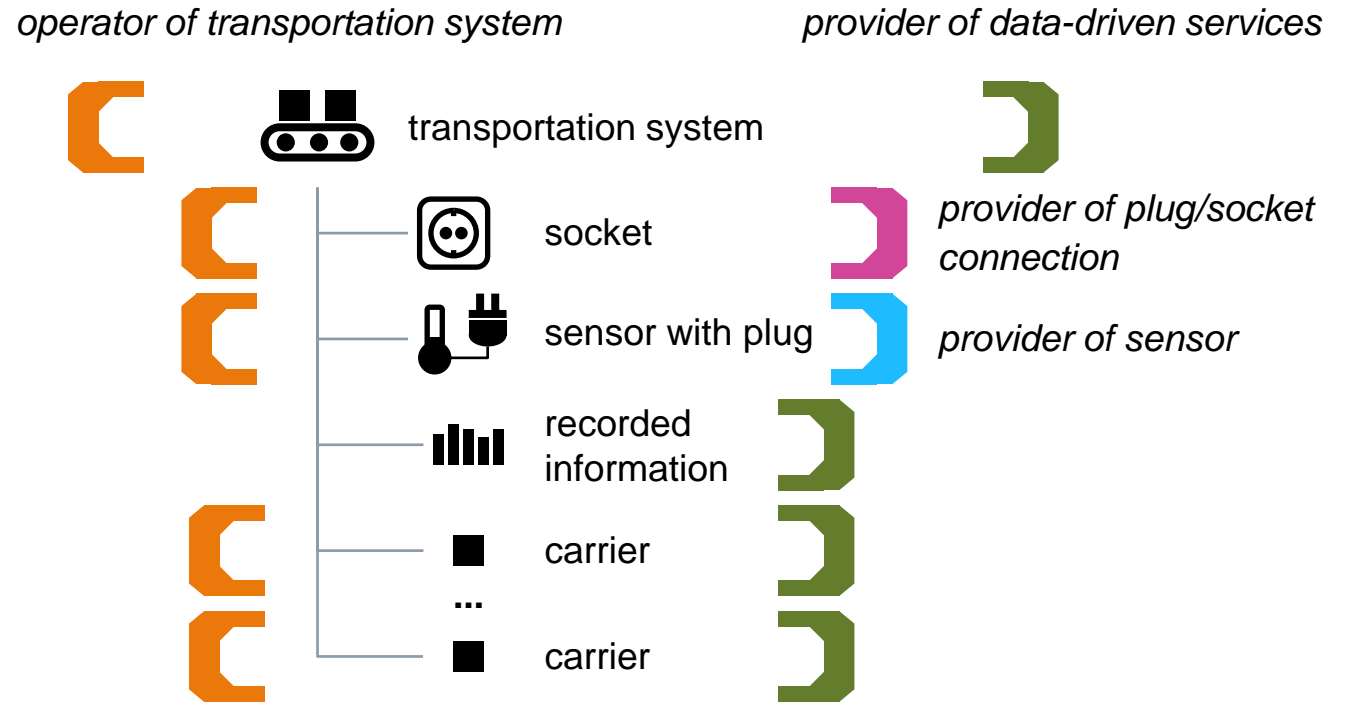## Generic Concept to Manage Digital Representatives of Assets

Cross-cutting issue in all activities: **Digital representations of assets** are generated in a variety of different software systems by different stakeholder and need to be managed throughout their entire lifecycle

Assets (Examples)

intelligent object: asset administration shell deployed on asset

passive object: asset administration shell not deployed on asset

complex object: asset composed of other assets with own asset administration shells

pure information object

Asset Administration Shells (Example)

operator of transportation system   *provider of data-driven services*

transportation system

socket   *provider of plug/socket connection*

sensor with plug   *provider of sensor*

recorded information

carrier

...

carrier

ZVEI funded open source project openAAS as an **implementation** based on OPC-UA of the asset administration shell

Practical application of openAAS (open Asset Administration Shell)
Take Away

Customer benefits first

- Digitalization in manufacturing will be successful only if there exists **market needs** for digitalization solutions
- Create solutions which generate **customer benefits**

Role of technical concepts

- Distinguish between **business**, **usage**, and **functional** perspective
- Impact of technical concepts ultimately achieved only by **dissemination** in practice in form of "standards"

Practical application of openAAS (open Asset Administration Shell)

- openAAS is an **implementation** of the concept of an asset administration shell in the context of a research project
- Implementation based on OPC-UA allows easy **integration in existing installations** and applications
- We still have to shape the common mutual understanding of **purpose** and **scope** of the asset administration shell
- We are facing a difficult **balancing act** between a "thorough" approach and the risk of not addressing the core issues

Thank you for your attention!

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