



# Eliminating Data Silos with MQTT at the Edge

March 2024 Webinar

# Speakers



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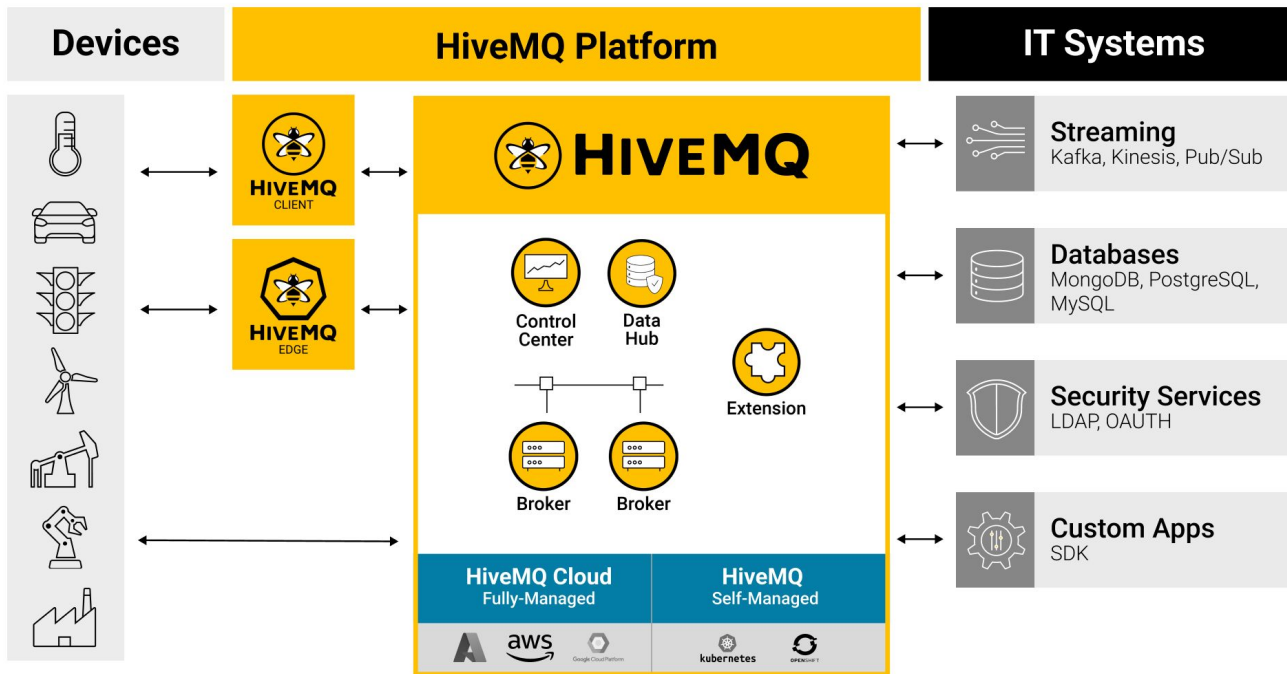
Principal Engineer - HiveMQ



# Agenda

- **Introduction**
- **OT-IT Data Integration Challenges**
- **Why MQTT for OT-IT Data Integration**
- **Key Steps to Unlocking OT Data for IT Integration**
- **Demo: OT-IT Data Integration with HiveMQ Edge**
- **Q&A**





# Key Industries



**Connected Car & Mobility**



**Manufacturing & Industrial Automation**



**Transportation & Logistics**



**Connected Assets & Products**





The manufacturing industry is data rich and information poor

-In Search of Excellence

## Opportunities

# For Industrial Digital Transformation.

- Machine data is under-utilized
- No processes to capture value from data.
- Data not treated as an asset



# Driving Forces for Digital Transformation in Industrial Sector

01

Data-Driven decision making and supply chain optimization.

02

Increased competition and consumer demand

03

Sustainability and regulatory compliance

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# OT-IT Data Integration Required for Enabling Digital Transformation.





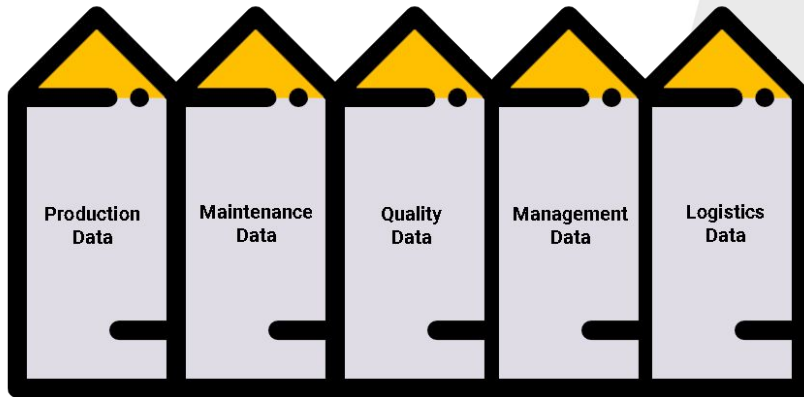
# OT-IT Data Integration Challenges

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# Prevalence of Data Silos

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- Varied data sources and protocols
- Lack of a unified ecosystem
- Prohibits OT - IT convergence



# Prohibitive Cost of Edge Connectivity

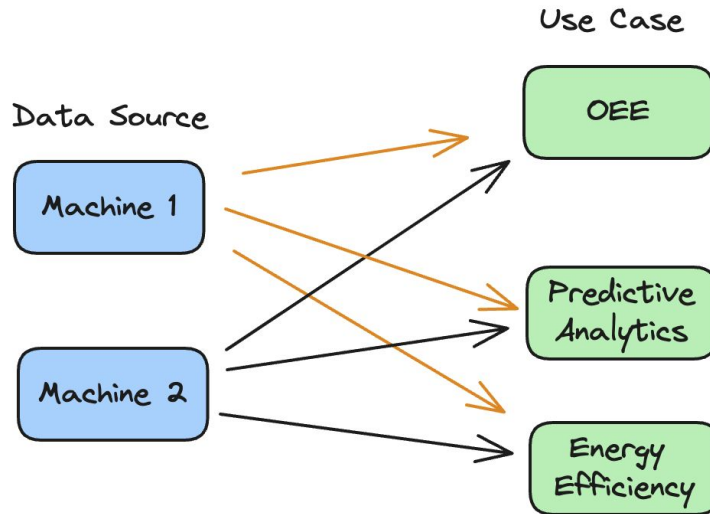
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## DATA IS LOCKED BEHIND PROPRIETARY INTERFACES

- Specialized connectors required
- Specific expertise required to gather data
- Increased time-to-value

# Connectivity Infrastructure Replication

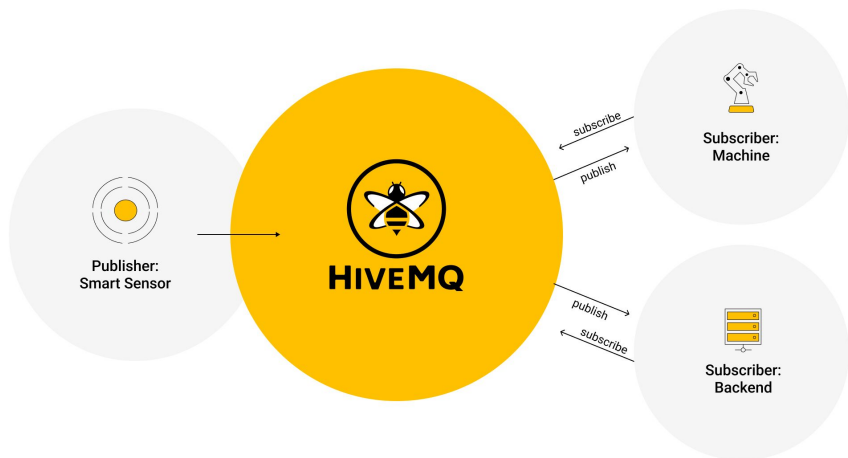


- Complex integration
- Hard to scale
- Tightly Coupled
- Results in Data Silos

# Why MQTT for OT-IT Data Integration?

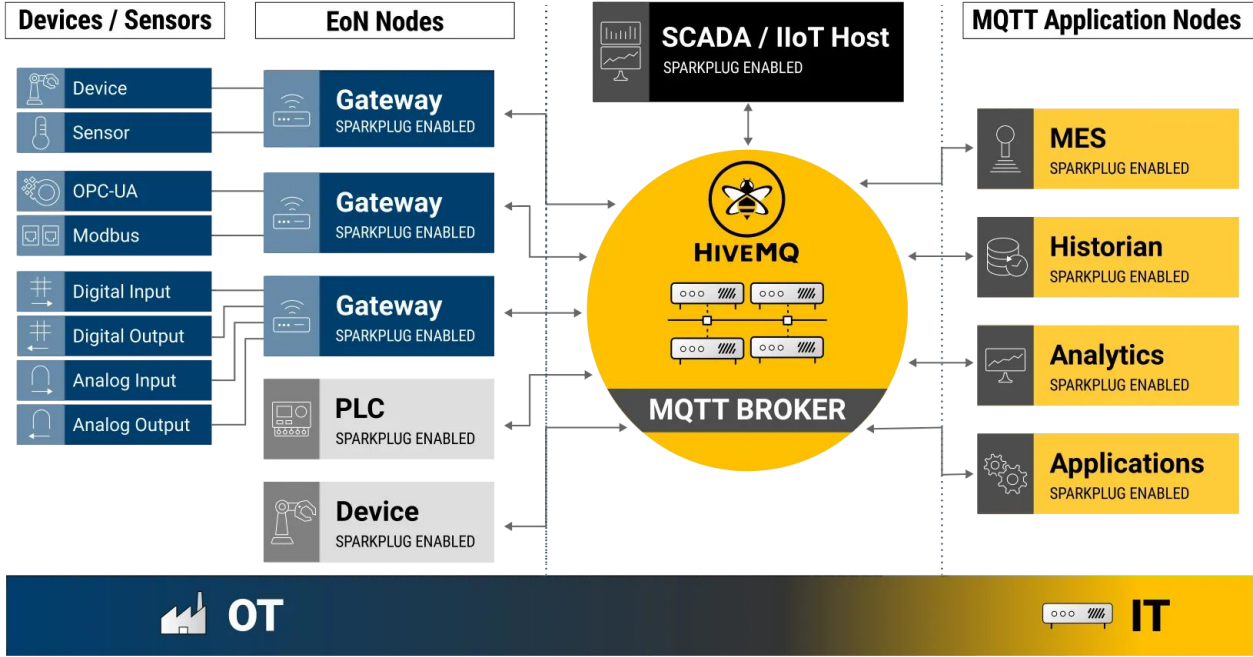


# MQTT for Seamless OT-IT Data Integration



- Publish-Subscribe
- Open-Architecture
- Edge-Driven
- Lightweight
- Highly-Scalable
- Simplified Integration

# MQTT Based Industrial Architecture



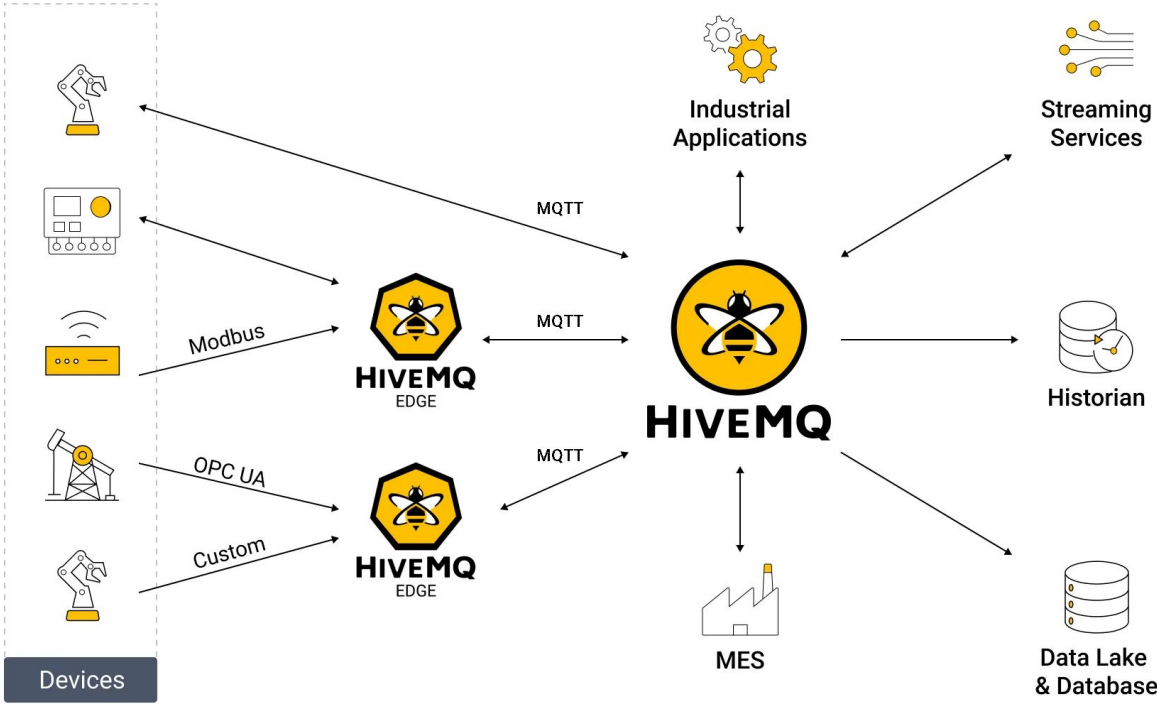
# Key Steps to Unlocking OT Data for IT Integration

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# Protocol Conversion



# Data Modelling

Define the structure, relationships, and characteristics of the data

**Machine ID** (unique identifier for the machine)  
**Timestamp** (time when the reading was taken)  
**Temperature** (current temperature of the machine)  
**Vibration** (current vibration level of the machine)  
**Output Speed** (current speed of the output from the machine)

*A simple data model for a machine*

# Data Normalization

Streamline the data, reducing redundancy, and enhancing data integrity

**Machine ID:** 001

**Timestamp:** 2023-05-12T14:00:00Z (UTC time)

**Temperature:** 75 (degrees Celsius)

**Vibration:** 3.2 (mm/s)

**Output Speed:** 50 (units per hour)

*Machine data after normalisation*



# Data Transformation



Convert raw data into a more suitable format for analysis

**Machine ID:** 001

**Shift:** Morning (2023-05-12T06:00:00Z to 2023-05-12T14:00:00Z)

**Average Output Speed:** 48 (units per hour)

*Machine data after transformation*



# Data Contextualisation

Enhance the interpretability of the data for more accurate and effective decision-making.

**Machine ID:** 001

**Shift:** Morning (2023-05-12T06:00:00Z to 2023-05-12T14:00:00Z)

**Average Output Speed:** 48 (units per hour)

**Product:** Widget A

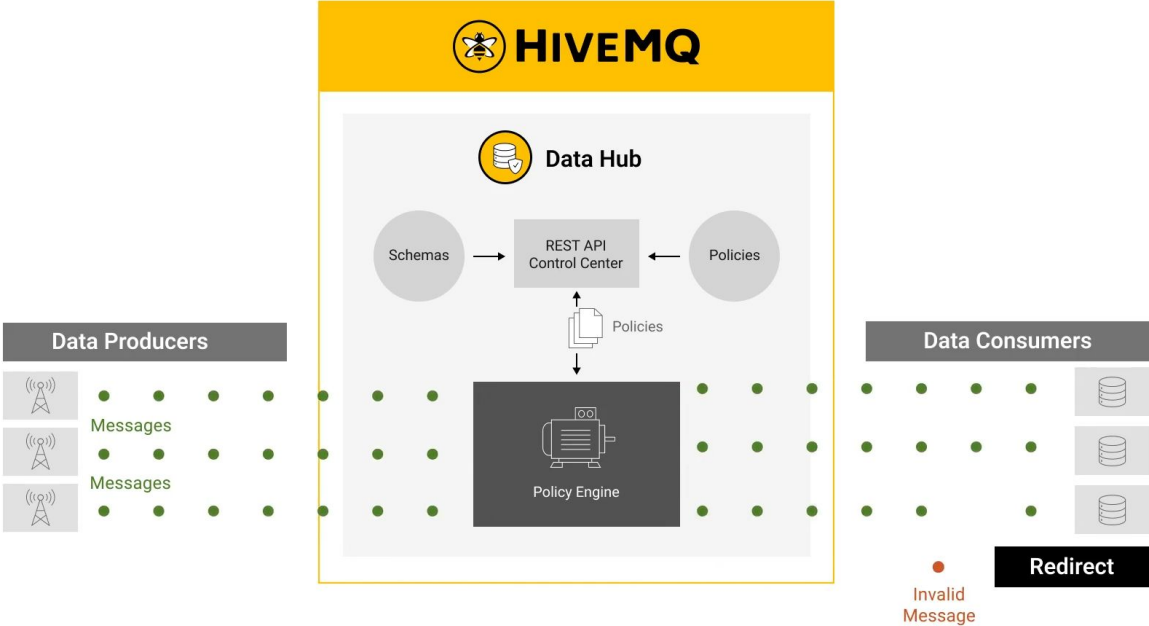
**Maintenance Activity:** None

**Environmental Anomalies:** Power surge reported at 2023-05-12T13:00:00Z

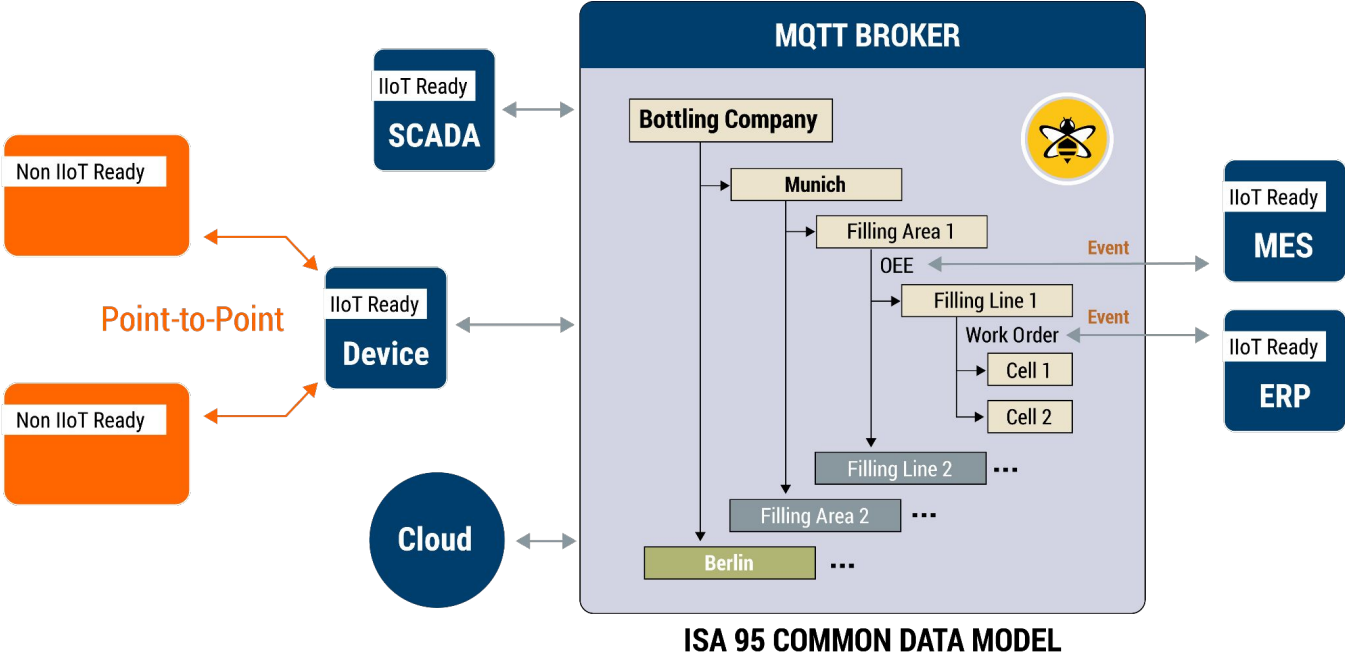
*Machine data after contextualisation*



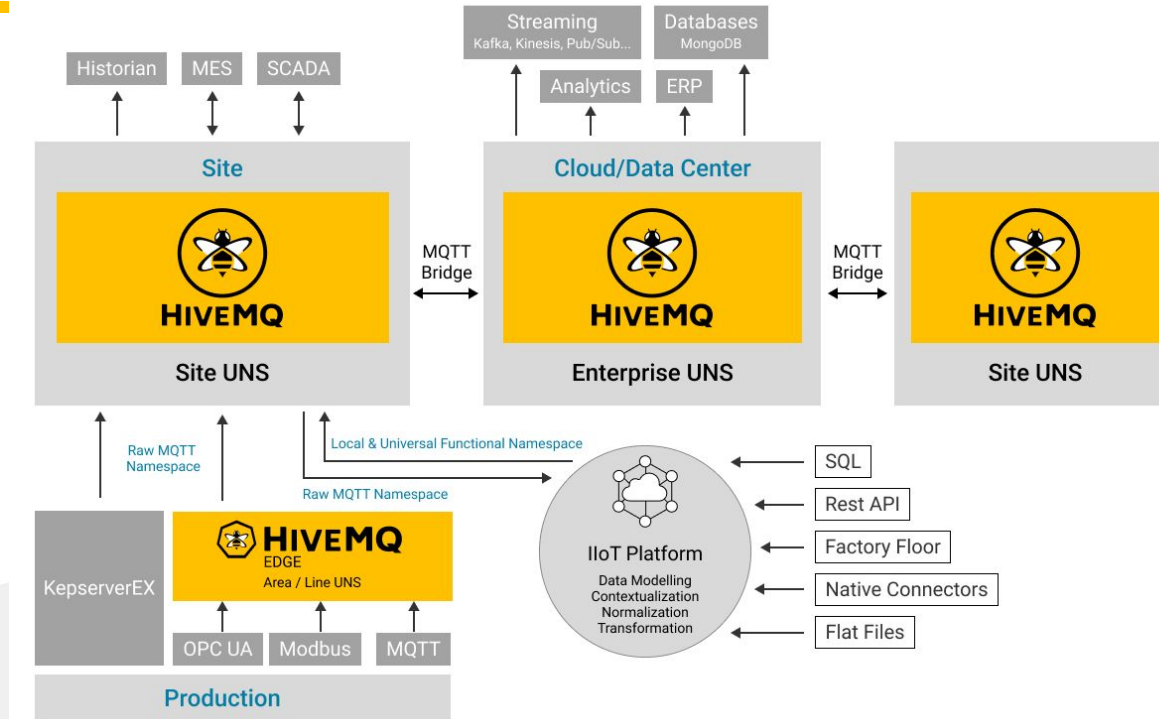
# Data Quality Management



# OT-IT Data Unification

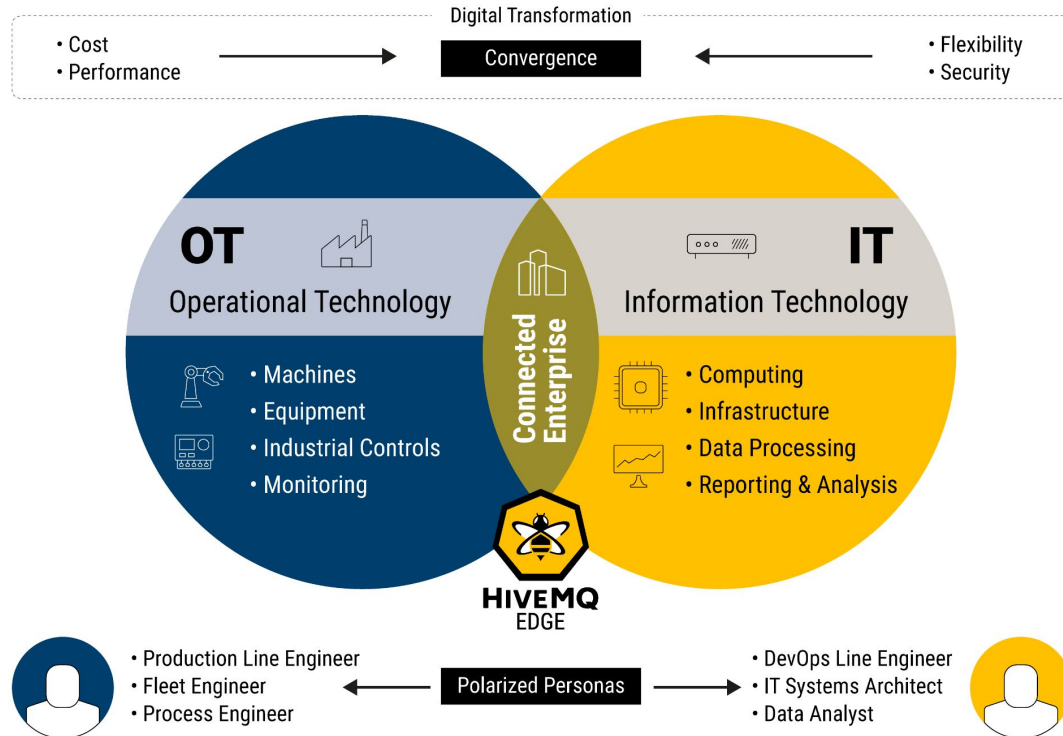


# Reference Architecture for OT-IT Integration





# Demo: Introducing HiveMQ Edge for OT-IT Data Integration



# Thank You!

## Q&A

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