Workshop
Maintenance 4.0

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Agenda

	Introduction
	Digital Transformation & Predictive Maintenance 4.0
	Plan, Do, Check, Act
	Conclusion
	Case Study

Digital Transformation is the Business Strategy; IIoT is the Technology Enabler

Why is everybody talking about Digital Transformation?

The promise of real improvements, motivated by people (and made possible by technology)

Automating and optimizing operational processes in new areas that up until now weren't possible

What is Industrial IoT?

Improved measurement technology

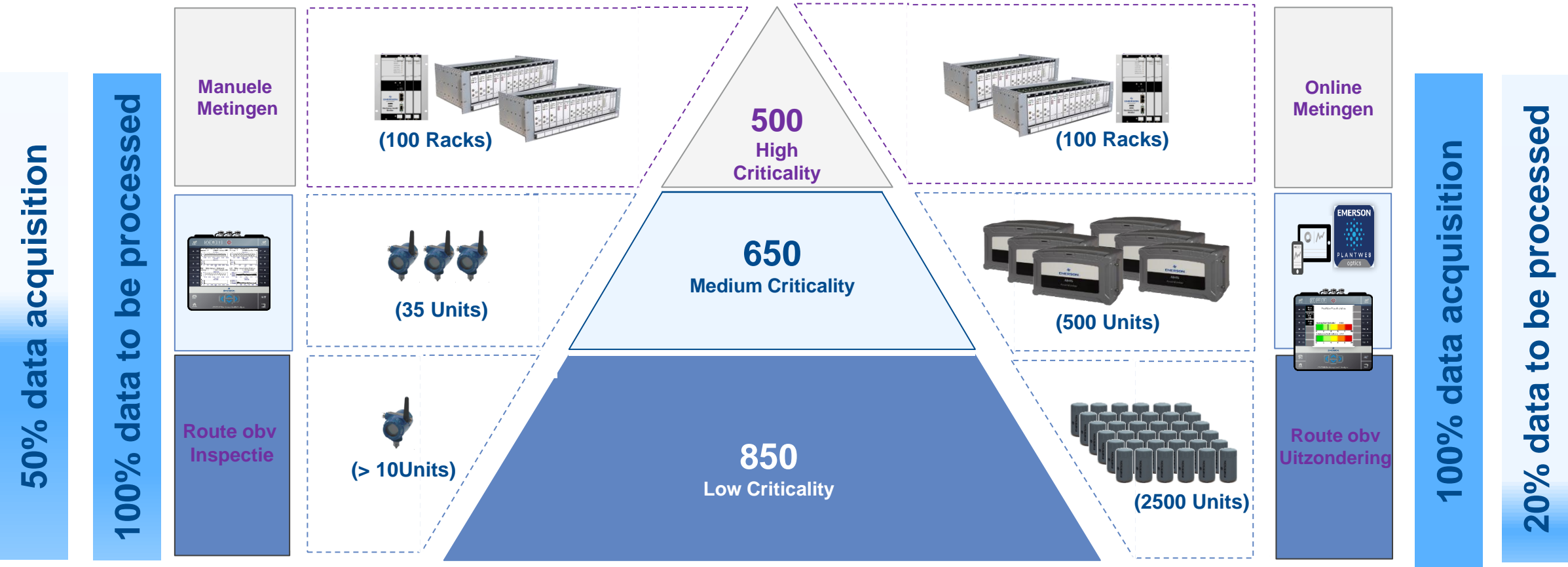Cost efficient and cybersecure connectivity

Advanced Edge analytics

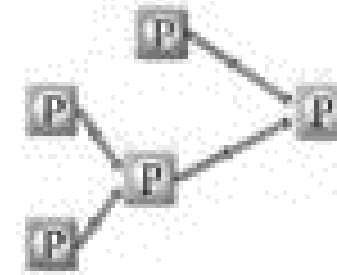# Digital Transformation of Asset management

Strategy today → **3 years** → **Digital Transformation**

50% data acquisition

100% data to be processed

Manuele Metingen

(100 Racks)

(35 Units)

Route obv Inspectie

(> 10Units)

500 High Criticality

650 Medium Criticality

850 Low Criticality

(100 Racks)

(500 Units)

(2500 Units)

Online Metingen

Route obv Uitzondering

100% data acquisition

20% data to be processed

ROI

| P&ID review | Criticality and Failuremode | PM & PdM set-up | Optimising the PM plan | Cost/Benefit analysis |

DO: Collecting Asset Data
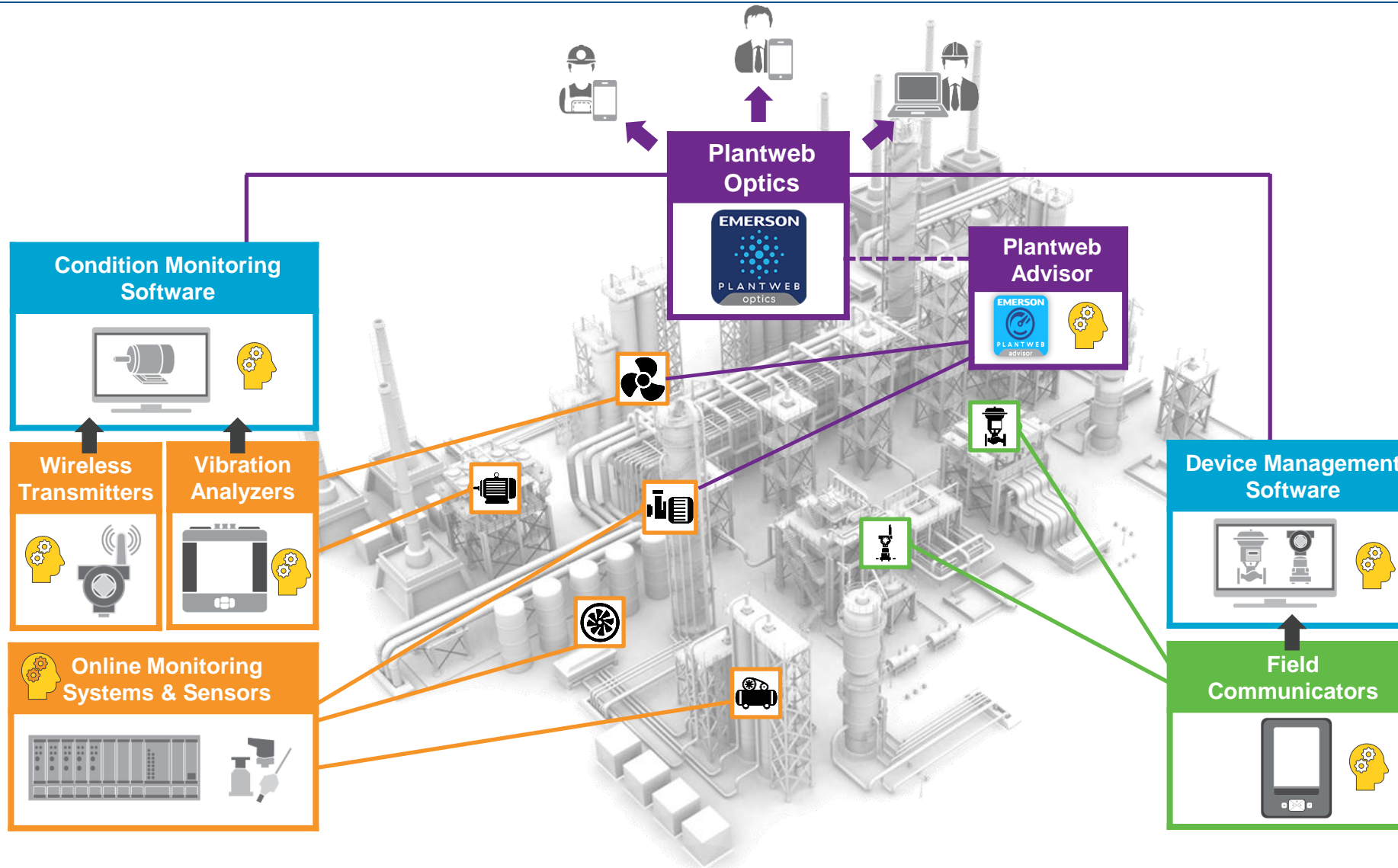
CHECK: Visualising, Analysing and Predict

Process data

AMS Device Manager

SMV Pro

Digital Valve Controllers

CMM

Business Systems

PLANTWEB optics

Asset Data

Mobile Clients

Detailed Analysis

KPI Dashboards
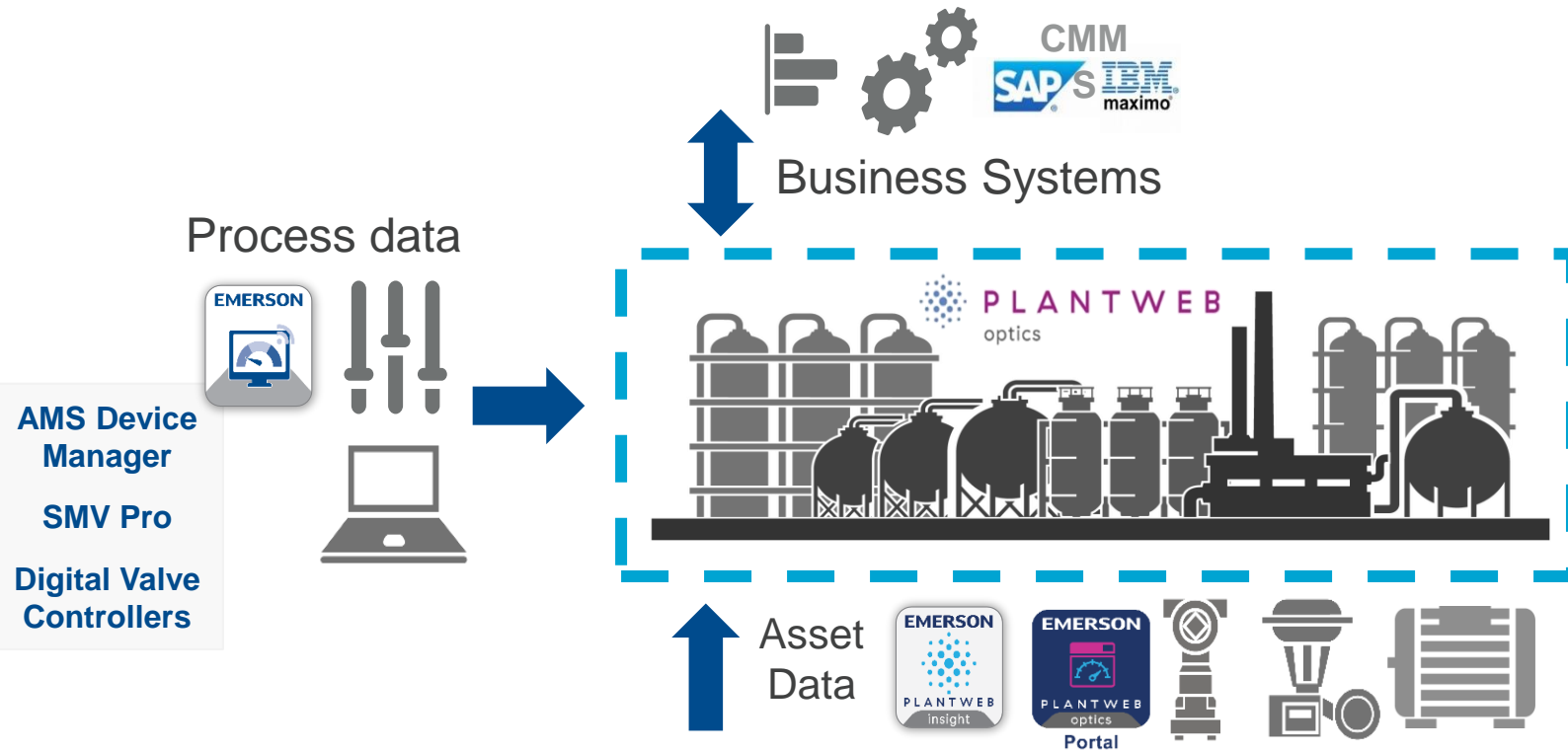
CONDITION-BASED	PRE-CONFIGURED	INTEGRATED MULTI-ASSET	ADVANCED & ENTERPRISE	ASSET OPTIMIZATION
Device & Machinery Diagnostics	Asset Health	Asset Health & Efficiency	Asset Performance Platform	Digital Twins

ACT: Maintain & Improve
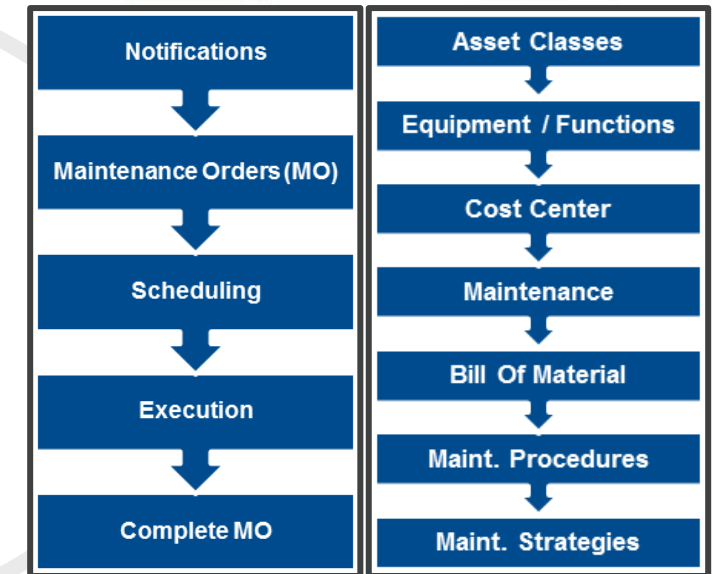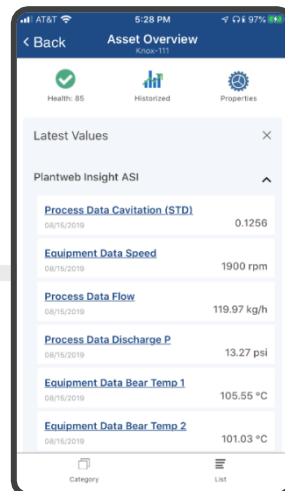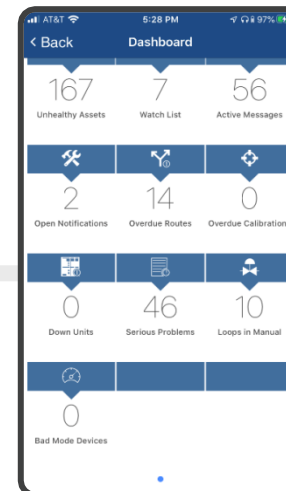

1. Alert

2. Creating a notification
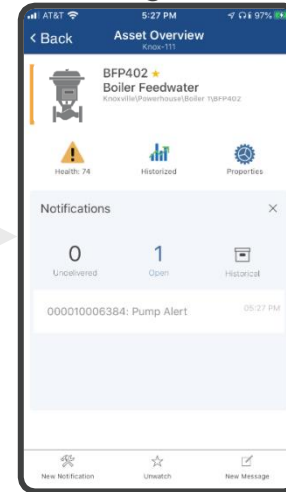
3. Plan & Schedule the work

5. Asset is back OK

4. Status Follow-up

Sleuteltijd

Emerson Confidential

Plantweb Ecosysteem closes the Loop

Plan → **Do** → **Check** → **Act**

Strategy and priority   *Collecting Asset Data*   *Visualise, Analyse & Predict*   *Maintain & Improve*

ROI

Assets

Asset Health

Asset Performantie

Geautomatiseerde Diagnose

CMMS

SAP
IBM maximo

Plant Manager

Reliability Supervisor

Maintenance Technician

Global Operations

| Asset Taxonomy, Criticality Analysis, Failure modes, Cost/benefit | Automated data collection Real-time data More assets monitored | Automated Analysis | CMMS integration Integrated workflows "Closed loop" | Internal visibility Relevant information Integratid visualization Mobility & Collaboration |

"With Plantweb Optics we expect to change the way we do Maintenance."
– Evonik, early adopter

Emerson's Reliability Solutions portfolio

Industrial plant layout
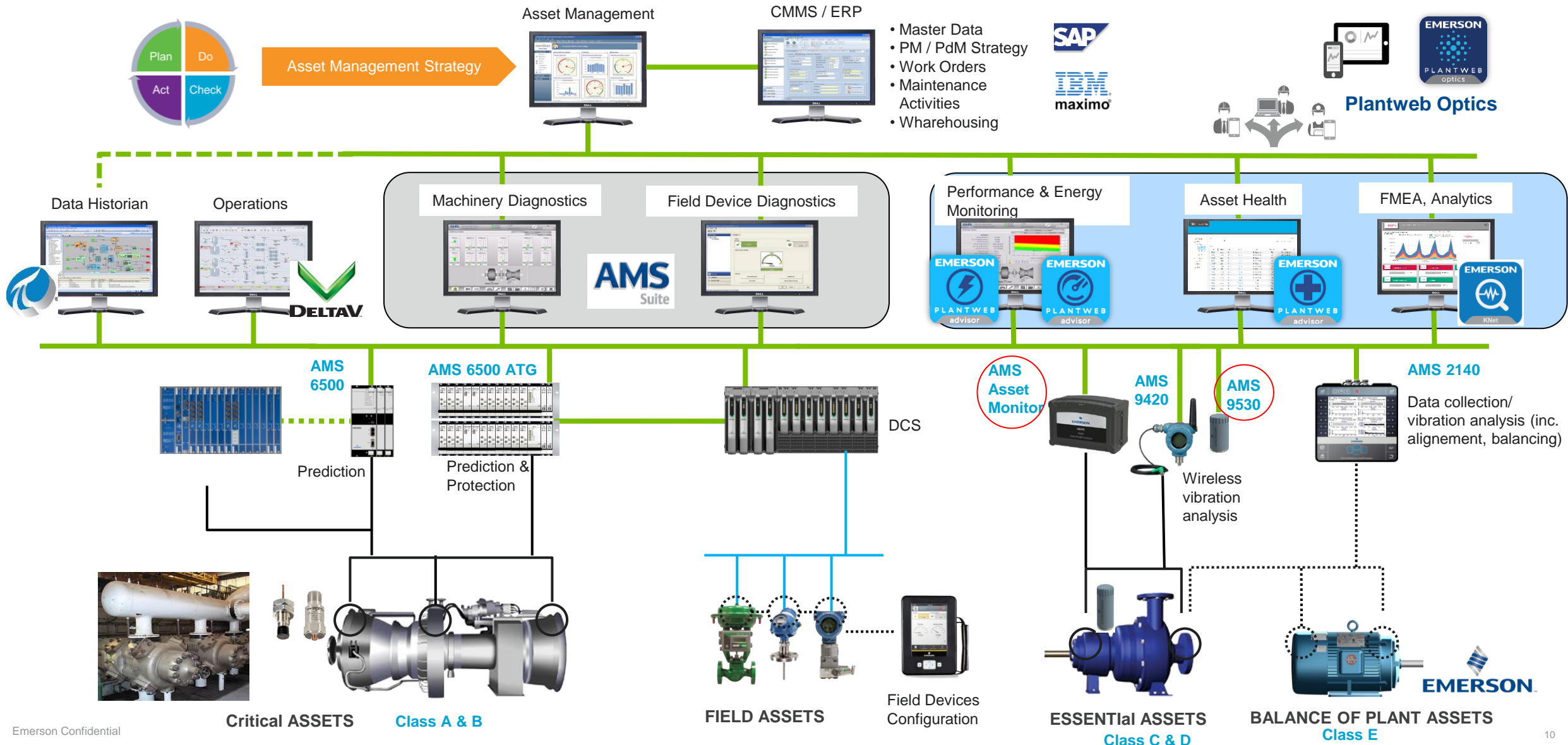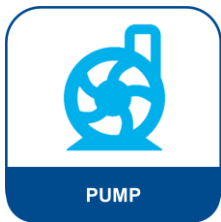
AMS Wireless Vibration Monitor

Plantweb Insight

- Easy Install
- Battery management
- ATEX
- Lifespan – battery 3 to 5 years

COOLING TOWER

PUMP

Sensor

- Single or Triaxial plus Temp sensor
- 13 absolute values like Overall vibration, analysis parameters and spectrum
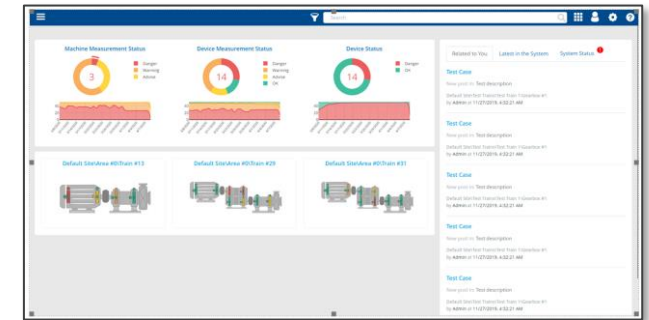- Cybersecure *Wireless*HART® Mesh Network

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AMS
Wireless
Vibration Monitor

Vertical
Horizontal
Axial
96mm H x 51mm Ø

- *Fully configurable settings*
- *Prescriptive Analytics/ Edge device* ⭐

AMS Machine Works

- Fully integrated in AMS Machine Works software

- Compact, self-contained
- Cl I, Div 1 / IP66 / NEMA 4X enclosure

AMS Asset Monitor – Emerson's Edge Analytics **IIOT** Device

Fan - axial, direct motor drive

Fan - axial, gearbox drive

Fan - centrifugal, centerhung

Fan - centrifugal, overhung

Gearbox - single reduction

Generic - rotating, centerhung

Generic - rotating, overhung

Heat exchanger - tube - advisor

Motor - electric, synchronous

Pump - centrifugal, centerhung

Pump - centrifugal, overhung

Pump - centrifugal, overhung - advisor
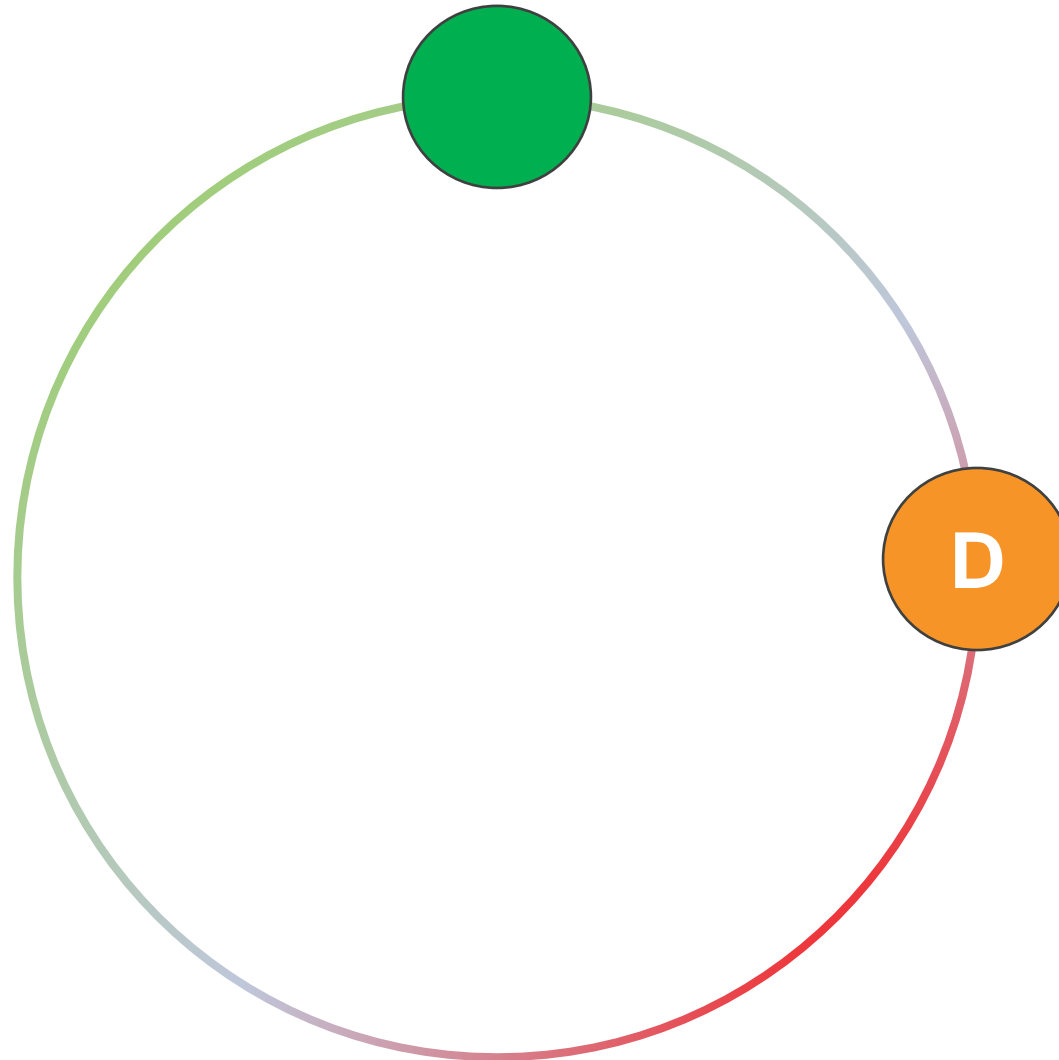
Case Study : NLG Processing en Distributie

P
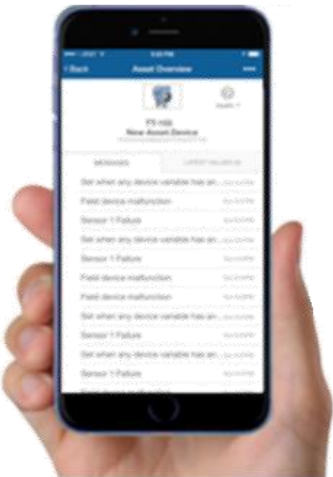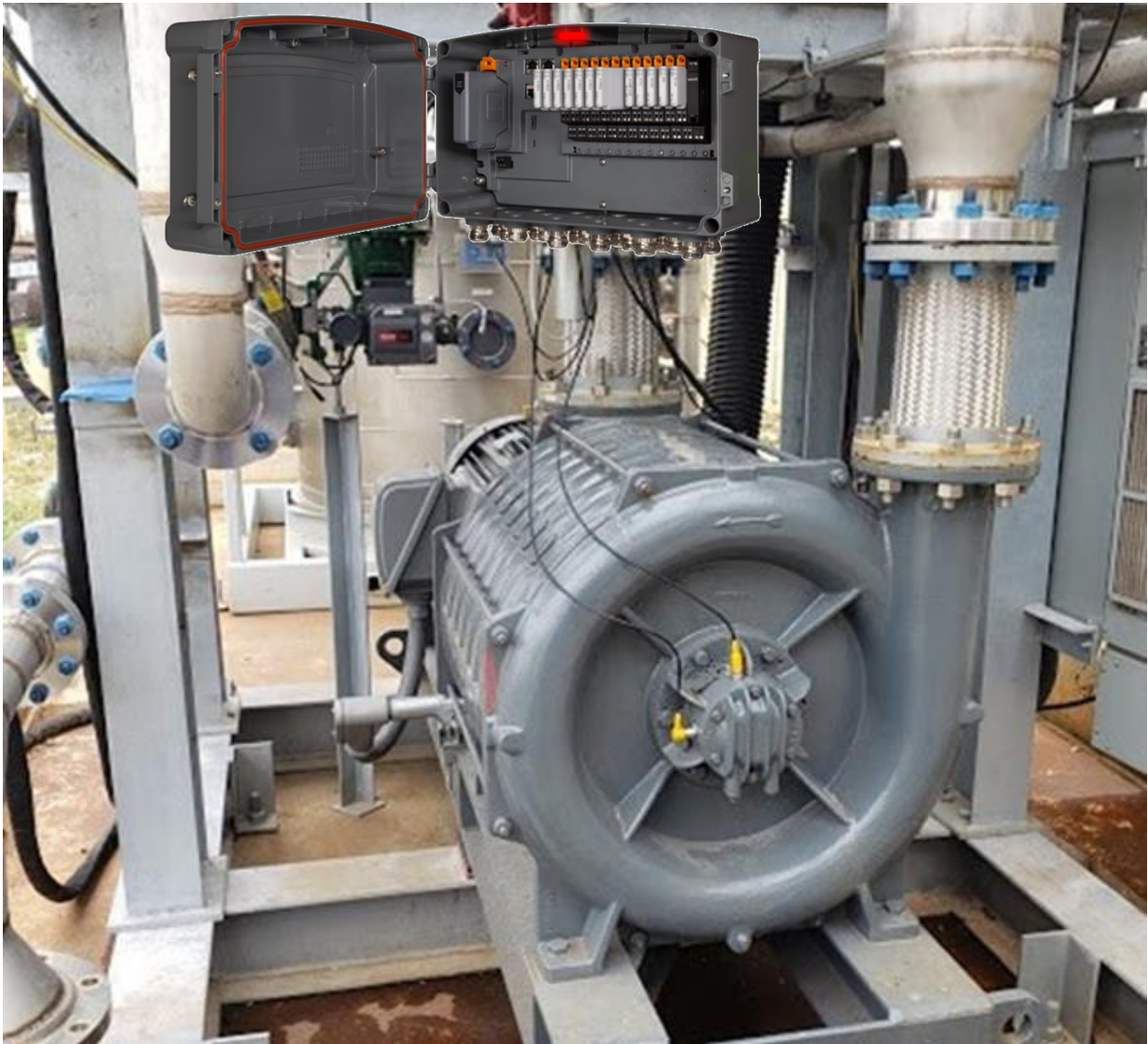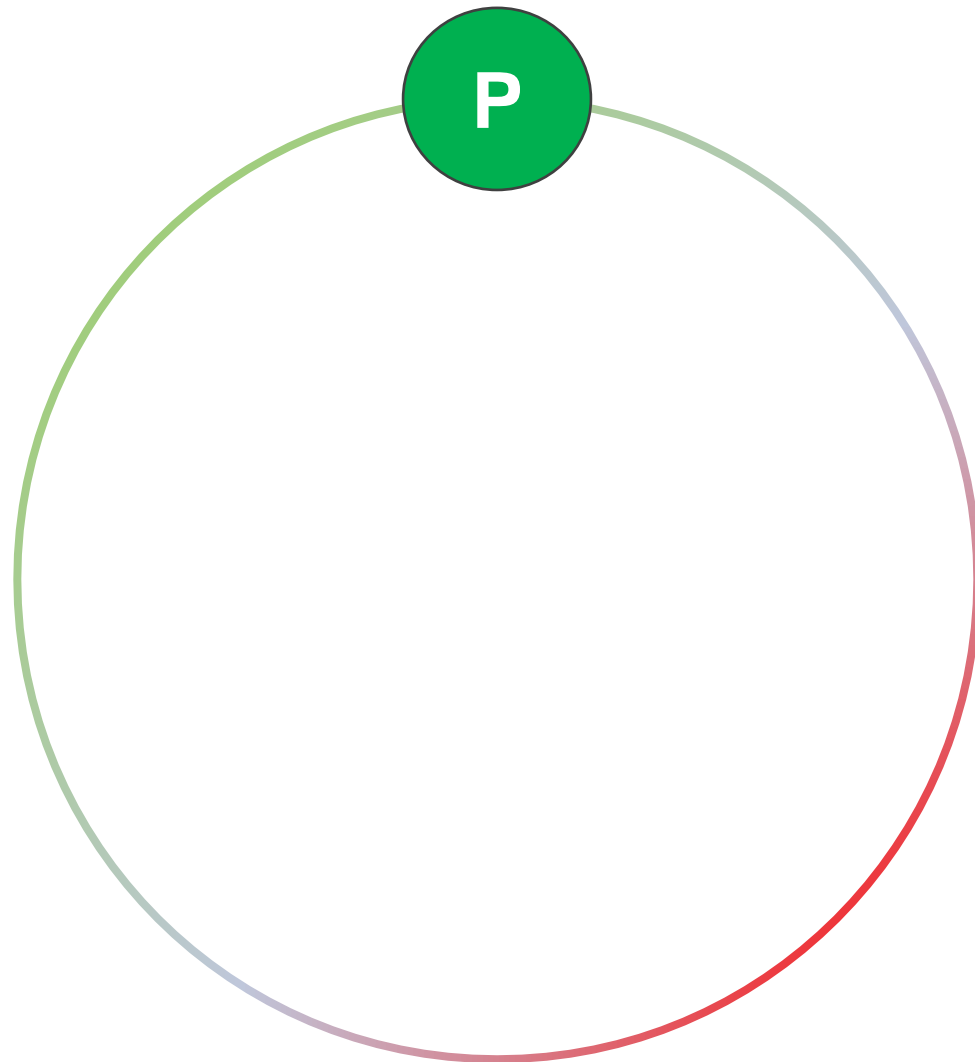
System : Gas metering & Condensate Removal

Assets : Heat Exchangers, Vessels, Valves, pumps

Failure modes : Tube Fouling, Demister degradation, Seizure, alignment/balancing
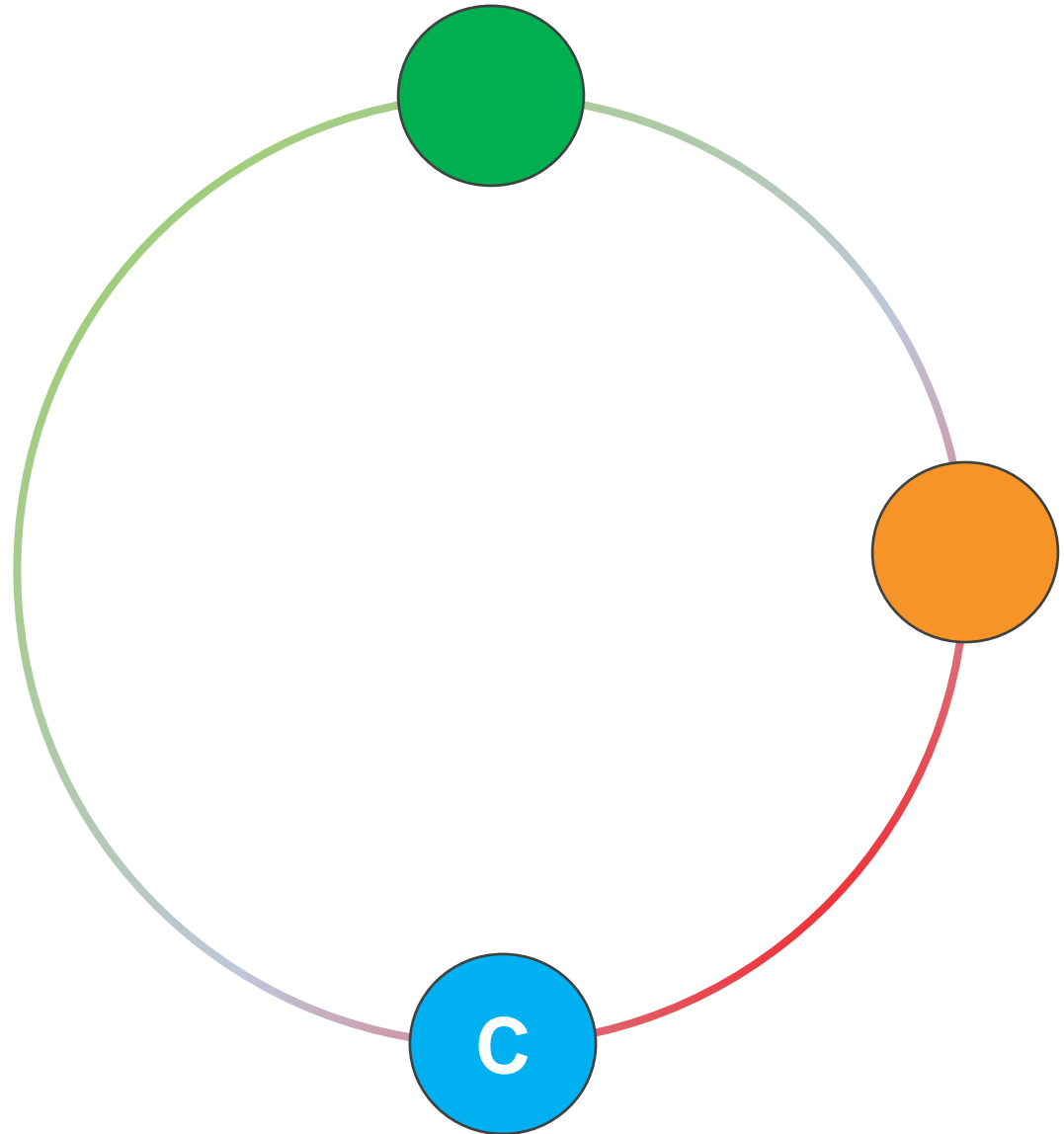
Case Study : NLG Processing en Distributie

Sensors :
Temperature,
Corrosion, Pressure,
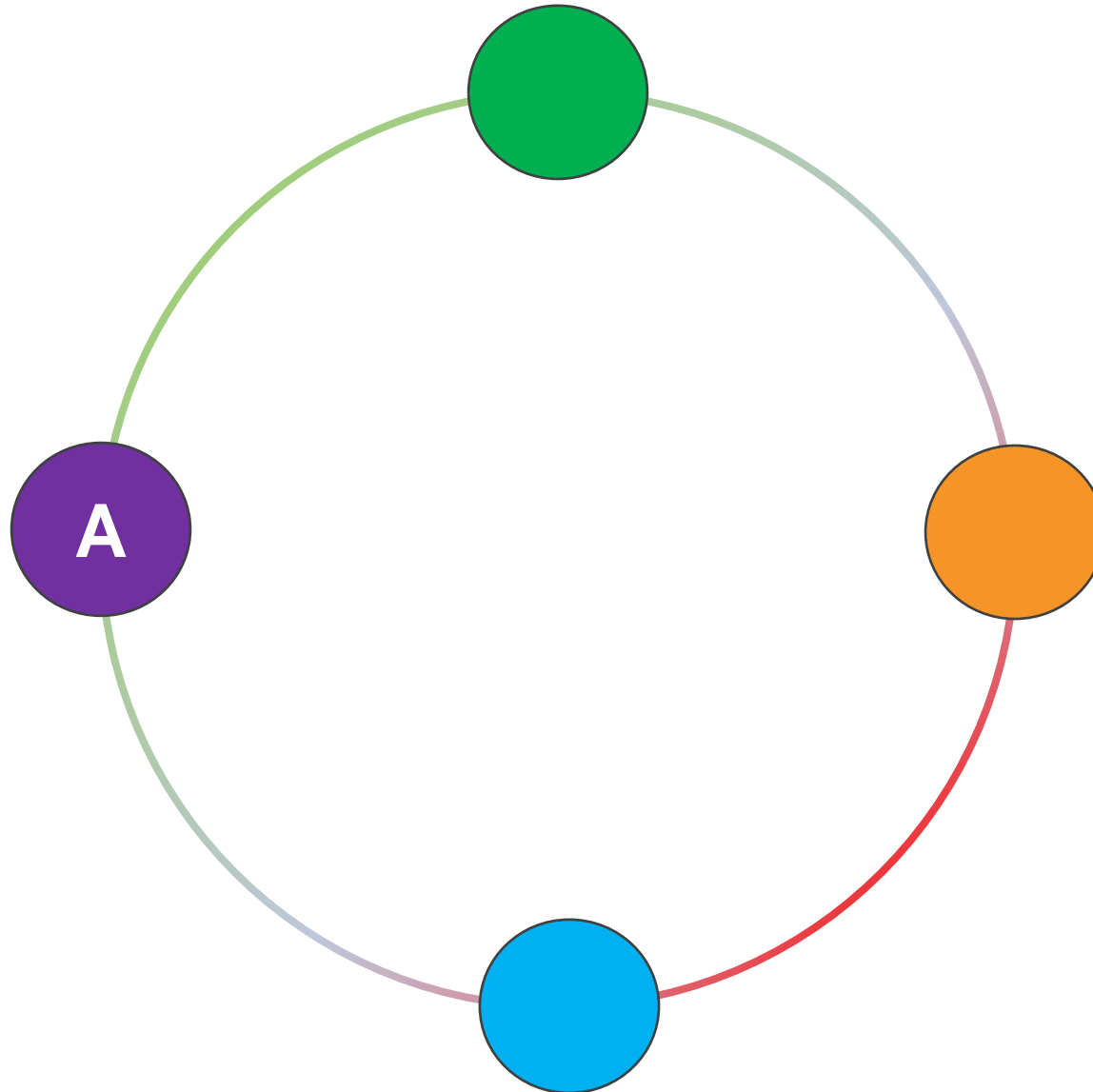**Leak detection &**
Acoustic

Software : Plantweb

Case Study : NLG Processing en Distributie

Real-time Continuous Analysis

Relevante modellen voor Process Monitoring en Metingen
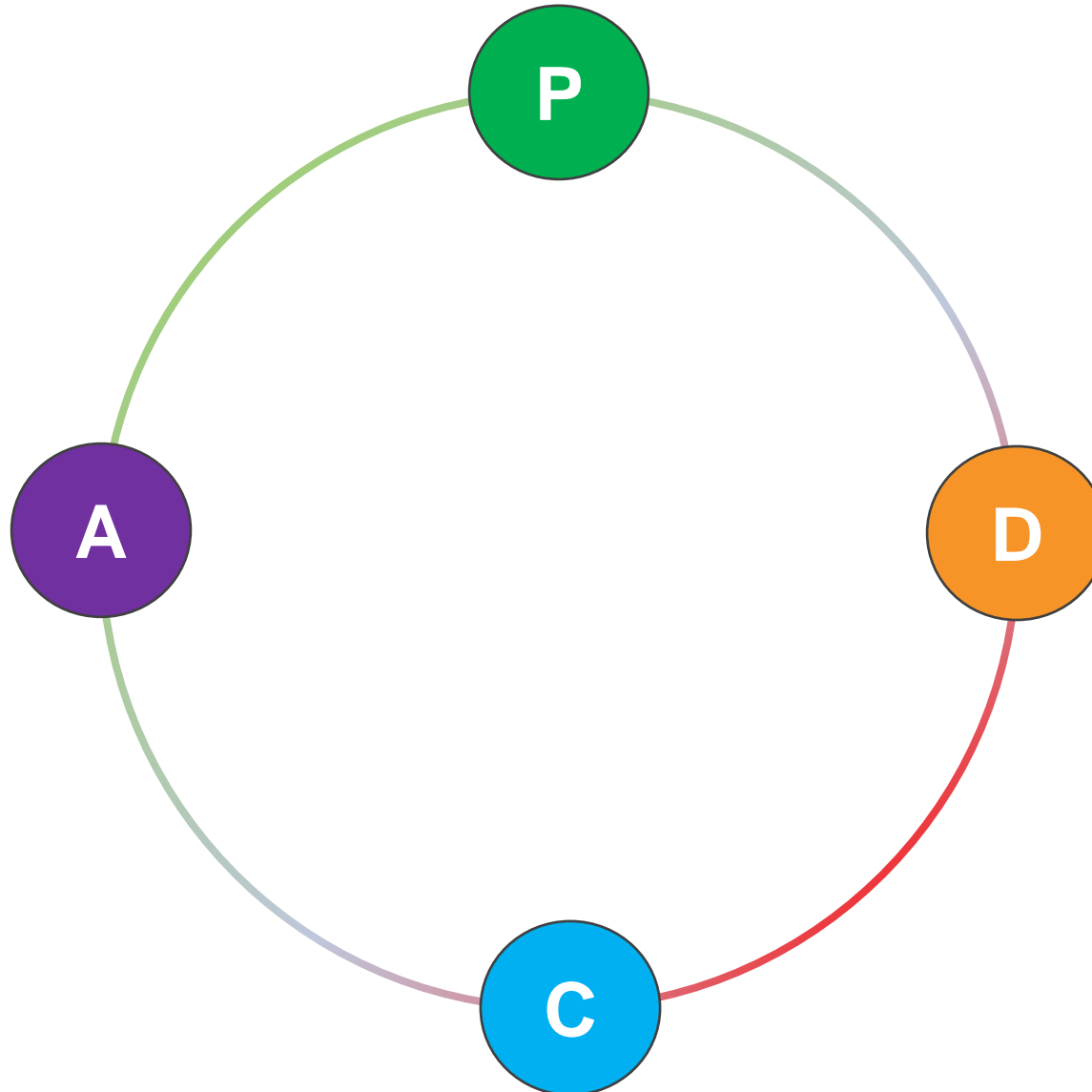
Case Study : NLG Processing en Distributie

Continu opvolging via Real-time ROI model

Invloed op Downtime, Maintenance Kost en Work Order KPI's

Case Study : NLG Processing en Distributie

Current OPEX
1.35 M€

Capex To Change
245 k€

Potential Opex
366 k€

ROI (jaarlijks)
958 k€

Conclusion