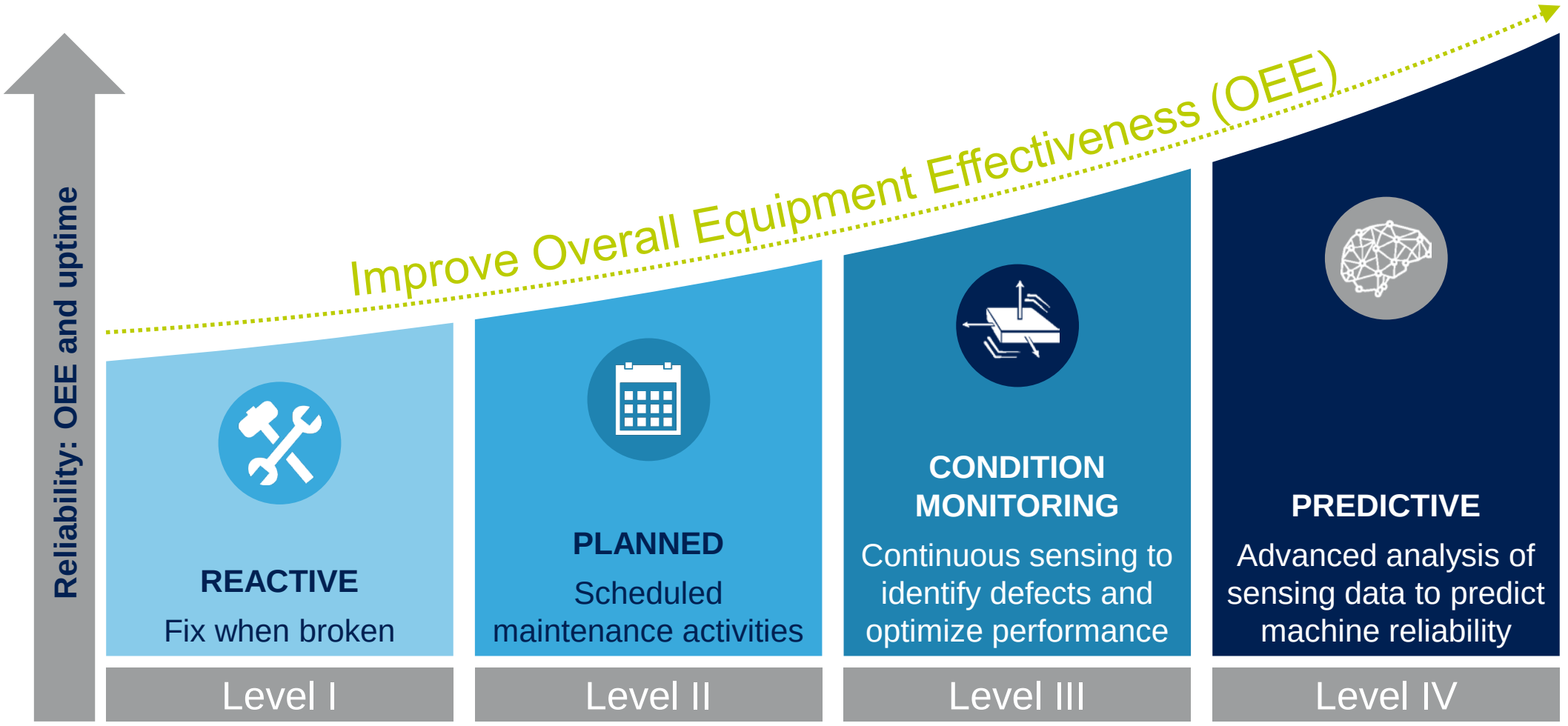
Predictive Maintenance

Condition Monitoring

Maintenance Strategy Continuum

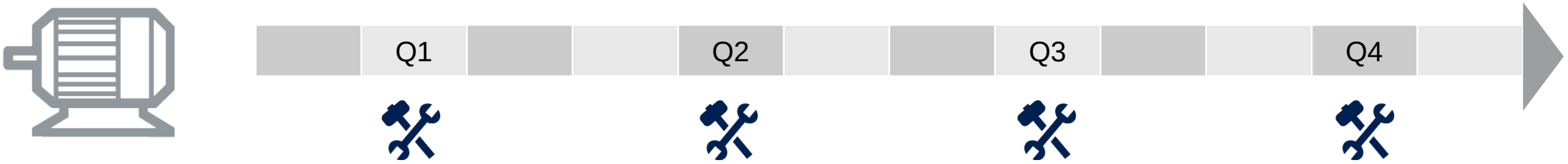
Improve Overall Equipment Effectiveness



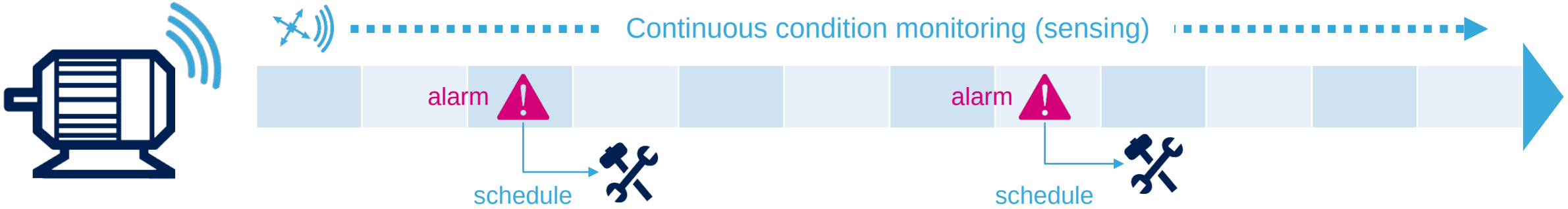
Predictive Maintenance

Minimizes the Impact on Production and Optimizes Cost

Preventive Maintenance (scheduled)

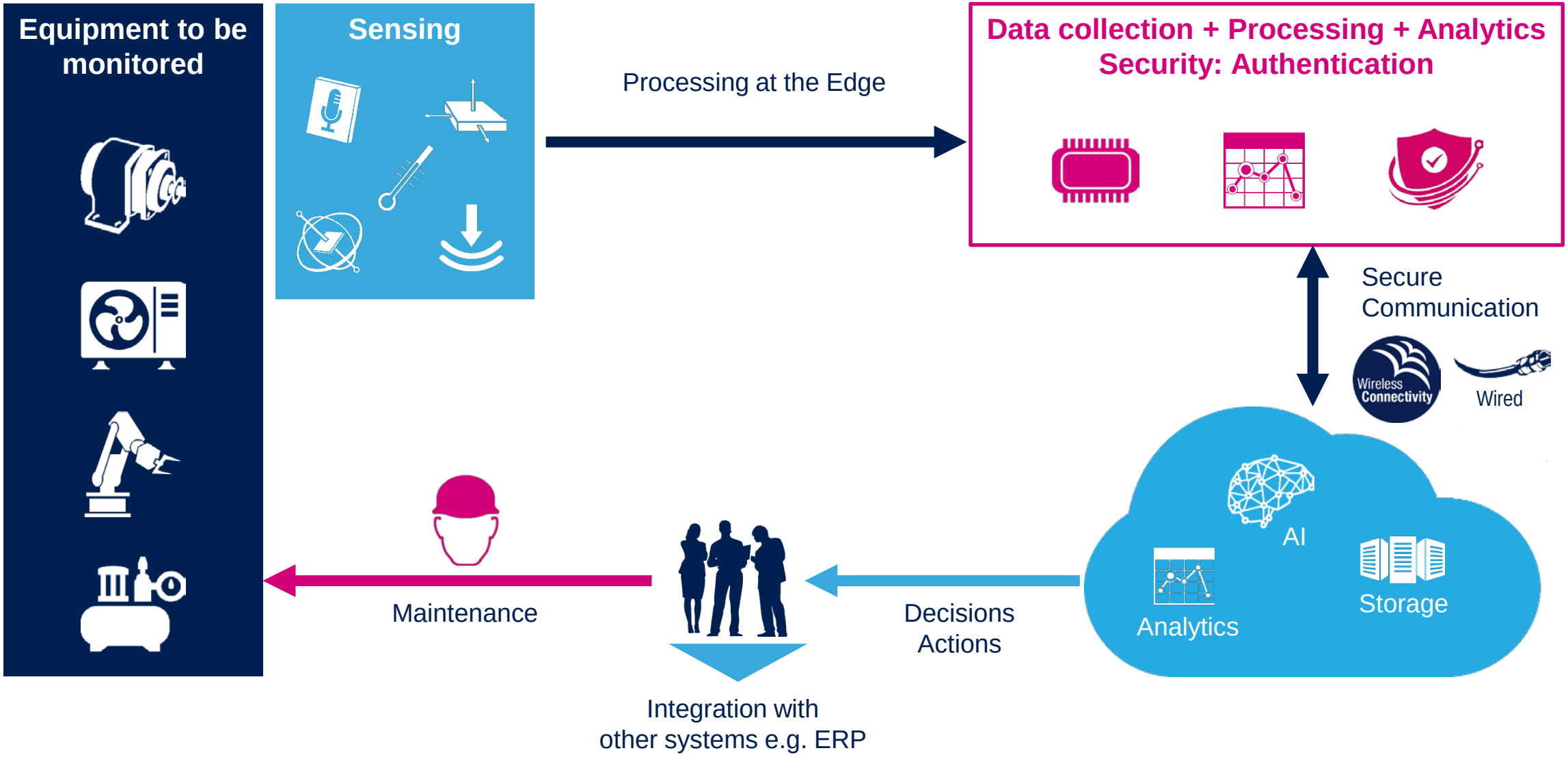


Predictive Maintenance (at the optimal moment)



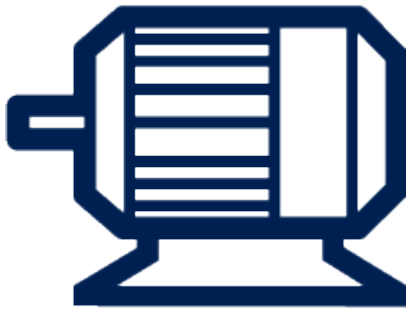
Predictive Maintenance

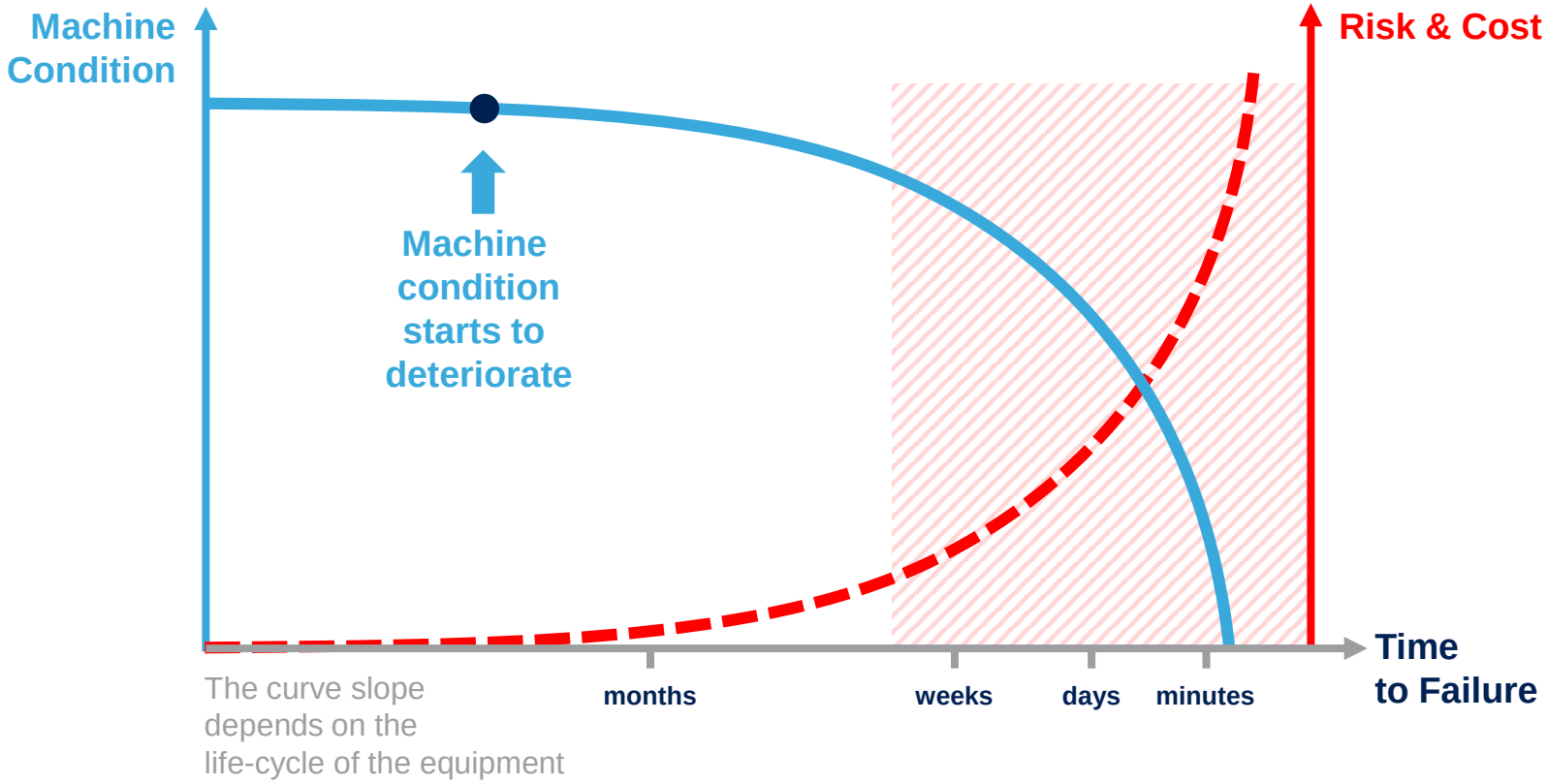
Principles



Machine Condition Deterioration

Signals and Risk



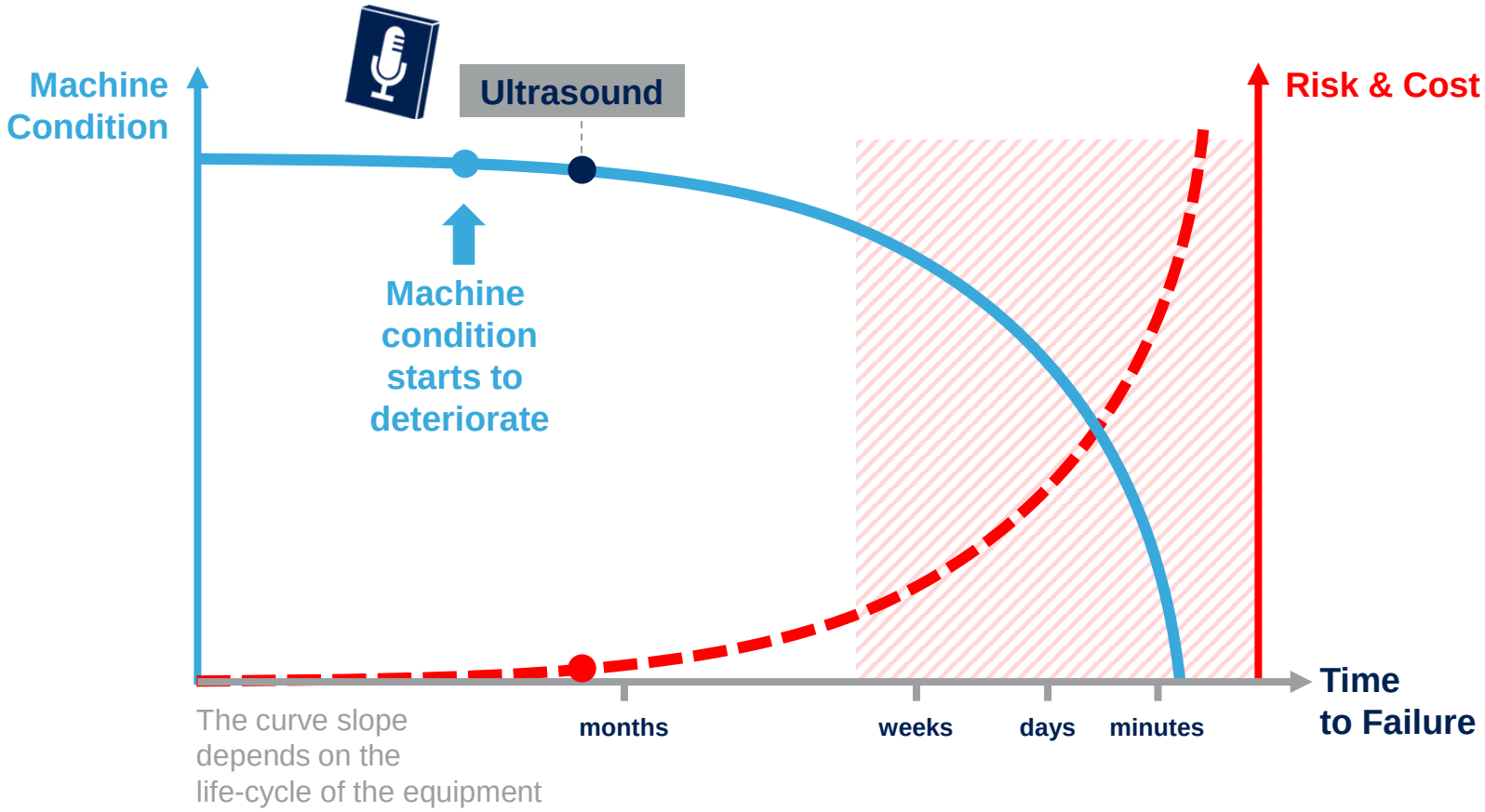


Ultrasound Noise Emission

Very Early Signs of Deterioration



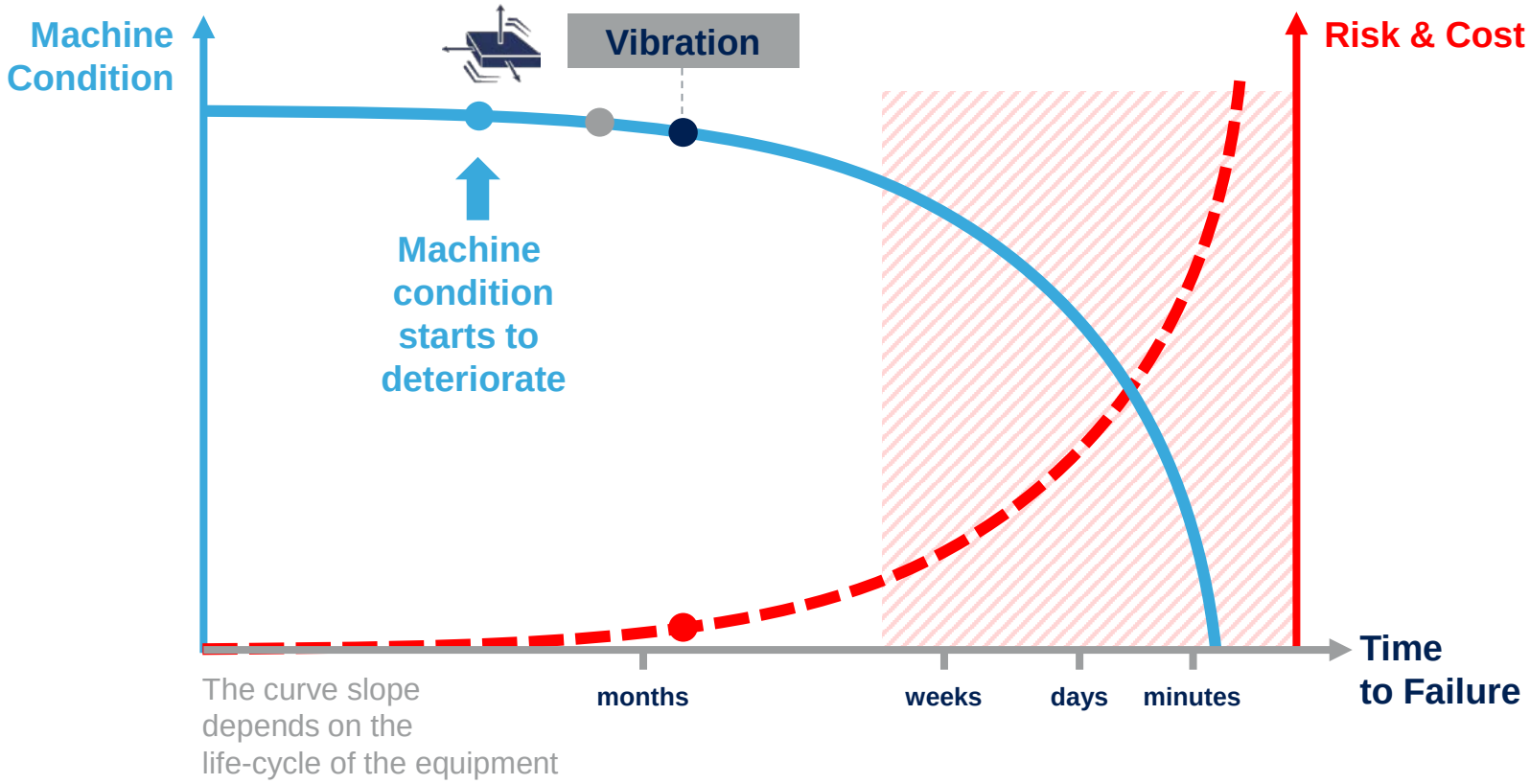
Ultrasound



Vibration Frequency & Amplitude Changes

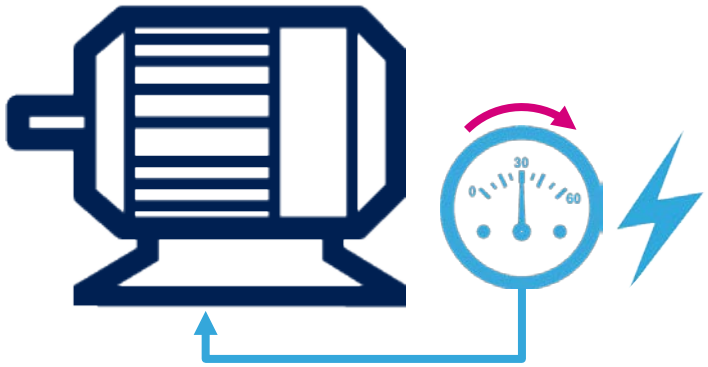
Caused by Specific Problems

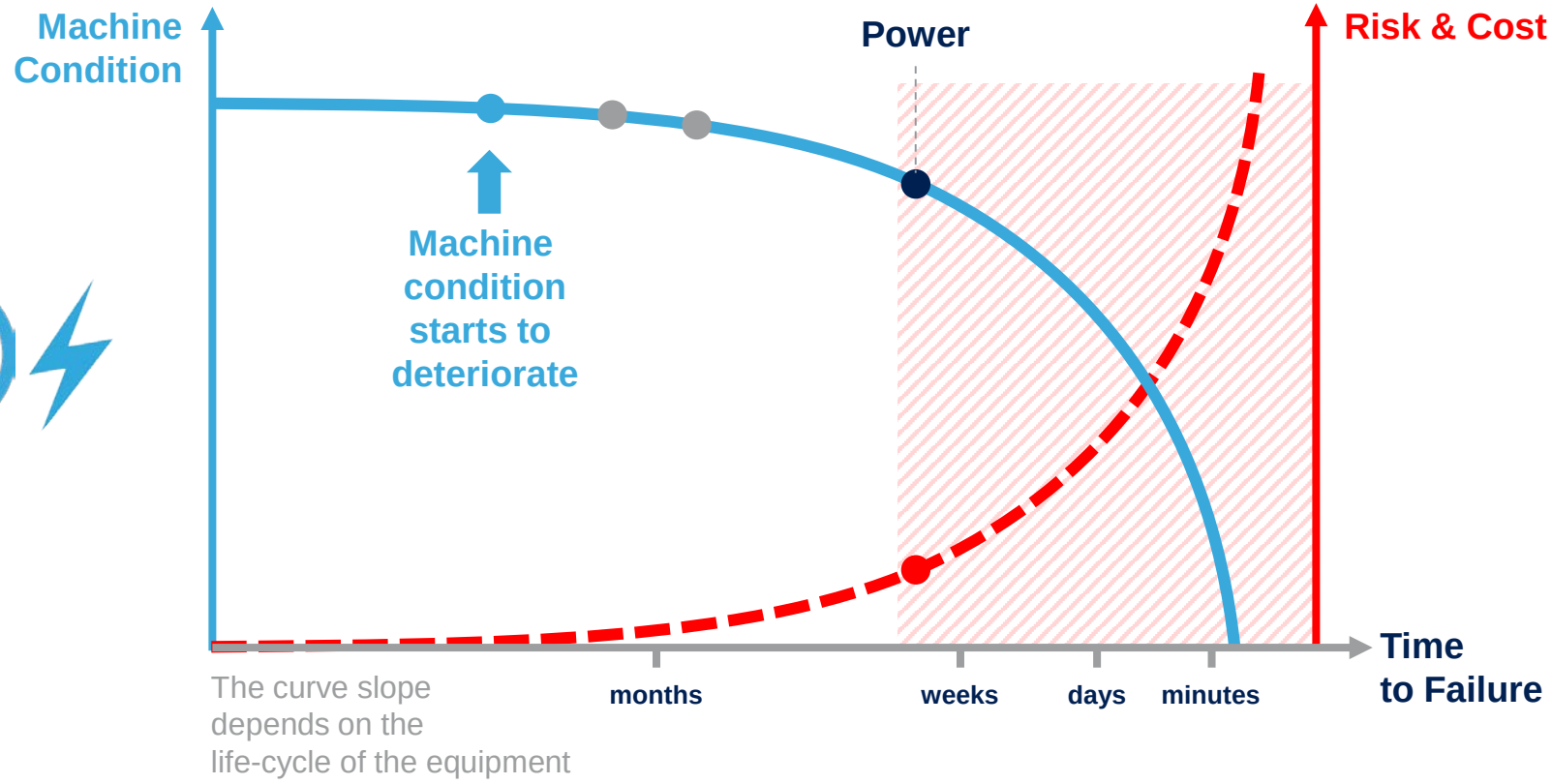




Power Consumptions Increases

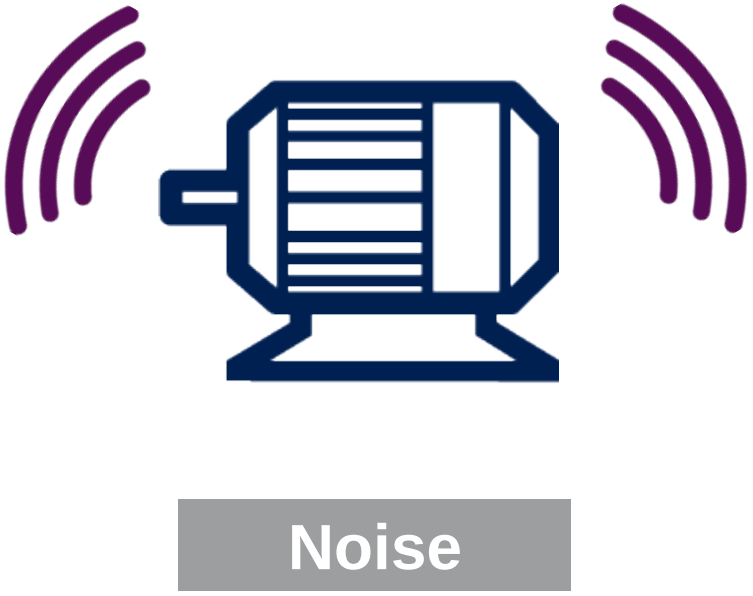
Damage is Already Present

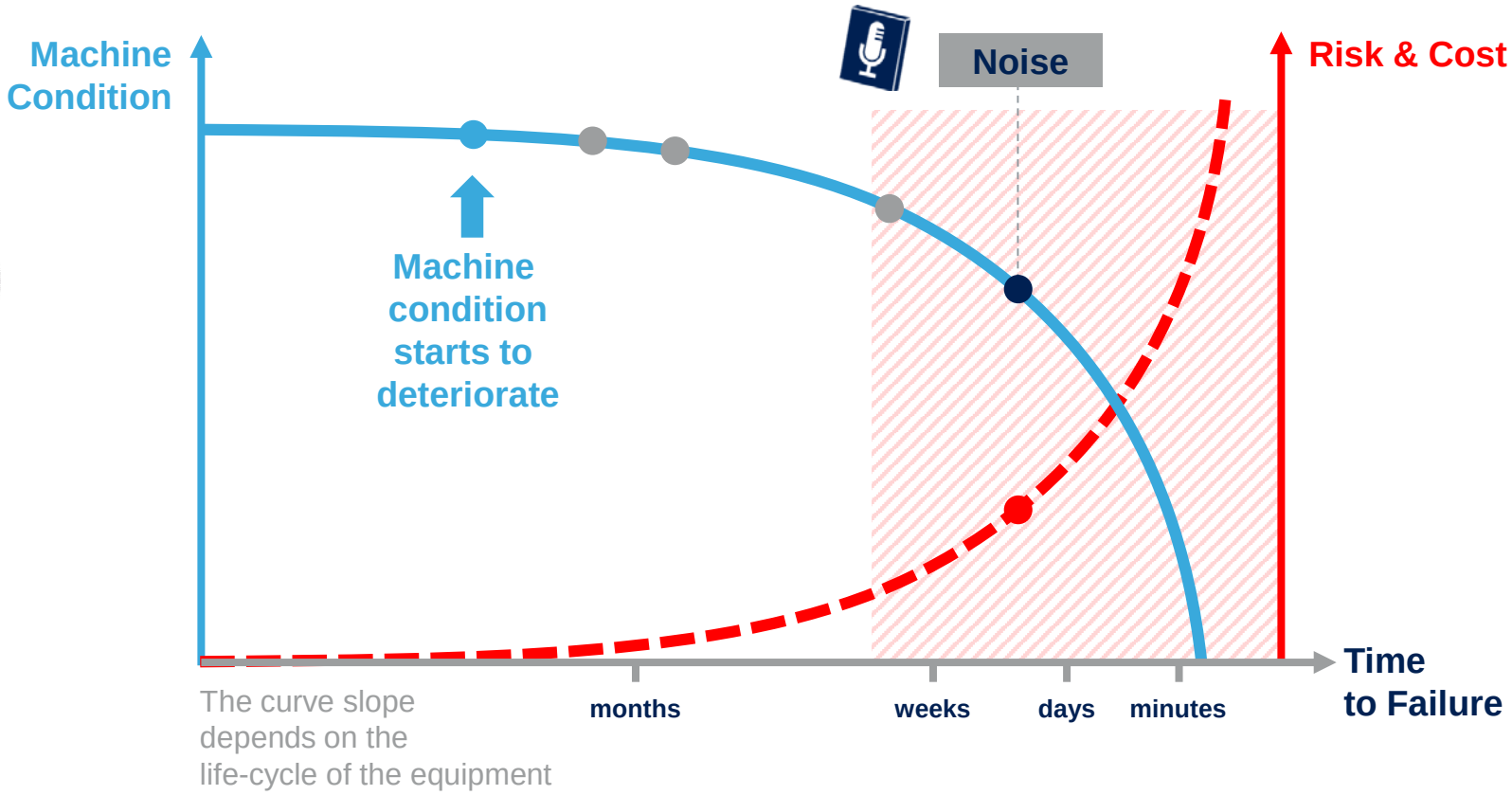




Audible Noise Emission

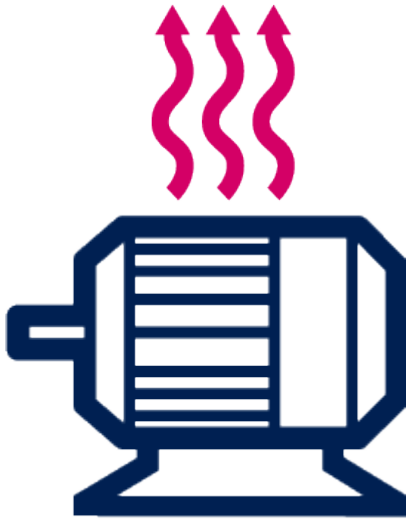
Risk of Failure Escalates Significantly



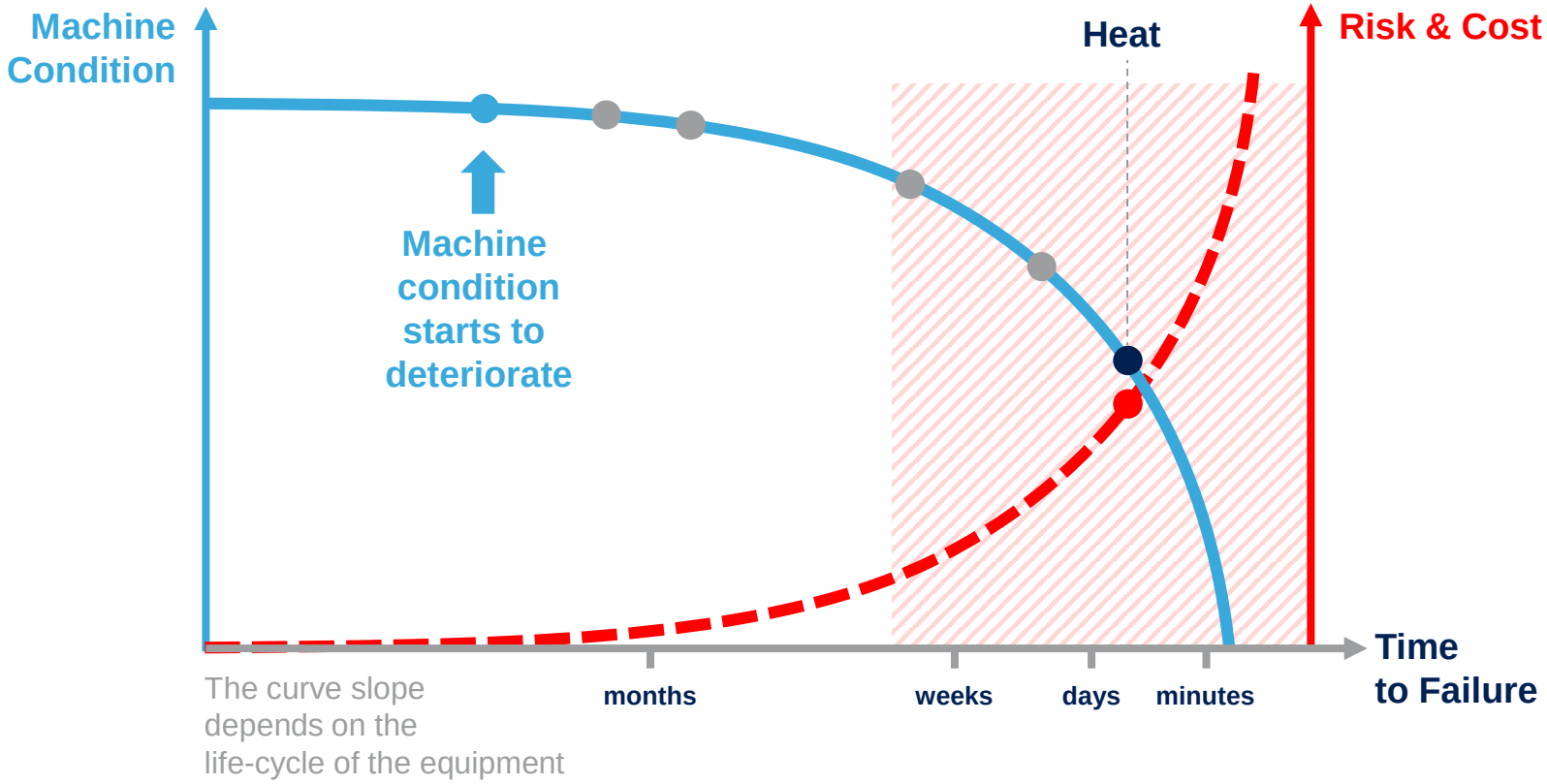


Machine is Overheating

Close to Failure



Heat

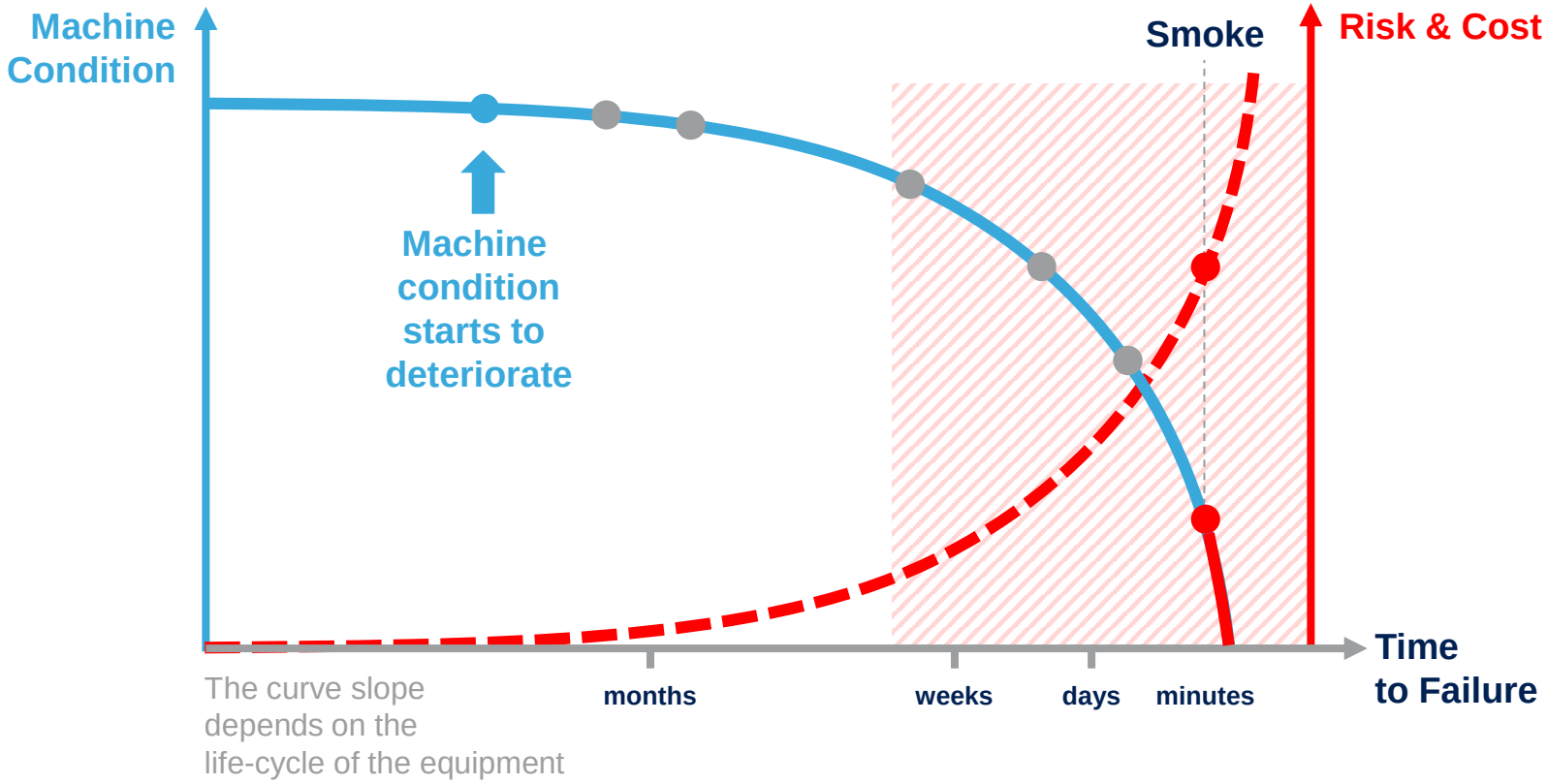


Smoke / Machine Stops

Failure!



Smoke



Architecture Optimization

Constraints of Centralized Data Processing



Raw Data Collection

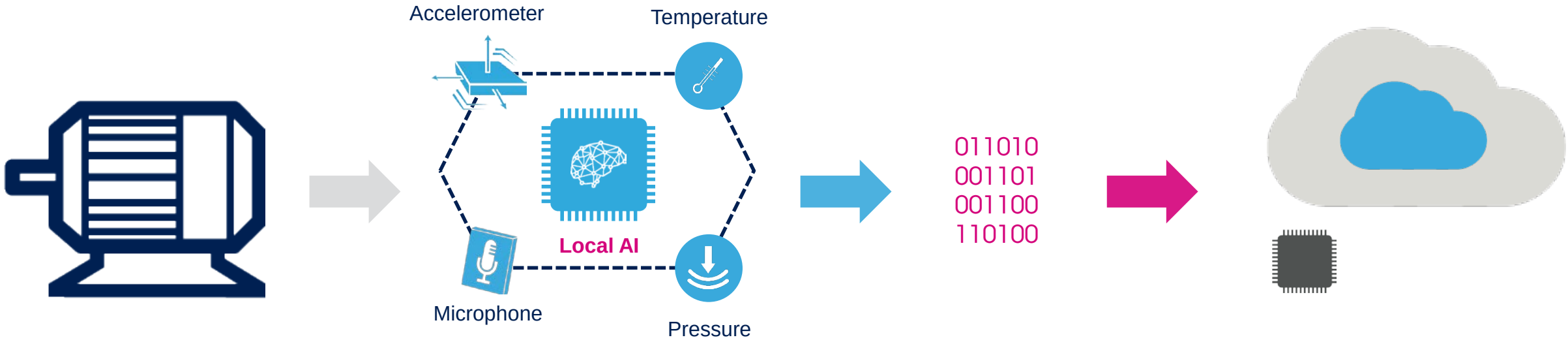
Huge Amount of Data

Large Storage and Data Processing

Current approach

Architecture Optimization

Moving the Intelligence to the Edge



Sensors fusion with AI Capabilities

Pre-processed
Data and Alarms

Smart and Light
Cloud

Local AI processing capabilities enable new approaches

End-to-End Tools

from Sensor to Cloud

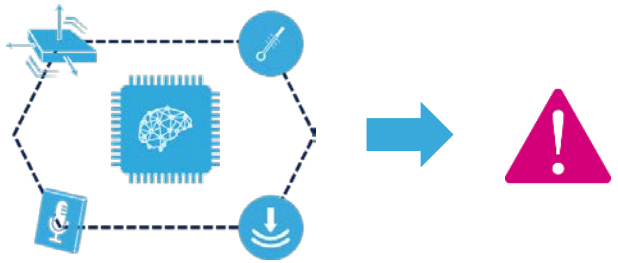
Ultrasound, Vibration, Noise & Environmental data processing at the Edge

Modular Reference Designs
for **Wired** and **Wireless** Sensor Nodes

Processing at the edge of Ultrasound, Vibration, Noise and Environmental sensor data for detection and alert

“Ready to use” secure framework communication between Sensors and Cloud





Secure
Communication







Starter kit available

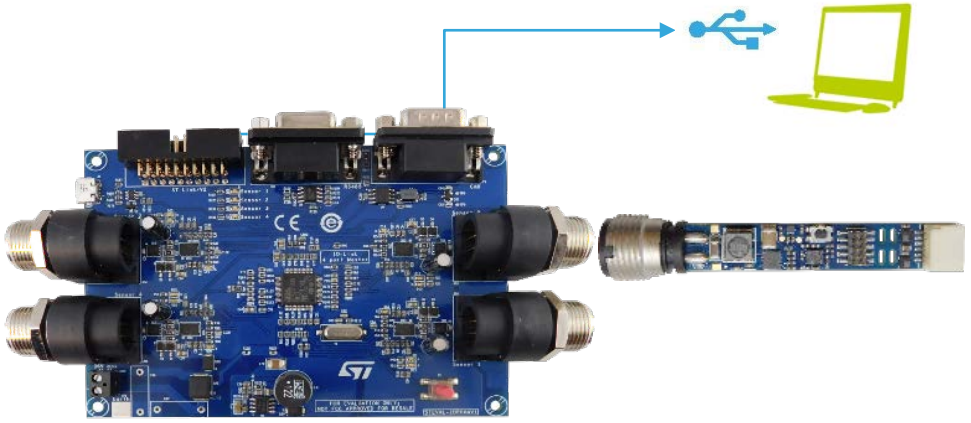
Predictive Maintenance Solutions

Kit with Sensors and IO-Link Capability

STEVAL-BFA001V1B
Stand Alone Sensor Node



STEVAL-IPD004V1 Expand your capabilities up to 4 nodes

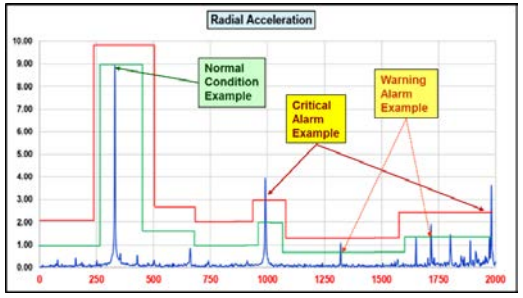


Sensing

Connectivity

Processing

Vibration Monitoring:
RMS / ACC. Peak
FFT embedded !



Adapter RS485 / USB
Optional USB
PC GUI



Coming Soon (Q1 2019)

Industrial Wireless Sensor Node

Sensing

Connectivity

Power

Security

Processing

Industrial Wireless Node (with secure connection)

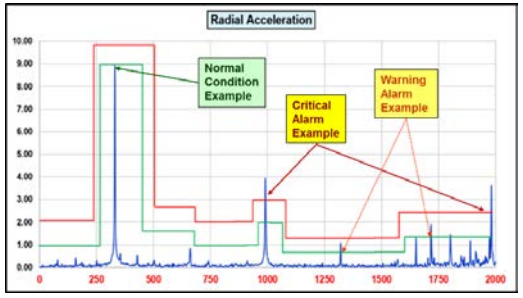


Multiple Connectivity Extension

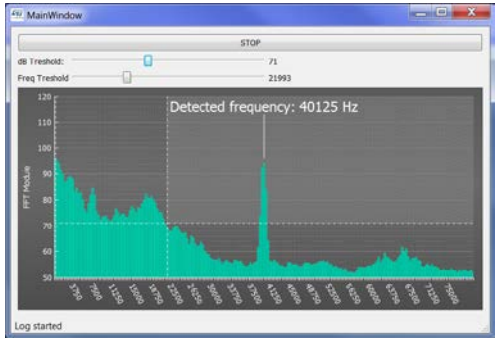




Vibration Monitoring:
RMS / ACC. Peak
FFT embedded !



Ultrasound Detection!



Predictive Maintenance

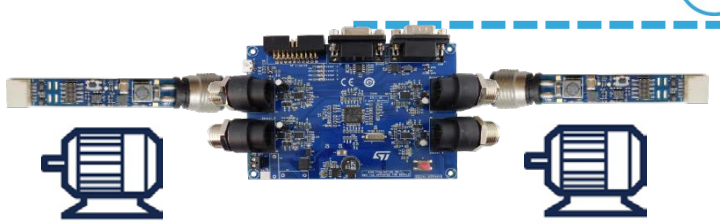
Demo: How it Works

Ultrasound, Vibration, Environmental processing multi nodes demos

Sensor Nodes

Gateway

Cloud Dashboard



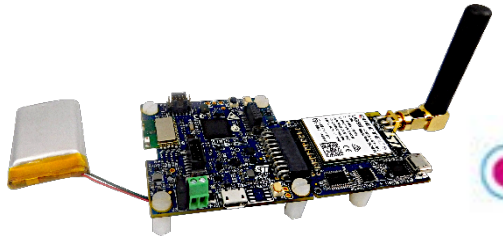
BoothDemo1

BoothDemo2

Serial Connectivity

Hand Shaking – Upstream Data

Downstream

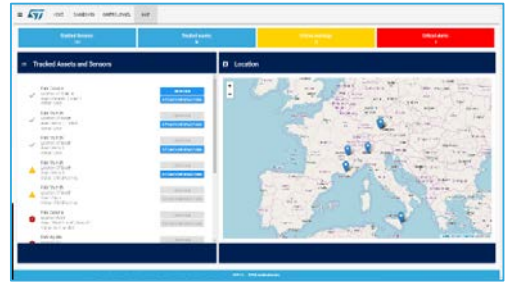


STWIN_CELL

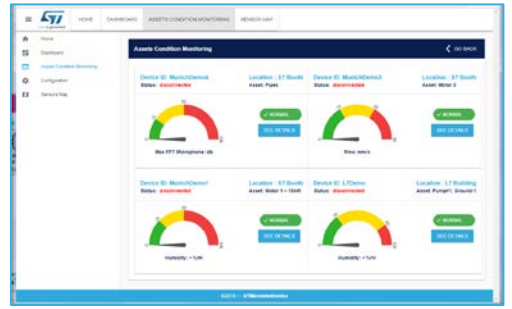
Cellular Connectivity

Hand Shaking – Upstream Data

Downstream





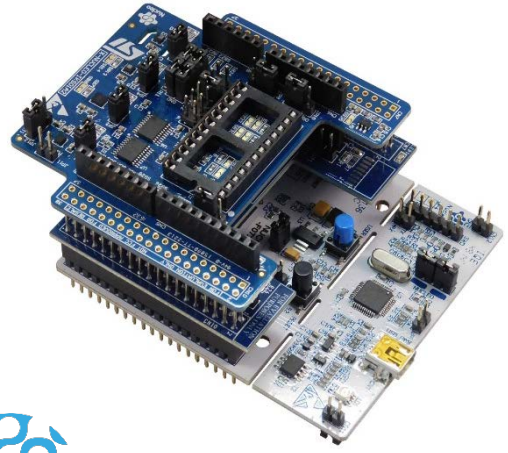


Simplify

Your Design

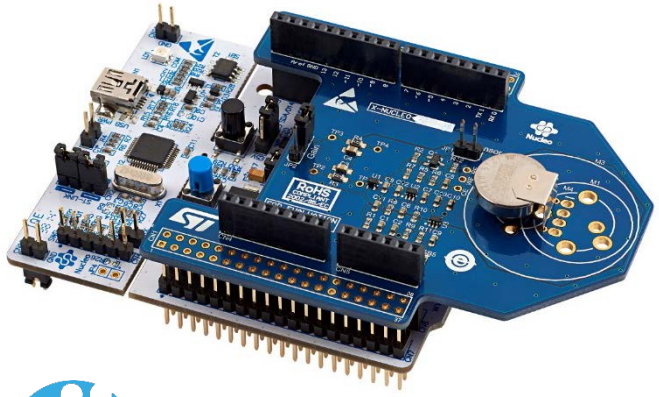
STM32 Nucleo Boards

Motion & Environmental Sensing



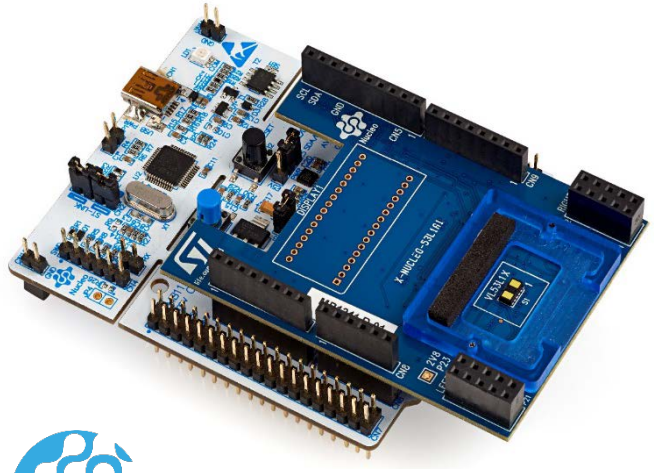
X-NUCLEO-IKS01A2

Gas Sensing



P-NUCLEO-IKA02A1

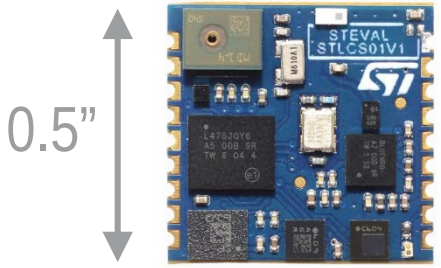
Proximity Sensing



X-NUCLEO-53L1A1

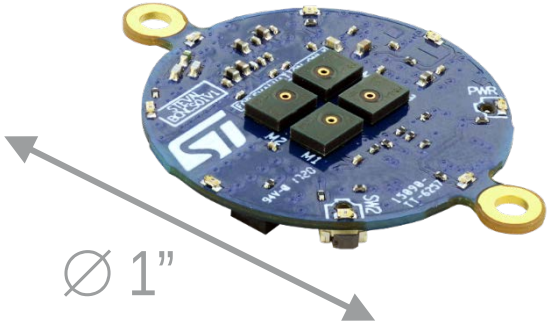
Form Factor Boards

SensorTile



STEVAL-STLCS01V1

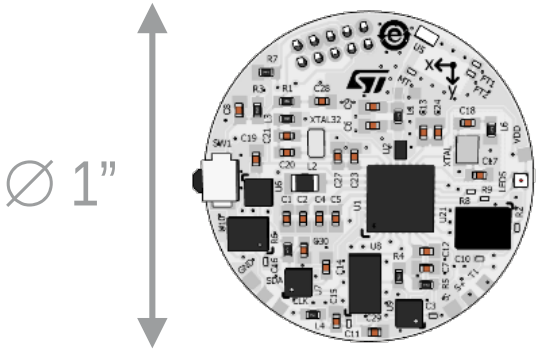
BlueCoin



STEVAL-BCNKT01V1

NEW

BlueNRG-Tile

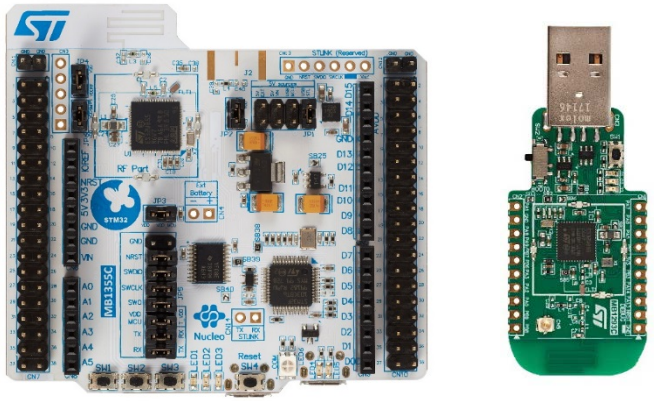


BlueNRG-Tile

Connectivity Boards

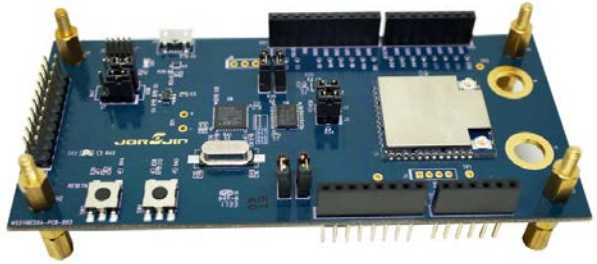
NEW

STM32 MCU with Bluetooth



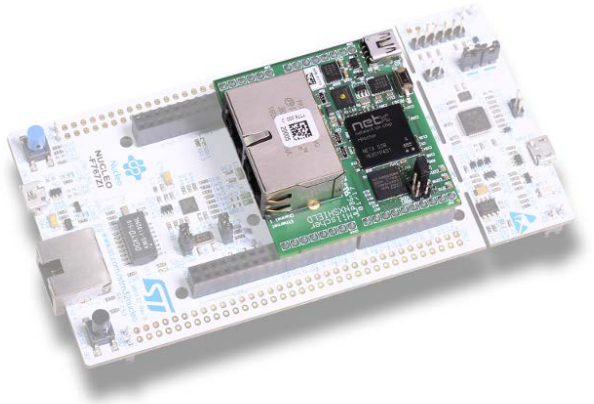
STEVAL-STLCS01V1

Bluetooth / Sigfox Dual-radio



STEVAL-BCNKT01V1

Hilscher netSHIELD



STM32 Nucleo

I-NUCLEO-NETX