

# The Digitisation of Maintenance

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# Agenda

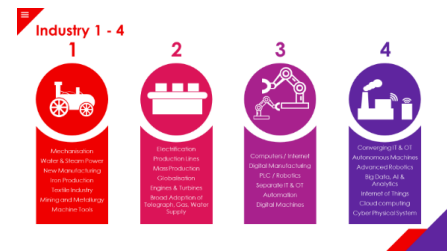
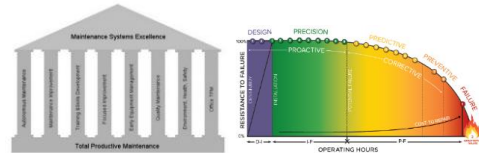
1. Introductions
2. What is Maintenance?
3. How can digitalization support?
4. What about security
5. How can RS support you?
6. Questions



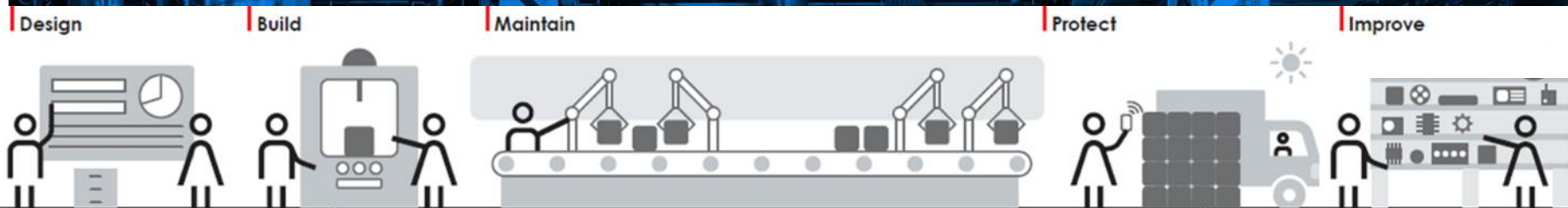
# Introductions



# Who am I?



# Who is RS Group plc?



We are a **global integrated omni-channel** solutions partner for **industrial B2B customers**

We **help** designers, builders and maintainers of **industrial** equipment and operations work **safely** and **sustainably**

**c.1.2m**

customers across  
>130 countries

**>2,500**

suppliers

**14**

distribution  
centres globally

**>700,000**

stocked products

**3m**

unstocked products

**c.60,000**

parcels distributed  
daily

**c.75%**

of Group revenue from  
industrial product range

**18 / 14,767**

Sustainalytics  
companies globally

**c. £210**

average order  
value

**c.64%**

Of Group revenue  
from digital\*

**c.13%**

of Group revenue  
from own-brand

**c.20%**

of Group revenue  
from solutions

**75**

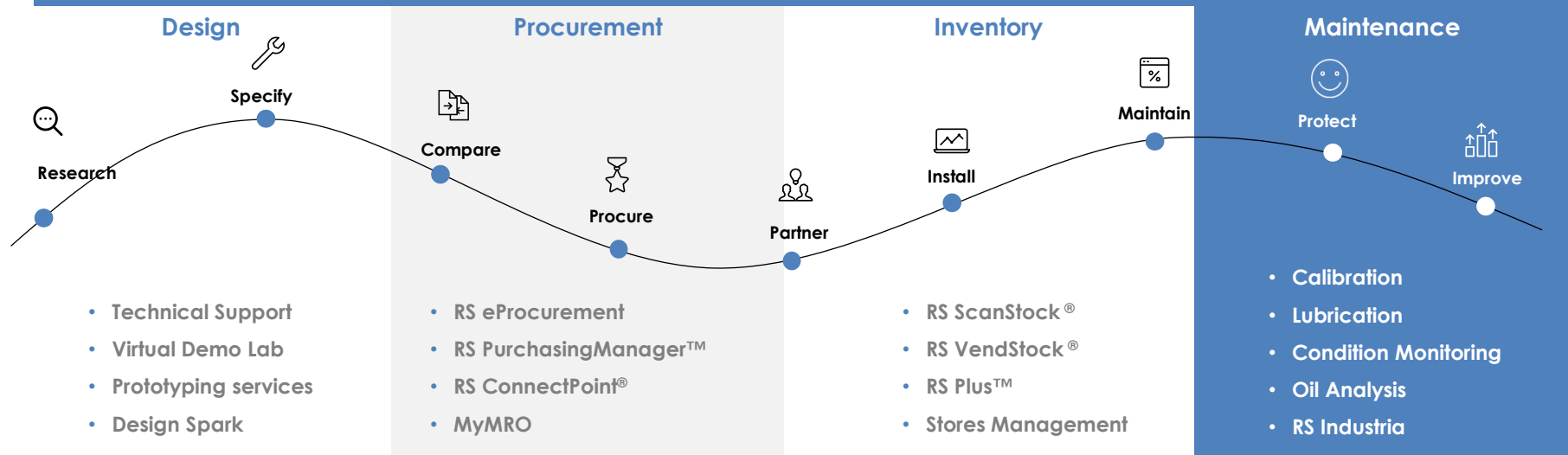
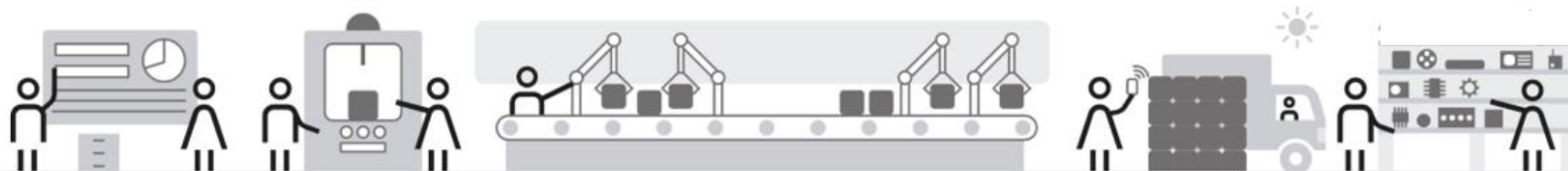
employment  
engagement score

**<1%**

share of a highly  
fragmented market

\* like-for-like

# Solutions to span our customers' lifecycle



A photograph of the Heinz factory in Wigan. In the foreground, a large black sign with gold lettering and trim stands on a grey granite base. The sign features the 'Heinz' logo in a stylized script and a welcome message below it. The background shows a long, modern industrial building with a red brick lower section and a white upper section with large windows. A tall, silver and black chimney is visible behind the building. The sky is overcast.

# Heinz

WELCOME TO  
KIT'T GREEN, WIGAN.  
HOME OF BRITAIN'S  
BEST LOVED BRAND

Reception →

# What is Maintenance?



**“Maintenance is the process of keeping plant and equipment in good working condition so that efficiency is retained and the life is increased.”**

A person wearing a dark jacket is holding a tablet computer, interacting with a dashboard that displays various charts and data. The background is a blurred industrial environment with machinery and pipes, all bathed in a warm, yellowish light.

**It's not complicated  
– but it is hard!**

# Five core questions for effective maintenance management

All of which require accurate data

What is the state of my assets?

What is my required level of service?

Which assets are critical to sustained performance?

What are my best investment strategies?

Do I have the organisational capability to deliver?

# 4 Generations of Maintenance

Adopted from "Reliability Centred Maintenance" by John Moubray

## 1st Generation (pre 1950s)

- Predominately reactive or time-based
- Little understanding of reliability theory

## 2nd Generation (1950s – 1970s)

- Emerging understanding of reliability – lead by civil aerospace
- Growth of preventative maintenance
- Increased asset reliability, lower cost of ownership

## 3rd Generation (1970s – now)

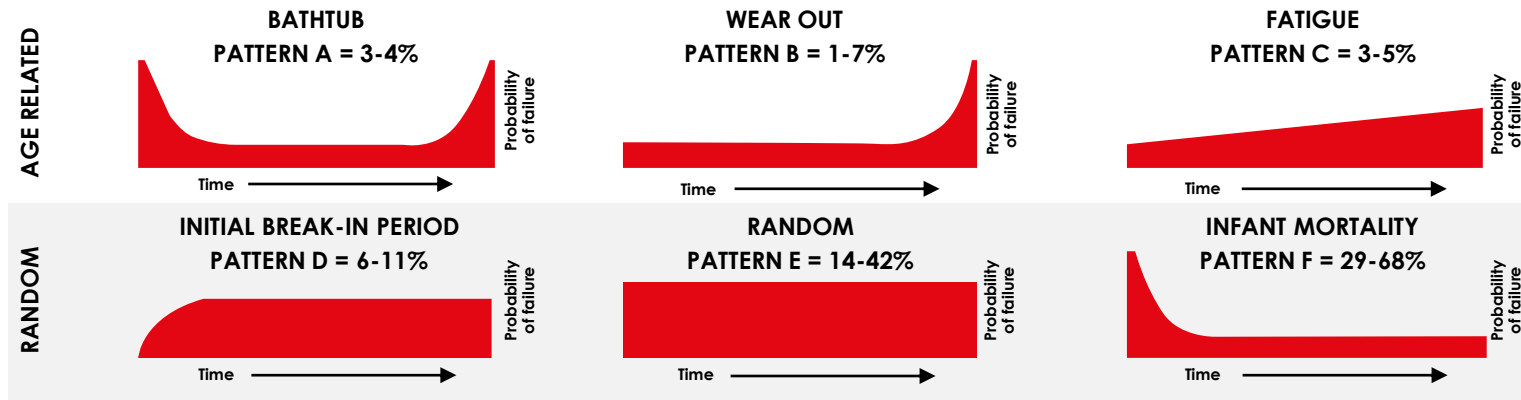
- Development of Reliability Centred Maintenance
- Growing use of CM & CBM
- R&M modelling giving improved system availability & safety
- Greatly extended asset life

## 4th Generation (emerging)

- Business Centred Maintenance
- Use of big & small data in maintenance
- Emergence of reliable prognostics
- Low cost scalable PdM for medium criticality equipment
- Integration of CM and CMMS

# Failure Patterns

Reliabilityweb.com



Random failures account for 77% – 92% of all failures  
Age related failure characterises the remaining 8% – 23%

# Maintenance Maturity Model

Adopted from Winston Ledet (1999)

## Appears cheap but...

- High cost of spares
- High cost of labour
- High cost of finished goods
- High personal & operational risk

## Appears expensive but...

- Low cost of spares
- Low cost of labour
- Low cost of finished goods
- Low personal & operational risk

### **Reactive:**

Fix it after it fails

### **Planned:**

Fix it before it fails

### **Predictive:**

Measure & Fix

### **Reliability Centred:**

Don't just fix it, improve it

### **Enterprise:**

Improve continuously

Where most of us are

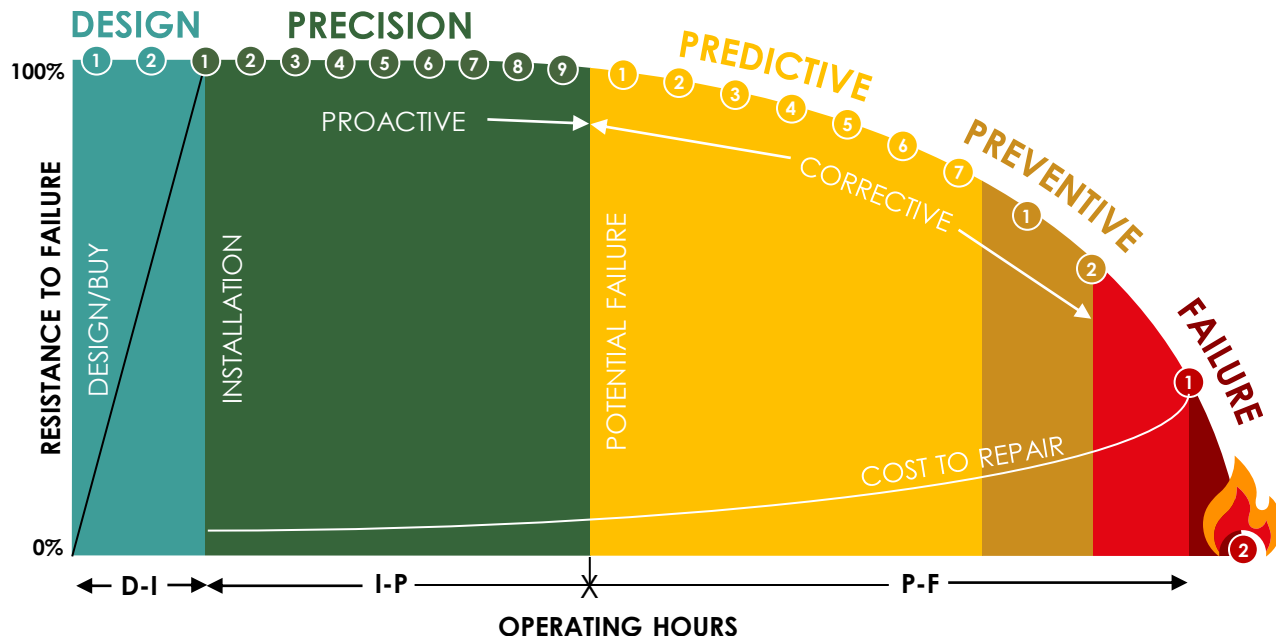
Getting here is hard – as it's about changing behaviours

# What do we measure?

Reliabilityweb.com

## D-I-P-F Curve

(Design-Installation-Potential Failure-Failure)



### DESIGN/BUY

1. Design for Reliability (DFR)
2. Purchase for Purpose

### PRECISION

1. Precision Commissioning
2. Precision Installation
3. Defect Elimination
4. Precision Alignment and Balancing
5. Work Processes and Procedures
6. Asset Condition Management
7. Lubrication Reliability
8. Clean to Inspect (5S)
9. Operate for Reliability

### PREDICTIVE

1. Condition Directed Tasks
2. Ultrasound Testing (UT)
3. Fluid Analysis (FA)
4. Vibration Analysis (VIB)
5. Motor Testing (MT)
6. Infrared Imaging (IR)
7. Non Destructive Testing (NDT)

### PREVENTATIVE

1. Time-Directed Tasks
2. Human Senses (audible noise, hot to touch, smell)

### FAILURE

1. Functional Failure
2. Catastrophic Failure



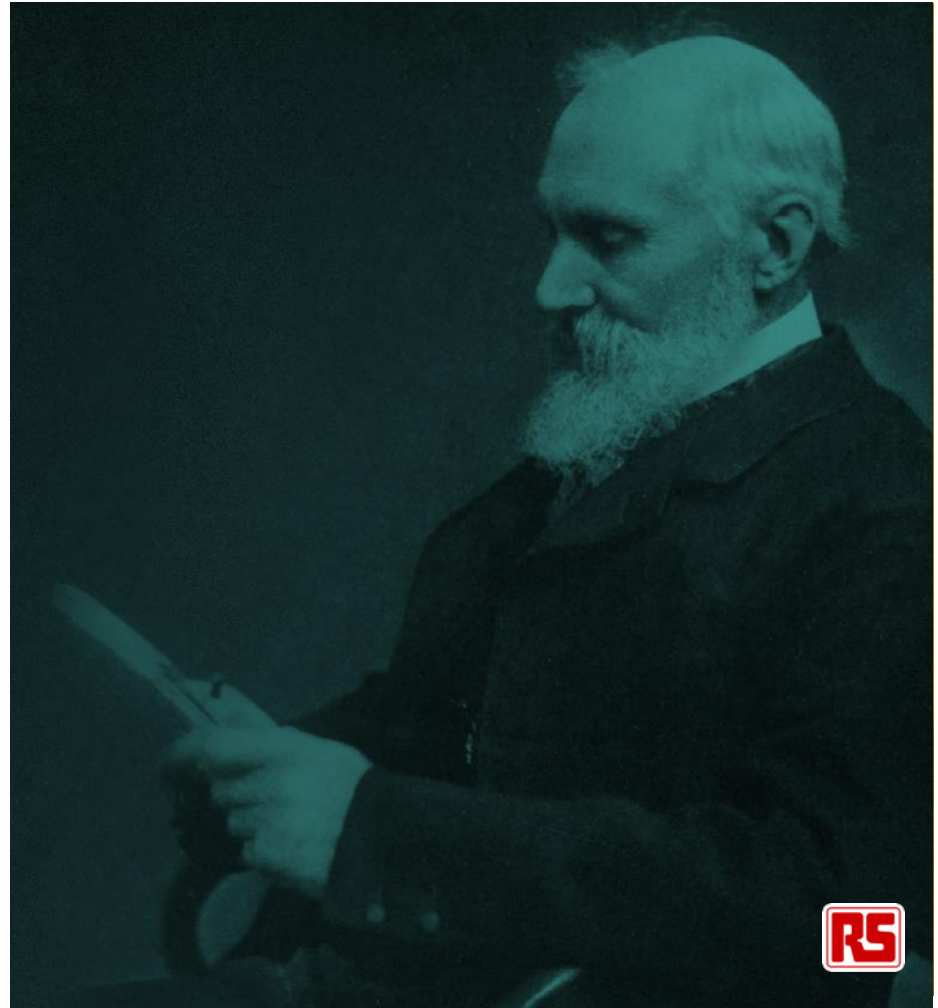
# RS Maintenance Solutions

# How can digitalization support?

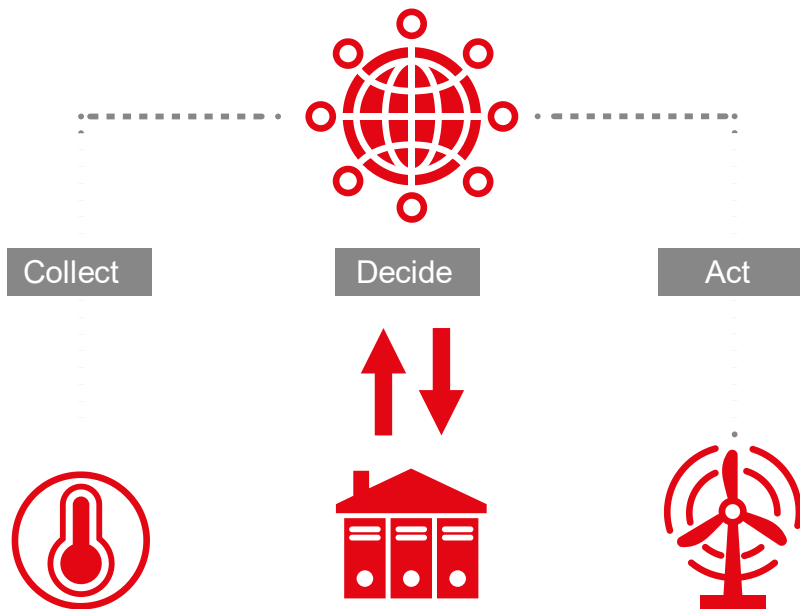


**“To measure  
is to know”**

Williams Thomson, Lord Kelvin



# Data-led decision making: Collect – Decide – Act



# Why does digitalisation give us better data-led decisions?

## The Four V's of big data

### 1. VOLUME

The size of data

### 2. VARIETY

Different types of data

### 3. VELOCITY

The rate at which the data is generated

### 4. VERACITY

The trustworthiness of the data

# Predictive maintenance requires time and understanding



# Factories are already full of data

## New Data

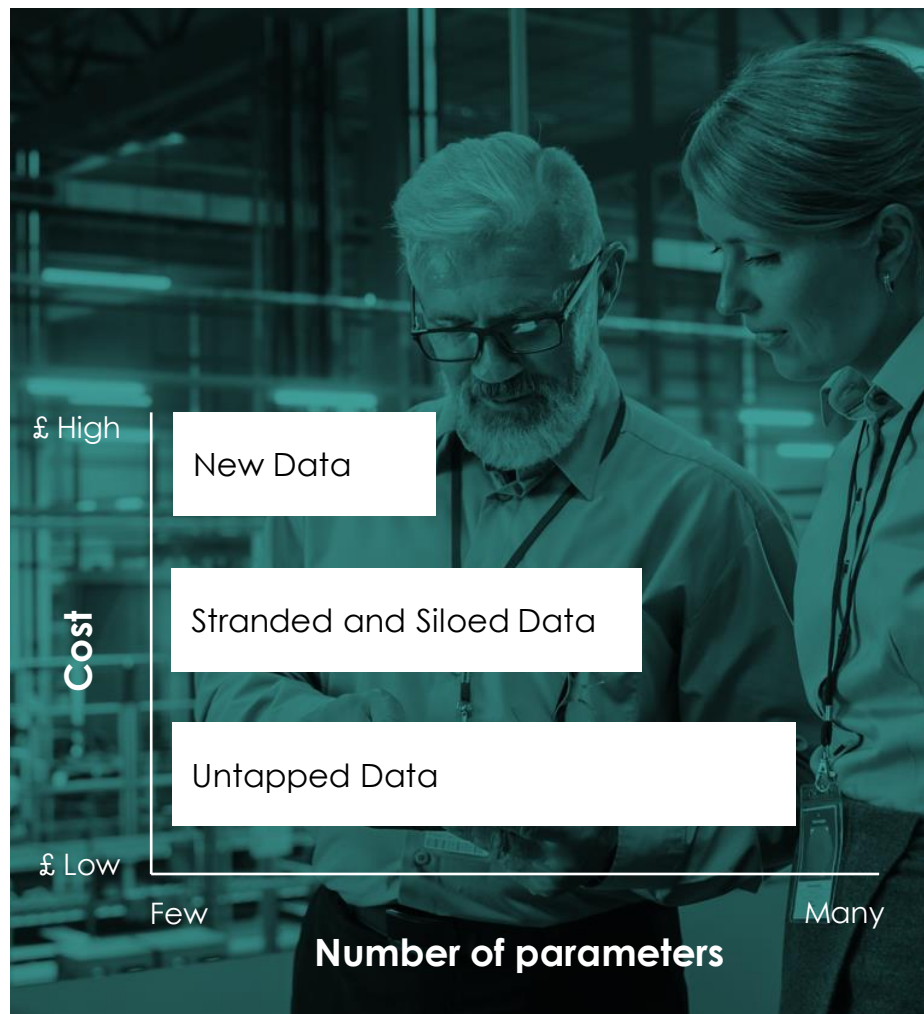
- New sensors, actuators and other end point devices
- £100s - £1000s per data point

## Stranded and Siloed Data

- In the environment today and 3<sup>rd</sup> party integrated e.g data locked in the machine by the OEM
- £10s £100s per data point

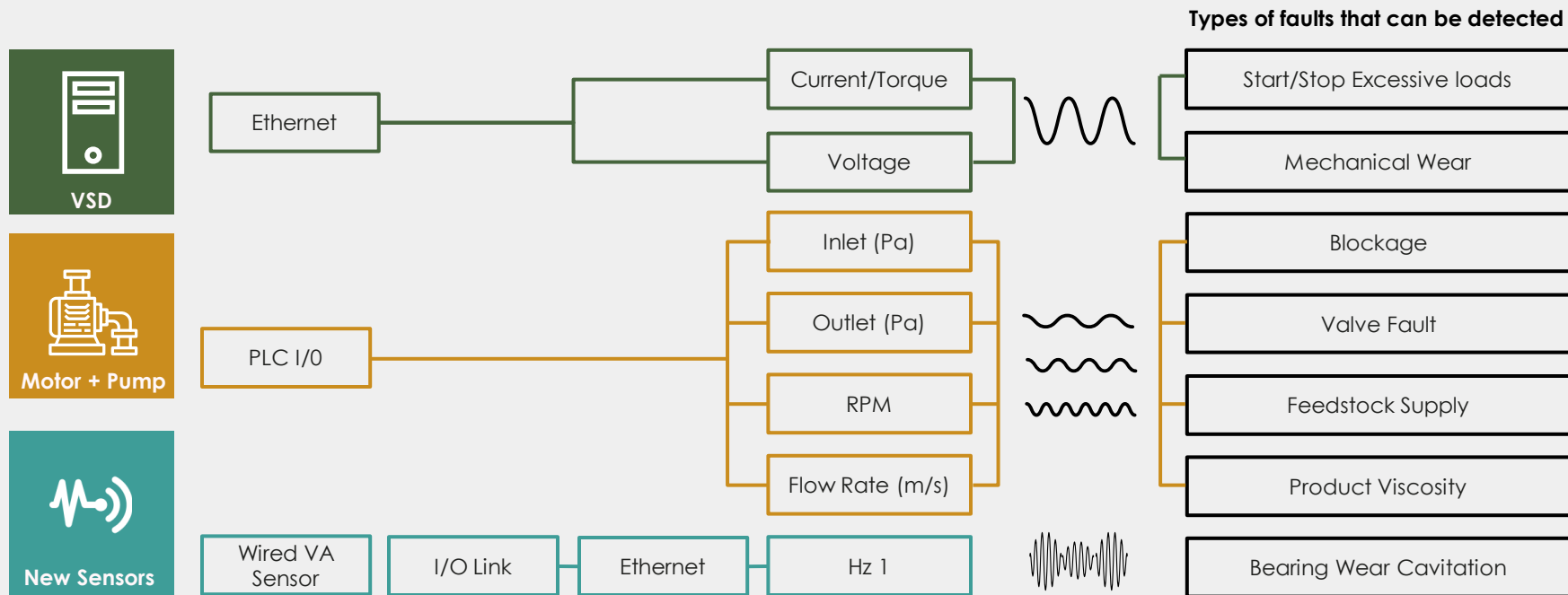
## Untapped Data

- In the environment today but not integrated e.g. open-source process control data, inverter drive data
- £1s - £10s per data point





# Balancing Data Value Vs Cost of Acquisition



RS Industria is an open industrial data platform and service that enables our customers to make data-led decisions in the management of their assets and their MRO supply chain –  
**securely backed by a market-leading, resilient and enduring FTSE 100 business.**



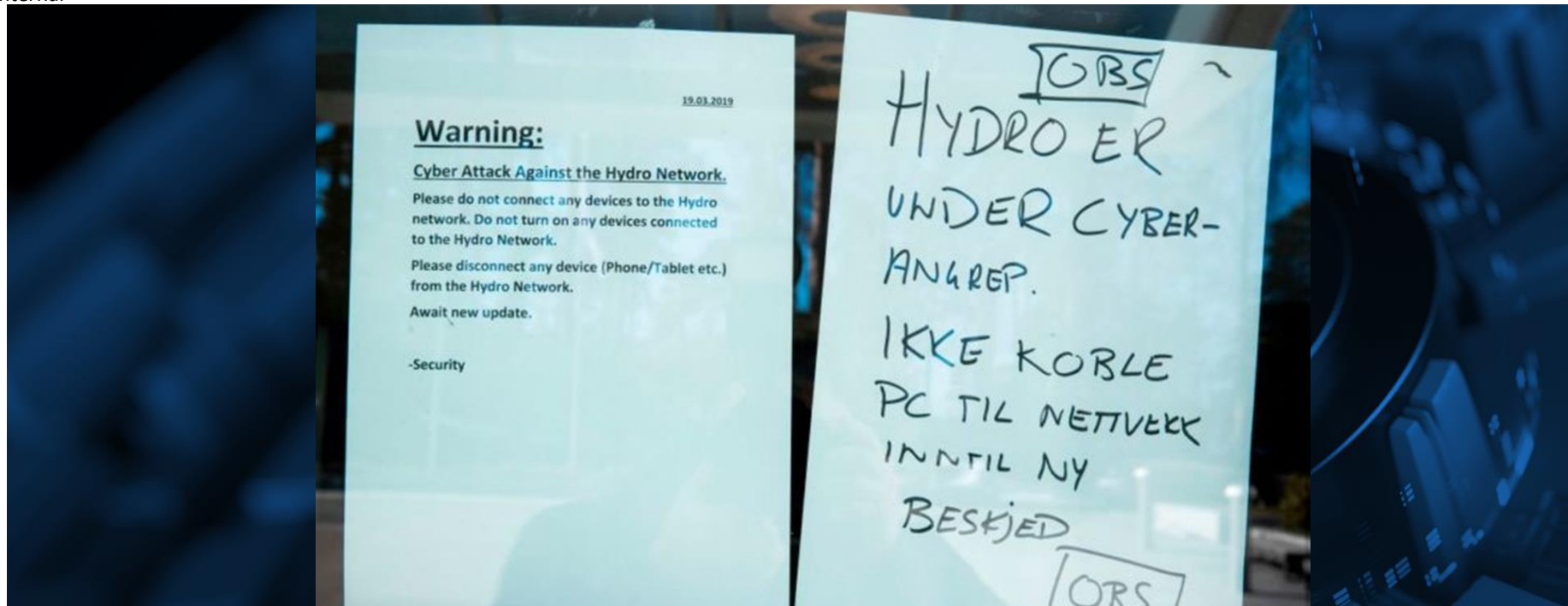
# Industria

*Start Simple* *Grow Smart™*



# What about security?






## Norsk Hydro: Hydro subject to cyber-attack

Hydro became victim of an extensive cyber-attack in the early hours of Tuesday (CET), impacting operations in several of the company's business areas.

IT-systems in most business areas are impacted and Hydro is switching to manual operations as far as possible. Hydro is working to contain and neutralize the attack, but does not yet know the full extent of the situation.

 TechCrunch

Europol detains hackers behind 2019 Norsk Hydro ransomware attack

Europol and its law enforcement partners have disrupted a network of organized cybercriminals behind a string of ransomware attacks that has...

29 Oct 2021

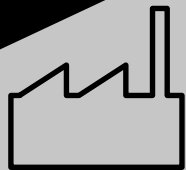
# The importance of knowing and managing your vulnerabilities

## 57%

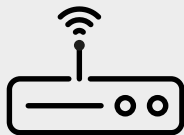
of breach victims said they were breached due to an unpatched known vulnerability



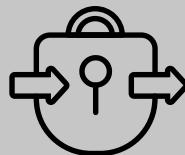
# Connected & Protected



**On-site**  
Multiple data sources  
with network access



**Edge Gateway**  
Secure  
hardware



**Connectivity**  
Secure Data  
Transmission



**Cloud-based hosting**  
Secure cloud  
hosting in AWS



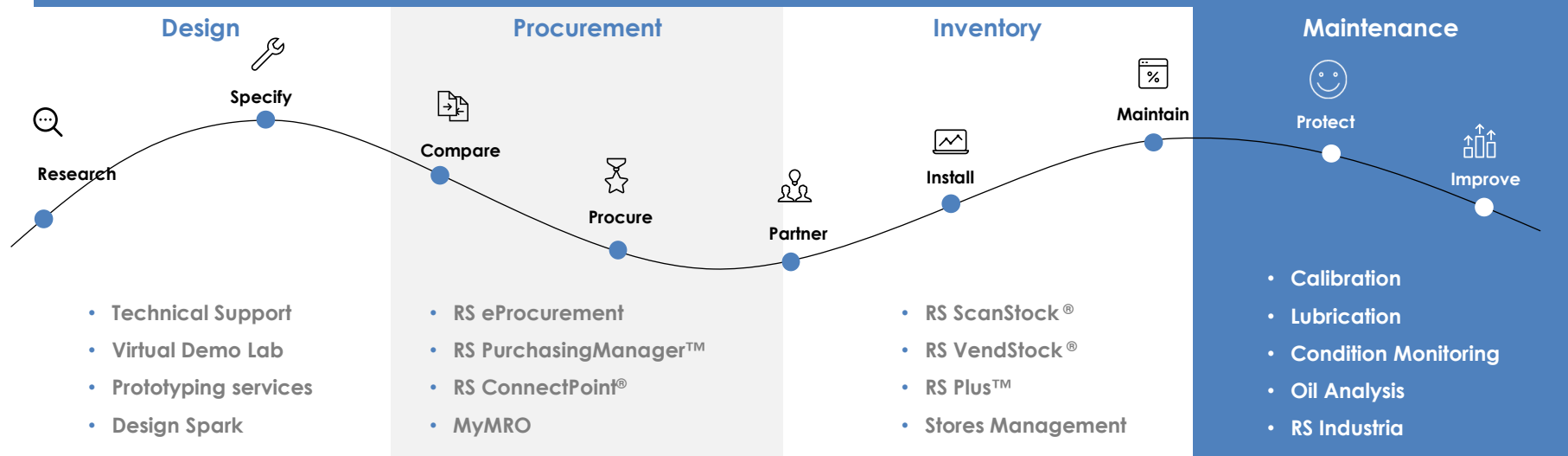
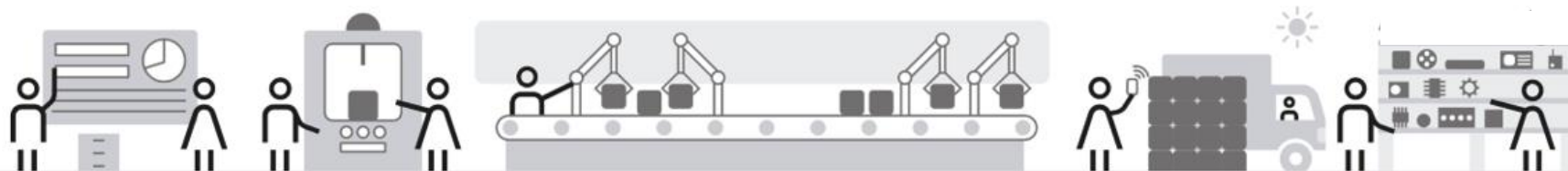
**End users**  
Full Web and Mobile  
App Security

Our Support every  
step of the way

# How can RS support you in your maintenance programme?



# Solutions to span our customers' lifecycle



# Any questions?

**If you'd like to continue the conversation  
come and visit us on stand E44**

