

How to use data to optimize asset performance via Industrial IoT?

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Agenda

Topic

1 IloT Introduction

2 IloT Business Drivers

3 IloT Asset Performance Monitoring Solution

4 Customer Projects Examples

5 Summary and Q&As

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The Industrial Internet of Things (IIoT)

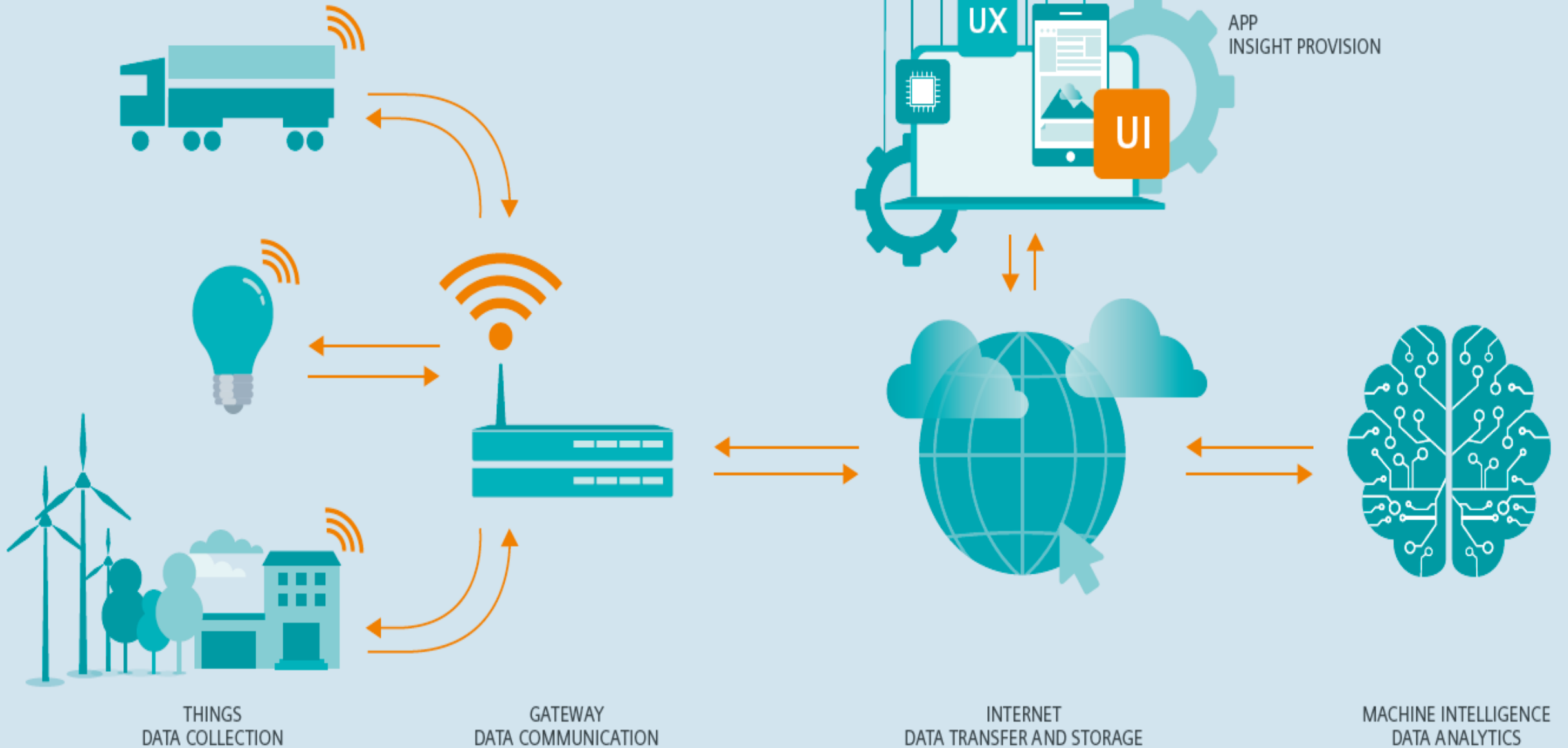
refers to **interconnected** sensors, instruments, and other devices networked together with computers' industrial applications, including, but not limited to, manufacturing and energy management.

This connectivity allows for **data collection**, exchange and **analysis**, **potentially facilitating improvements in productivity and efficiency** as well as other economic benefits.^[1]

The IIoT is an evolution that allows for a higher degree of automation by using cloud computing to refine and optimize the process controls.

The IIoT in a nutshell

Connect things and create an insight



“Connected devices do not generate any value on their own. It is all about finding the right use cases, that do...!”

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1 IloT Introduction

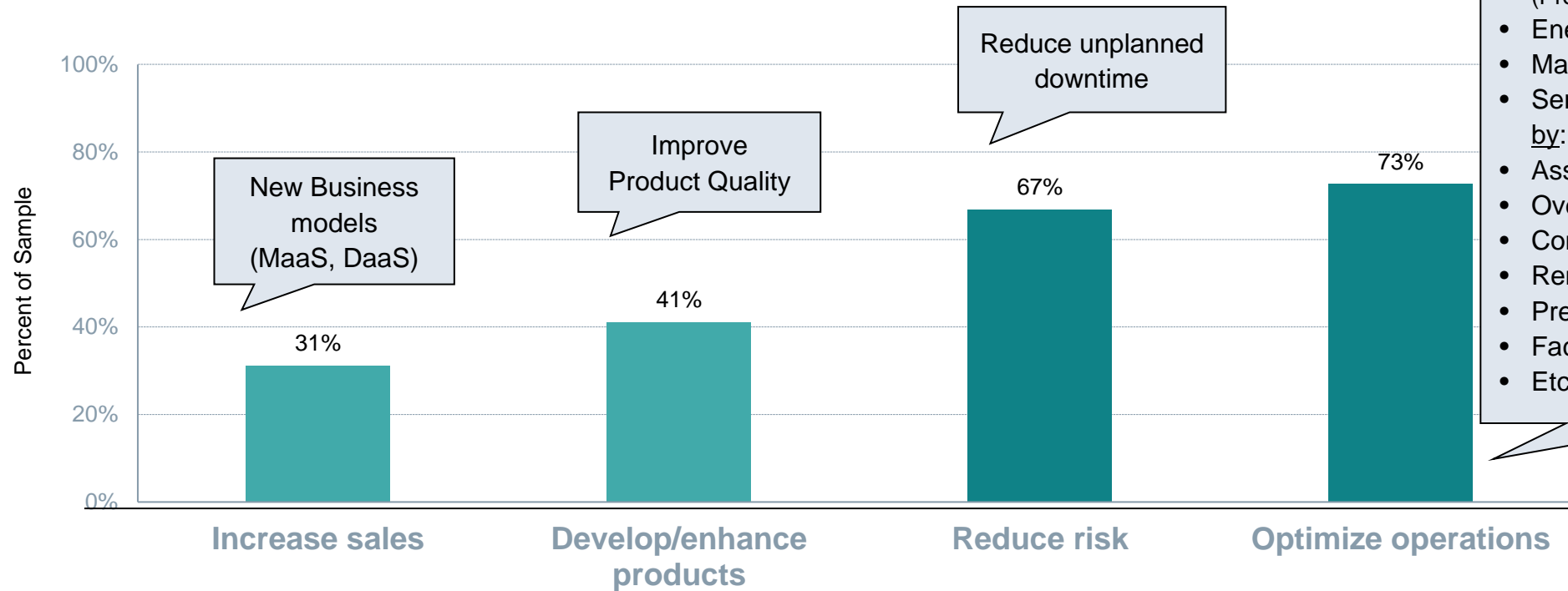
2 **IloT Business Drivers**

3 IloT Asset Performance Monitoring Solution

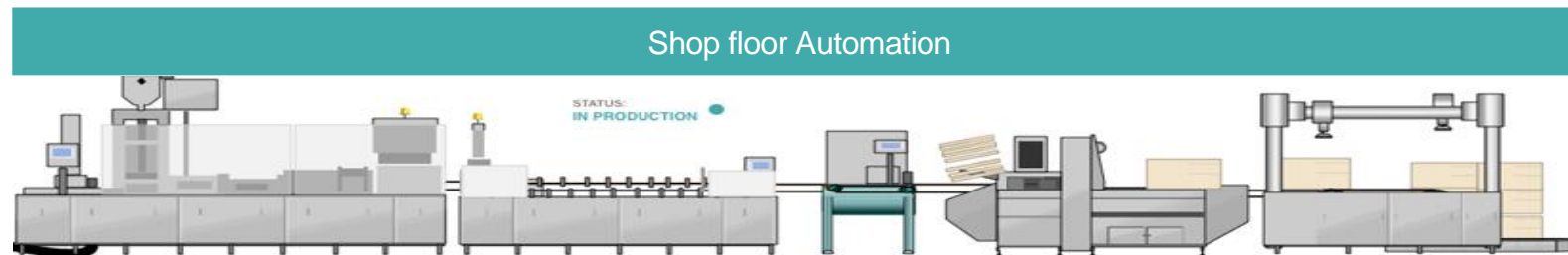
4 Customer Projects Examples

5 Summary and Q&As

Which business drivers initiate IoT use cases?



- Production efficiency (Process, Yield, Quality, Materials, Waste)
- Energy Efficiency
- Maintenance Costs
- Service Optimization
- by:
- Asset Mgmt & Digital Twin
- Overall Equipment Efficiency (OEE)
- Condition based Monitoring
- Remote Diagnostics
- Predictive maintenance
- Factory of Future (Edge, AI, AR/VR)
- Etc.



The background features a woman in a white hard hat and safety vest looking to the right. Overlaid on this are various technical and industrial graphics: a wind turbine, a robotic arm, a server rack, a gear, and a control panel. On the left, there are vertical columns of binary code (0s and 1s).

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Today, **less than 5% of all data** generated in manufacturing plants is **analyzed for insights**

This means we are still **reactive**
rather than **proactive**

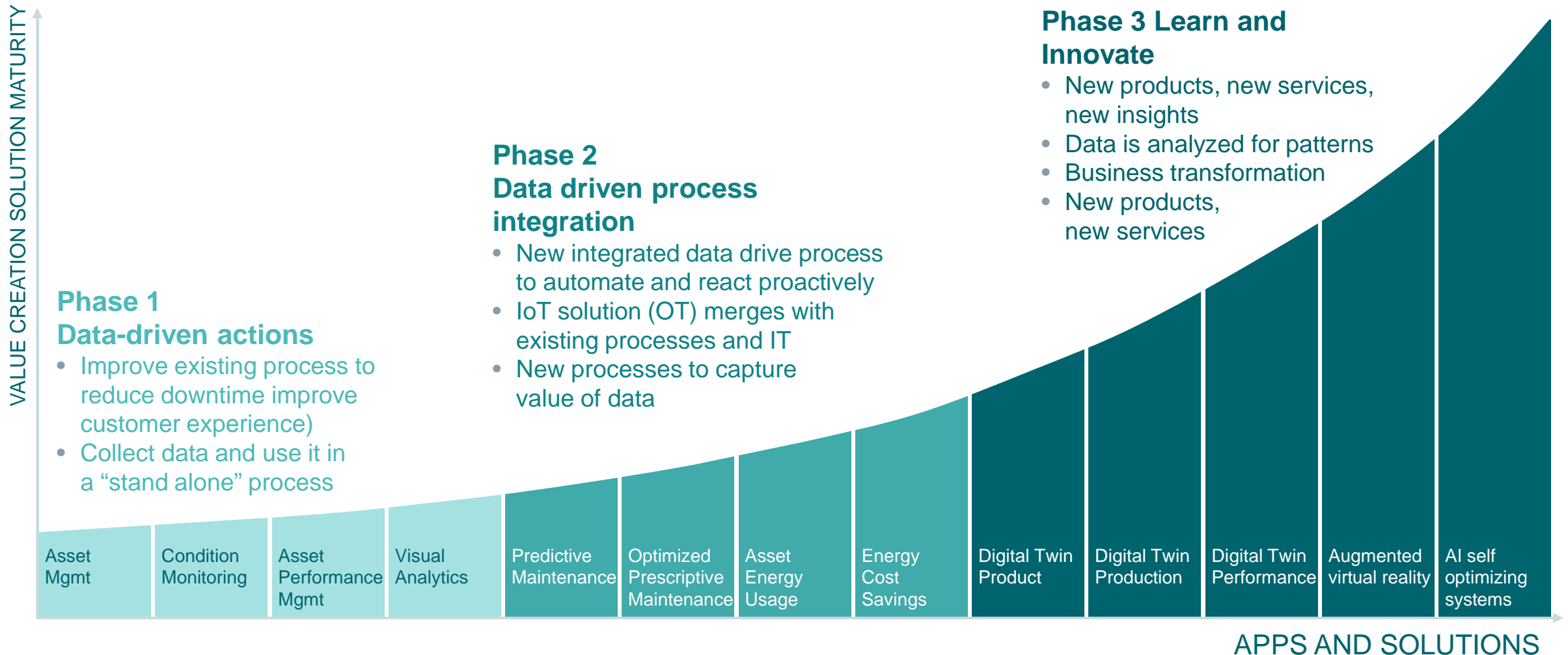
Harnessing the richness of the data
enables us to be **predictive**

Digital Transformation is a journey to unlock the value of your data

Digital Maturity Model - A phased, planned approach with targeted outcomes

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Your peers are moving the goal posts for success Are you adjusting?

Collecting and analyzing industrial data provides...

- detailed insights into performance for improved OEE
- increased machine availability
- lower maintenance costs



86%

of companies report
increase in profitability
with machine monitoring
and optimization

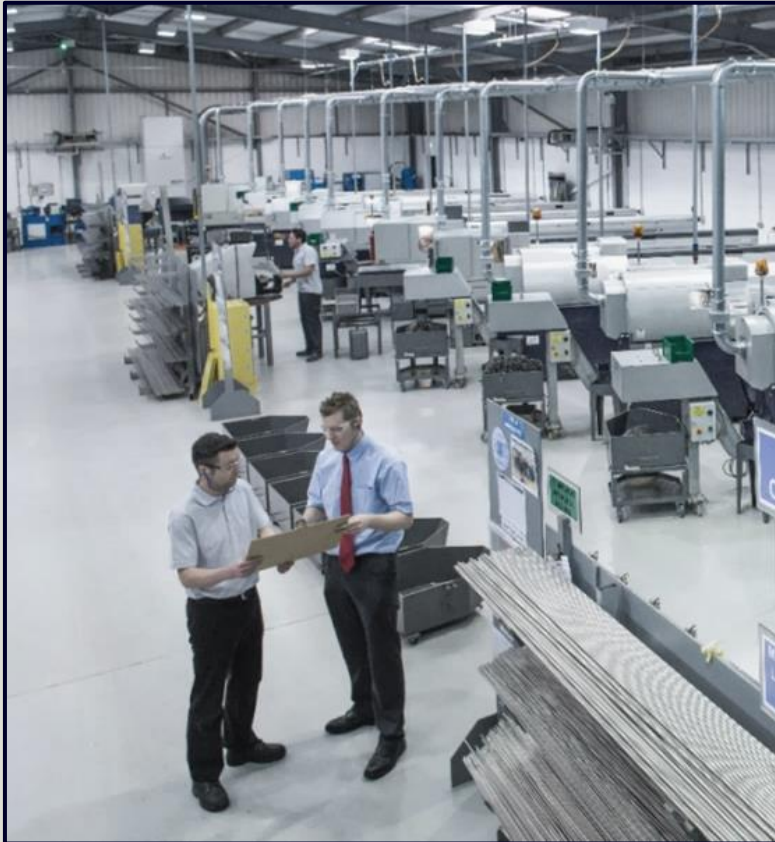
75%

Top performing companies
are **75% more likely to be**
able to react in near-real
time to machine anomalies

10% - 12%

Average gains with
smart factory initiatives

What challenges must you overcome to make your factory smarter?



Manufacturers often struggle with...



Manual input, paper-based tools, human errors



Missing standardization of data capturing methods



Heterogenous equipment landscape (hardware and software)



Missing intelligence to make data insightful and available

Solve these challenges and realize immediate value

Performance Monitoring and Collaborative Improvement



Reduce maintenance costs

- Expediate service to machines with mobile notification handling



Increase OEE

- Increase machine uptime and efficiency with quicker solutions



Optimize operational performance

- Provide full access to relevant machine KPIs to solve problems, find solutions, and share best practices with all stakeholders

Customer Successes

20%

Increase in operational efficiency

10%

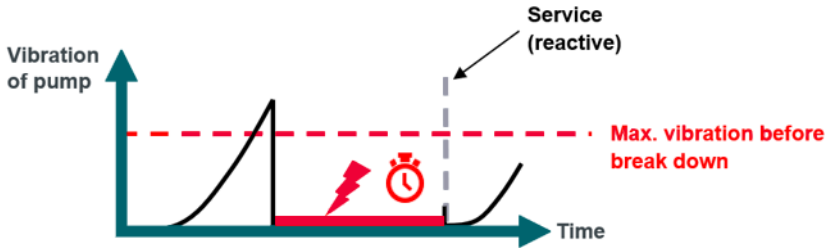
Increase in maintenance efficiency

What options do you have for providing service?

Move beyond efficient asset transparency and maintenance

Reactive services

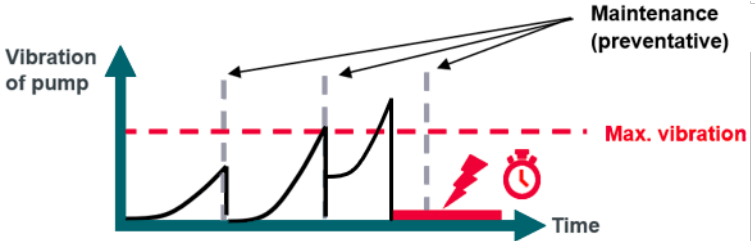
Maintenance after failure occurs



- ↓ Asset availability
- ↑ Downtime
- ↑ Repair costs

Time-based maintenance

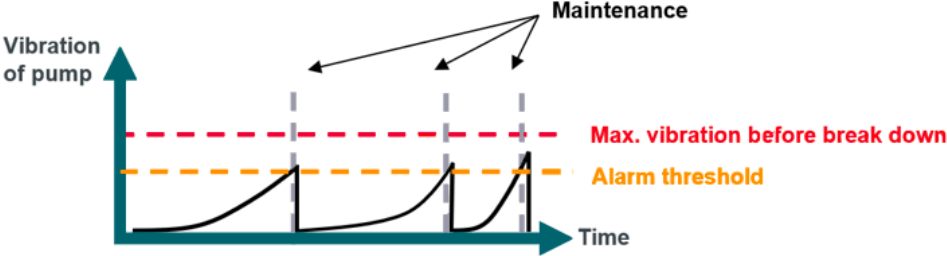
Maintenance in scheduled intervals, whether needed or not



- Asset availability
- Downtime
- ↑ Repair costs

Siemens solution

Reduce downtime:
maintenance only when needed



- ↑ Asset availability
- ↓ Downtime
- ↓ Repair costs

Performance Monitoring and Collaborative Improvement

**is a dedicated MindSphere
solution**

that enables you to reduce downtime &
maintenance cost by solving problems faster.

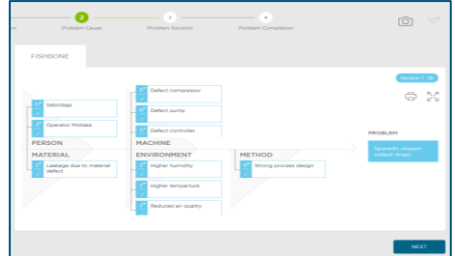
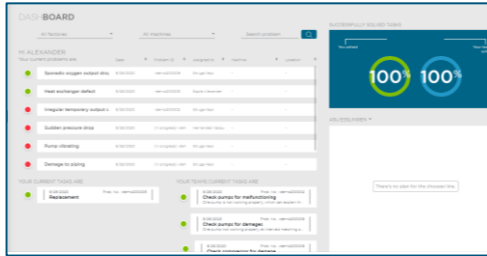
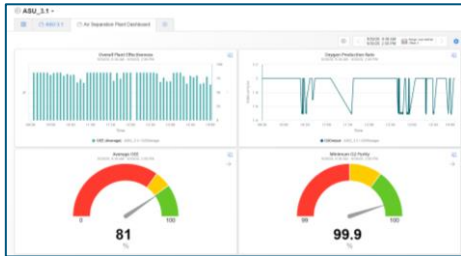
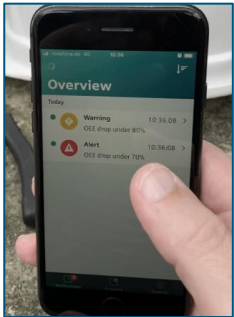
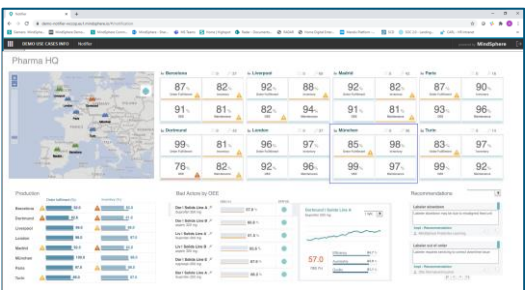
Performance Monitoring and Collaborative Improvement

Integrates the capabilities of three powerful apps



Performance Monitoring and Collaborative Improvement


Typical User Journey



Receive & assign

Receives and views notifications of OEE decline (from mobile device).


Assigns notification to service technician.



Plant Manager

Receive & accept


Accepts notification to indicate work is starting.



Service Technician

Analyze


Uses performance dashboard to get additional transparency on machines.



Service Technician

Research


Searches the collaboration database to find a solution already deployed at another site.



Service Technician

Improve

If there is no solution available: uses different methods to solve the problem and then **documents in the collaboration board**.

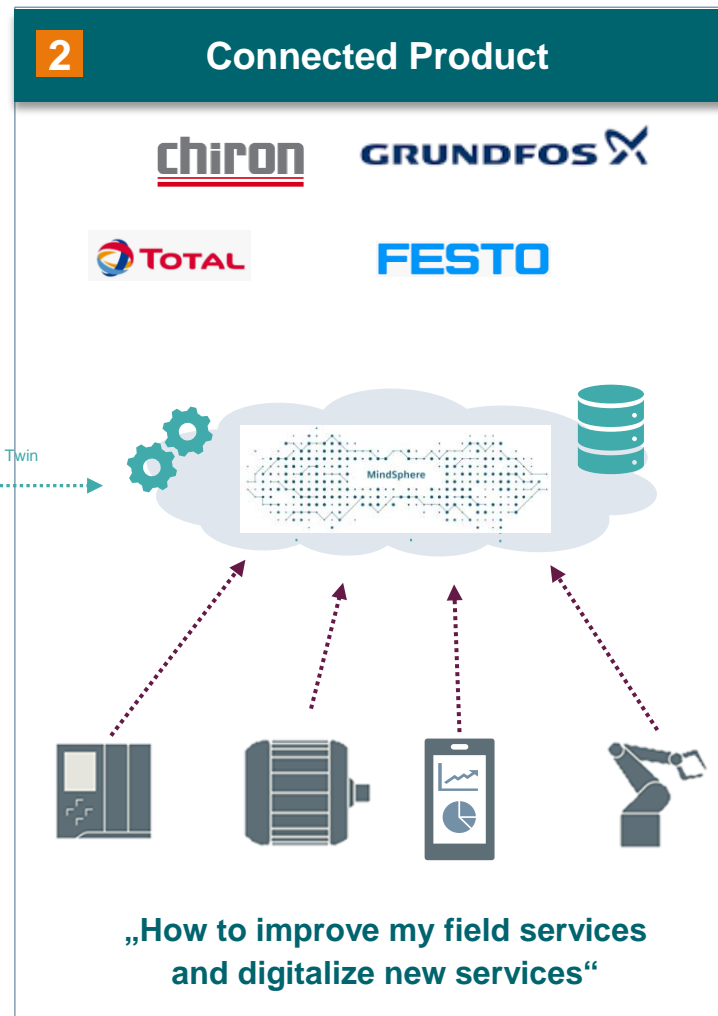
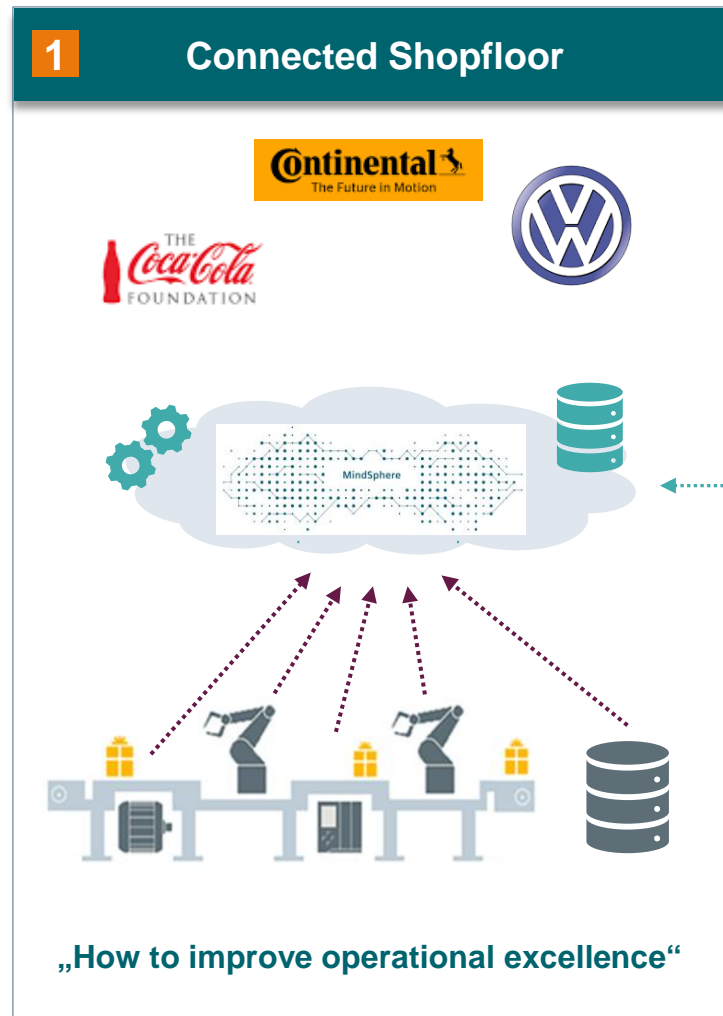


Plant Manager, Service Technician, etc.

This solution can be used both by machine operators and machine builders

Optimizing Shopfloor:

- Improve quality of service
- Increase availability of products
- Improve coverage of services



Digital Twin

Optimizing Field Assets/Services:

- Reduce cost of service
- Increase speed of service
- Offer new digital services

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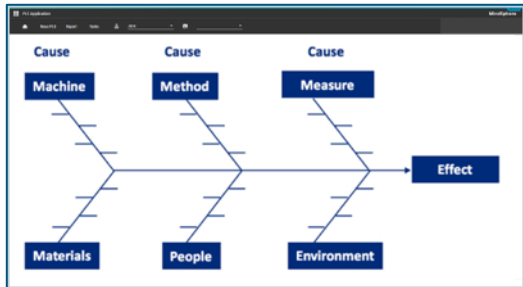
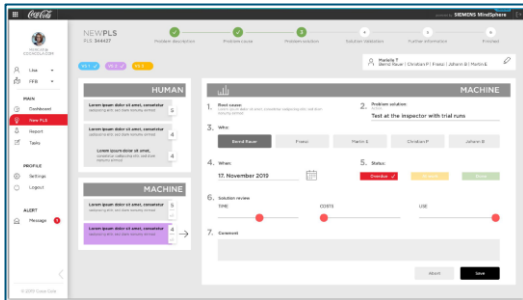
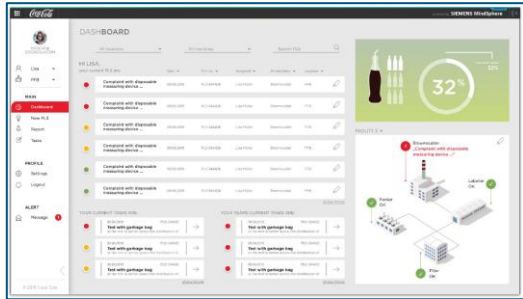
3 IloT Asset Performance Monitoring Solution

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Digital Twin of Performance – Coca Cola, Austria

Smarter shop-floor



Industry Challenges

- Increase availability of lines
- Reduce cost for maintenance
- Leverage the know-how of employees

MindSphere IoT Solution

- Define possible causes of shop floor problems and include live and historic machine data
- Manage tasks and track the problem-solving process
- Share solutions with others and access their problem-solving stories
- Digital A3 problem solving method (quality process) across multiple sites

Customer Benefits

- Reduced root cause identification time
- Increased availability of lines
- Utilizing the global knowledge of the employees
- Reduced paper, and making shop floor data available for analytics
- Analyzing failure reasons of all lines and plants, and identifying low performing and error-prone machines



10% increase in maintenance efficiency

Siemens MindSphere selected as # 1 in functional market comparison

Customer profile	Largest Technical Service Provider for the Energy Sector in the Netherlands
Customer objectives	<p>Performance based services</p> <ul style="list-style-type: none"> • New Business Models for Performance Based Services • Improve service & maintenance with IIoT • One IIOT platform for <u>all</u> use-cases: Predictive maintenance for B2B Heat Pumps, Electro Pump, Solar Farm, Feed Production, Rail & Road Infrastructure • Improve Employee Satisfaction (Field Service Engineers)
Approach	<p>One integrated approach</p> <ul style="list-style-type: none"> • Select #1 functional best in class platform from 177 IOT solutions! • Top-down solution from sensors to edge to cloud intelligence • OT meets IT, where Industry 4.0 speaks up • Combined technical demo & commercial approach • Multi level & multi site involvement
Timeline	



Business drivers:

- Increase revenue – new digital services
- Reduce costs – service optimization
- Reduce risks – avoid penalties

Decision for Siemens	<ul style="list-style-type: none"> • MindSphere App Store & Industry Solutions • Customer Experience (Tenant structure) • Device integration & security • Custom dashboard look 'n feel • Powerful algorithm freedom • External gateway connectivity • Mendix integration
Volume & potential	<p><internal></p>
Competition	<ul style="list-style-type: none"> • Rockwell / PTC – Thingworx • Schneider / Ecostruxure • Software AG / Cumulocity • Hitachi / Lumada • GE / Predix • Aspentech / Mnuho • Semiotic Labs / SAM4 • And 170 others
Next steps	<internal>



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Summary and Q&As

MindSphere: Industrial IoT Solutions as a service

Faster time to value at lower risk



60%
less time

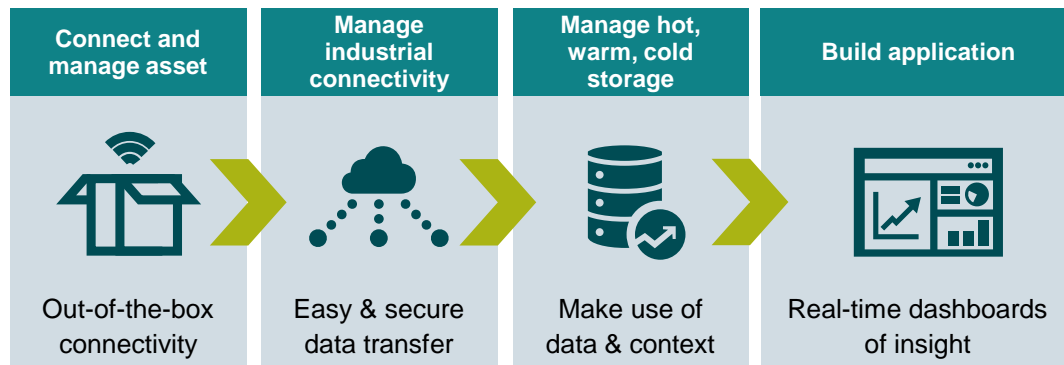
25%
less OpEx

40%
less CapEx

90%
less risk

Timeline to value

BUY



When you buy from MindSphere, you get:

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



MindSphere usage possibilities in a nutshell

Connect things and create insight across whole product value chain



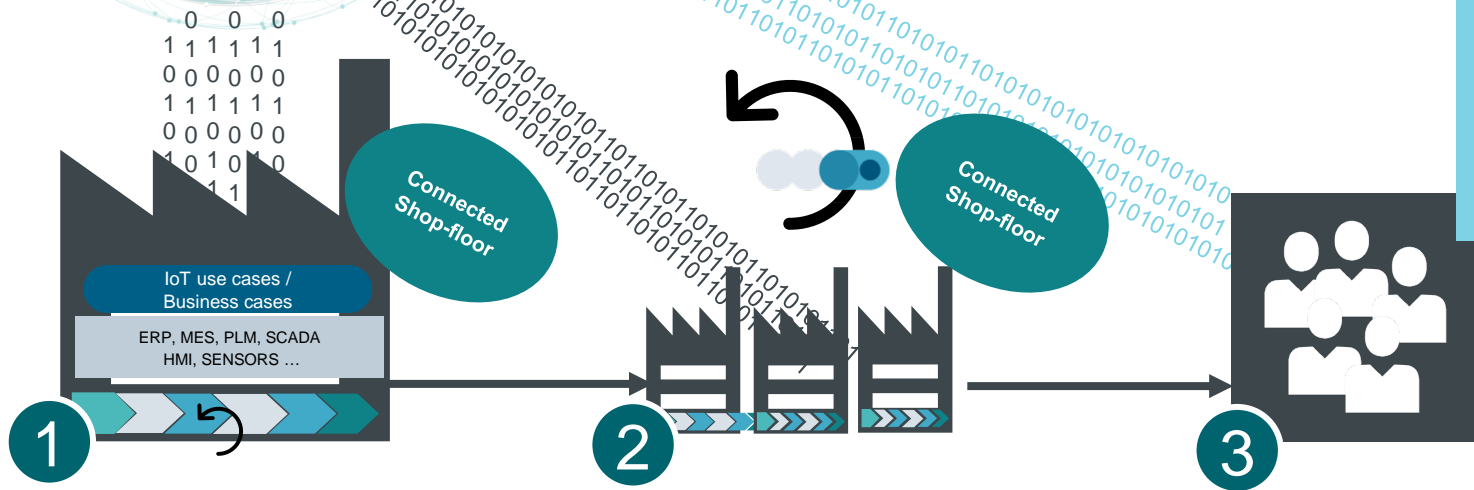
- Lower implementation risk
- Faster time 2 value
- Rapid development tool
- Less CAPEX and OPEX



- AZURE/ AWS
- SAP
- PLM
- Etc.



- Track and trace
- Avoid production outage



- Cost savings in energy, waste, maintenance, warranty and spare parts
- Increase productivity & quality
- Reduce downtimes and increase OEE
- Operational transparency

- Stay competitive
- Increase revenue streams
- Reduce non conformance costs
- Avoid product recalls

MindSphere
enables
digitalization

MindSphere Facts & Figures

Increasing IIoT ecosystem

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80

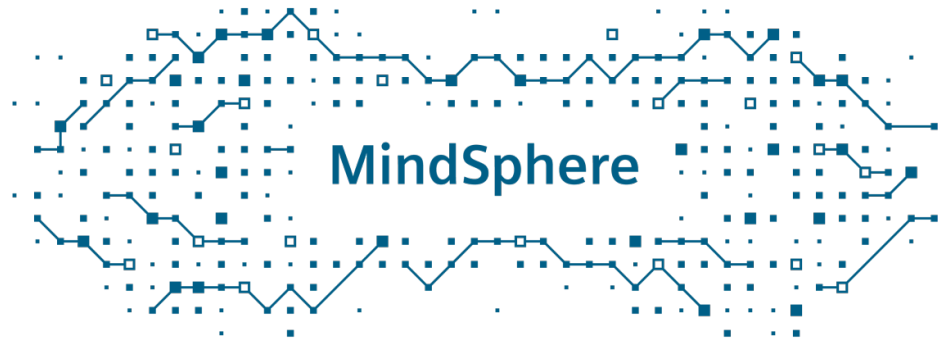
Siemens plants
worldwide connected

> 300 Partners
(internal & external)

>85

Apps on
MindSphere Store

> 600 developers



90+

Use cases in
Siemens plants

> 1000 Customers
(400+ Operated Apps)

> 35,000

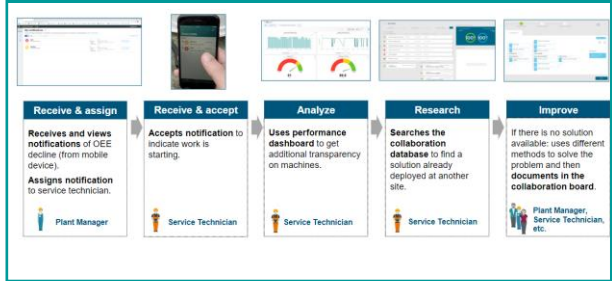
Registered Ms users
(internal & external)

MindSphere Out-of-box Solutions Overview

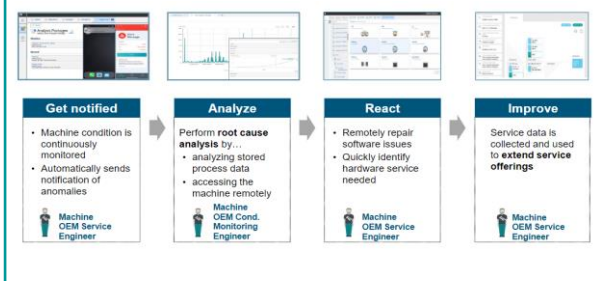
Quick time to value

Seen Today

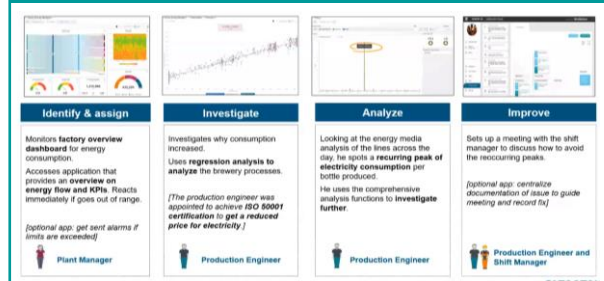
1 Performance monitoring & Collaborative Improvement



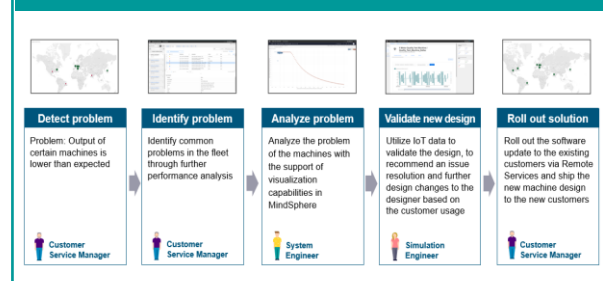
#2 Condition monitoring & Integrated Remote Services



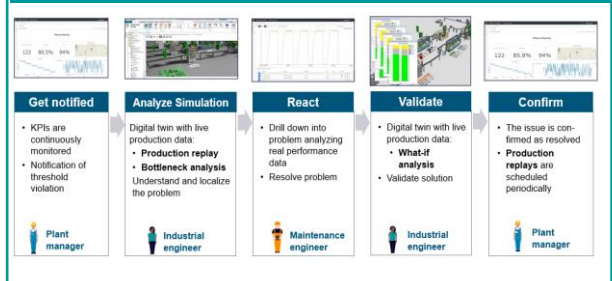
#3 Energy Management



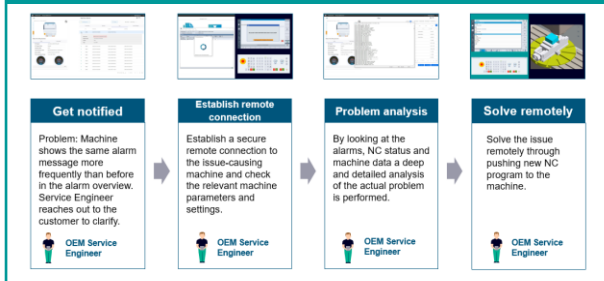
#4 Analytics-based Product Engineering



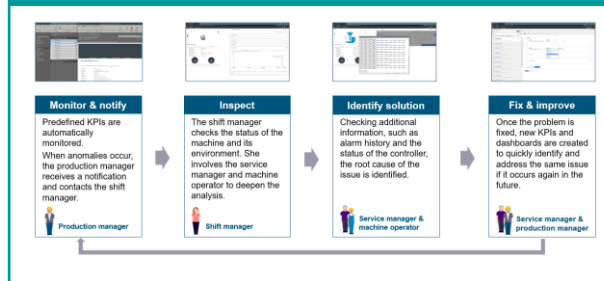
#5 Advanced Production Analytics & Optimization



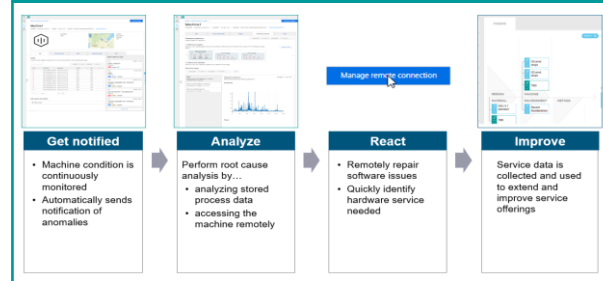
#6 Remote Service for CNC Machine Tool Builder



#7 Data-driven productivity improvement for CNC machine tool users

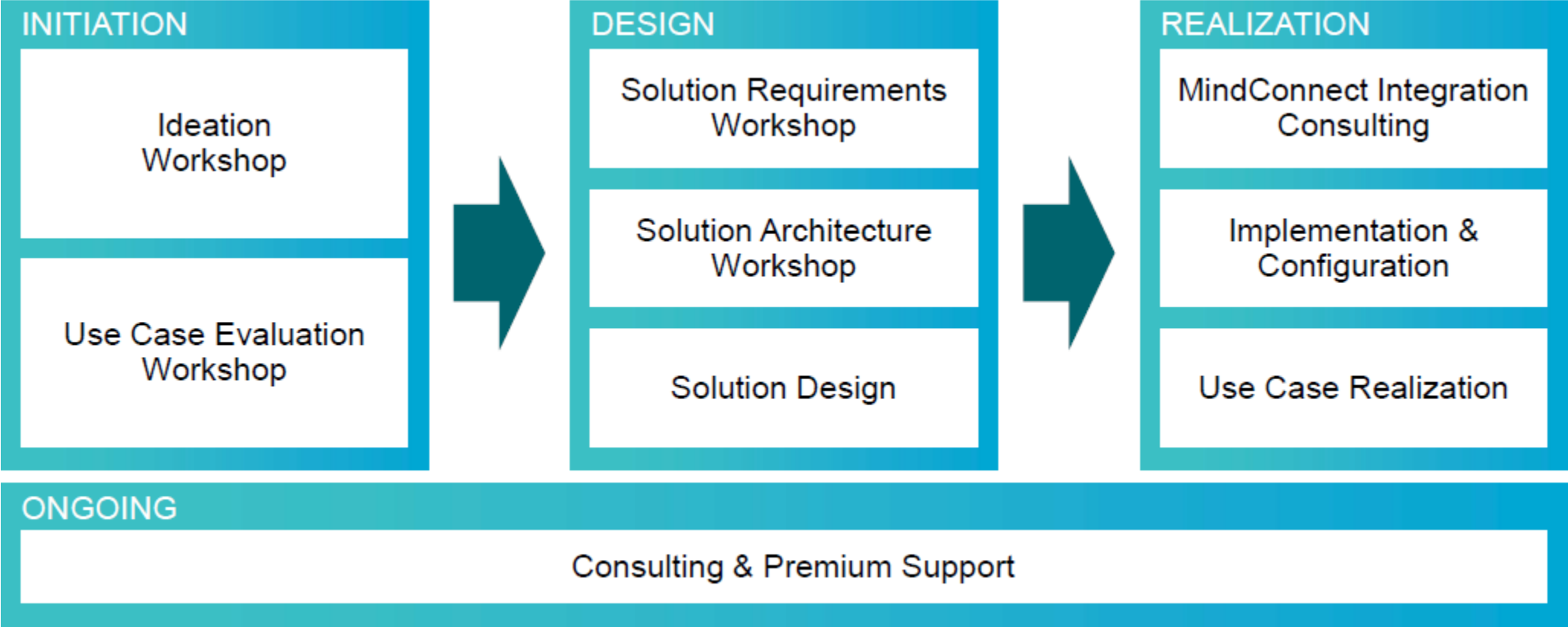


#8 Asset Health & Service Hub



Siemens workshops

Support you on your digitalization journey



Thank You!

If you would like to learn more about Siemen's IIoT solutions, please contact...



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Questions

