Senseye Predictive Maintenance

Scalable & sustainable asset intelligence for industrial leaders

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Introduction

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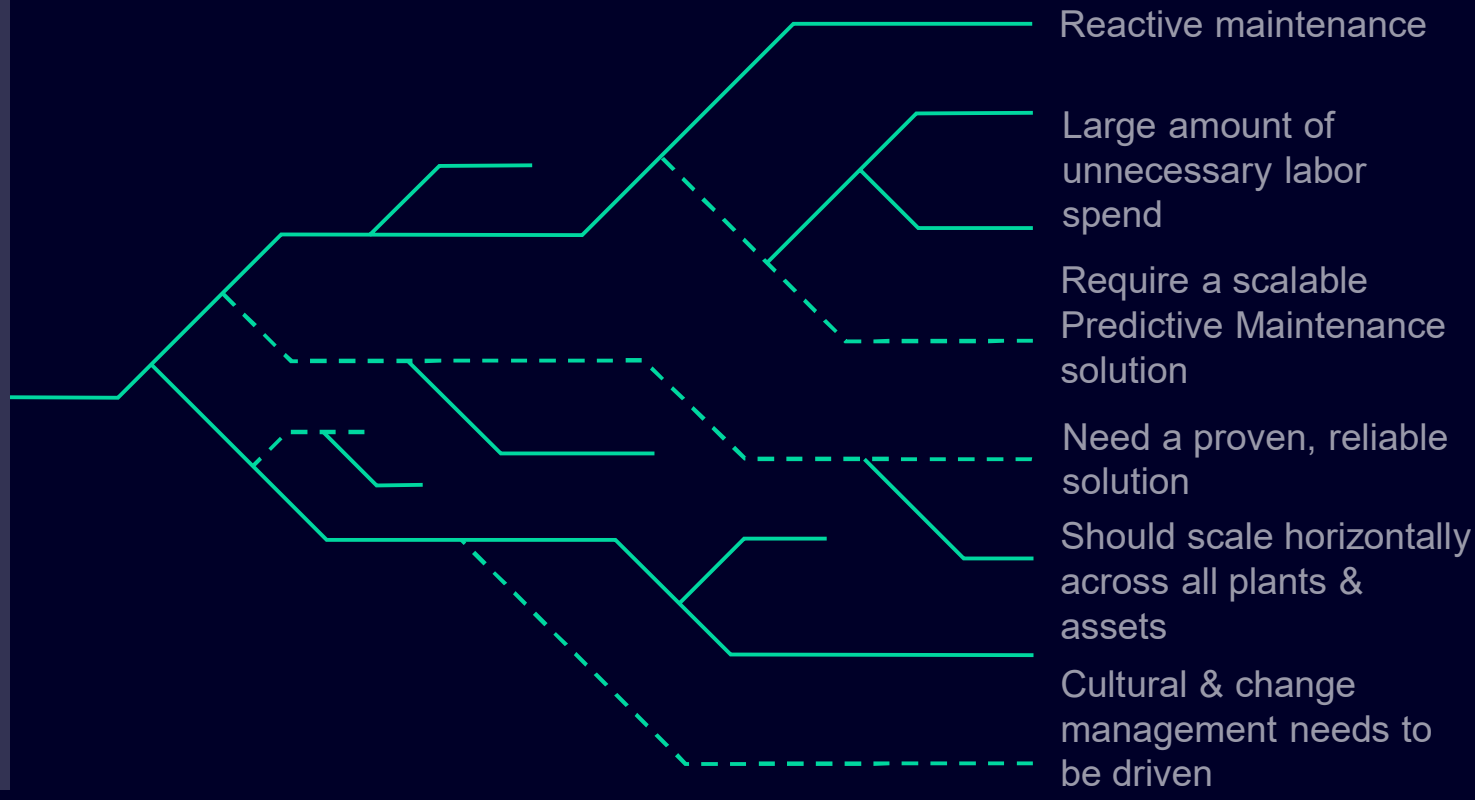
Predictive Maintenance at scale is filled with challenges

“80% of analytics projects fail to deliver Business Outcomes”

Gartner 2020



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Challenges …

MAINTAINING UPTIME

PRECISE & CORRECT MAINTENANCE

REDUCING RISKS AND OPERATING COSTS

SUPPORTING REMOTE WORK

INCREASING SUSTAINABILITY

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Compounded by …

SCALABILITY

DATA SILOS

SKILLS SHORTAGE

LOW ADOPTION

COLLABORATION & ENGAGEMENT

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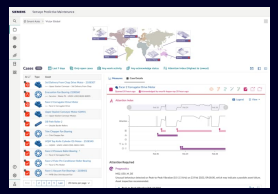
What is Senseye Predictive Maintenance?



An automated asset intelligence and predictive maintenance software tool, designed to meet the challenges of today

ADRESSING NOT JUST DOWNTIME

- MAINTAINING UPTIME
- PRECISE & CORRECT MAINTENANCE
- REDUCING RISKS AND OPERATING COSTS
- SUPPORTING REMOTE WORK
- INCREASING SUSTAINABILITY

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"We saved $45m in labor and unplanned downtime avoidance at a single site since 2019.

Maintenance Manager, Global Automotive Manufacturer

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Proven with Companies Like ...

Global Automotive Manufacturer

- ROI in <3 months
- Achieved a 50% reduction in downtime
- Several tens of $m downtime avoided to date at a single site
- Global deployment – over 100,000 machines and 650+ countries

Leading European Corrugated Packaging Company

- Expanding globally
- Senseye Predictive Maintenance was the only solution tested that was able to achieve a downtime reduction
- 20+ different types of machines
- Working with retrofitted sensors on legacy machines

Global Steelmaking Producer

- ROI in <6 months
- Using data collected from Siemens controllers & retrofitted sensors
- Used directly by maintenance staff, no data scientists necessary

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Global automaker saves millions with Senseye Predictive Maintenance

The collaboration started in 2016, scaling from tens of assets in the UK, to 2500+ across Europe by the start of the following year. Senseye Predictive Maintenance is now used globally to monitor over 10,000 assets in 9 factories.

Client project team:
2016: 3 people / **2023:** 3 people

hired to enable scale: 0

Asset types: 100+

Unplanned downtime avoided: $$m++
ROI achieved in <3 months

2016
January – First meeting
Started a project to analyze data for one zone at the UK factory

2017
January – Site expansion
400 assets being monitored

2018
Global expansion started. Europe, Japan and North America

2019 onwards
9 factories across the world, 10,000+ assets in one account with 650+ concurrent users

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Global steelmaker unearths value

Since 2019, multiple projects have been conducted in parallel in with best practice being shared, resulting in a scalable PdM solution that fits into the client ecosystem to unearth business value from existing data platforms.

Disparate data sources:
Senseye Predictive Maintenance has integrated disparate sensing data into a single system, giving valuable insights to maintenance engineers

ROI:
The client has seen numerous events across sites that, if left unchecked would have ended in extremely costly failure

2019
First deployment integrating with Siemens and IBA

2021
Wales
Company sign up to scale solution in Wales

2022+
Senseye beyond deployed across further regions

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Major Aluminium producer achieved ROI in 6 months

Since winning a thorough competitive tender process in 2018 against 12 competitive solutions including Falkonry, IBM, Microsoft, Uptake, MTell and SparkCognition, over 1,000 highly complex assets are now being monitored at the original site, without any additional sensors being installed.

 # FTEs hired for the deployment: 0
Wanted PdM as a managed product.
Efficient implementation enabled quick results.

Additional sensors installed: 0
Leveraging existing machine & maintenance data feeds
Able to easily add more assets as they scale.

ROI in 2019: 10x
Achieved initial ROI in 6 months.
Reduced unplanned downtime by 20% - significant improvements in OEE

2018
Competitive tender
Senseye won against 12 competitors including industry standards and newcomers

2019
Initial Deployment
50 assets initially brought in.
ROI achieved in 3 months

2023
1,000+ assets covered in original site.
Global expansion in progress

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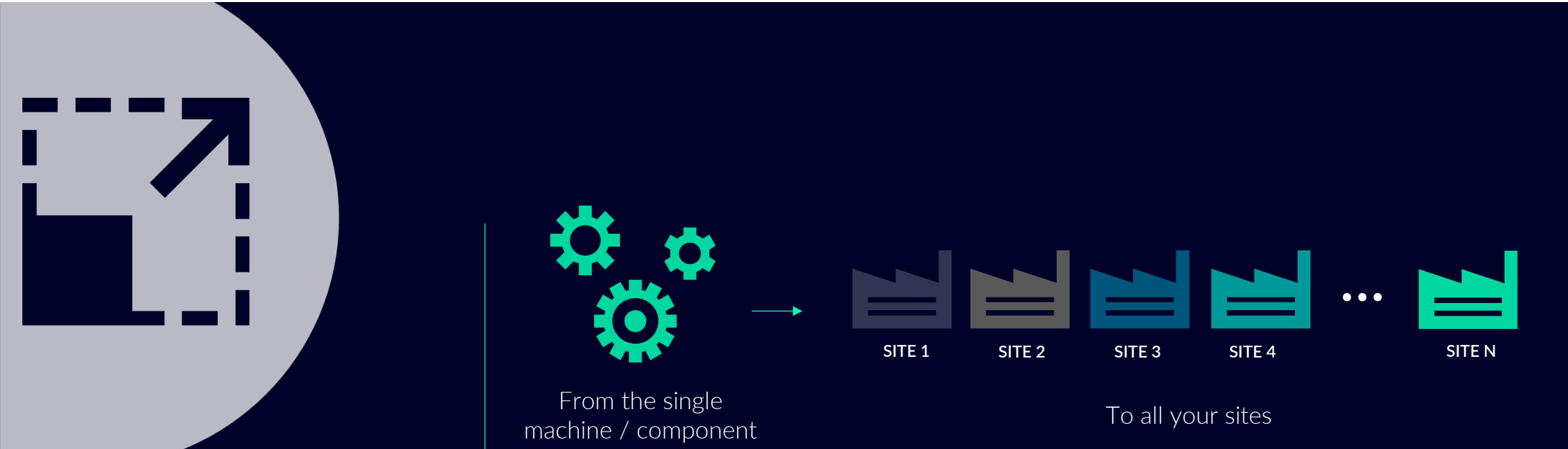

From the single machine / component

To all your sites

How do your clients **effectively manage these challenges?**

While addressing **skills shortages**, **adoption challenges** and **sustainability targets**?

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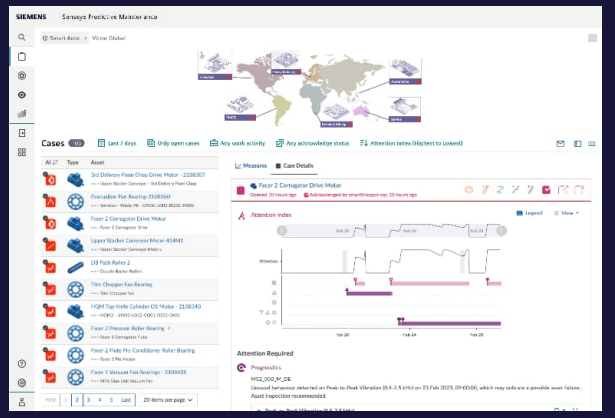
Senseye Predictive Maintenance

Use AI to automate the analysis of any and every kind of machine.

Senseye Predictive Maintenance focuses on the business outcomes.



Scalable & sustainable asset intelligence

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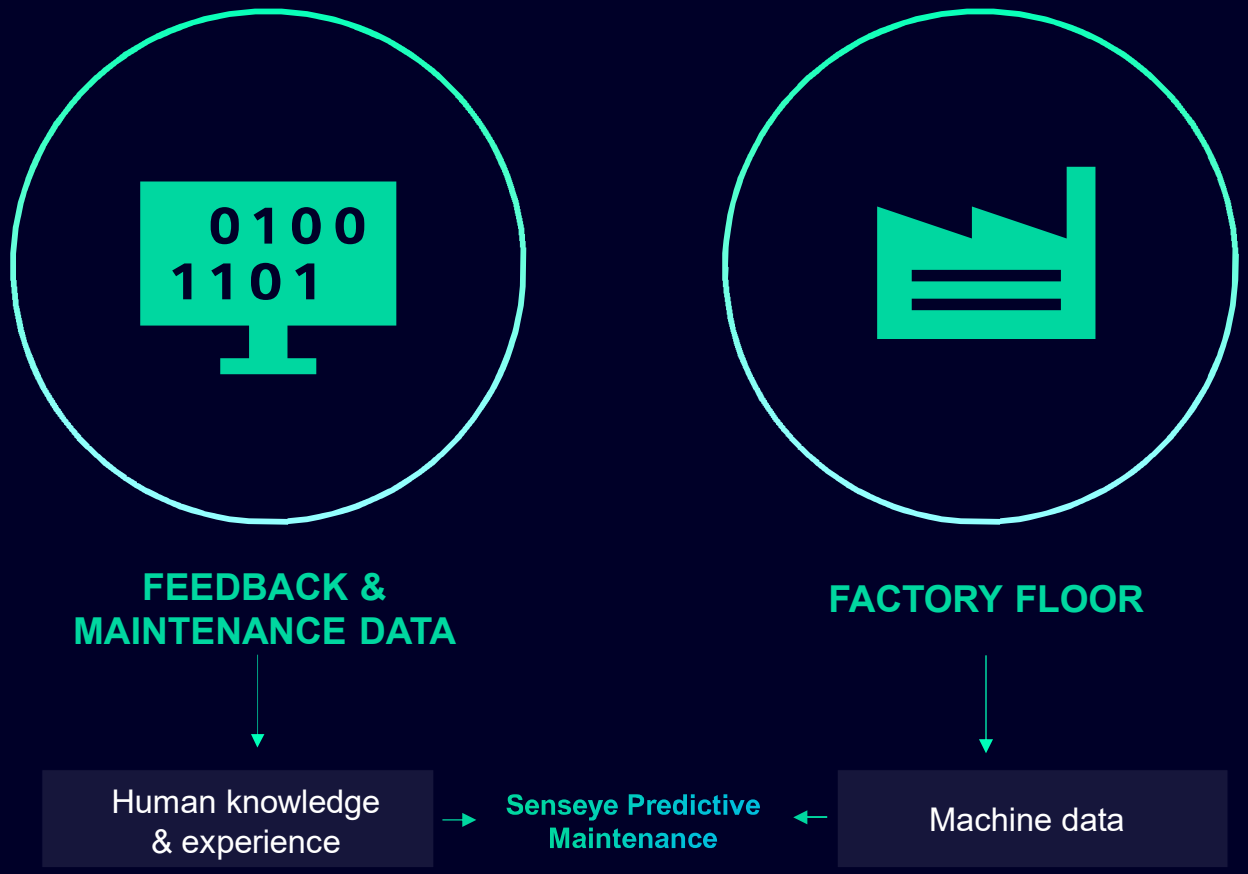
Senseye Predictive Maintenance



- **Use AI to automate the future analysis** of any and every kind of machine
- **Senseye Predictive Maintenance is automated** and learns from machine and maintainer behavior
- Focuses on the **business outcomes**

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Asset Intelligence to business outcomes

Increase availability

- Maintain ahead of time
- Remove unplanned stoppages

Precise & correct maintenance

- Focus on things that matter
- Reduce spares
- Sustain quality

Reduce operational costs & risks

- Reduced environmental risks
- Increase safety & compliance

Supports mobile working

- Enabling remote inspection & permits
- Reduces risks
- Helps to address skills shortages

Increases sustainability

- Reduces waste, energy use, carbon footprint and parts consumption
- Increases asset lifetime

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Live demo

From the shop floor to business outcomes

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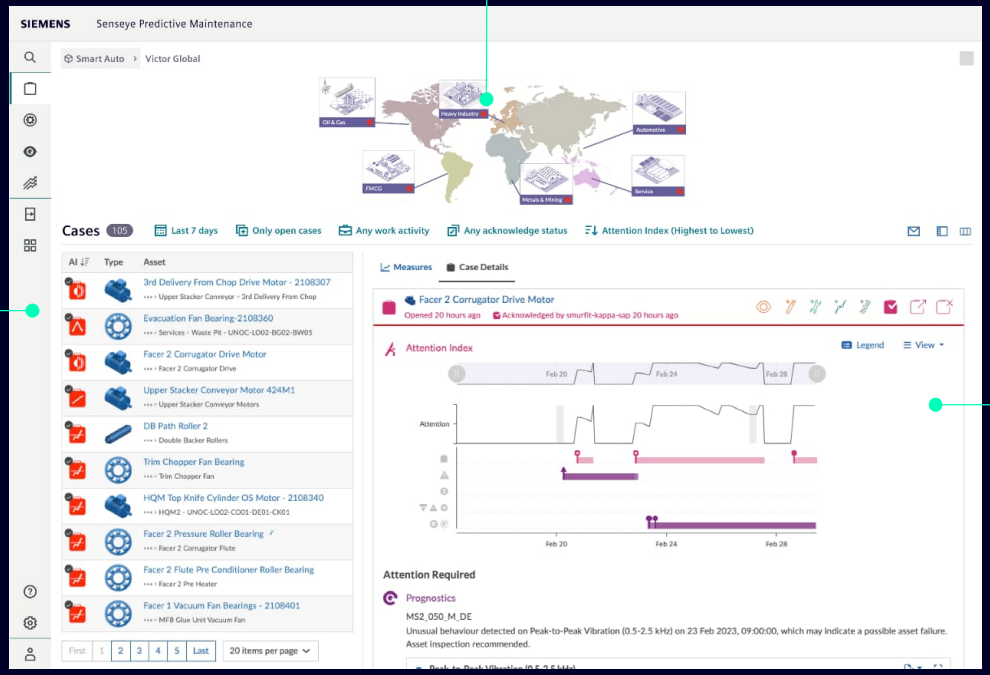
Senseye Predictive Maintenance – SaaS software

ANY & MANY

- Monitor and manage any connected machinery, from 10 to 10,000+
- Scale effortlessly
- Group permissions management

ATTENTION INDEX

- Automated condition monitoring and prognostic insights
- Helps you to focus on the essentials
- Takes the guesswork out of asset management
- Use as evidence to delay or reduce planned maintenance



FOCUS MAINTENANCE EFFORT

- Improved Predictive Maintenance planning
- Prioritise labour usage
- Understand need for intervention

CLOUD BASED & RESPONSIVE

- Accessible on any modern web device
- Nothing to install or maintain
- Full SSO support

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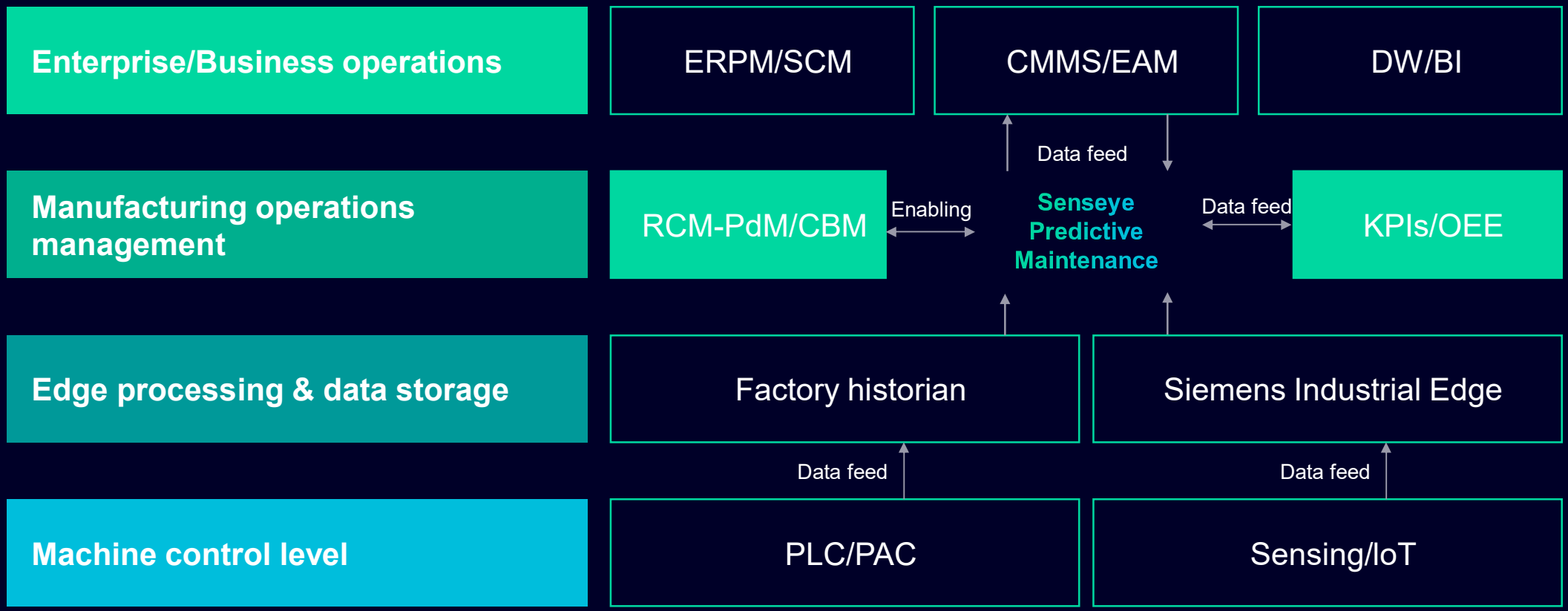
From site to Senseye Predictive Maintenance



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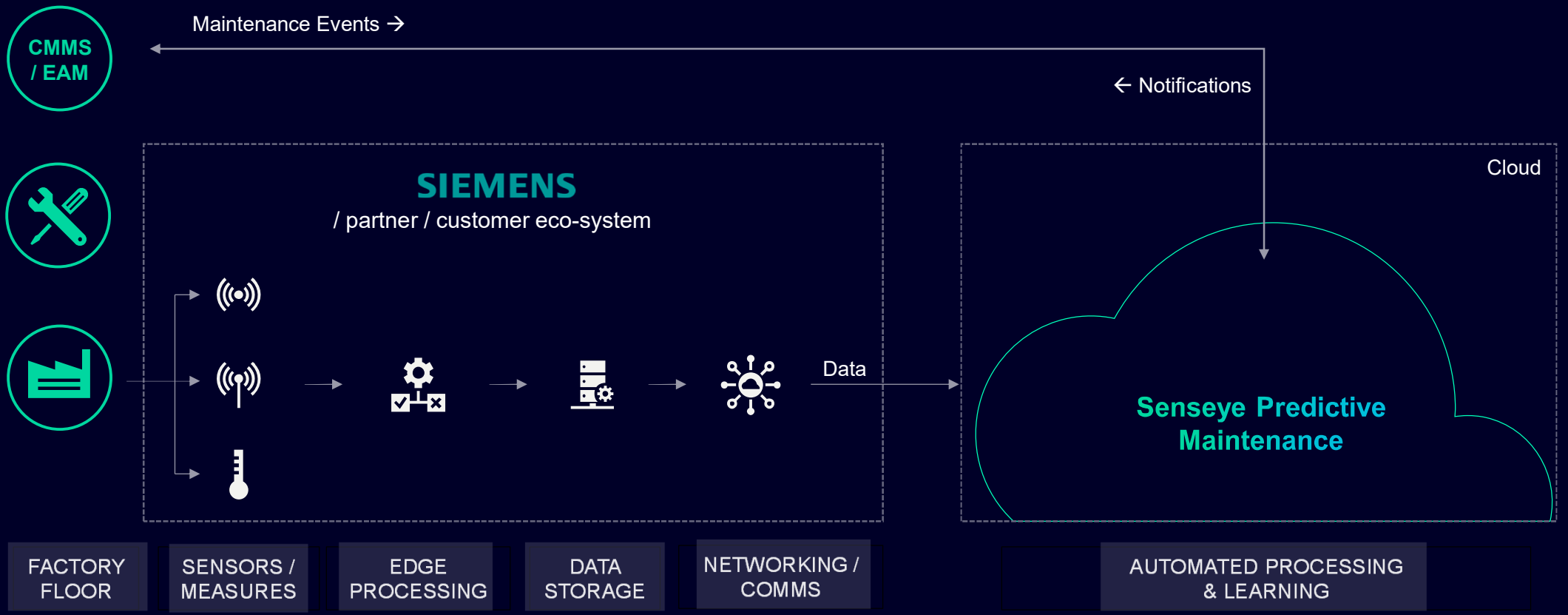
From site to Senseye Predictive Maintenance



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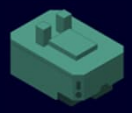
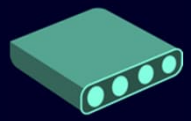
Sensor, machine and industry-agnostic


AGVs


FANS


CONVEYORS

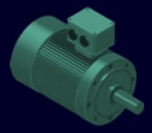

GEARBOXES


PUMPS

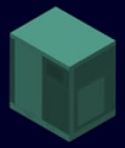

MIXERS


ROBOTS


POWER & DRIVES


MOTORS


BUCKET ELEVATOR


CHILLERS


MANY MORE

Senseye Predictive Maintenance monitors over 500+ different types of assets across diverse industries, sectors & verticals

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Wrapup

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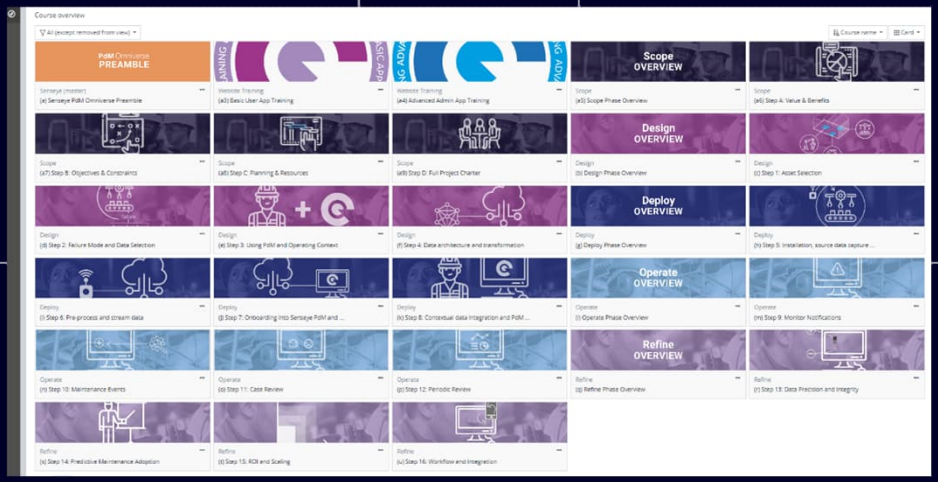
Senseye Knowledge Platform – framework & guide to business outcomes

Complete user journey online

- Tools and guidance for each step
- 5 phases x 4 steps + 4 courses; total of 20 steps

Knowledge base & best practices for

- Assets, failure modes, measures, …
- Data integration, onboarding & refining
- Value & asset discovery, IIoT stacks & deployment



Self guided training

- Portal & training
- Backpack compatible badges/user certification

Created from

- 100+ years of combined Condition Monitoring experience
- Millions of sensors onboarded in Senseye Predictive Maintenance

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Senseye Knowledge Platform

Scope	Design	Deploy	Operate	Refine
1.	2.	3.	4.	5.
• Understand value and benefits • Define objectives and Constraints • Planning & Resources • Establish project charter	• Asset selection • Identify failure modes and related data • Using PdM and context • Data architecture and transformation	• Installation, data capture and storage • Pre-processing and streaming data • Onboarding & configuration • Contextual data setup	• Notification monitoring • Maintenance events • Case reviews • Periodic reviews	• Improving data precision & integrity • Increasing PdM adoption • ROI and scaling • Workflows and integration

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Example Deployment

2 Weeks

SCOPE / DESIGN

Value & project workshop

Workshop held to map business outcomes to deployment inputs and technical architecture

2 Weeks

DEPLOY

Data check & integration

Ensuring suitable data, integration with existing IT systems will be performed and assets & workflows will be configured

1 Week

DEPLOY

Historical data loading & analysis

Senseye Predictive Maintenance analytics will import the available historical data and automatically build models of normal machine behavior

1 Day

OPERATE

Training & success coaching

Senseye deliver training so that you are ready to rapidly drive a Return on Investment.

Enabling

- Leverage existing investments
- Rapid ROI and capability delivery
- Scalable platform for future extension
- Fully composable solution

Benefits

Powering Asset Intelligence

- Reduced spares usage
- Increased availability
- Precise maintenance
- Full remote diagnostics & monitoring
- Cost saving
- Sustainability

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Differentiators

Used by maintainers, learns from **humans & machines**

Senseye Predictive Maintenance

- Scale massively horizontally
- Asset, system & sensor agnostic
- Automated & unsupervised– using AI
- Senseye Knowledge Platform - framework to drive change

Focus on **business outcomes**

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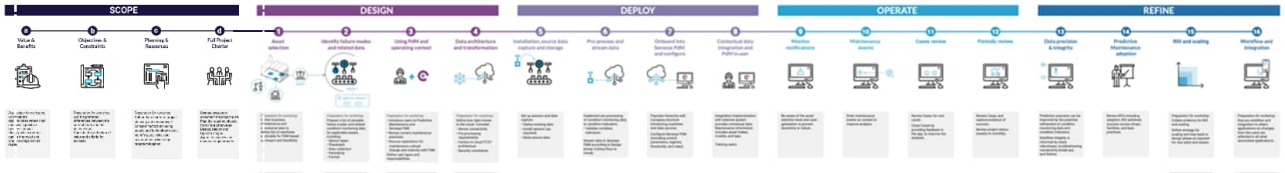
Next steps – Follow the Senseye Knowledge Platform

- Workshops
- Supporting Booklets
- White papers
- Review gates
- Online community

- Support forum
- Case studies
- Video tutorials
- Constantly updated
- Administered by Senseye PdM team

Scope **1.** Design **2.** Deploy **3.** Operate **4.** Refine **5.**



Scope workshop – remote / onsite

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Proven outcomes to support industrial leaders

Increased availability

- Maintain ahead of time
- No unplanned stoppages

Precise & correct maintenance

- Focus on things that matter
- Reduced spares use
- Efficient resource use
- Sustained quality

Reduced operational costs & risks

- Reduced environ-mental risks
- Increased safety & compliance

Support mobile workers

- Remote inspection & permits
- Reduced risks
- Addresses skills shortage

Increased sustainability

- Increase asset lifetime
- Reduced parts consumption
- Reduced energy use
- Reduced waste

Benefits

- Increased sustainability & productivity (do more with less)
- Reduced operational cost and risk

Outcomes

- 50% downtime reduction
- 30% maintenance efficiency increase

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How it works

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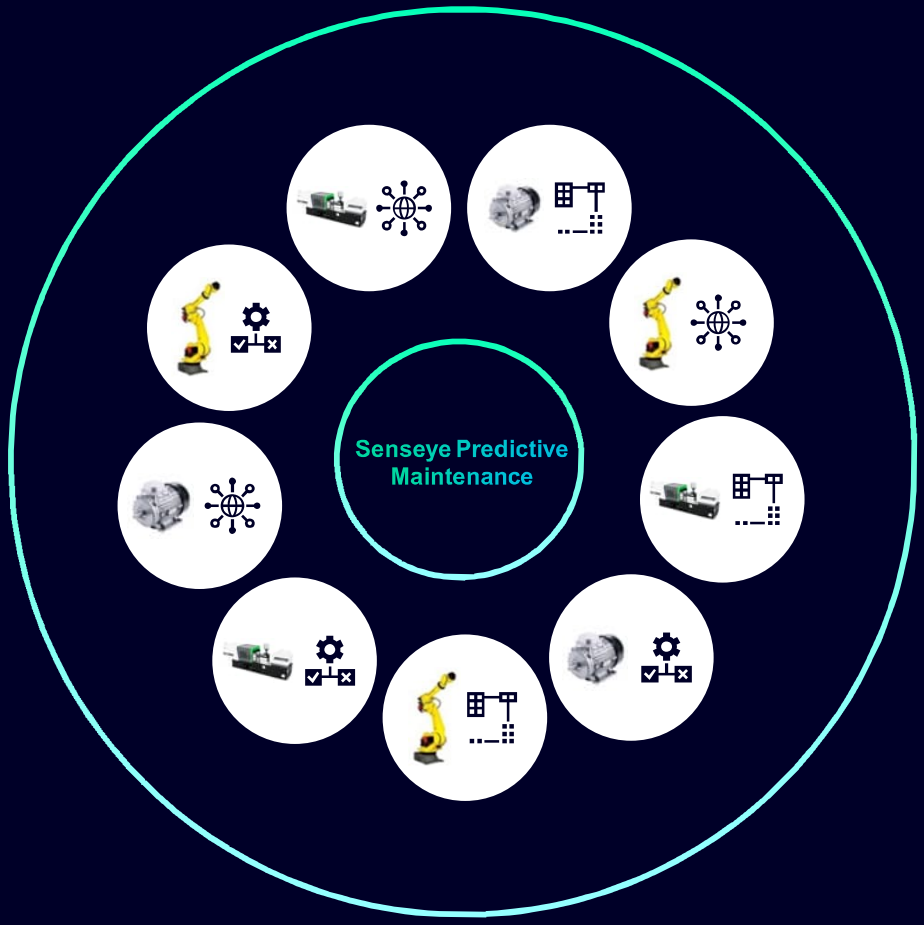
What is an asset?



An asset is a point in an environment that **will have cases raised** against it.

This unit can be **a physical machine** e.g., a motor, or **a self-contained system** e.g., a lubrication circulation control system.

The asset should be able to be **repaired or replaced independently of others** e.g., you can replace a motor independently of a coupled gearbox.

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Automated learning from condition indicators

- Pressure
- Current
- Torque
- Vibration

Unique digital fingerprint of normal asset behavior.

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Automated learning from condition indicators

Pressure

Current

Torque

Vibration

Normal **vs.** Live Data

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Senseye Predictive Maintenance has the technical edge

Diagnostics & Condition monitoring

- Anomaly detection
- AI & ML based
- Pattern matching
- Trend detection
- State & usage aware
- Threshold predictions

Prognostics

- Probability of risk forecasting
- Degradation forecasting

Attention index

- Learns maintainer preferences
- Criticality analysis
- Automated prioritization

> *How is my machinery behaving right now?”*

> *When will my machine fail?”*

> *Which machines should be prioritised for maintenance?”*

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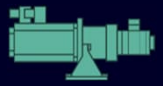
Condition Monitoring Data Examples

Torque per axis

Capture data in consistent state

Max Torque / Axis after last weld and return to home



Input & output pressure

Measure performance

Differential Pressure across pump
Mean, Min, Max

Motor Current

Extract statistical characteristics

Peak Start Current,
Mean Running Current,
Peak Running Current

Condition Monitoring Data

Senseye Predictive Maintenance

AUTOMATED PROCESSING & LEARNING

SENSORS / MEASURES

EDGE PROCESSING

CONDITION MONITORING DATA

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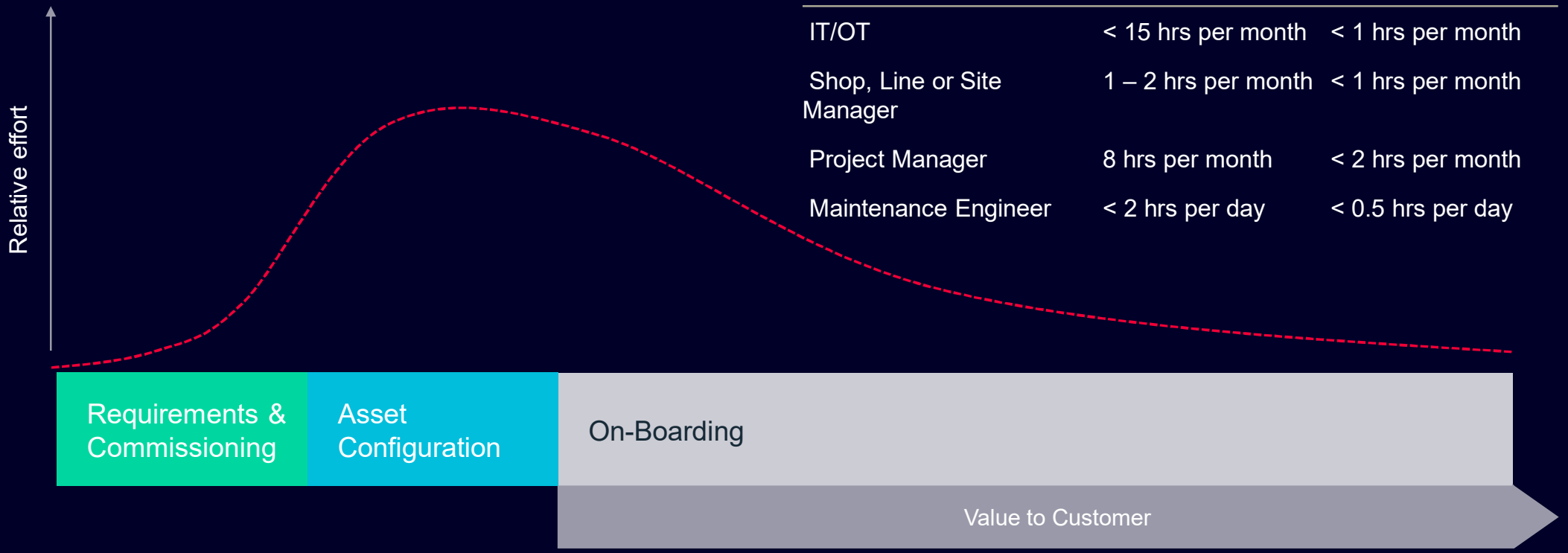
Deployment process & adoption



Role	Effort (during first 3 month)	Effort (steady state)
IT/OT	< 15 hrs per month	< 1 hrs per month
Shop, Line or Site Manager	1 – 2 hrs per month	< 1 hrs per month
Project Manager	8 hrs per month	< 2 hrs per month
Maintenance Engineer	< 2 hrs per day	< 0.5 hrs per day

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CONDITION MONITORING

- An engineering discipline to support maintenance decision-making
- Uses sensor data to measure the condition of a machine

CONDITION-BASED MAINTENANCE

- Replaces planned maintenance
- Uses evidence from condition monitoring rather than traditional route-based manual readings

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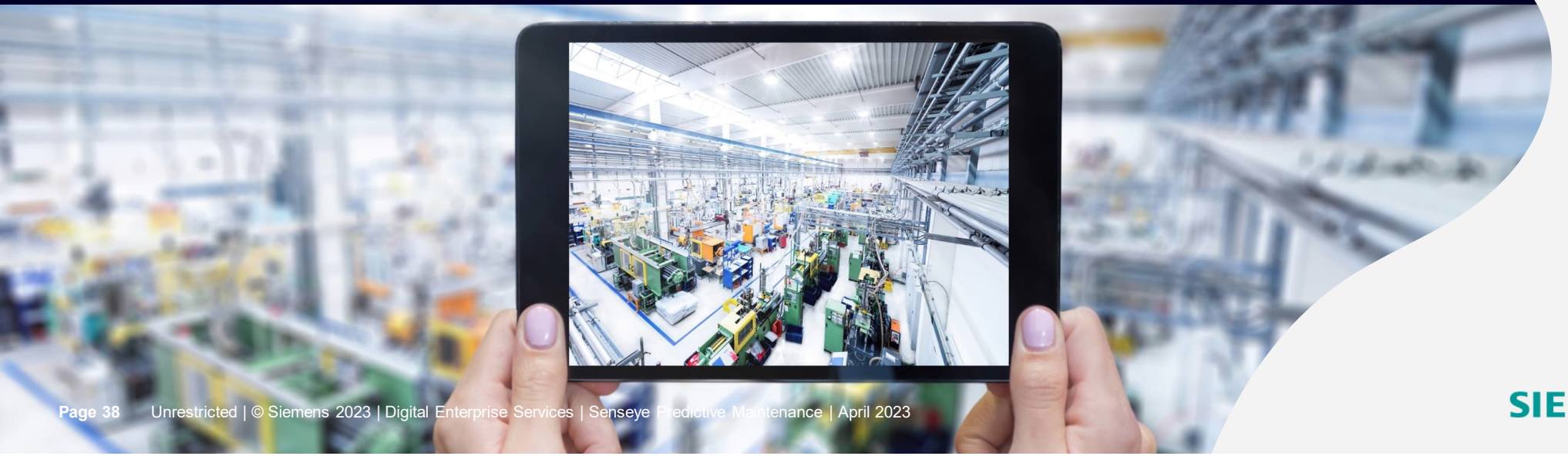
PREDICTIVE MAINTENANCE

- Uses **on-line monitoring** to establish the condition of machines
- **Predicts maintenance needs** by using machine data
- Sources data **during normal operations**
- **Minimizes disruption** to operations for sampling or measuring
- Enables a proactive maintenance strategy of **1000s of machines**



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