



# Leveraging edge architectures for digital transformation in brownfield factories

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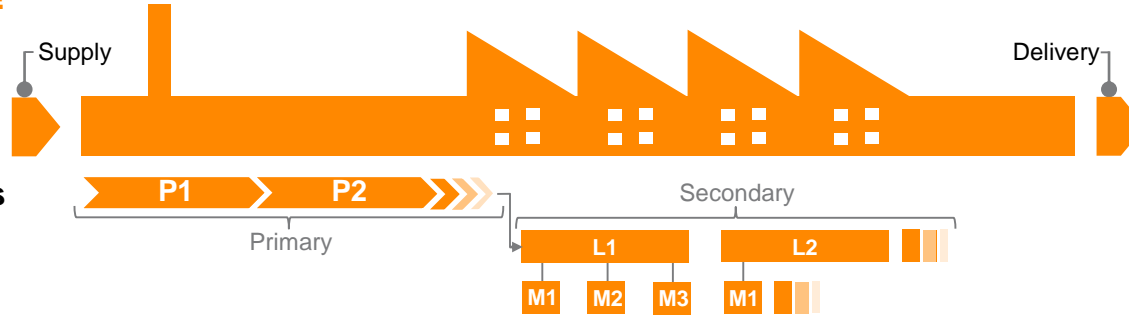


# What every factory manager wants



## Today and Tomorrow !

- Site
- Processes
- Lines
- Machines



### Productivity

OEE

Coordination

Availability

### Quality

Approved Standards

Track & Trace

Monitoring of KPIs

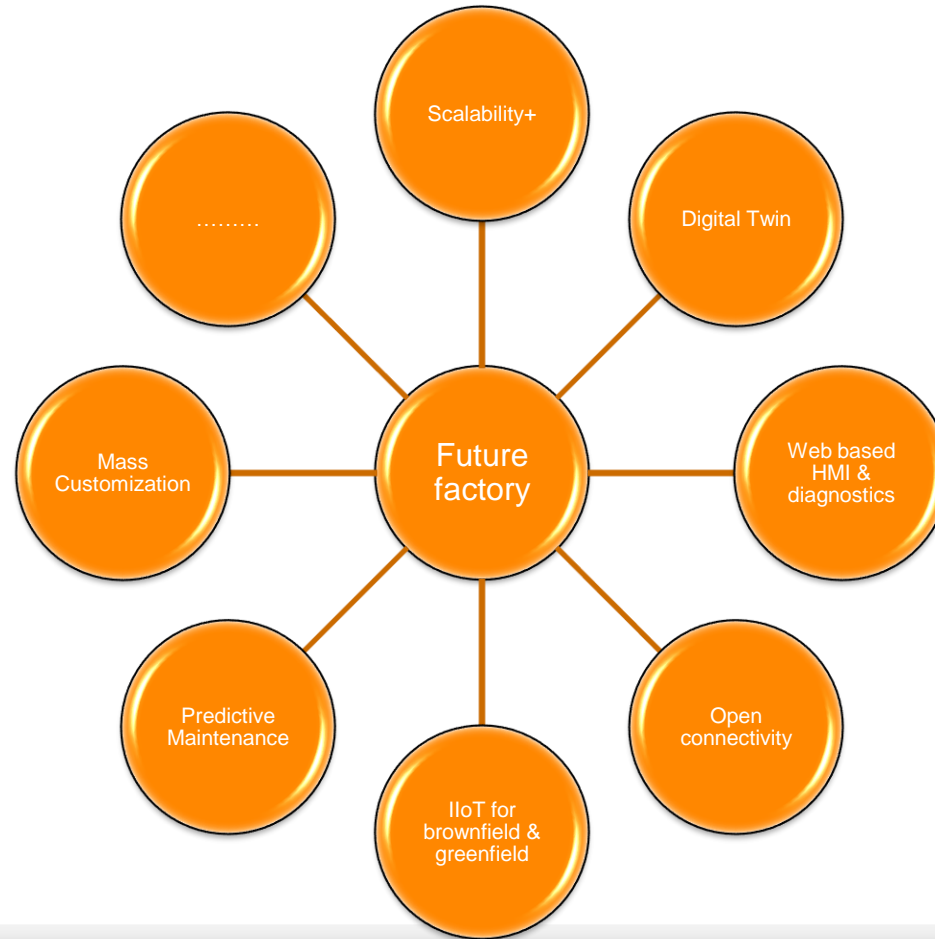
### Maintenance

Diagnostics

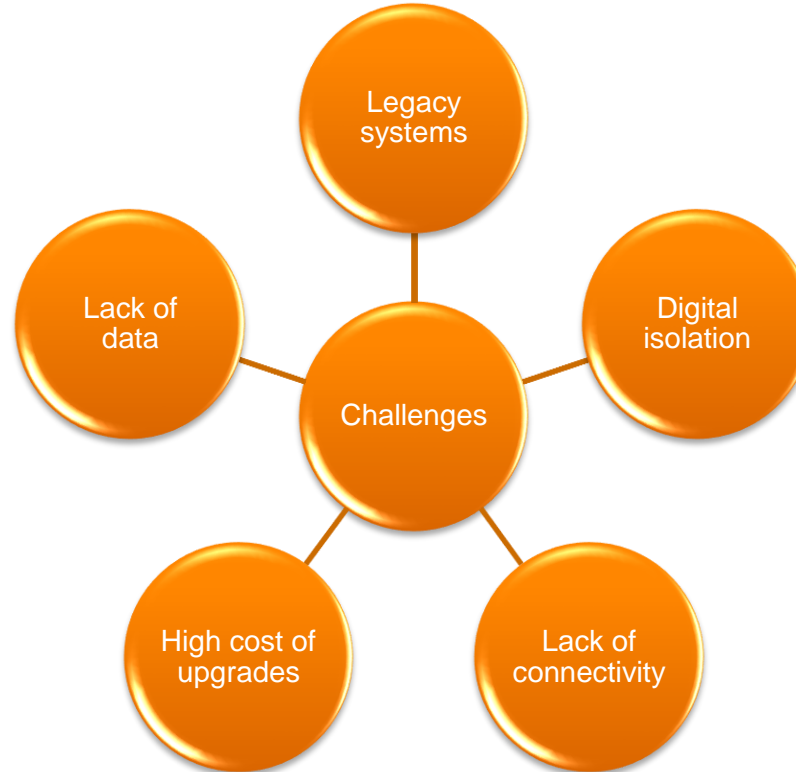
Asset Management

Condition Monitoring

# What future factories need?

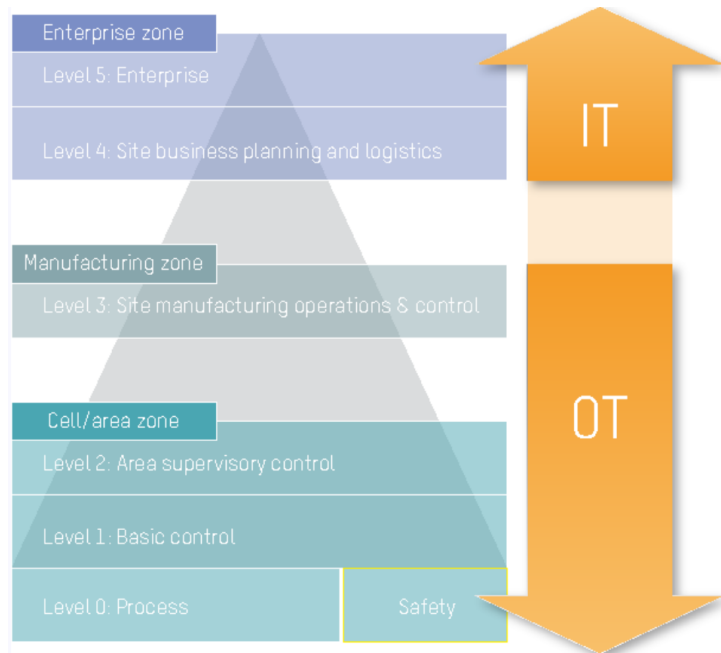


# Challenges for brownfield in digital transformation





## Digital Industrial Transformation



### Information Technology versus Operational Technology

Industrial IoT requires communication between  
Enterprise zone and Manufacturing zone  
Moving ever closer together

### Distributed Intelligence

Data processing near to sensors  
Fast transformation into convertible intelligence

### Minimizing of risk

Availability of cloud, required bandwidth, short response time

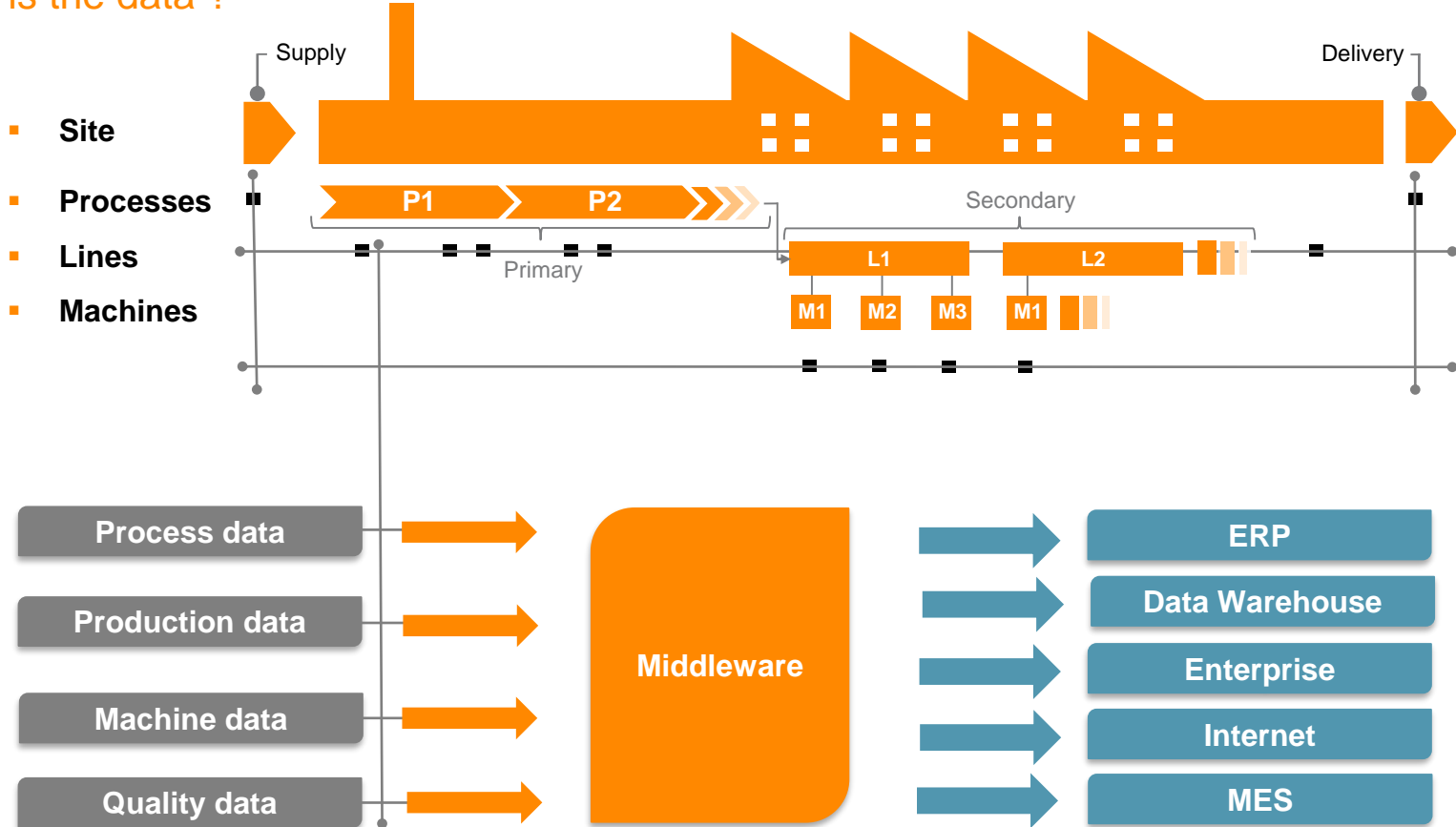
### Immediate and permanent analysis

Men and machine are more united

# Middleware for easy of access



## Where is the data ?





- Do I need a cloud platform or can I do without one?
- Cybersecurity : How do I secure my data?
- How much do I need to invest?
- .....



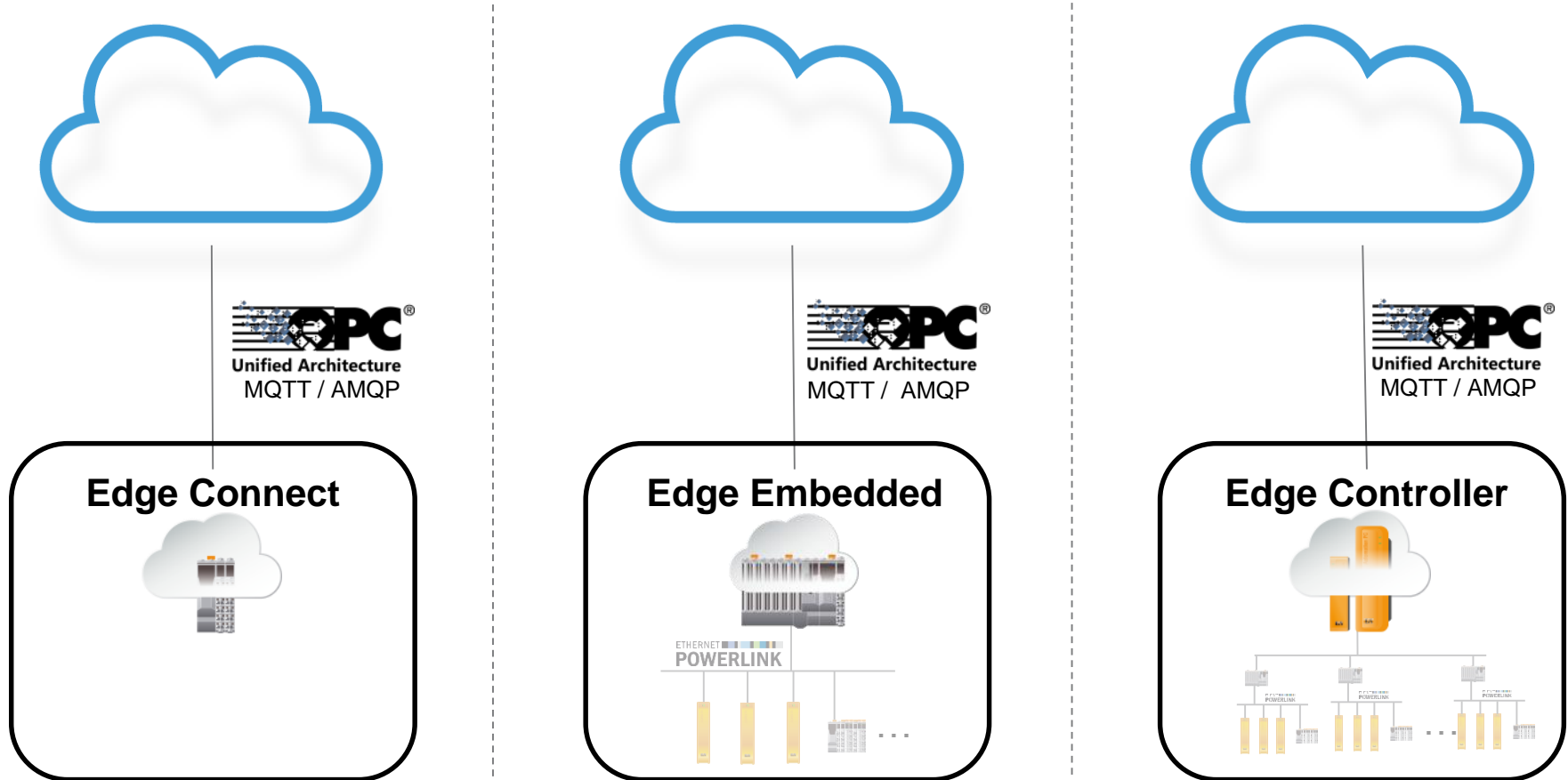


# **Solution** **Edge Architectures**



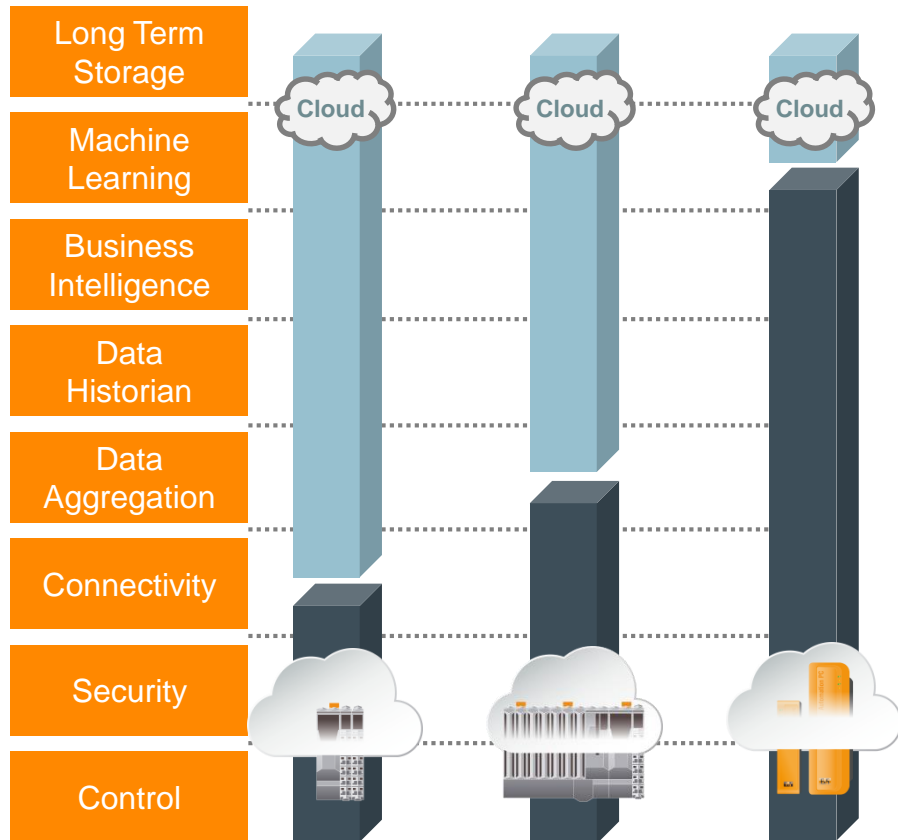
# Edge Architecture: IT / OT convergence

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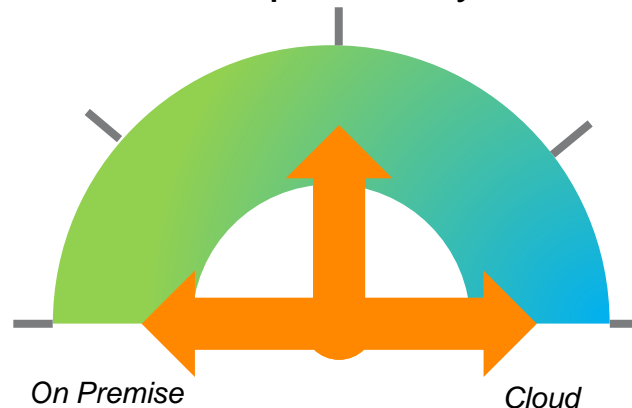


# Edge Architecture

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## Responsibility

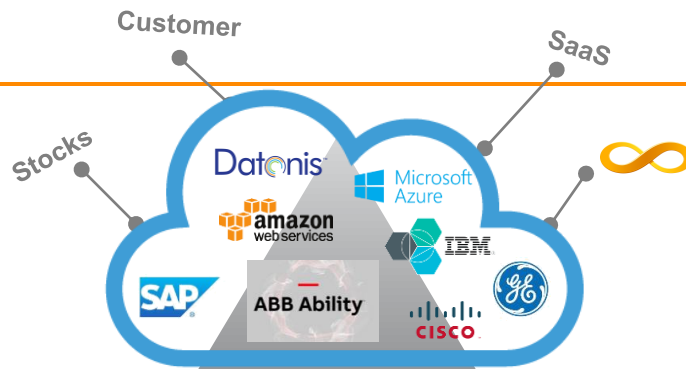


Availability of (redundant) high-performance SQL and non-SQL database  
Simple data pre-processing through new functionalities within the map-framework  
Auto-discovery for plug and produce  
Extensive analytics, trend and reporting features  
Direct access to databases  
Decentralized intelligence through methods and mechanisms  
Asset management and software deployment  
Embedded security through standard OPC UA mechanisms  
Control performance monitoring

# SMART FACTORY

## From Edge to Cloud

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Enterprise

**ERP Level**

Enterprise Resource Planning

Plant

**MES Level**

Manufacturing Execution System

Edge Controller

**Supervision Level**

Distributed Control System (DCS)

Supervisory Control Data Acquisition (SCADA)

Process

Edge Embedded

**Control Level**

Machine / line / cell controllers

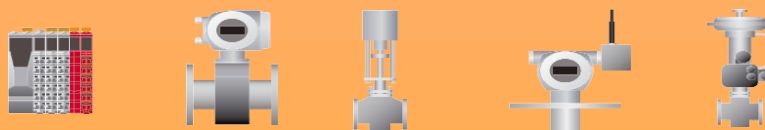
Shop Floor

Edge Connect

**Device Level**

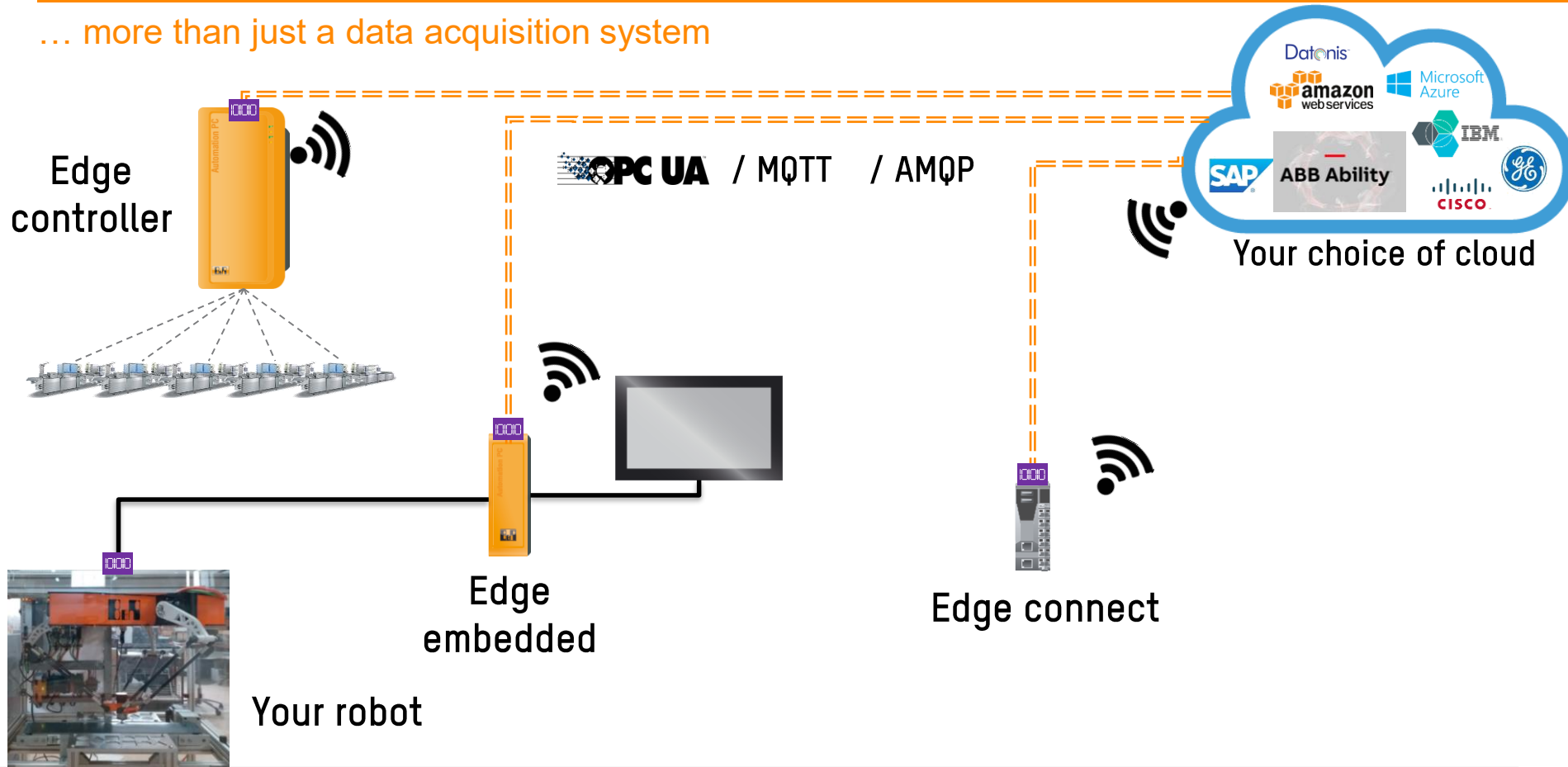
Sensor-actor-machine

Component



# Edge Architectures for IIoT – Smart Factory

... more than just a data acquisition system





# Use Cases

# Use Case: Food and Beverage



## The Company Nestlé

### End User

The world's largest food and beverage company

### Process technology and components in different end markets

Nestlé's products contain baby food, medical food, bottled water, breakfast cereals, coffee, and so on.



# Use Case: Food and Beverage



## Basic Concept

Various systems and technologies



No real-time data collection



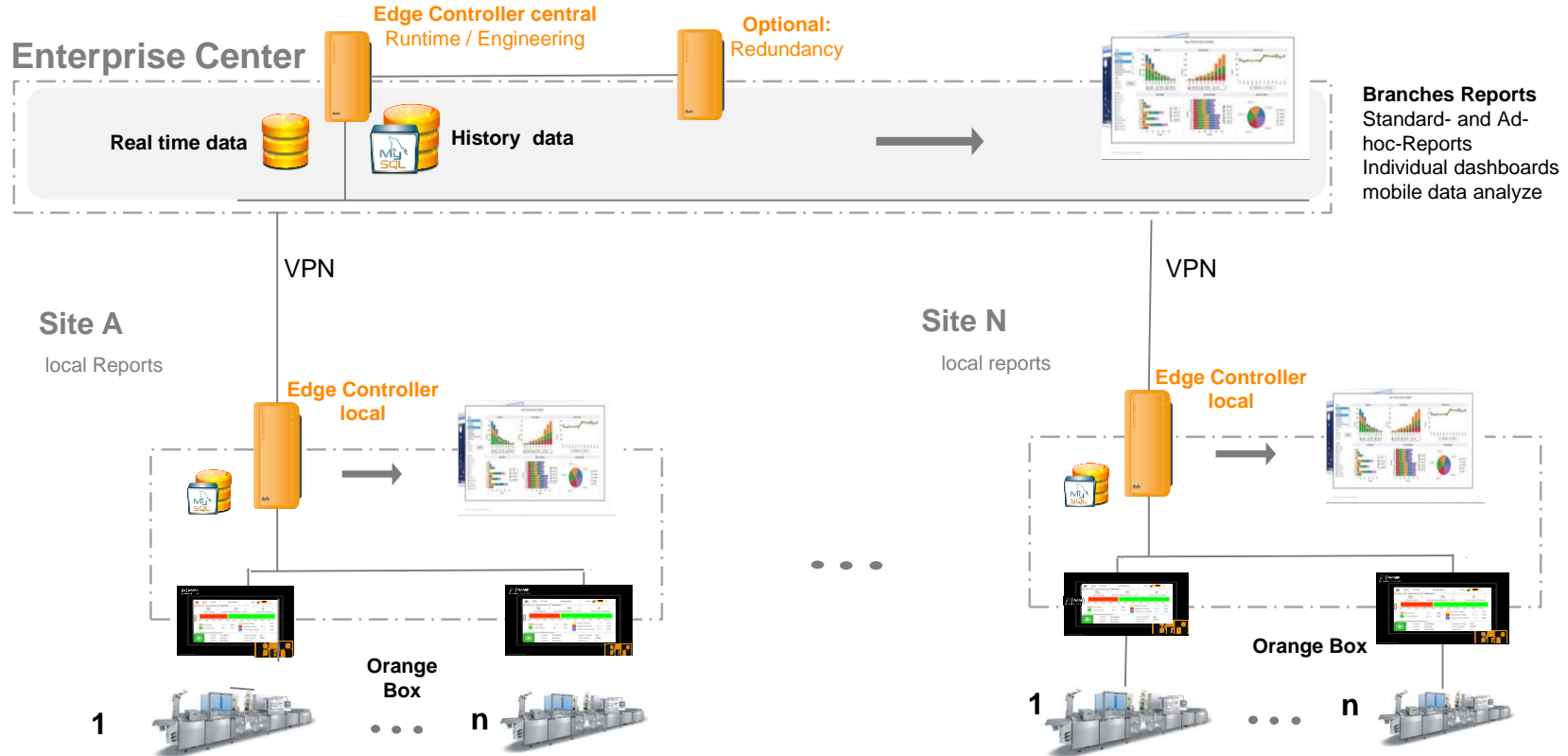
Machines from different generations



# Use Case: Food and Beverage



## System Layout





# Use Case - Plastech smart factories with APROL

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- Improved OEE
- Integrated energy & condition monitoring in Edge Controller
- Integrated BMS in Edge controller
- Reduced cost of implementation
- Higher efficiency and performance



Video: <https://youtu.be/vPkzYVmSCEo>

Article: <https://www.br-automation.com/en-in/about-us/customer-magazine/special-editions/automation-india/edition-3/adding-smart-to-factories/>



# About us

B&R Industrial Automation (A member of the ABB Group)



# Automation for machines and factories

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**Machine  
automation**



**Open Automation  
Technologies**



**Solutions for  
process optimization**



**Plant  
automation**



**Factory  
automation**



**Process  
automation**



# Industries

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Automotive



Robotics & handling



Metal



Mobile applications



Maritime & offshore



Consumer goods



*Food & Beverage industry,  
home & personal care,  
tobacco*

Processing industries



*Chemical, pharma,  
metallurgy, mining, oil & gas*

Energy



Packaging



Plastics



Textile



Woodworking



Printing & converting





# Complete product portfolio

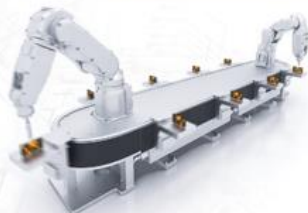
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Vision systems



Track technology



Frequency inverter



Motion control



Industrial PCs



Operation and monitoring



Integrated safety technology



PLC systems & I/O systems



Scalability+  
Integrated Automation



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## More than 200 offices



trust in B&R – worldwide



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