

Process Automation for Digitalization in the Oil & Gas Industry

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Digitalization – Fields of Innovation



Data
analytics



Simulation
tools



Secure
connectivity



Artificial
Intelligence



Cloud and
platform
technology



Cyber
Security

Digitalization is changing the world ...

**The next trillion dollars
will be earned with data –
for our customers and
for our industries.**

M. Dell, founder of Dell Inc.

**Data will be the resource
of the future.**

A. Merkel, German Chancellor

**Data is a gold mine for a wide
range of business areas.**

S. Gabriel, German Foreign Minister

A lot can happen in a year

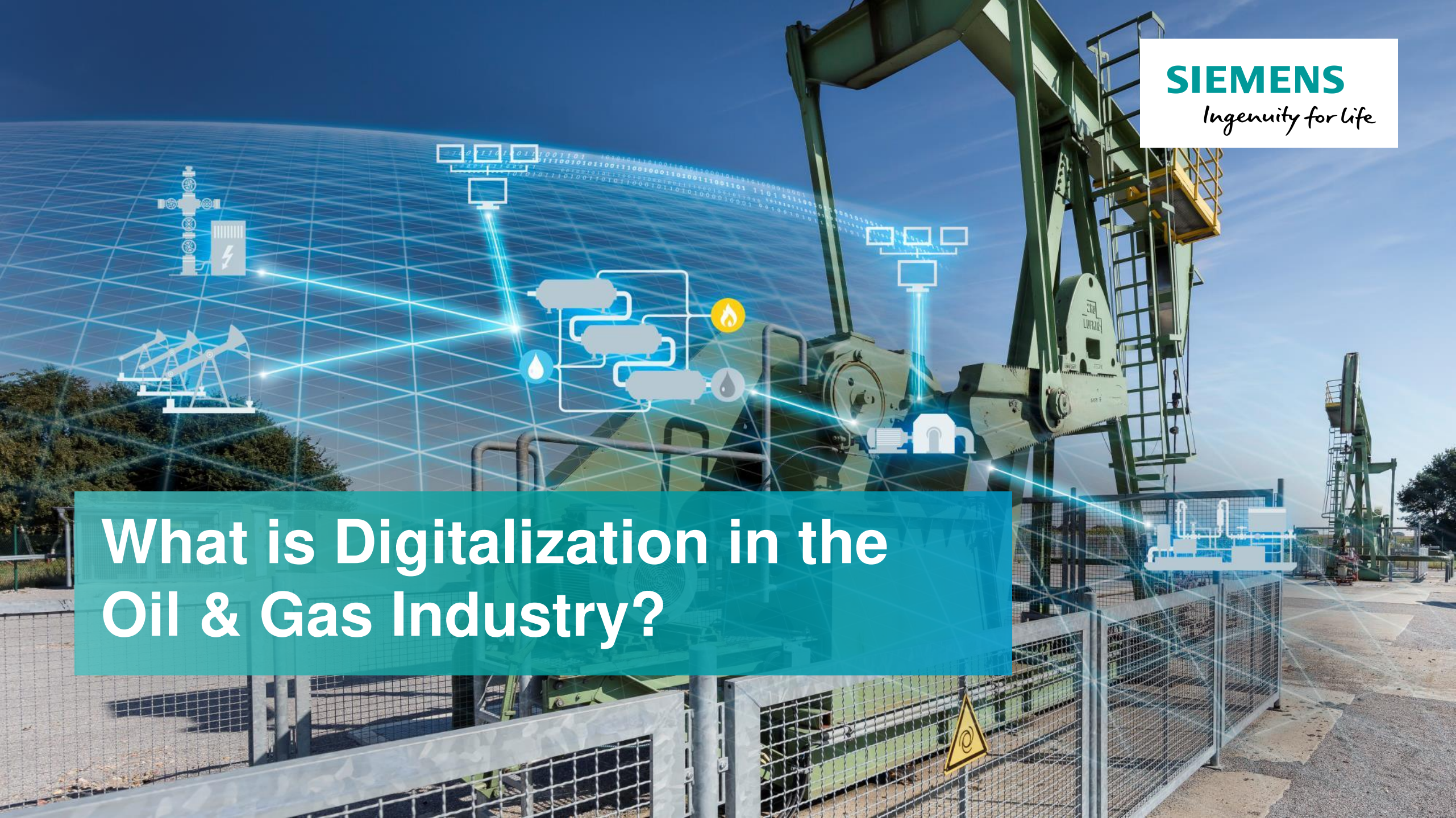
>**50%** of the world's data
was created last year ...
but **less than 0.5%**
was analyzed or used

A lot can happen in a day

5.5 million new “things”
get connected every day,
and **50 billion** by 2020



What is Digitalization in the Oil & Gas Industry?



Digitalization is the next level to yield productivity within O&G



Computing power
Connectivity
Sensors
Cloud computing
Data analysis ...



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Digitalization



Next level of productivity



Automation



Siemens as experienced partner for Automation and Electrification

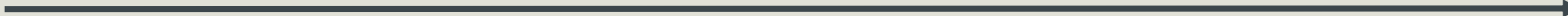


Electrification



Pioneer for Digitalization in industry

Time



Digitalization – Key innovation fields in the digital age... but there is already potential right in front of us

Digitalization Innovation Fields



Data
analytics



Artificial
Intelligence



Simulation
tools



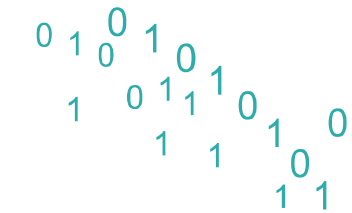
Cloud and platform
technology



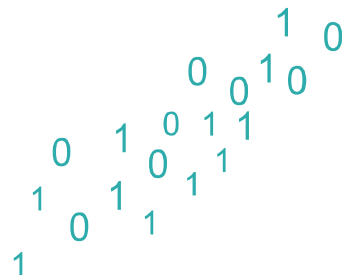
Secure
connectivity



Cyber
Security



How to create value out of it?



Current situation

“

... although talking HART ...

85% of 25 million

HART devices may only transfer

1 process value

via 4 to 20 mA to the operator
or asset manager.

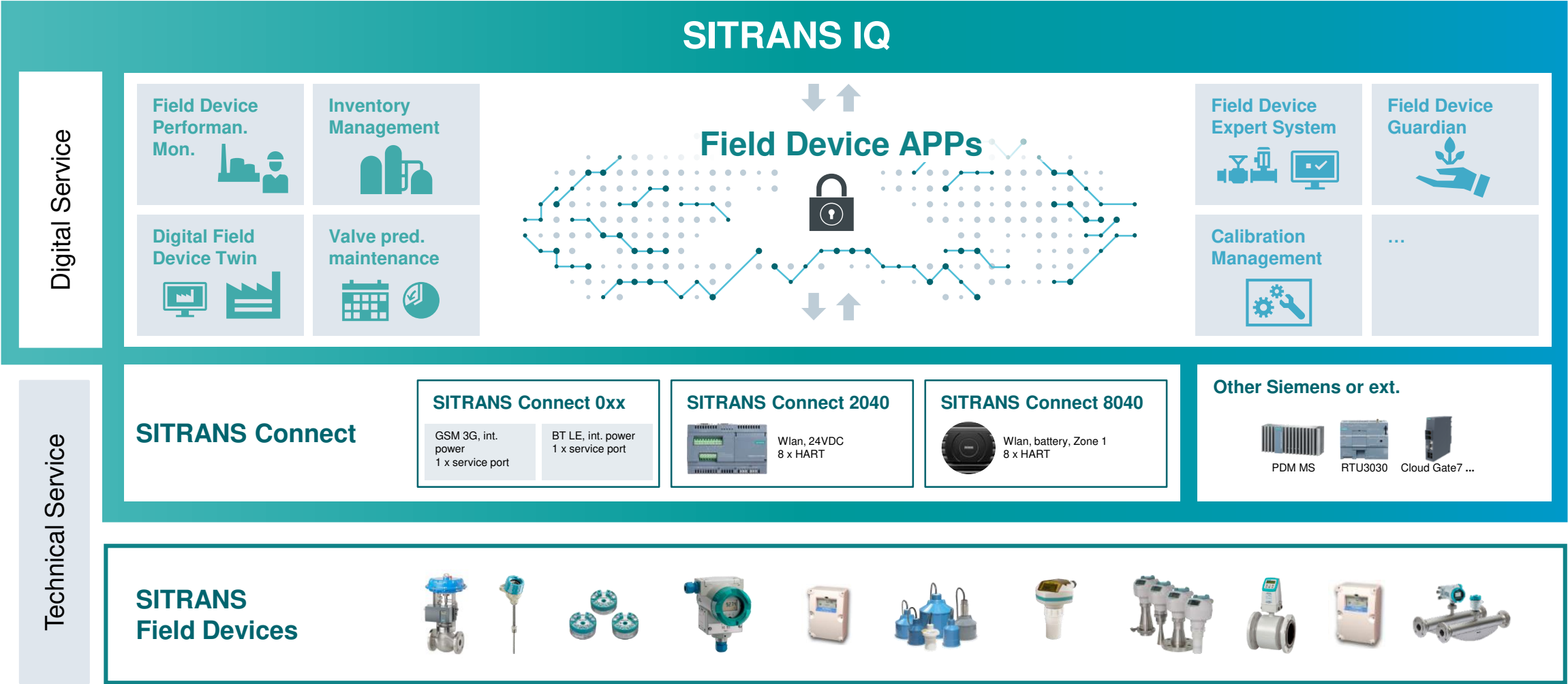
”

Source: Hart Communication Foundation (HCF)

E.g. unused but valuable “stranded data”
SIPART PS2 like

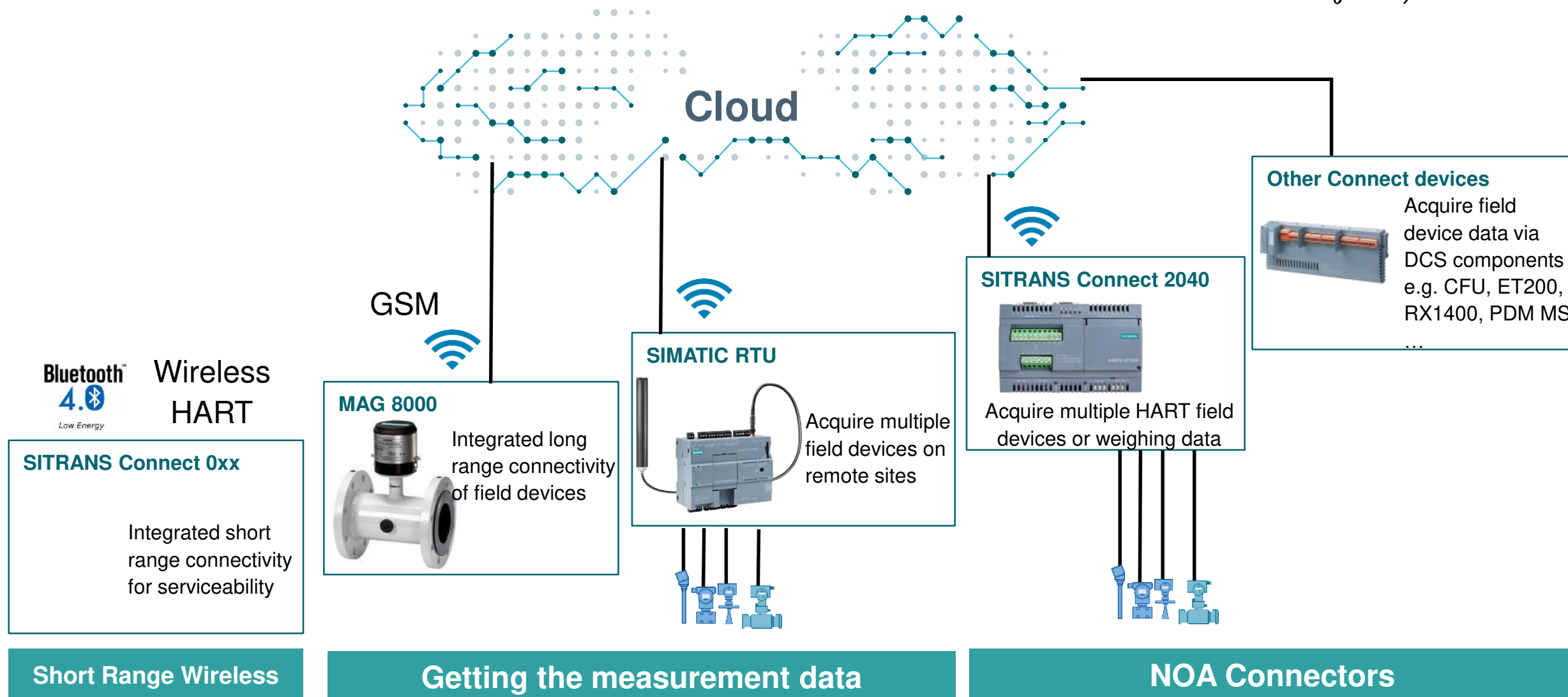
- **Pneumatic leakage, valve friction**
- **End stop offsets due to deposits**
are unused since years!

SITRANS IQ – Our digital field device platform for performance, efficiency and reduced downtime across the life cycle



SITRANS Connect - Connectivity on all automation levels to digitize your plant

SIEMENS
Ingenuity for life



Downtime planning: which devices do actually need to be serviced?

Example ethylen production plant



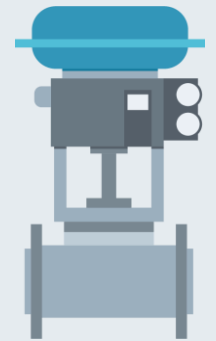
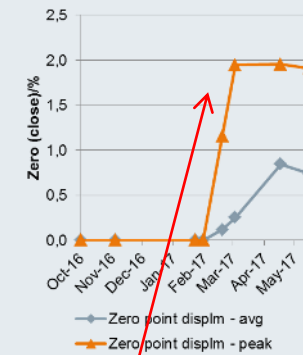
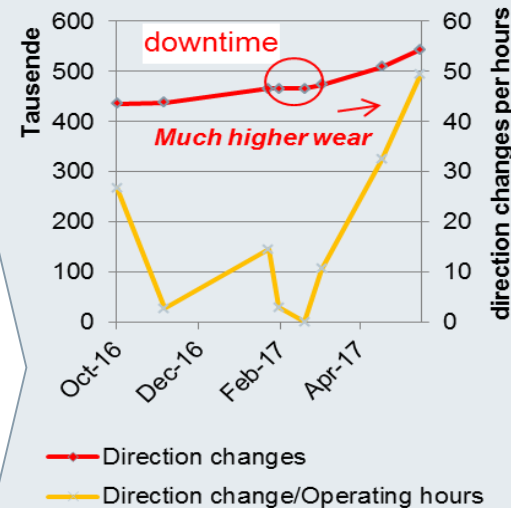
A total of **5.000** measuring points. Thereof

- **1.000** positioners
- **500** temperature sensors
- **150** flowmeters
-

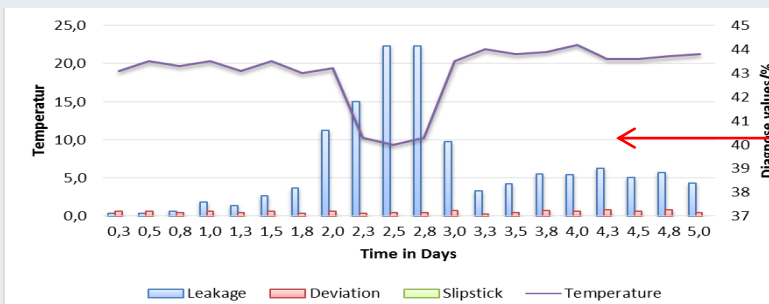
?

Which devices to focus on during downtimes?

Intelligent field devices inform about asset status



Valve does not fully close



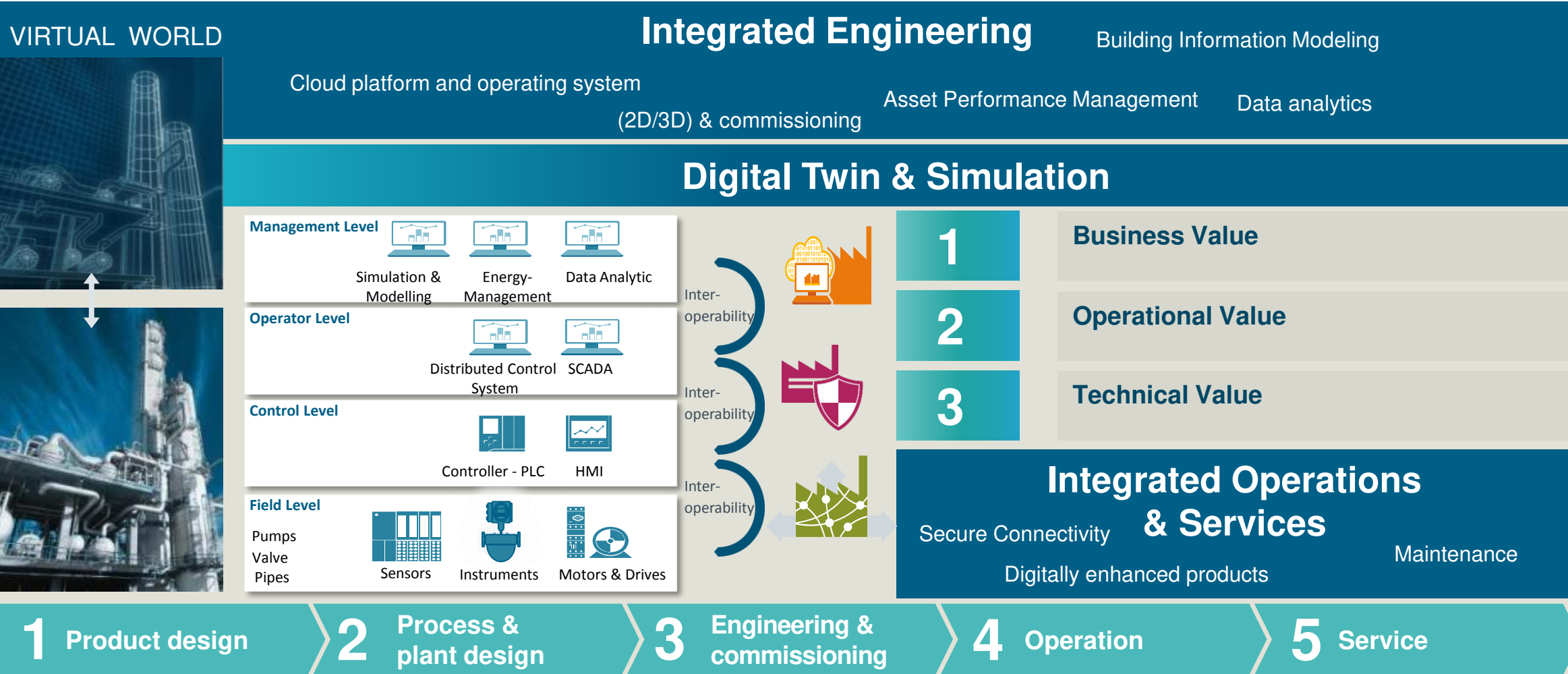
Higher leakage after event (temperature)

Temporal delimitation

Remote Field Services

Standardbrowser festlegen

Remote Collaboration V1.1 - Expert Control Center



Integrated Engineering for process plants: Digital Twin and 3D visualization of the plant

During engineering, the Digital Twin of the plant is created, even before the real plant exists ...

... this offers the possibility of an early 3D visualization of the plant, e.g. for training of service staff

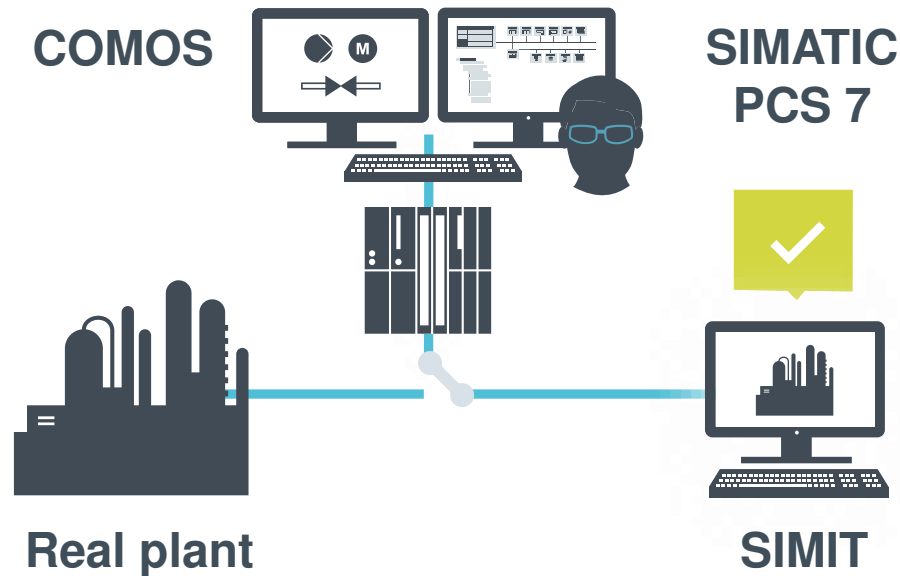


PD > DP





Integrated Engineering and Integrated Operations for process plants: Simulation improves engineering and operational efficiency



Your benefits in Engineering and Commissioning

- Seamless transfer of engineering data
- Simulation and testing of the automation functions
- Training of operating personnel
- ✓ **Efficient and smooth system startup of the real plant**
- ✓ **Avoidance of errors and costly reworking**
- ✓ **Increased safety**

1 Product design

2 Process & plant design

3 Engineering & commissioning

4 Operation

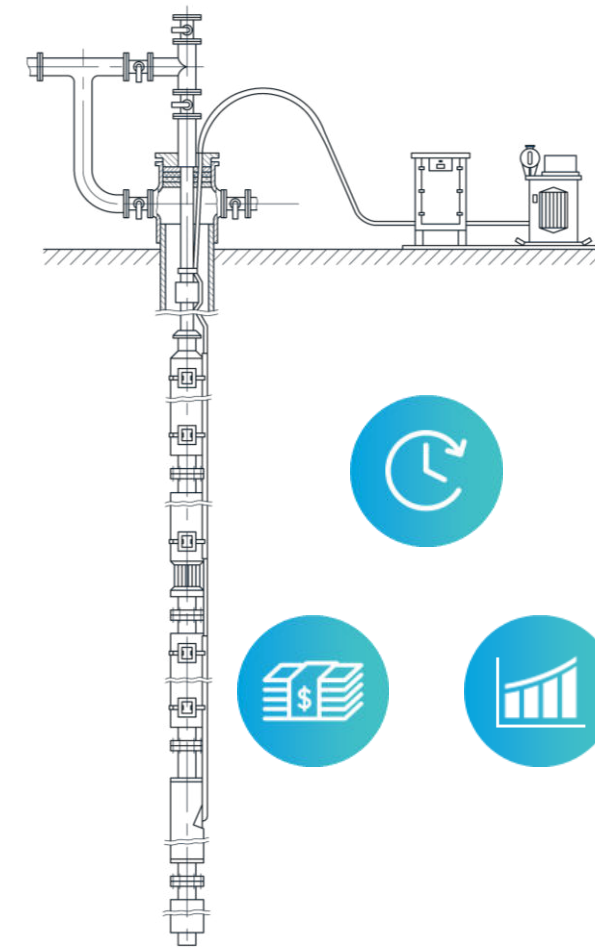
5 Service



Artificial Intelligence for ESPs

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Addressed topics	Our offering
<ul style="list-style-type: none">➤ Increase of produced oil➤ Decision support for ESP operators	<ul style="list-style-type: none">➤ AI* based early warning system for looming ESP failures➤ User-centered expert tool to analyze and document anomalies➤ LEARN environment for continuous AI capability improvement
More production by period	Expert efficiency gain
<ul style="list-style-type: none">➤ Decision support for early ESP replacement preparation (i.e. downtime reduction)	<ul style="list-style-type: none">➤ Permanent holistic pump surveillance and incident documentation➤ Support in interpretation of complex changes in pump behavior

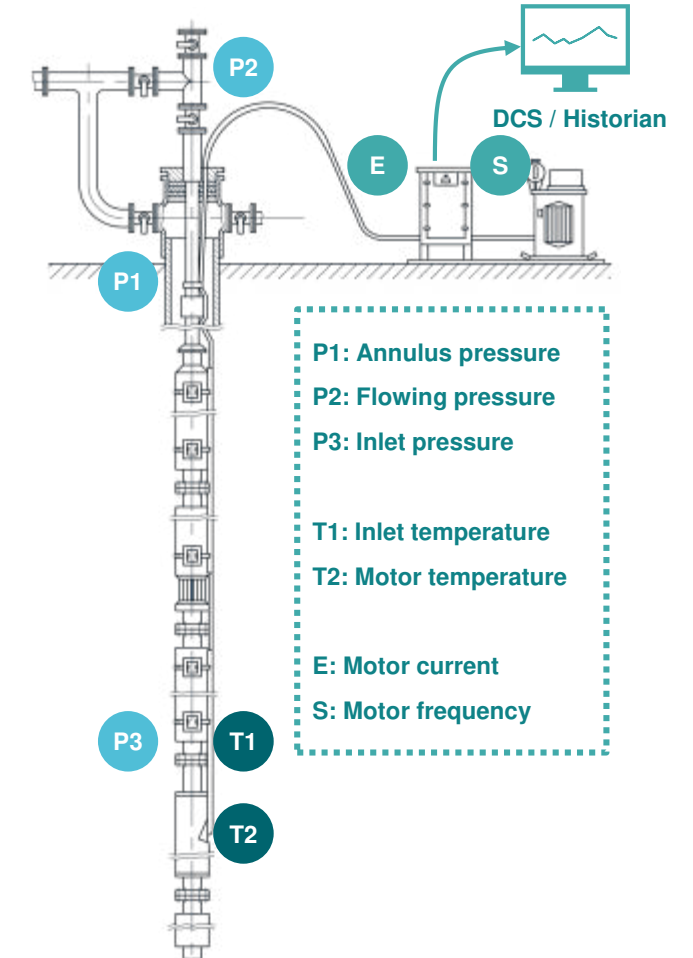
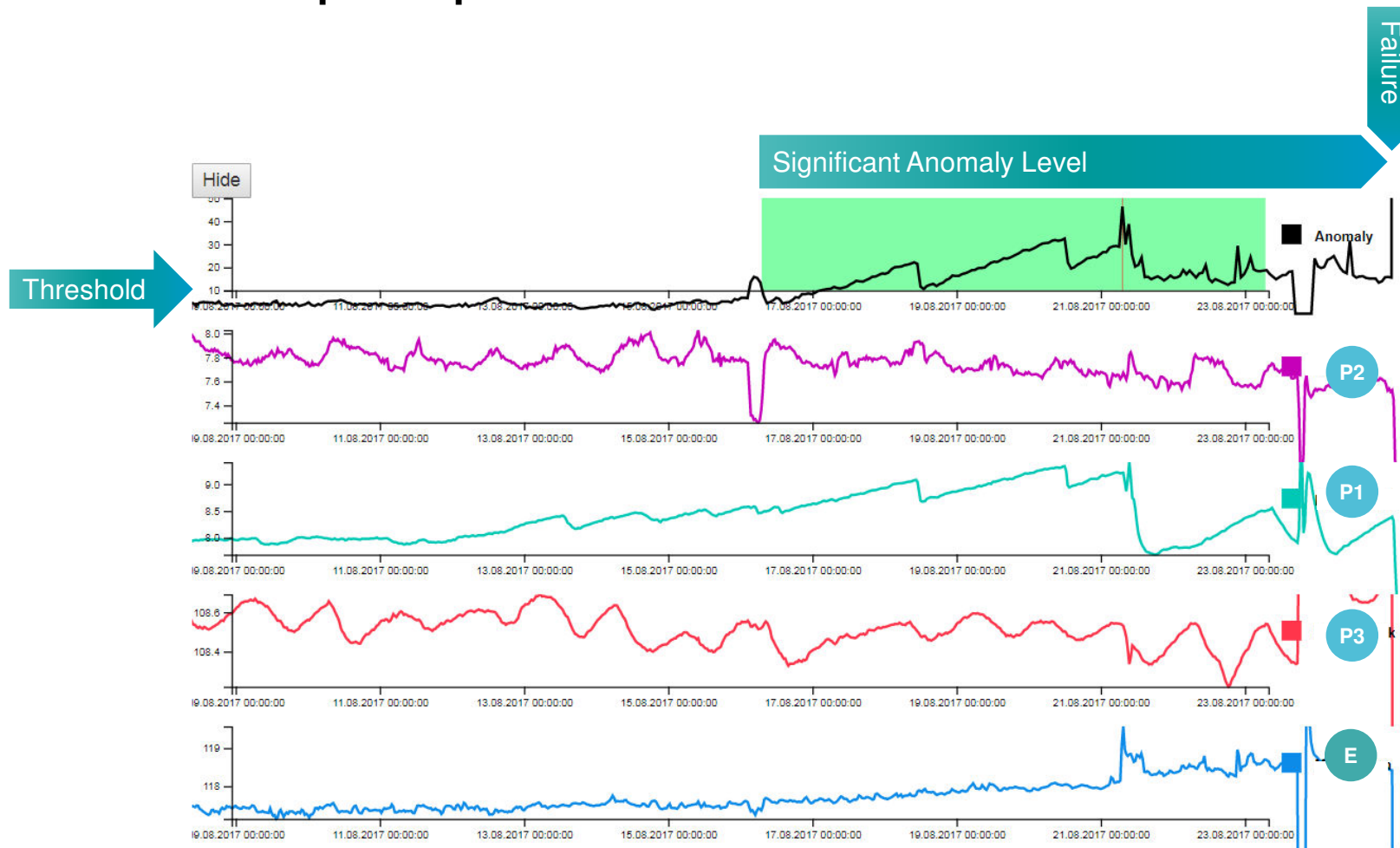




12 Days Early Warning shown in historical data

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Proof of concept completed



Process Automation for Digitalization in the O&G Industry

Thank you for your attention!



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A.O.G Exhibition Stand: H29