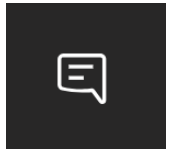
Velkommen til Siemens Webinar: MindSphere

Velkommen! Vi begynner 12.05

- **Vi tar opptak av webinaret (blir delt senere)**

- **Anbefaler aktivering av full-skjerm:**

- **Vi tar gjerne spørsmål i chatten og vi går gjennom disse til slutt.**



Knut Lønskog
Digital Enterprise : MindSphere

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MindSphere

The cloud based, open IoT operating system

siemens.tld/keyword


Connect Assets
Platform as a Service
Applications
MindSphere OS

Siemens knows IoT and connected devices
Powered by MindSphere

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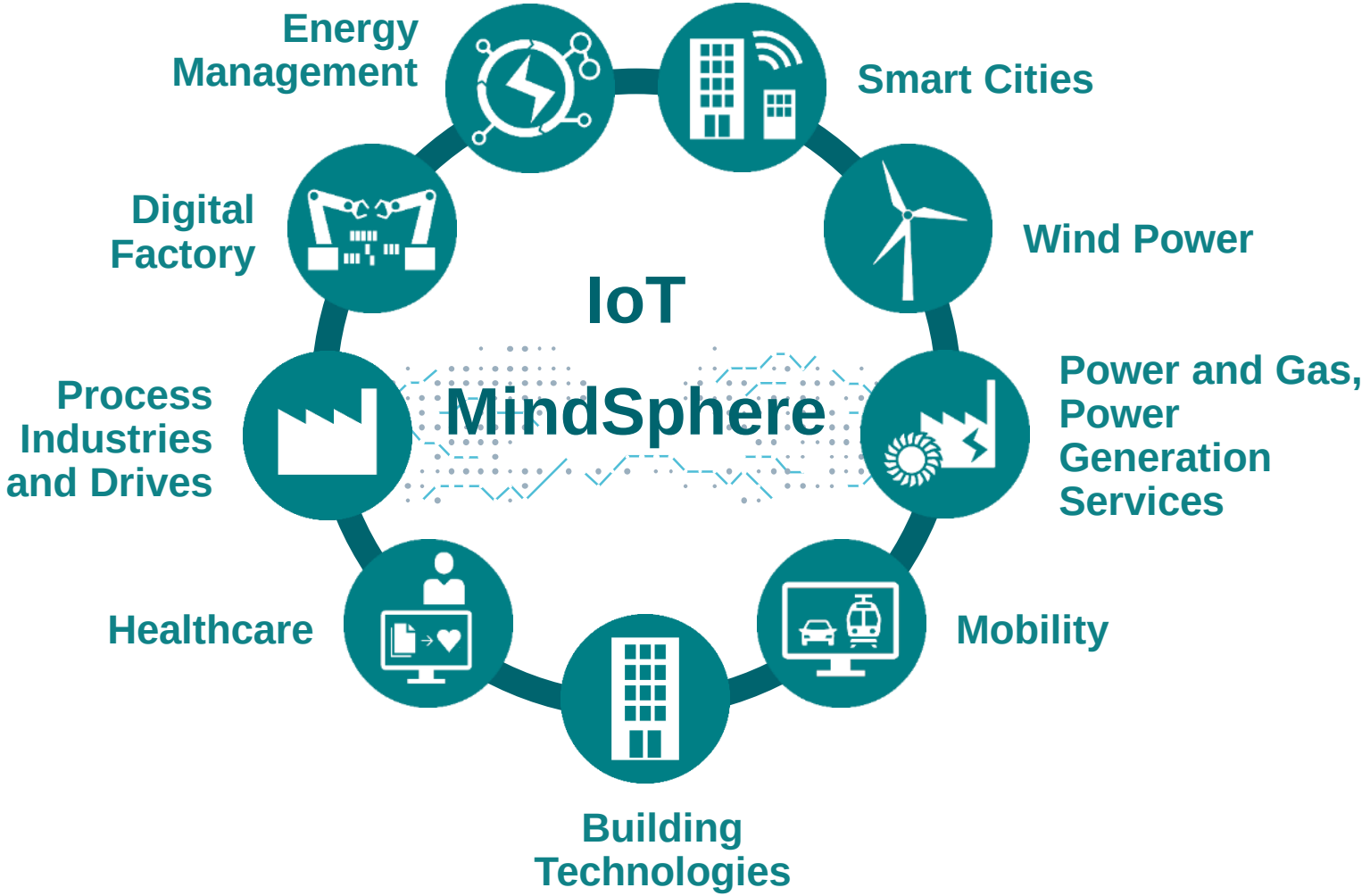
Siemens is the #1 automation provider, delivering mission critical operation and automation technology, with:

- **30M** automation systems
- **75M** contracted smart meters
- **over 1M connected products** in the field today



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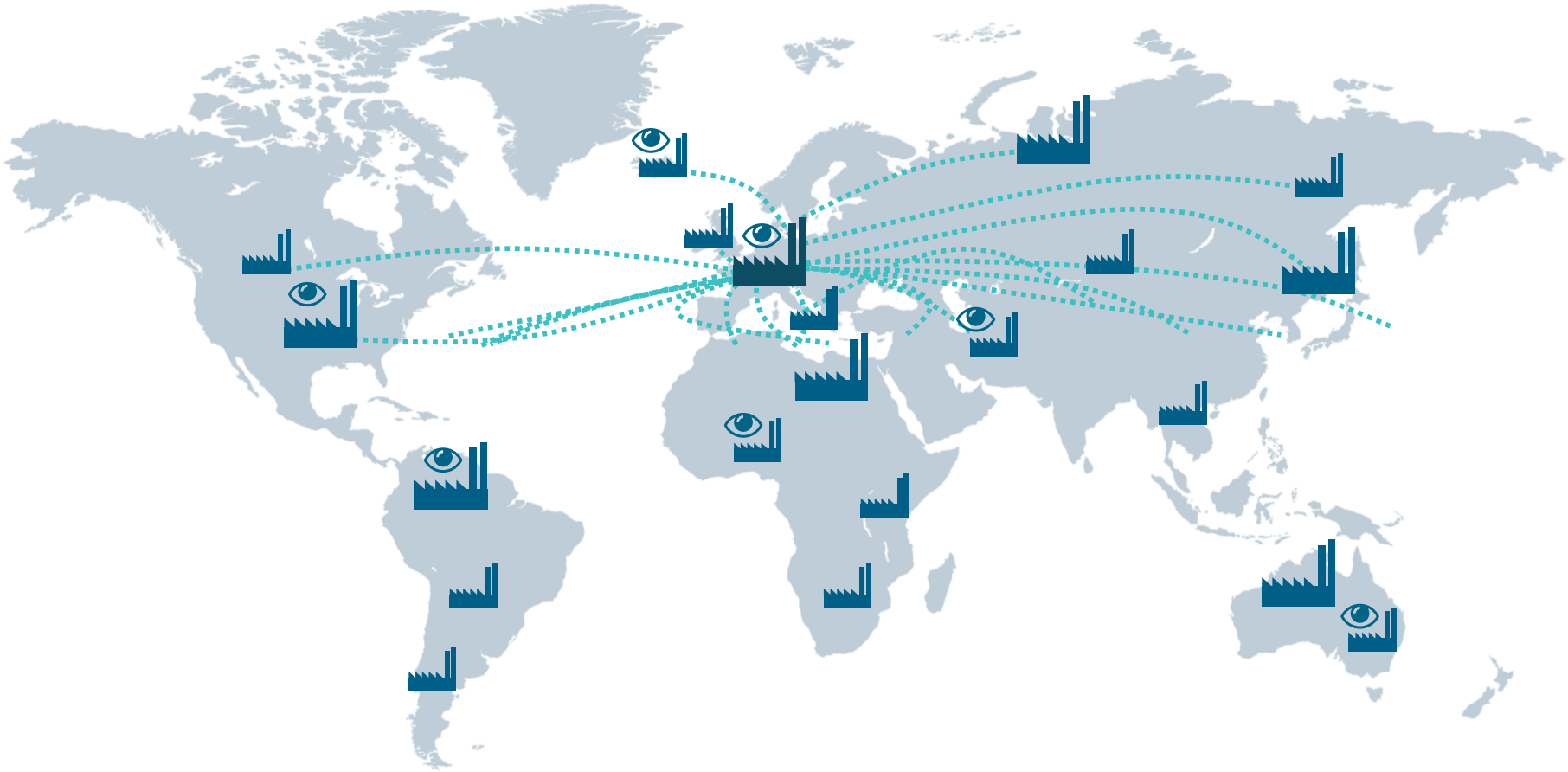
Why Cloud?

Connected global fleet

Storage and computing elasticity

Seamless updates

Data source integration




Applications
Open PaaS
MindSphere
Connectivity

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Microsoft Azure

aws

Alibaba Cloud

The IIoT jungle

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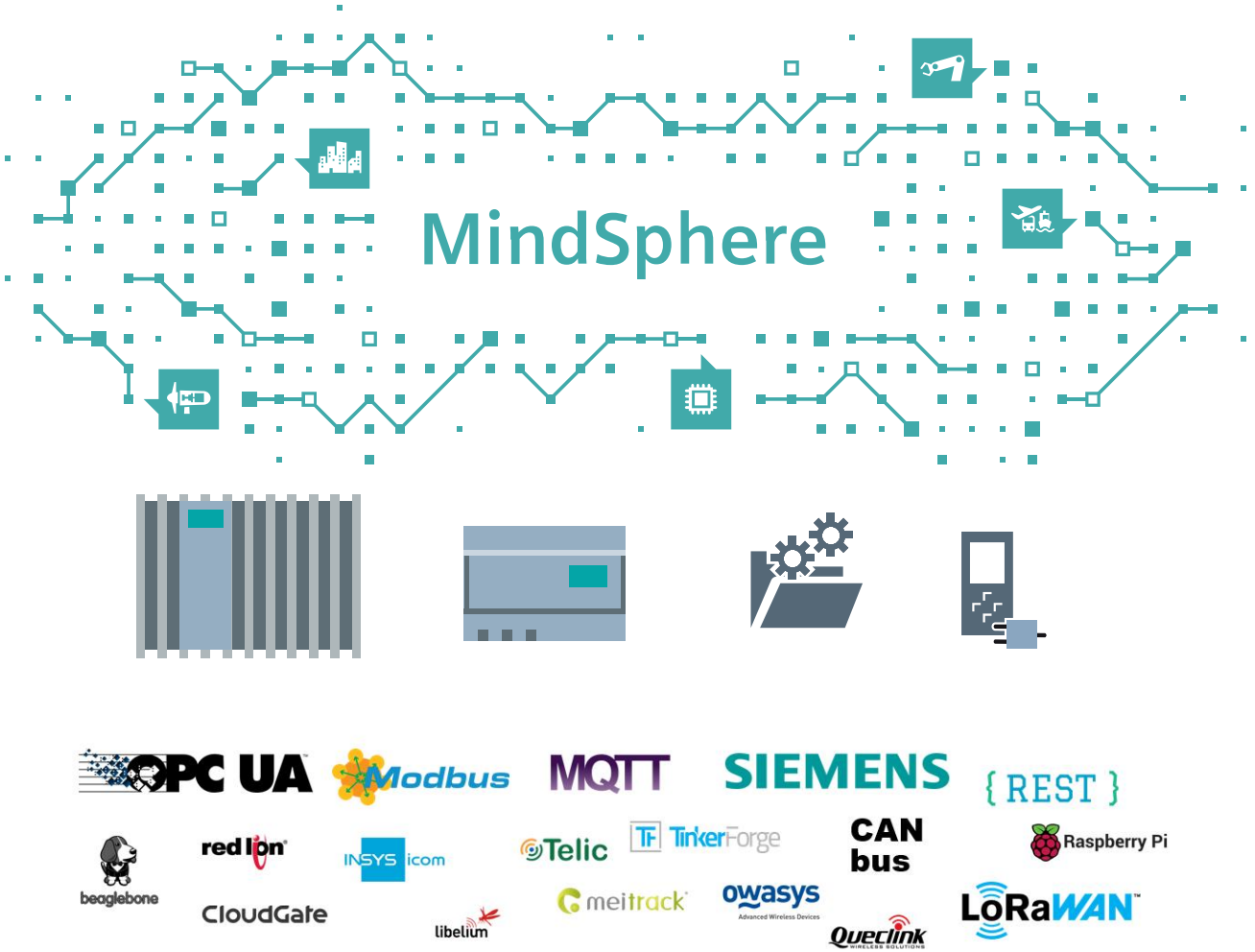

MindSphere: Faster time to value at lower risk
Building your own IoT solution vs. MindSphere

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60% less time

25% less OpEx

40% less CapEx

90% less risk

Timeline to value

BUY

Connect and manage asset	Manage industrial connectivity	Manage hot, warm, cold storage	Build application
Out-of-the-box connectivity	Easy & secure data transfer	Make use of data & context	Real-time dashboards of insight

When you buy from MindSphere, you get:

- ✓ Ready-made platform
- ✓ Pre-built applications
- ✓ Partner ecosystem
- ✓ minimize Capex and optimize Opex

MindSphere
The cloud-based, open IoT operating system from Siemens

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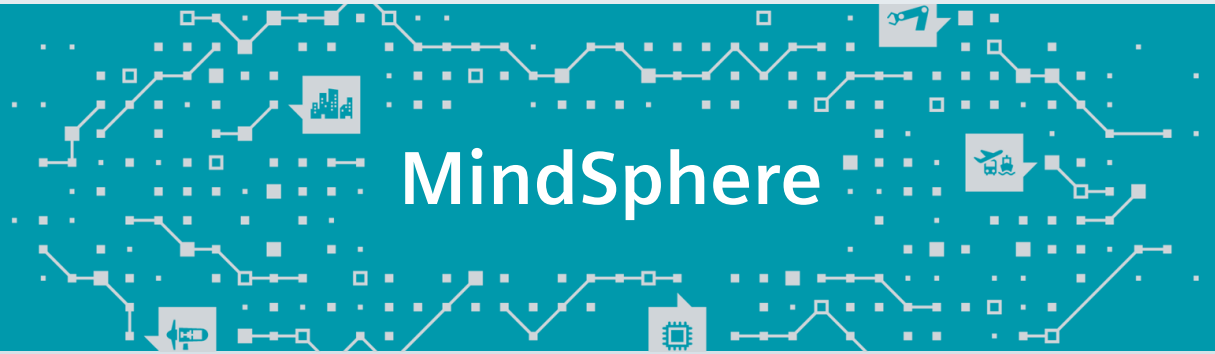
Applications

Powerful industry solutions
with advanced analytics

mx mendix
the app platform

Develop robust industrial
IoT solutions faster
with global scalability

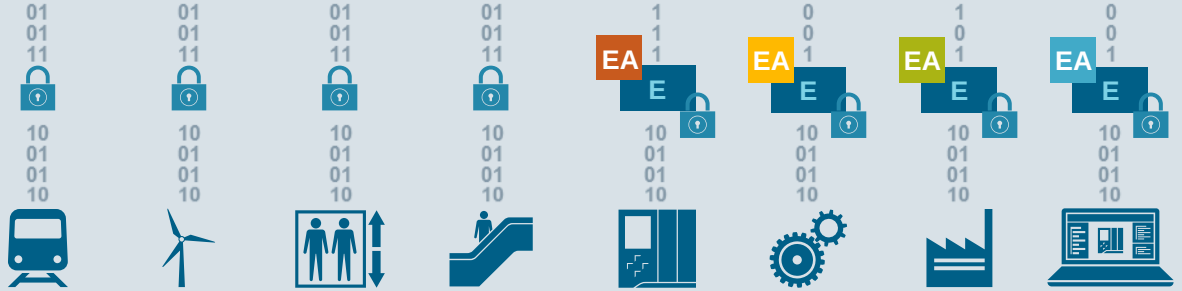


Edge Management

Edge Device Management,
Edge App Management,
and Edge App Store

Connectivity

Connect products, plants,
systems, machines and
enterprise applications



Edge Apps

Siemens, partner (OEM),
and 3rd-party Edge Apps

Edge Devices

Multiple enabled devices hosting
the Industrial Edge platform

Openness by Design
MindSphere Connectivity at a glance

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MindConnect Nano and MindConnect IoT2040

MindConnect API/LIB

MindConnect IoT Extension

MindConnect Integration

Openness by Design
e.g. for Devices & Web- and Enterprise- integrations

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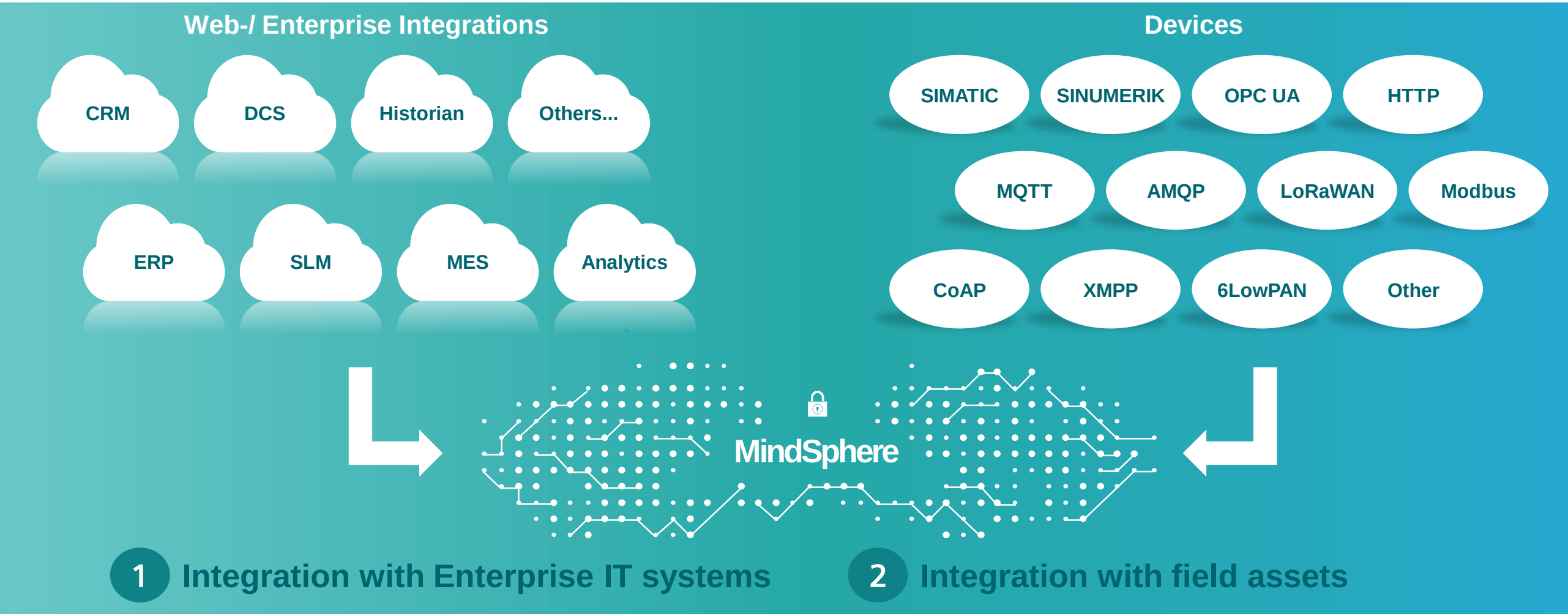

Cyber Security on MindSphere

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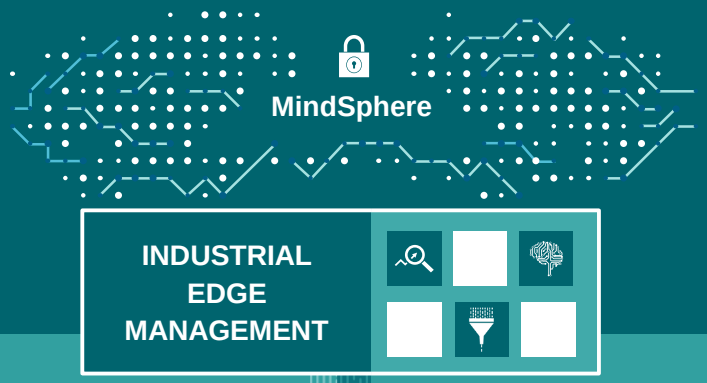
- Aligned to the principles of Industry Standards IEC 62443, ISO/IEC 27001, BSI
- Data in motion is always encrypted using 256-bit SSL/TLS encryption or better
- Data at rest is stored in certified cloud data centers (AWS, Azure) with highest security standards
- Siemens Gateway and Edge Devices are security hardened with separate field and external networks and internal firewalls
- Devices are initiating only outbound connections

How it works

End-to-end IIoT

CLOUD LEVEL



Enhances transparency and drives deep operational insights

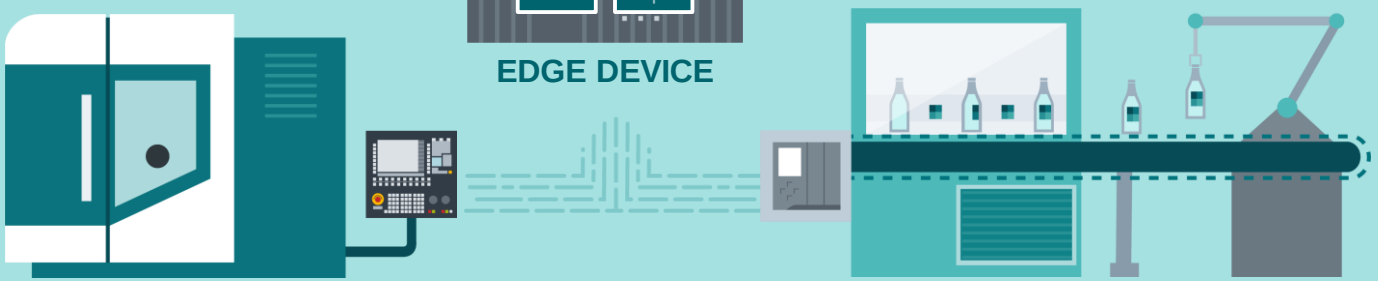
FACTORY LEVEL

DATA TO CLOUD

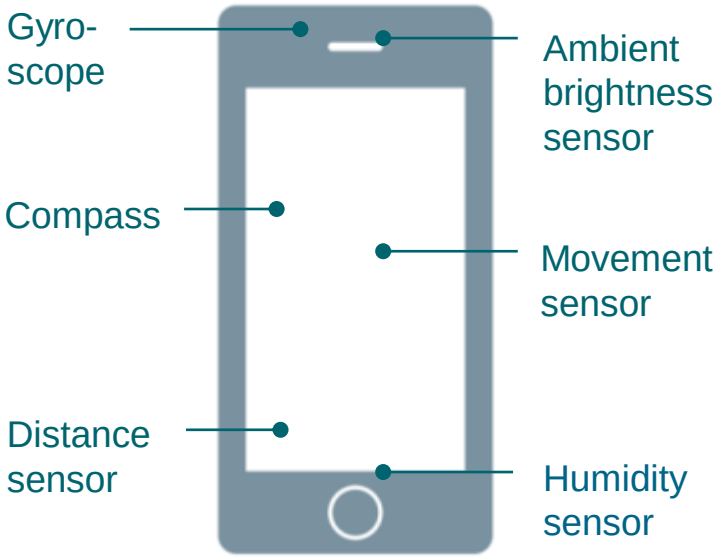
EDGE APP TO DEVICE

Transfers device data to cloud for storage and analysis

FIELD LEVEL



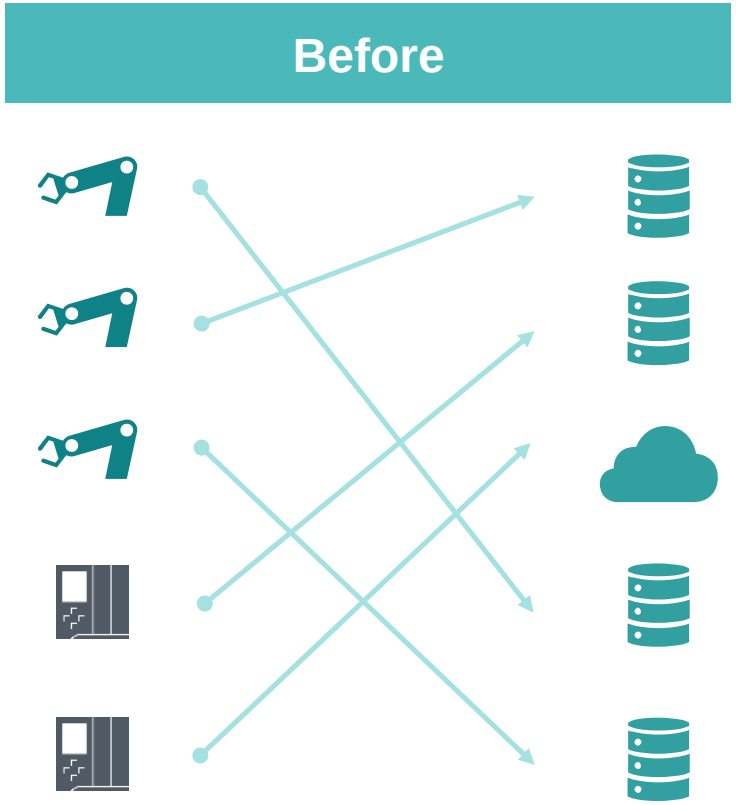
Connects legacy and new equipment for improved processes

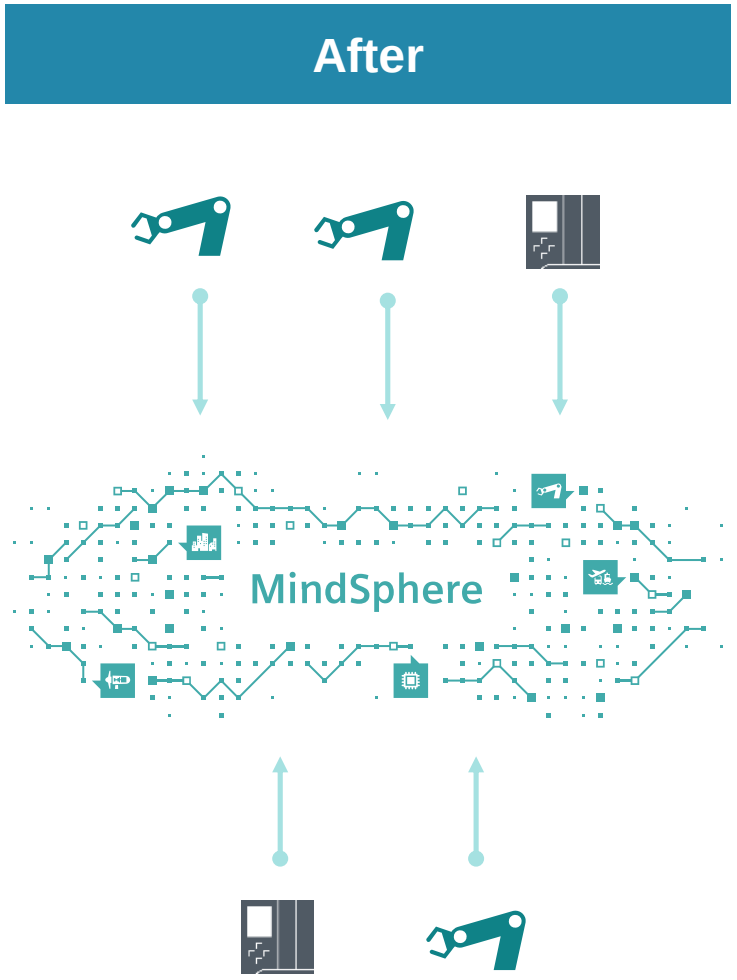


6 sensors

2000 data points

Now everything is connected





Volkswagen to cooperate with Siemens for Industrial Cloud

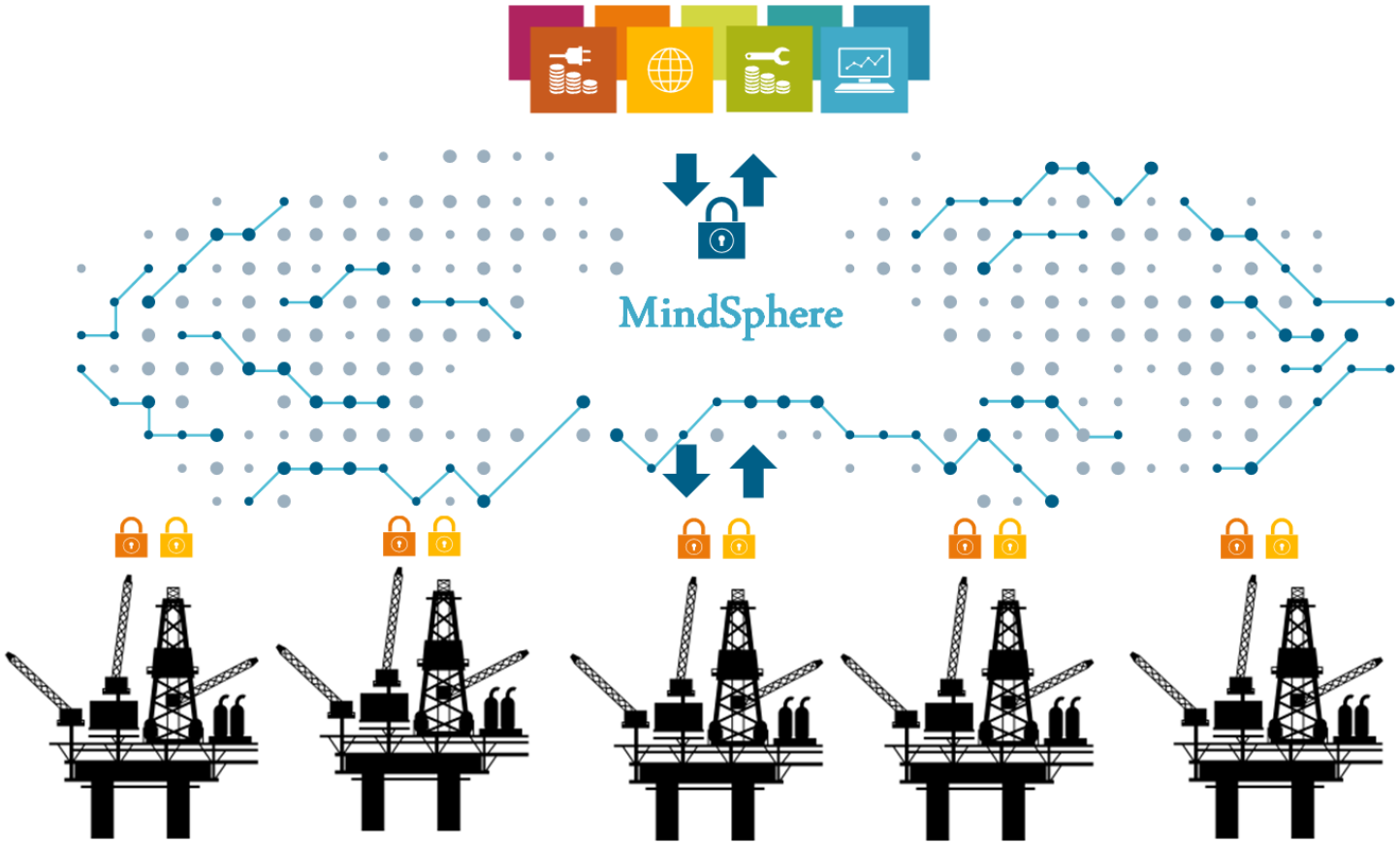
Connecting 122 plants using Siemens MindSphere, Automation and Industrial Edge to increase productivity

Volkswagen Industrial Cloud to be jointly developed with AWS and Siemens

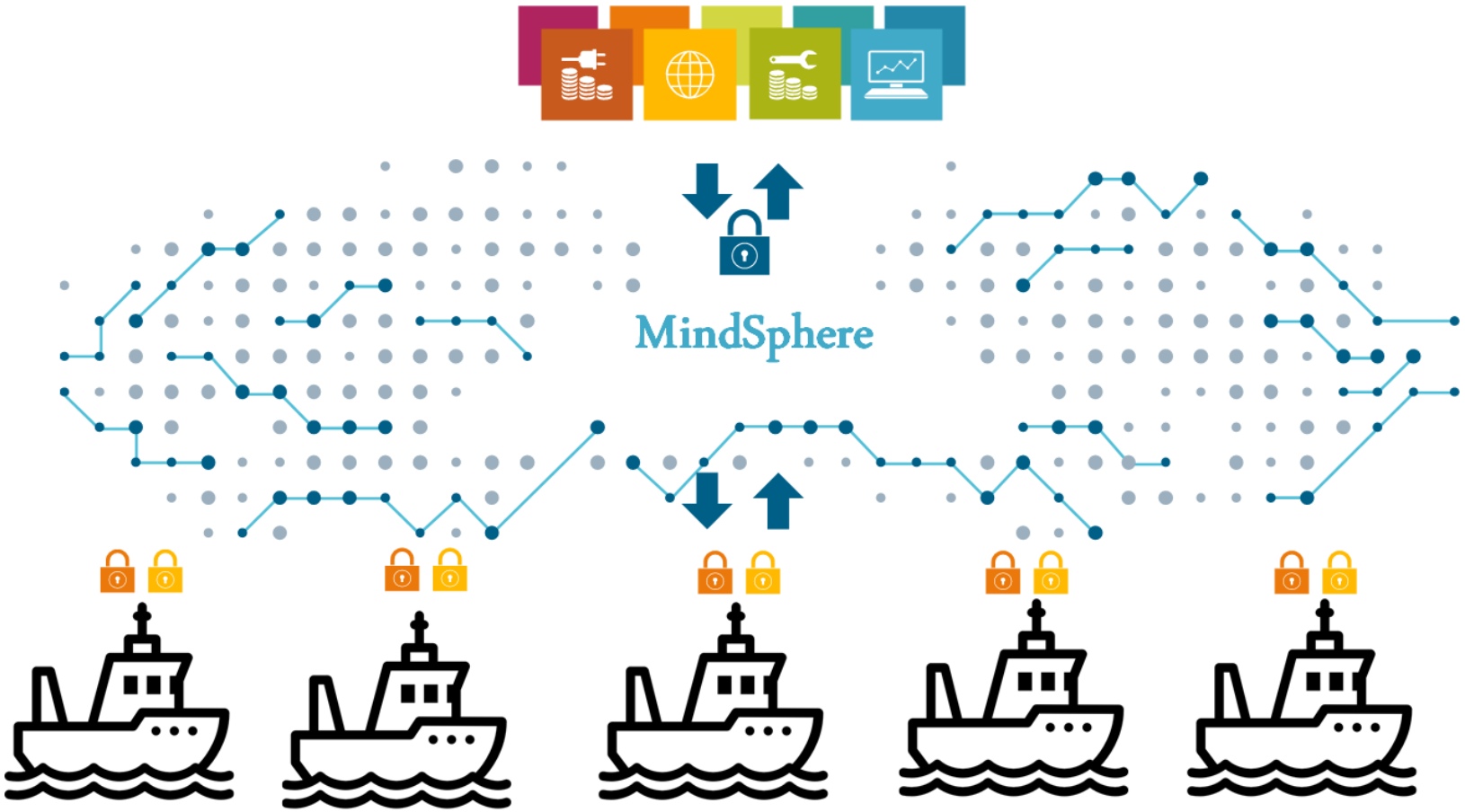
In Siemens, we have secured a strong partner with outstanding digitalization and industry expertise

Oliver Blume, Member of the Board of Management of Volkswagen AG

Extract value with data in relation



Extract value with data in relation



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MindSphere

11
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MindSphere components
- from visualization to advanced analytics

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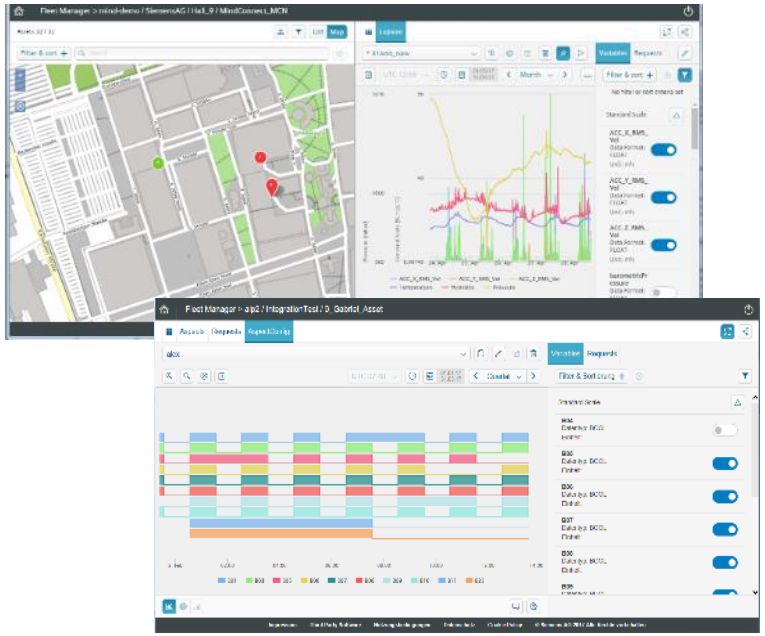
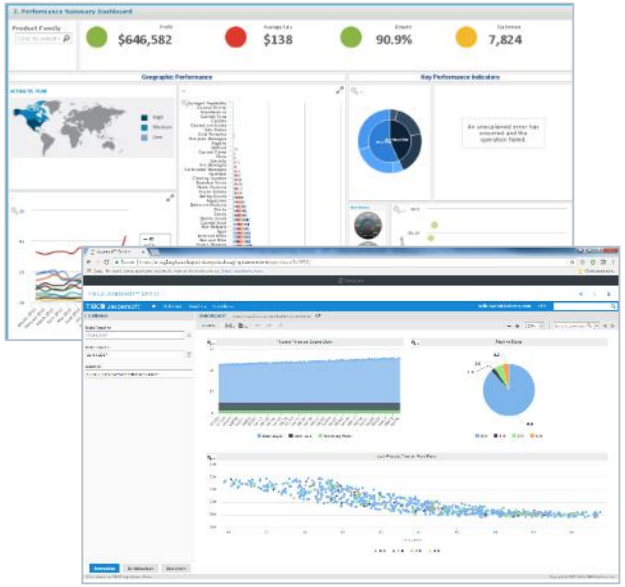
Visual Analyzer

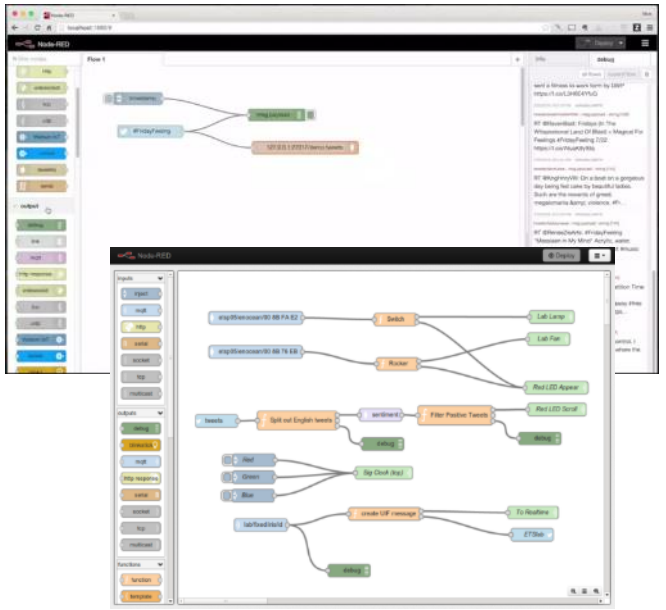
Visual Flow Creator

Data Exploration built on Tableau®

Predictive Learning

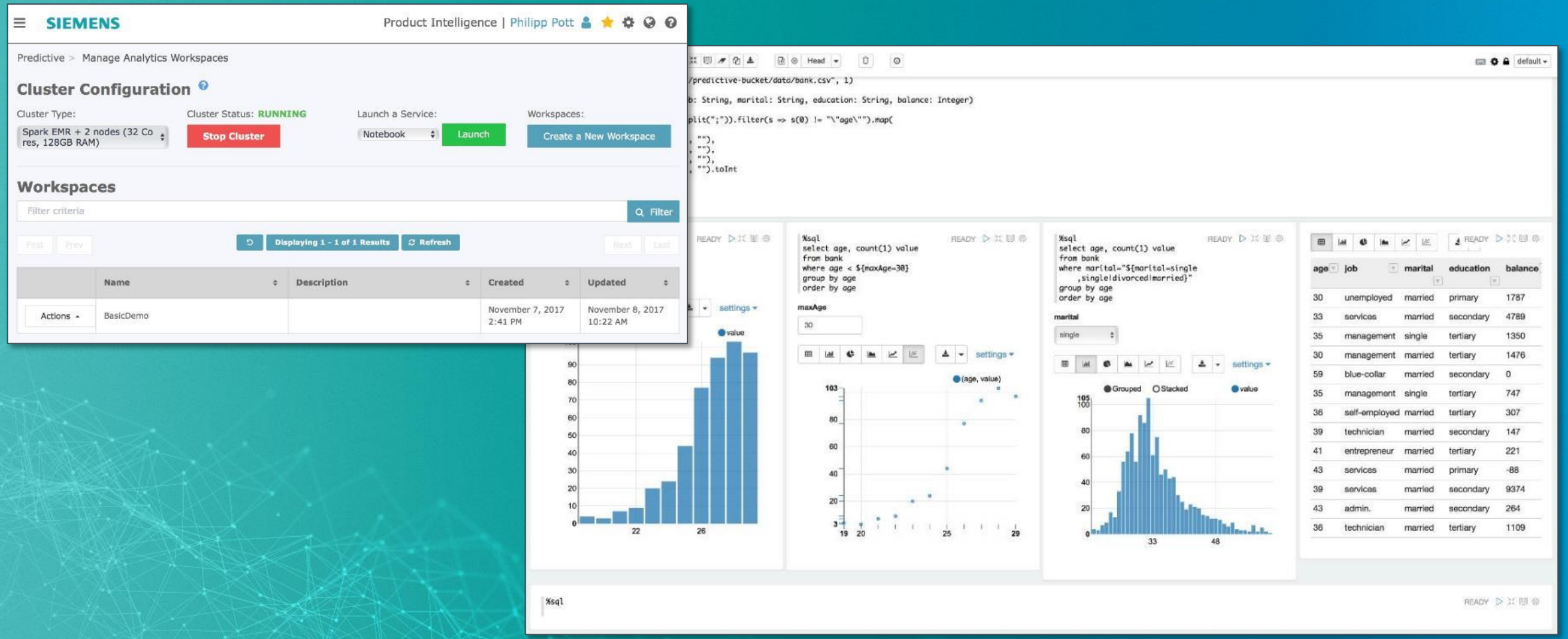






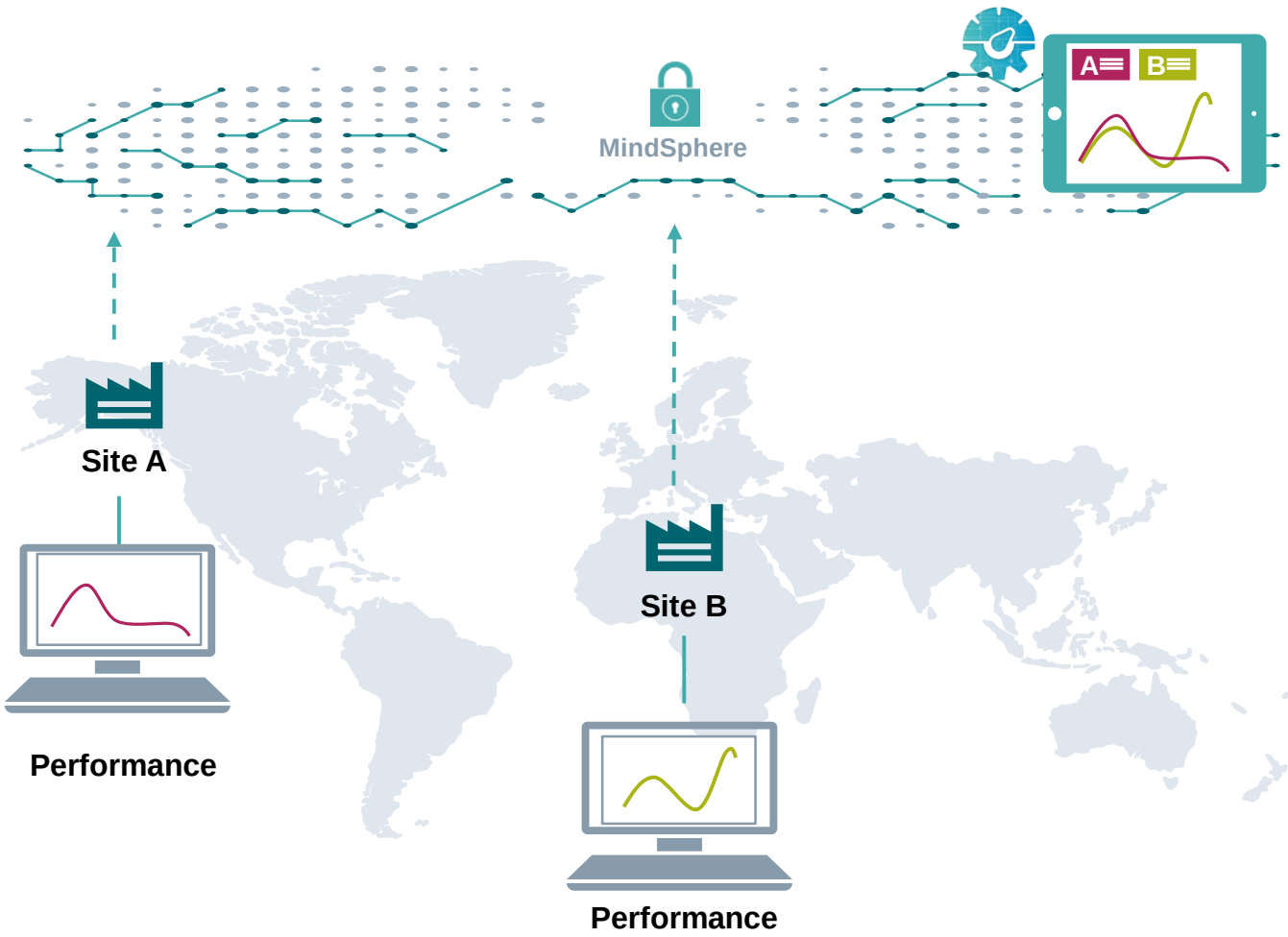
MindSphere Analytics

e.g. Predictive Learning – Machine Learning Cluster Environment



SIMATIC Performance Insight MindSphere app

Worldwide comparison of the effectiveness of lines



Scenario

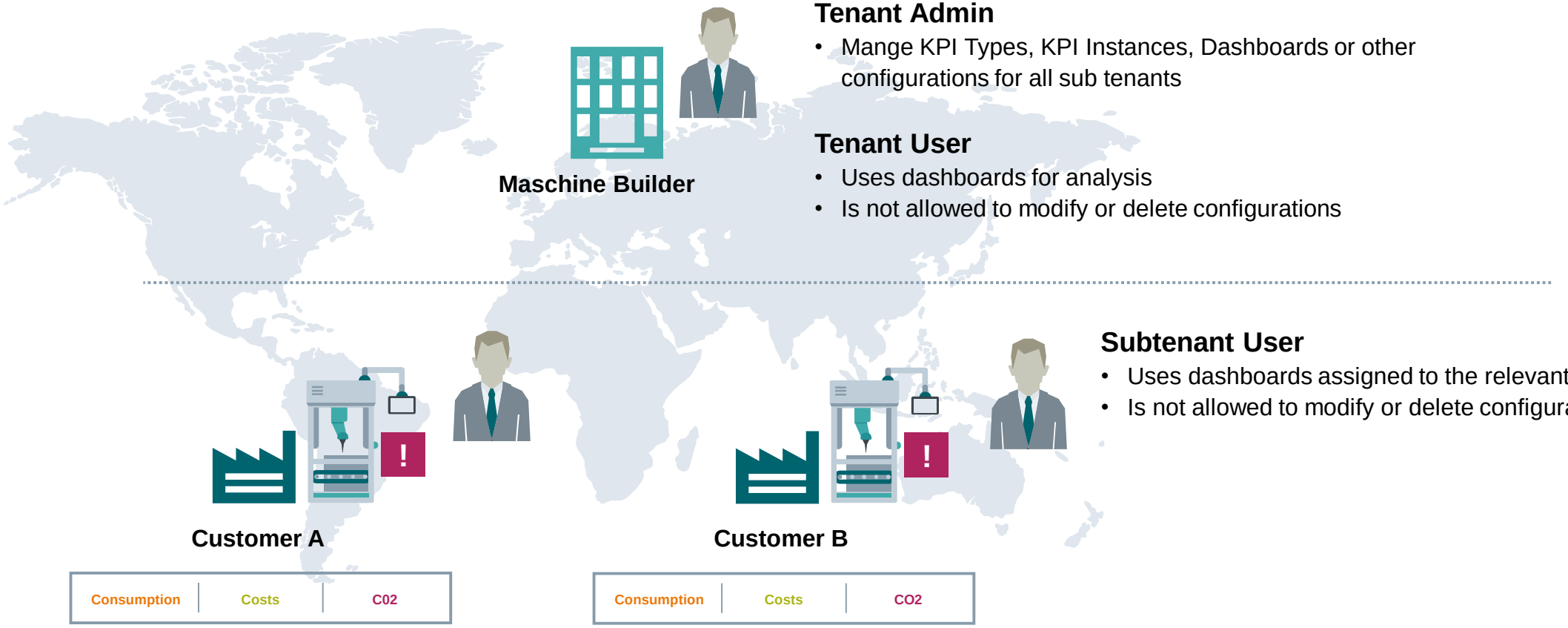
- Worldwide comparison of the energy efficiency of lines, sites,..
- Cloud Know How is low at the customer side
- Global access any time and every where

Additional steps

- Connection implementation for all the assets, lines, sites,…
- Data preparation in the systems
- Data visualization

SIMATIC Performance Insight
MindSphere app
Sub-Tenancy support

OEM Use Case



Tenant Admin
- Mange KPI Types, KPI Instances, Dashboards or other configurations for all sub tenants

Tenant User
- Uses dashboards for analysis
- Is not allowed to modify or delete configurations

Subtenant User
- Uses dashboards assigned to the relevant sub tenant assets
- Is not allowed to modify or delete configurations

SIMATIC Performance Insight
MindSphere app
Cross-Tenancy Support

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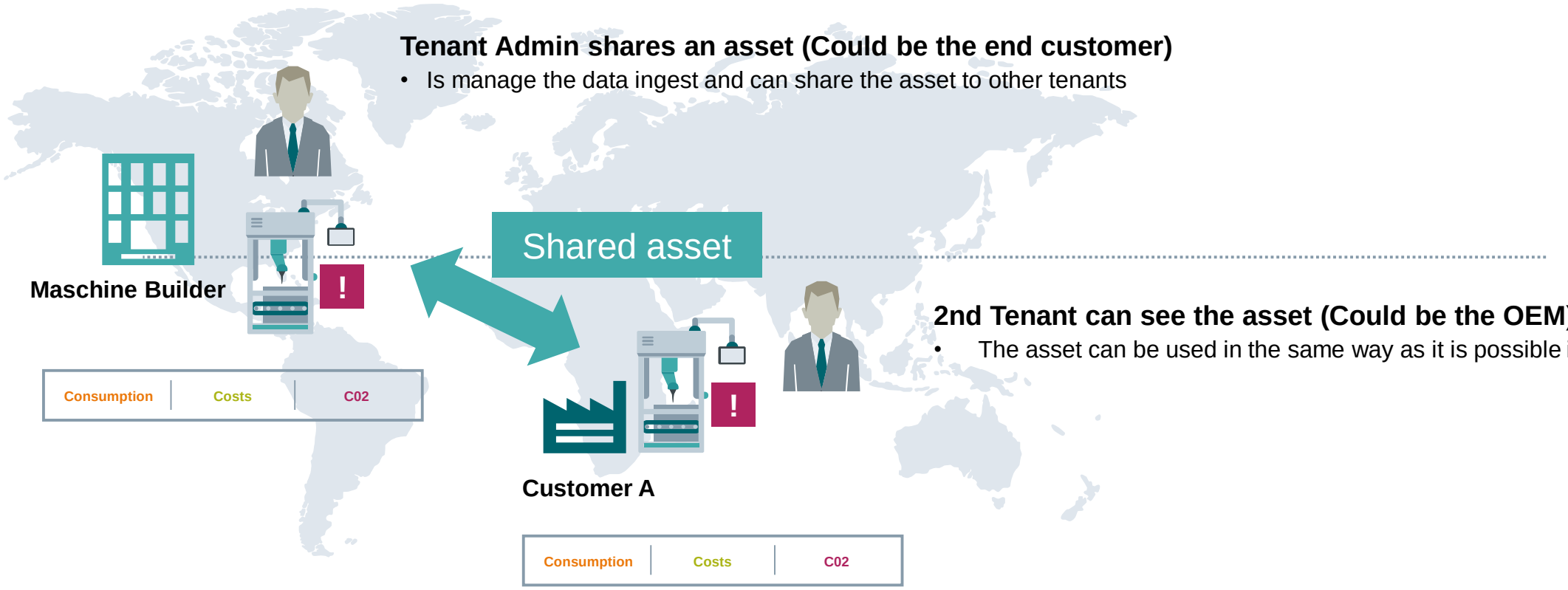
OEM – end customer Use Case

Tenant Admin shares an asset (Could be the end customer)

- Is manage the data ingest and can share the asset to other tenants



2nd Tenant can see the asset (Could be the OEM)

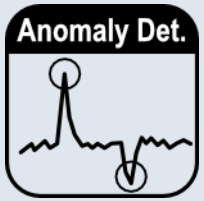
- The asset can be used in the same way as it is possible in the initial tenant

MindApp APIs in MindSphere - Examples
Details of Analytic APIs

Description

Anomaly Detection

Density based detection of anomalies trained with a golden batch data set for up to 10 dimensions



Trend Prediction

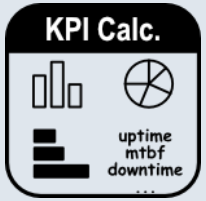
Provides linear & polynomial regression of time series data for predicting future data points, trends and range violations

Event Analytics

Provides the top ten error events of a given set of error messages, can be trained for detecting error patterns in event logs in a later stage

KPI Calculation

Statistical data on operating KPIs of a machine given a state variable as input that indicates the machine operating status



Usecase

- Condition Monitoring
- Early warning functionality
- Detection of many various fault conditions without explicit definition

- Detect end of life (EOL)
- Predict remaining time to take action e.g. replacement
- Seasonality removal as preparation for other tasks

- Alarm management
- System troubleshooting
- Root-cause analysis: identification of the root causes of faults or problems

- Monitor reliability, availability and maintainability
- Risk assessment and diagnostics applications
- Condition-based Mainten.

MindApp APIs in MindSphere - Examples
Details

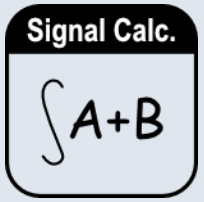
Description

Signal Validation

Finds range violations, spikes, sudden signal steps, extremely large signal variations (aka noise), bias deviation, dead bands and signal gaps for later processing e.g. Alerting

Signal Calculation

Provides signal mathematics such as filling dead bands, transformation, phase calculation and basic maths e.g. as step after Signal Validation

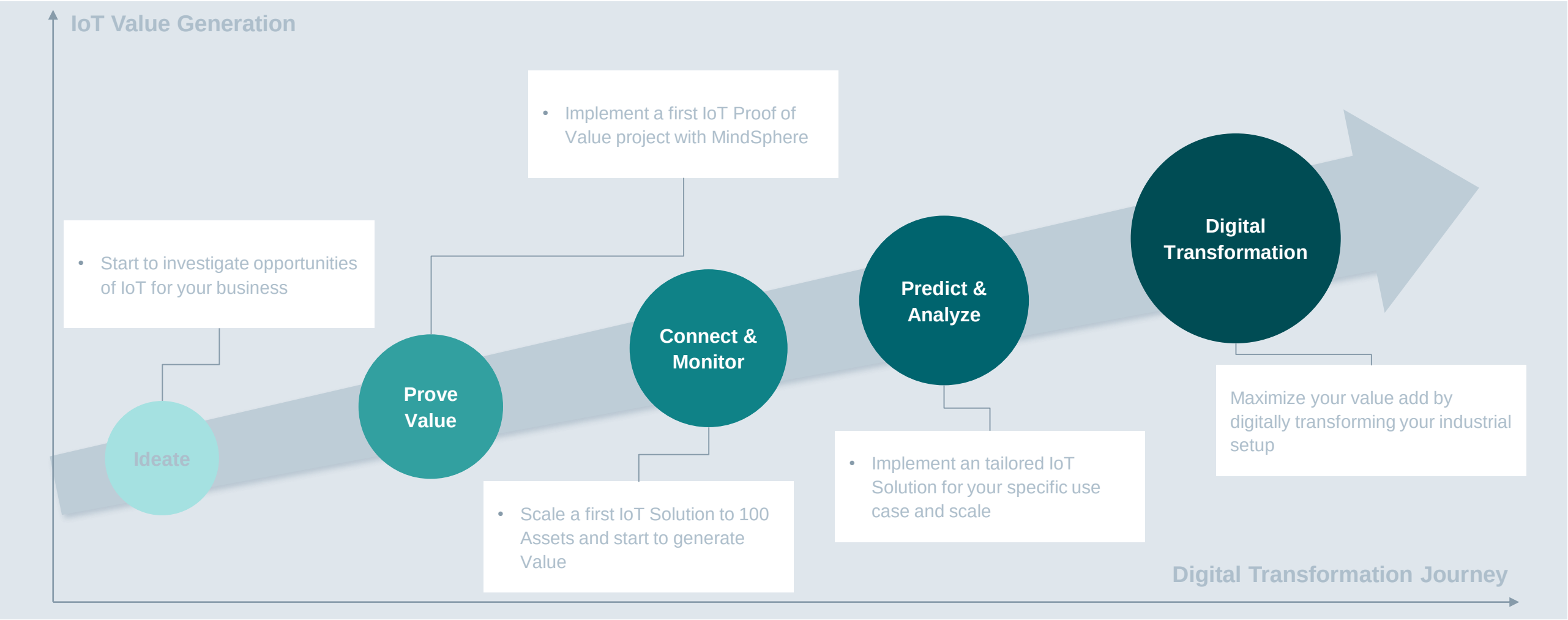


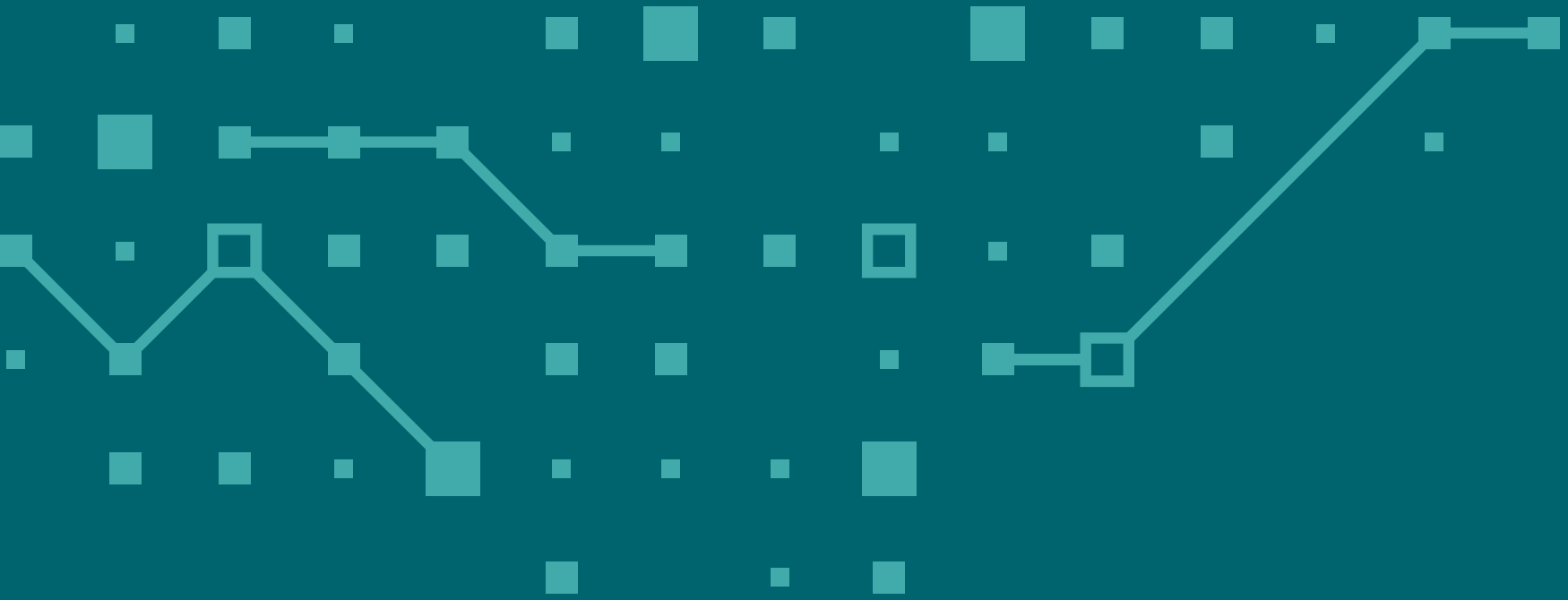
Usecase

- Detect missing sensor values from machineries
- Validate metering data
- Alerting for known sensor readings

- Replace missing or smooth existing sensor values
- Compute a parameter from sensor readings over a sliding window

Defined solution packages along the Digital Transformation Journey to drive scalability and customer value for Mid Market





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