Critical Innovations for Sustainable Mining

From Measurement to Operational Confidence with Heartbeat Technology

Matthew Kiem

MBA
(Master of Business Admin)

Electrotechnology Cert IV
(Instrumentation)

Apprenticeship
(Instrumentation Technician)

2023 **Global Account Manager - Mining**

State Manager - WA

2021

Solutions Business Development

2017

Industry Manager – Mining & Metals

2014

Product Manager – Level, Pressure, Gamma

2013

Account Manager

2011 Instrumentation Technician

2006

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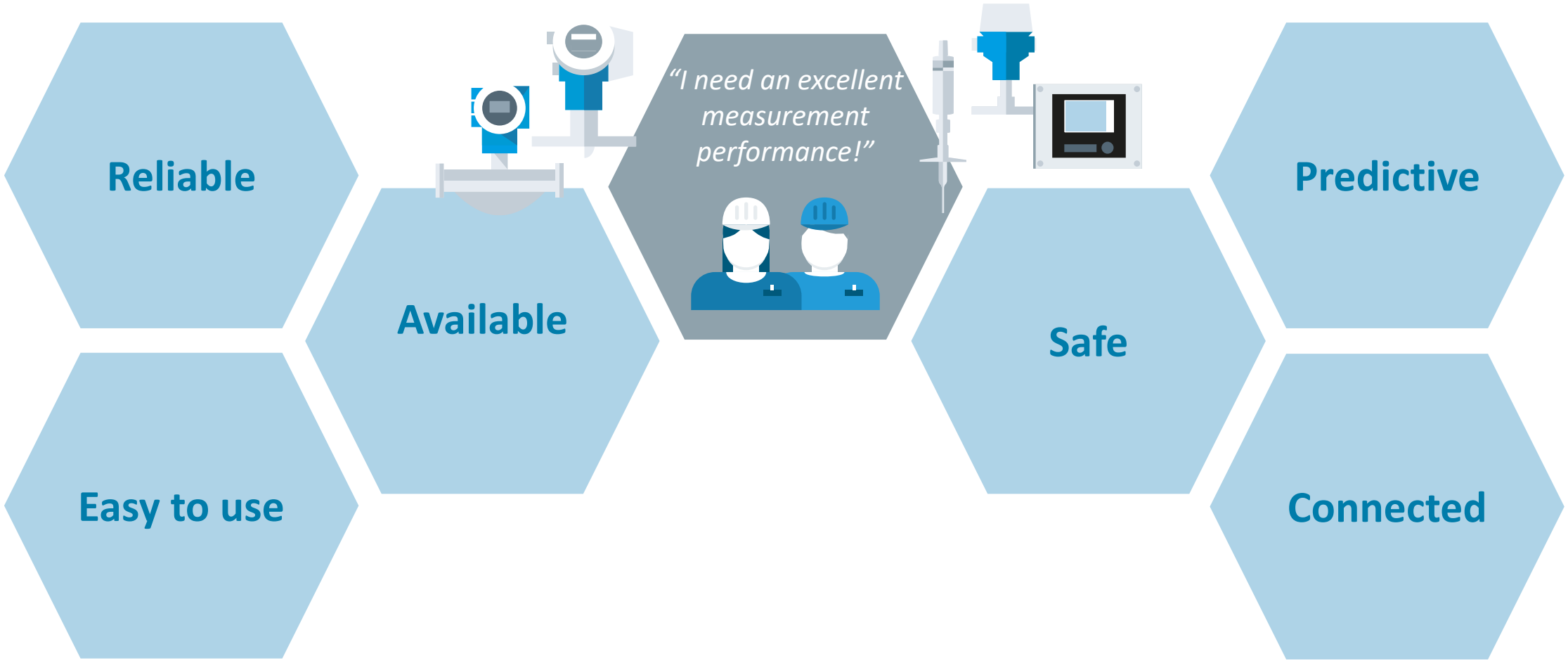
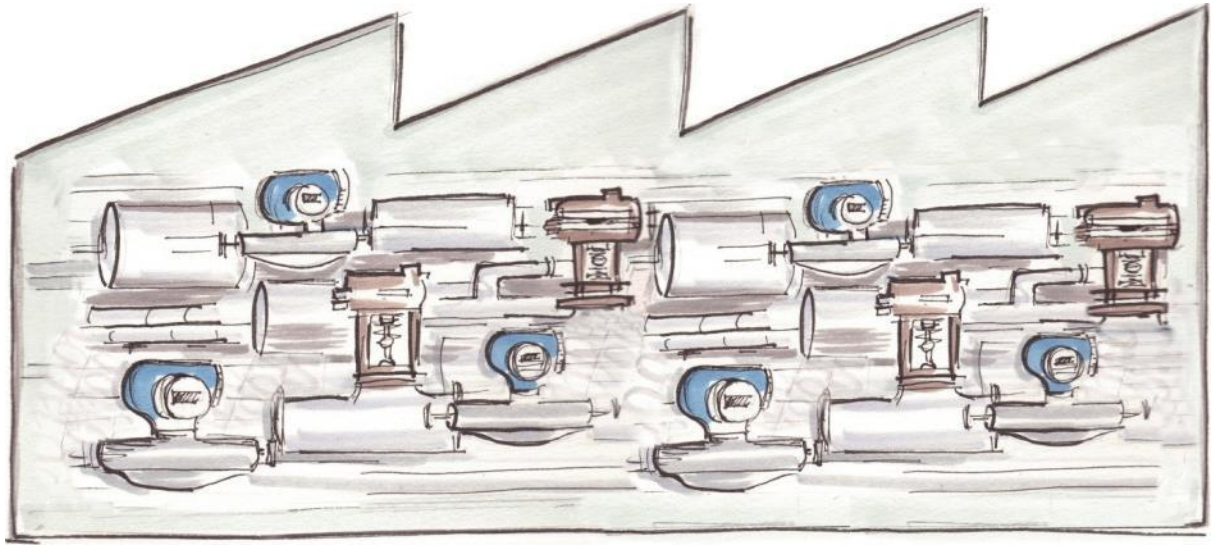
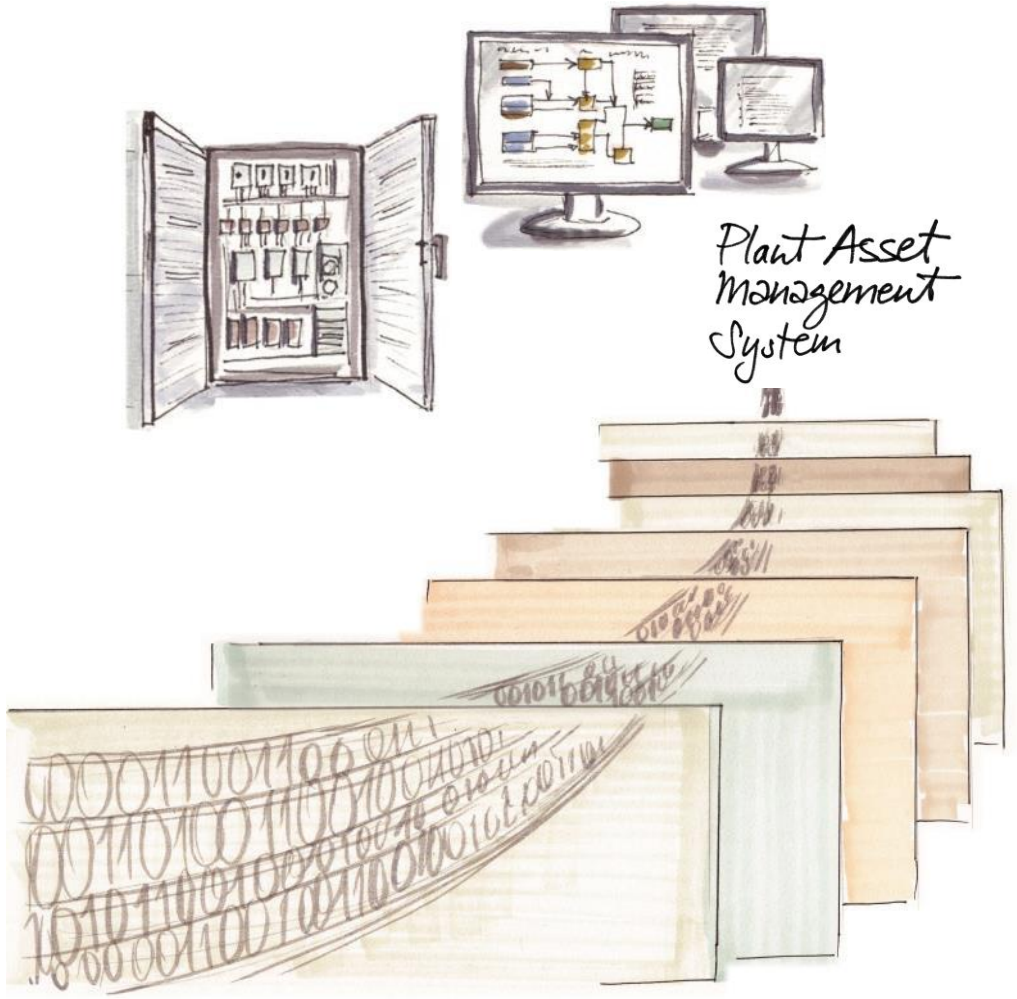
What do you demand from your instrumentation?



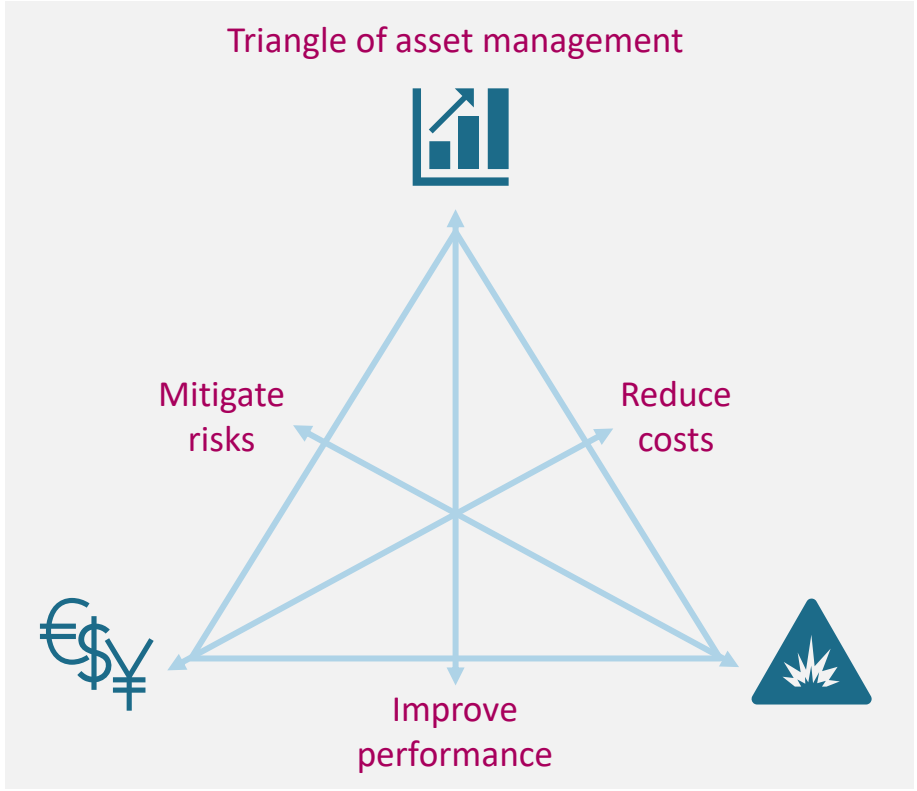
What stands in the way of using asset insights

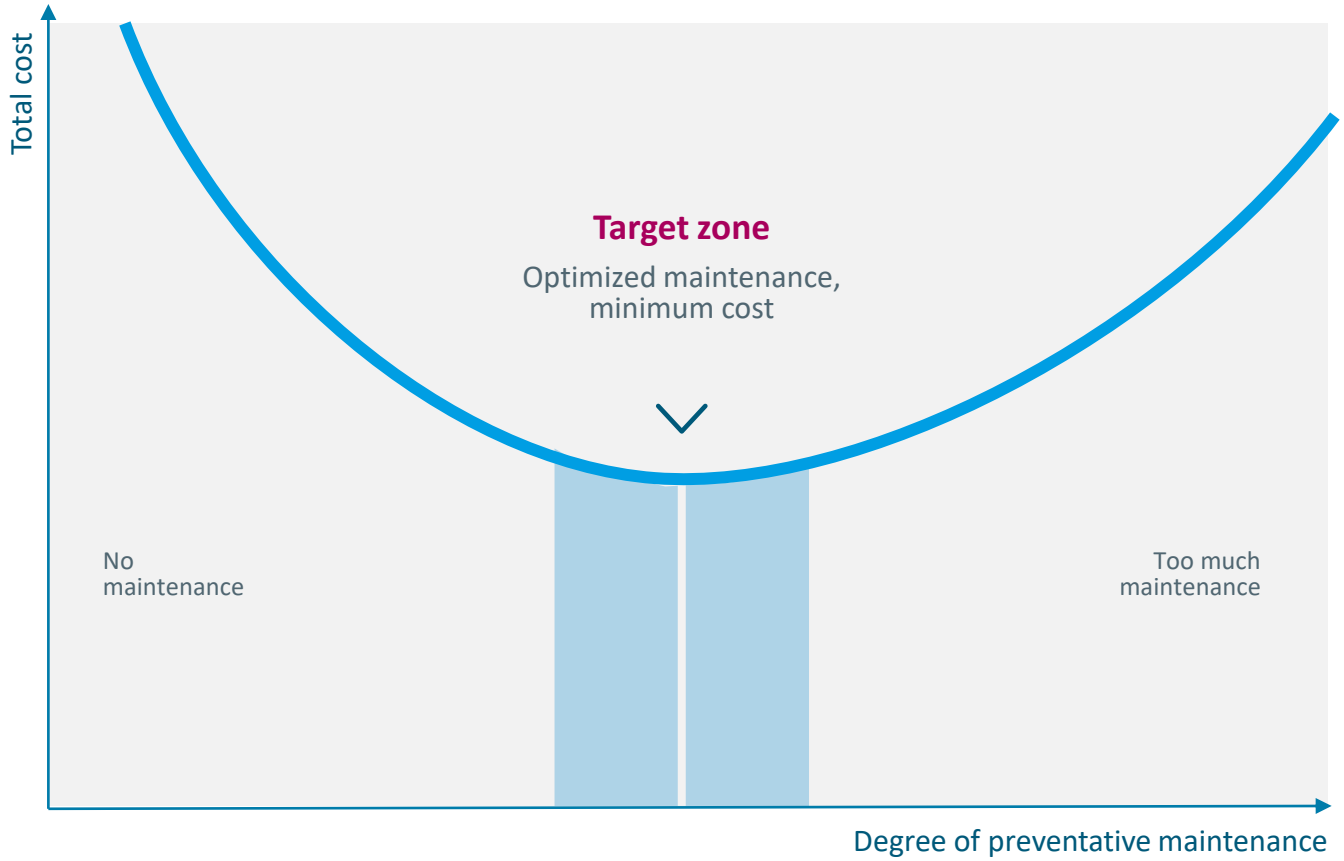
- Asset data remains hidden – on average operations only use 3% of what is available
- no seamless-integration (parallel to process value)
- high engineering-effort and expert knowledge required for data-analytics





Asset management strategy – finding the OPTIMUM





Heartbeat Technology

Increase your plant performance and ...

... boost reliability as well as safety levels	... reduce your verification efforts	... improve your process insights
Heartbeat Technology		
for diagnostics	**for verification**	**for monitoring**
		
Permanent process and device diagnostics	Documented device functionality without process interruption	Information for process optimization and predictive maintenance

Condition Monitoring and Process Optimisation

Condition monitoring enabling predictive maintenance by identifying process conditions that may negatively affect device or asset integrity or process performance

Most often occurring over a longer time period (weeks to years)

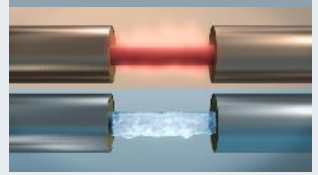
Corrosion

Abrasion

Buildup

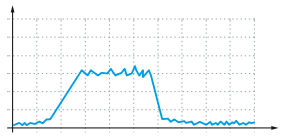
Mechanical stress

Thermal stress



Sensor condition

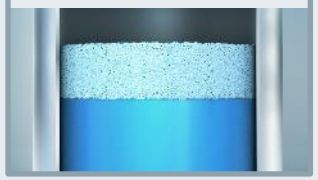
Supporting **process optimization** by identifying process anomalies (not critical to the device integrity, but might affect its performance) and monitoring of the device's **installation condition** to increase the reliability of the measuring point (or identify any need for corrective actions)



Ranging from transient conditions to more long term effects

Inhomogeneous medium

Foam detection



Availability

Environmental conditions

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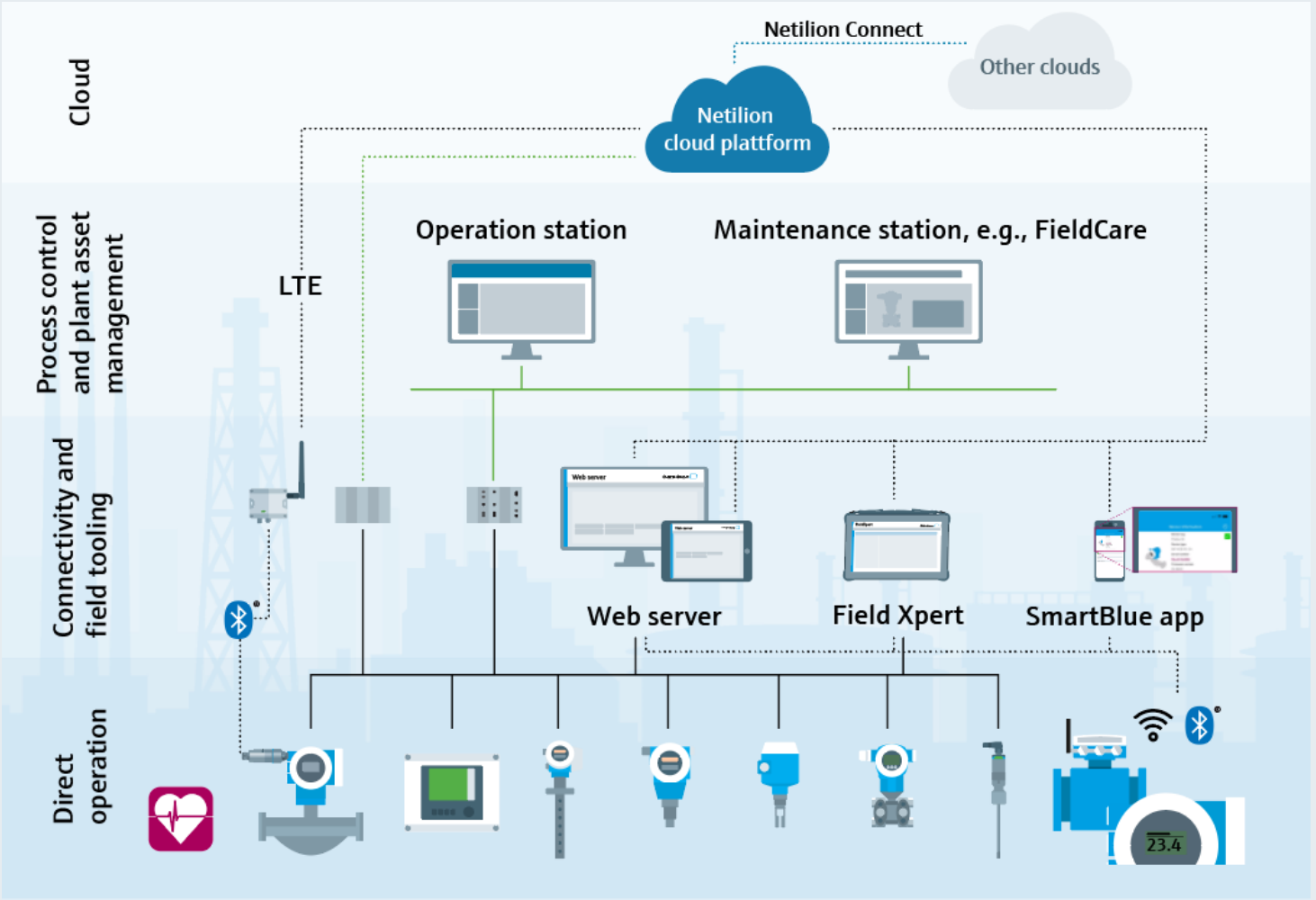
Heartbeat Technology functionalities are available across many interfaces

Release the potential given by connectivity to optimize your processes and operations

- **Connect** – Optimize your processes by integrating Heartbeat Technology functionalities into your infrastructure
- **Create value** – Exploit the full saving and efficiency potential of digitalization and IIoT by connecting your Heartbeat Technology field devices to the cloud
- **Expand the scope** – Obtain insights, not only on the individual device, but also on the overall health condition of all your installed devices via digital services
- **Increase efficiency** – Save time, reduce personnel exposure in the field and minimize risk of mistakes by accessing device specific information from anywhere
- **Stay secure** – Keep your information protected with our digital offering, which is designed in compliance with the highest industrial automation security standards

Use Heartbeat Technology in a connected environment and turn data into knowledge



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Example: Level measurement – build up detection

TAG: TANK1_Bottom_S1
Serial Number: F3005201124
Device: FMR52-BAALBBOAFK

Foam

Expected 28.10.2017 — Expected 11.11.2017

Details

A critical amount foam is expected for 28.10.2017

Build Up

Expected 23.08.2017 — Expected 03.09.2017

Details

Clearance exceeded

Terminal Voltage

Expected - — Expected - — Expected 29.11.2017 — Expected 12.12.2017

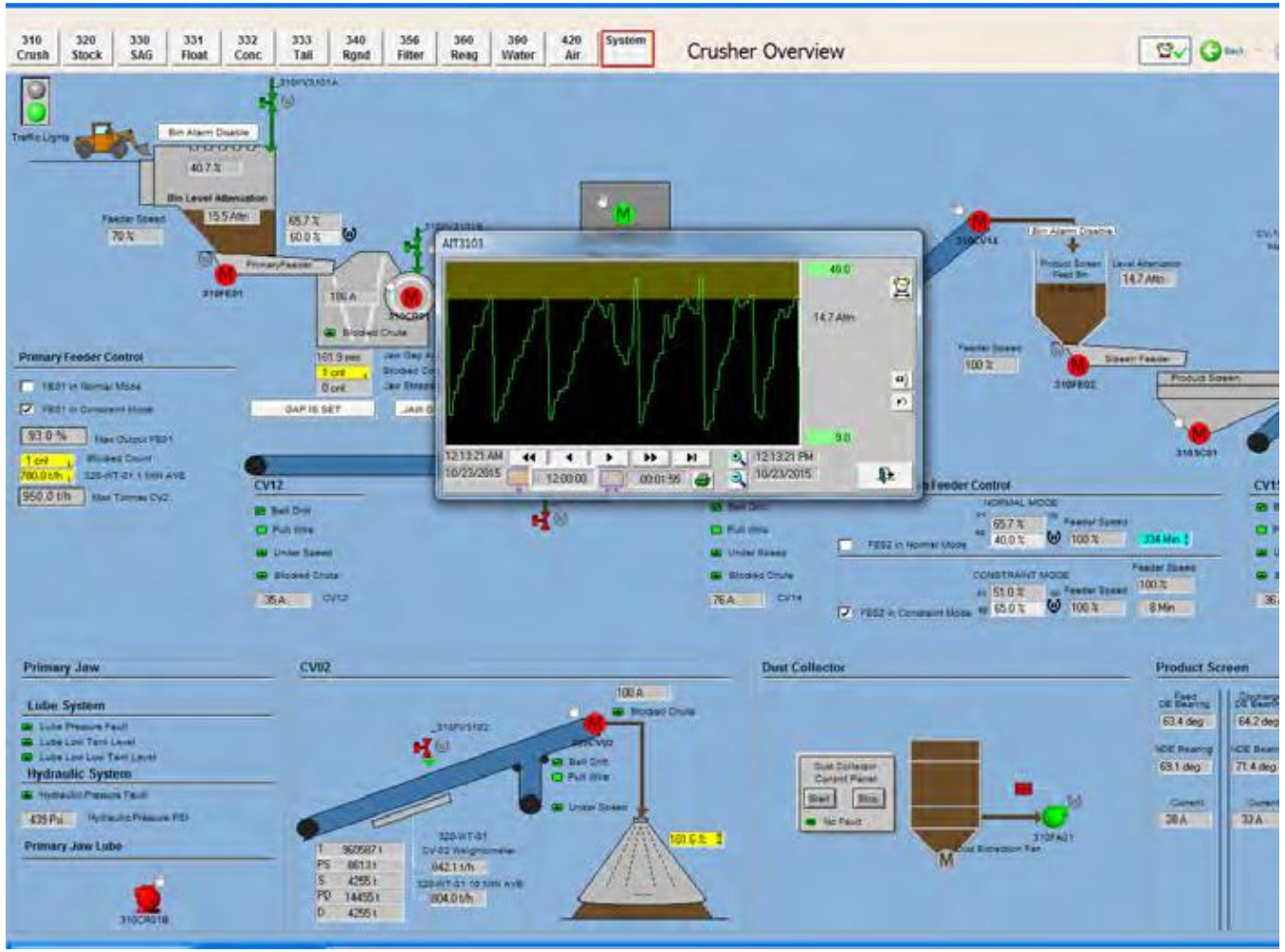
Details

A critical positive terminal voltage is expected for 29.10.2017

Electronic Temperature

Expected - — Expected -

Details



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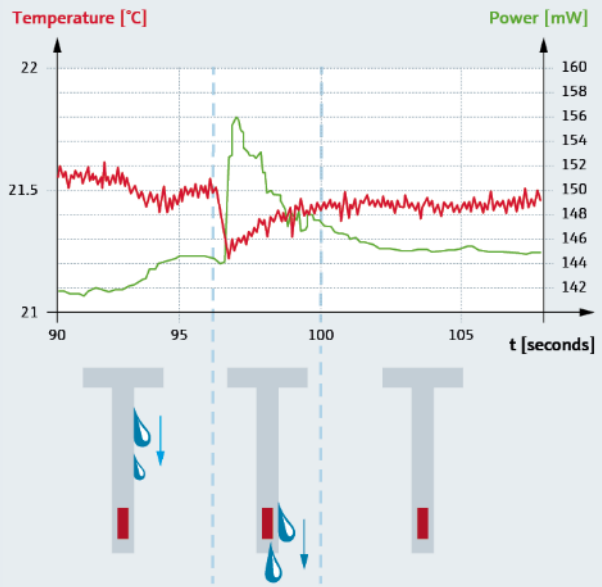
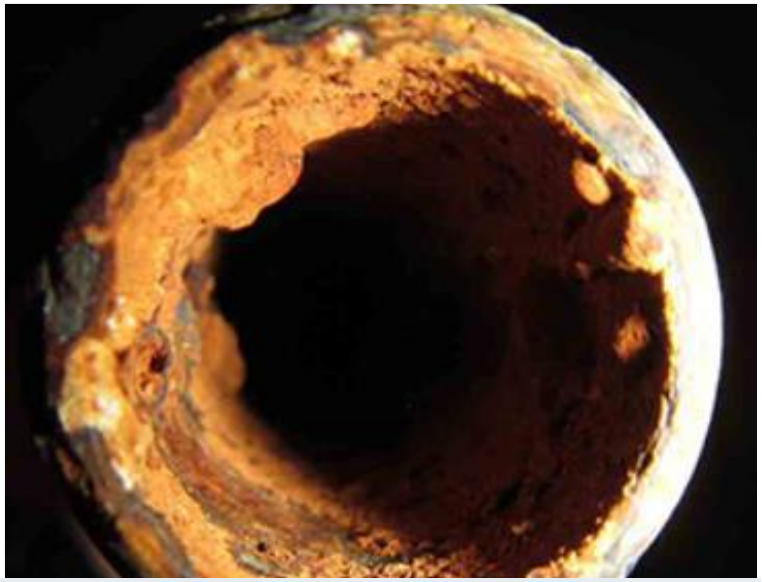
Example: inhomogeneous flow in gases – wet air in flotation

- Process stability measurement for thermal mass flow meters
- Wetness has a significant impact on the calculated gas mass flow rate for thermal flowmeters as the liquid formed on the sensor has very high heat transfer characteristics compared to most gases



Reduction in accuracy for traditional thermal mass meters

Thermal mass flowmeters are more common in flotation circuits due to direct mass measurement



Corrosion inside a pressurized carbon steel air pipe due to wet air

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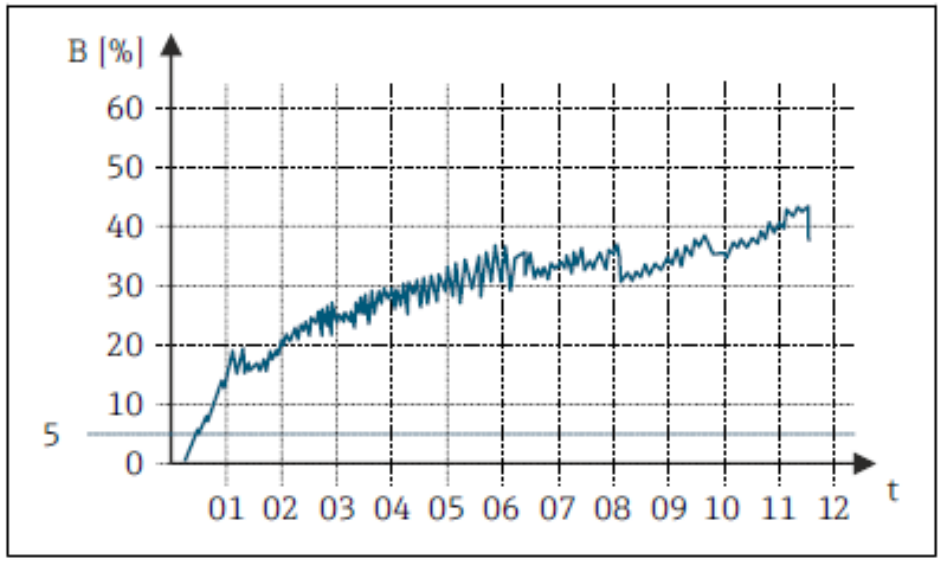
Example: Build up in electromagnetic flowmeters

- Build-up type: Iron hydroxide
- Monitoring duration: 12 months
- Diameter: DN 100 (4")
- Build-up thickness: 10 mm



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Condition Monitoring and Process Optimisation for Remote Sites

Water abstraction

Use case:

Advanced totalizer tracking and integration of Heartbeat Verification results for lithium brine

Scope:

- 44 battery-powered flow meters
- Netilion Cloud solution

Water management

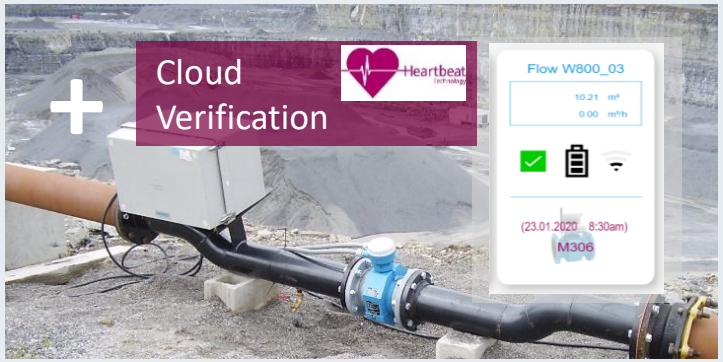
Use case:

Pit dewatering for an open cut mine

Scope:

- 20 battery-powered flow meters
- Netilion / battery flow meter

Water discharge



Use case:

Reducing efforts to report on days pumped

Scope:

- 19 flow meters on 11 sites
- Netilion Cloud solution

Remote analytical digitalization solution

Application: Raw water remote monitoring solution

Solution: Tank level, pH, conductivity, Chlorine, Turbidity, Quality measurement in a sampling panel, connected remotely via gateway and cloud visualization software for remote access

Workplace >> Tank | Hide secondary data | Auto refresh: Disabled | Currency | Unit | Time zone: Location

Tank group: - All - | Product: - All - | Supplier: - All - | Location: - All -

State	Location	Tank name	Level	Value	Unit	Free	Product	Time stamp
		Concentrate Tank	41%	17,930.4	l	26,069.6		17/06/21 08:15
		Potable Water Conductivity	3%	0.411	mS	4.589	Potable Water	17/06/21 08:15
		Potable Water pH	66%	9.3	pH	4.7	Potable Water	17/06/21 08:15
		Raw Water Chlorine	2%	2.5	mg/L	97.5	Potable Water	17/06/21 08:15
		Raw Water pH	64%	9.0	pH	5.0	Potable Water	17/06/21 08:15
		Raw Water Turbidity	32%	3.2	NTU	6.8	Potable Water	17/06/21 08:15
		Refractometer	0%	-0.0	brix	100.0	Hydraulic Fluid	17/06/21 08:15
		Tank 001	71%	32,799.7	l	13,600.3		17/06/21 08:15
		Tank 002	71%	32,735.2	l	13,664.8		17/06/21 08:15
		Tank 003	71%	32,717.8	l	13,682.2		17/06/21 08:15

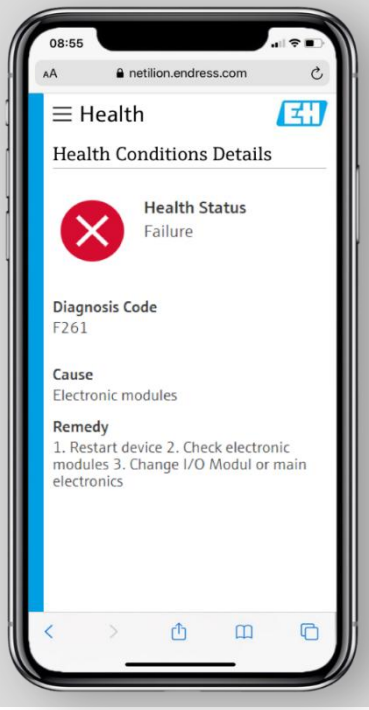
Visualization via web browser on PC, tablet or smartphone

Water analysis panel at water distribution network

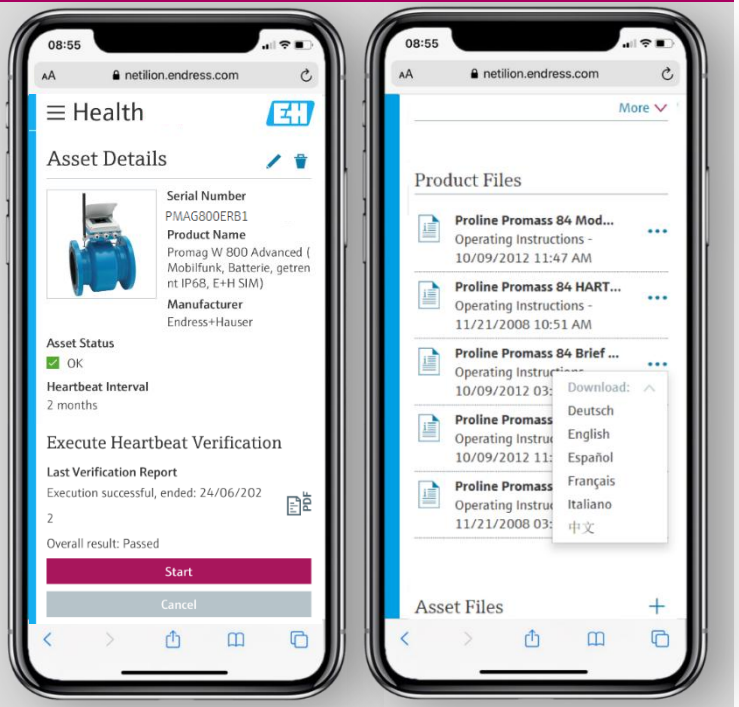
Sustainable Mining with Heartbeat Technology & Netilion

Remote access to

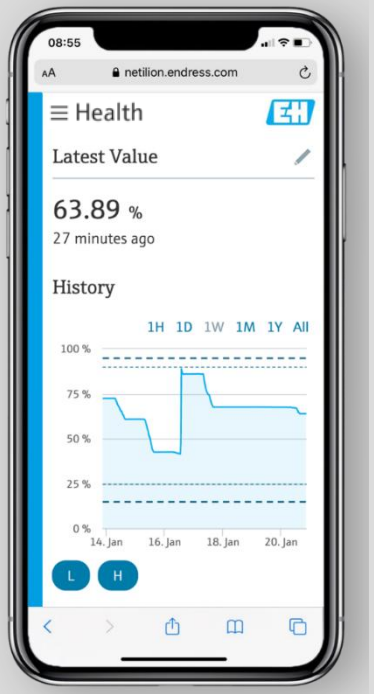
Permanent device diagnostics



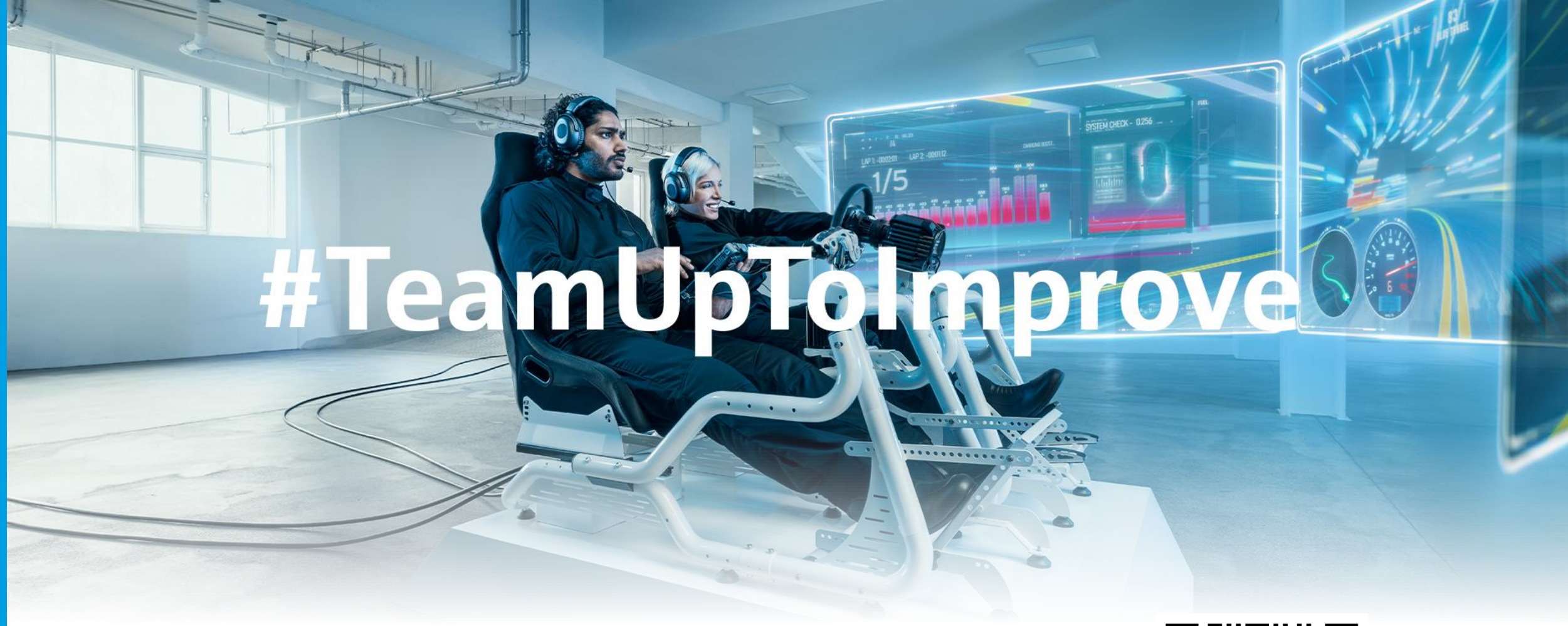
Trigger & scheduling automatic documentation



Process optimization and predictive maintenance*



*Primary measurement values (e.g. flow, level, pressure) are available. An extension with Heartbeat Technology parameters (e.g. HBSI, Buildup index) is in implementation.



Thank you for your interest in Heartbeat Technology and Netilion

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