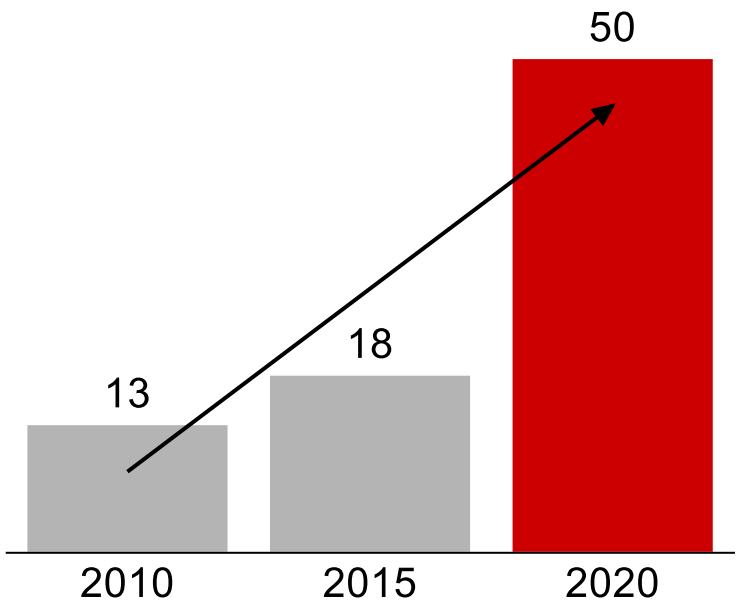
BAIN & COMPANY

# DIGITAL IN 2019

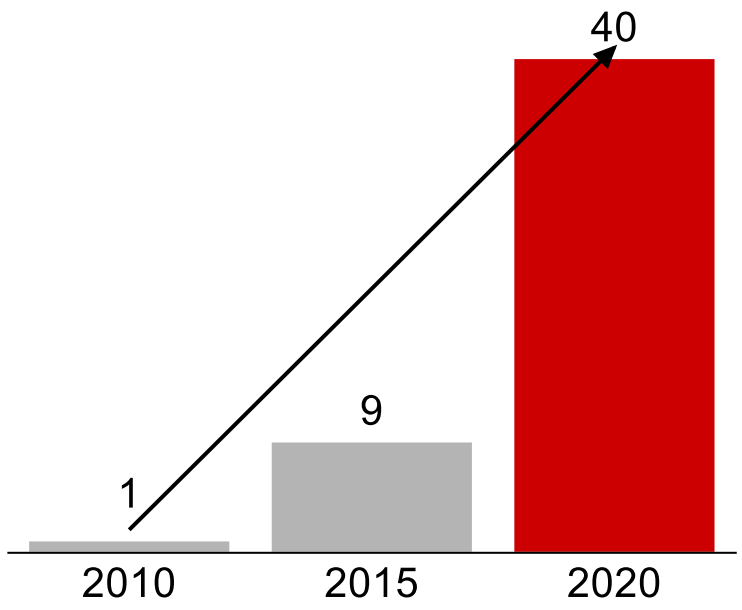
# Why now in industrials? ROIC on technology > WACC

## 1 Connectivity



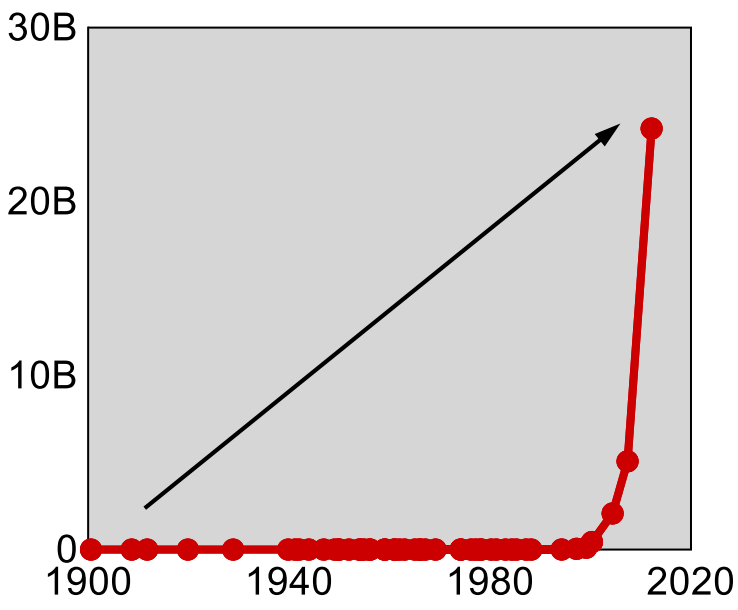

Connectivity: ~4x increase in devices
Number of connected devices (b)

## 2 Data




Data proliferation: a ~40x increase
(Data generated in zettabytes –
1zb = ~250b Dvds)

## 3 Power




Computing power:
exponential acceleration
(Calculations per Second per $1k)

# The impact on process industry significant

**Operations**

**A new weapon for the old fight on cost ('bend the cost curve')**

Digital offers new and faster ways to lower costs and increase yields, and opportunities for step changes will re-sort winners and losers.

**Customers**

**New pathways to drive customer value**

B2C engagement models sets the bar for increasingly many industrial customers; seamless customer experiences will become table stakes.

**Products & services**

**Business models uprooted across the value chain**

New economic models (e.g. disintermediation, outcomes rather than pounds) will grow in importance, with commoditization risks for traditional players.

**Supply & demand**

**End market disruptions impact demand, uncertainty increasing**

Disruption in end markets challenges traditional strategy and capacity planning.

**Digitalization will redefine feedstock dynamics**

Transformation of transportation market will change feedstock availability & price.

**More incremental**

**>$550B cumulative value?[1]**

**More transfor-mational**

Note: [1]Cumulative value at stake from Digitalization in Chemicals and Advanced Materials industries (WEF White Paper)

# Many practical use cases available; need for ‘choices’ and prioritization peaked

/ NON-EXHAUSTIVE

## Top 10 Digital technologies

- IoT, sensors & wearables
- Artificial intelligence
- Big data, analytics & visualization
- Process automation (RPA)
- Mobile & digital engagement
- Digital engineering
- Cloud
- Virtual reality & augmented reality
- Robots & vehicles
- 3D printing

## Operations

### Process / cost efficiency

- Supply control mgmt.
- Re-ordering automation
- Reagent/ dosage optimization
- PPE sensors
- Alarm mgmt. systems
- Predictive workforce analytics
- Remote control tower monitor
- QC and Process sensors
- QC automation
- Process optimization
- Output mix/grade optimization
- RFID materials control
- Supply Control Tower
- Fleet management
- Inventory forecasting
- S&OP modeling
- Procurement analytics
- Quality and HSE analytics
- Smart Assets by digitized EPC
- Digitization of engineering design
- Advanced process control system
- Rugged field tools
- AR/VR for training
- Dashboard, enhan. visual tools
- Warehouse picking
- Sourcing & Proc. autom.
- Remote assessment
- Task automation
- Process testing, QC automation
- Spare parts printing
- Autonomous hauling
- Field documentation automation

### “Always online”

- Heat monitoring
- Emissions monitoring
- Vibration monitoring
- Fatigue / corrosion monitoring
- Maintenance predictions
- Digitalization of turnarounds
- Combustion optimization
- Asset lifecycle analysis
- Heat efficiency monitoring
- Outage forecasts
- Geofencing
- Data protection / cybersecurity
- Biometric access
- Smart grid
- Digital Twin
- Asset visualization
- Facial and speech recognition
- Drone supervision
- Inspection robots
- Autonomous cleaning robots

## Customers

### Enhanced engagement

- Customer data mining
- Real-time customer intelligence
- Adaptive salesforce
- AI enabled CRM
- Cloud based collaboration
- Sensors for prod. tracking/QC
- Delivery optimization
- Demand forecasting
- Blockchain for payments / track
- Vendor managed inventory
- Intelligent/real-time pricing
- In-field sales tools
- Digital marketing
- Product visualization
- Virtual training academy
- Customer analytics (frontline)
- Customized mktg delivery
- Cloud/mobile plat. for salesforce
- Avatars & ‘bots”

### Simplified interface

- Data visualization
- Product usage data analysis
- Data warehouse
- Virtual malls/ suppl./ E–comm.
- Real time customer support
- Dynamic customer experience
- Automated lead gen
- Digital invoicing

## Products and services

### New & improved offering

- Service in place of products
- New, outcomes-based model
- Real-time advice to customers
- Software as a Service
- Precision dosage / prod. consist.
- Downstream solution dev.
- Digital customer engagement

### Accelerated R&D

- Adv. analytic for molecule model
- Crowdsourcing
- High throughput experimentation
- Product innovation platform
- 3D printing for R&D
- Rapid prototyping
- Autonomous robots for labs
- Predictive tech. comp
- Adv. super computing
- Data enhanced prods.

# Example: Some industry players aim to reinvent themselves

BIG RIVER STEEL

***"The tech company that makes steel"***

*"The world doesn't need another steel mill. It needs a steel mill willing to push the boundaries of what steel can do."*

Dave Stickler, CEO Big River Steel

- **First learning steel Mill:** Bold vision of CEO to create plant operations that **learn from every ton of steel** the mill melts/rolls
- **System of intelligence:** Created system intelligence to optimize profit per mill hour over multiple algorithms (e.g., maximize yields, enhance product quality and minimize costs through asset health)
- **Broad impact:** Impact beyond substantial bottom line impact. CEO plays active role on the broader stage (e.g., invited to White House AI Summit), BRS became hot take-over target

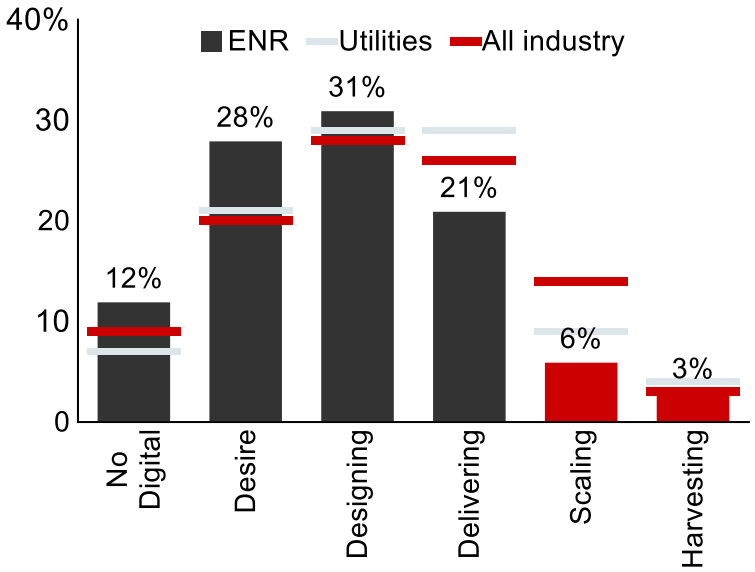
**What is the end state for Norwegian Process Industry?**

# But theory and experimentation is easy; transformation for most has been elusive

## Experimentation still the focus

Gartner

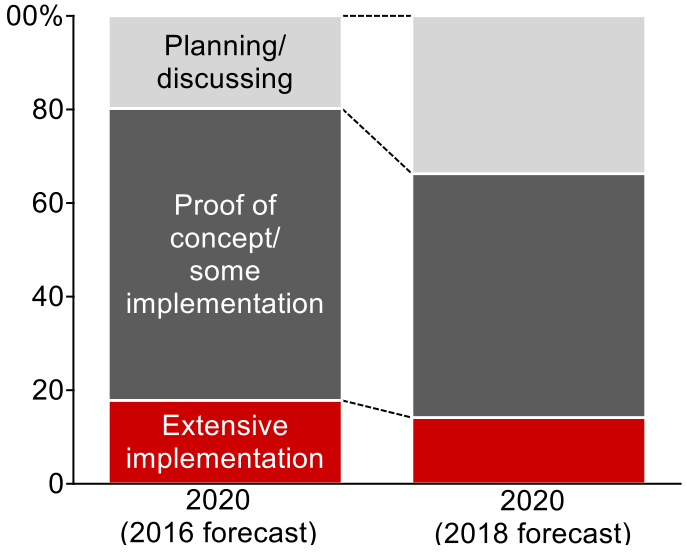
Stage of progess of digital efforts




## Transformation is much harder

BAIN & COMPANY

Organizations adopting IOT (%)




## Causing stall out

*"**Organizations are stuck in the early stages** of the attempt to transform. They have not evolved their operating model to execute new strategies."*
Gartner

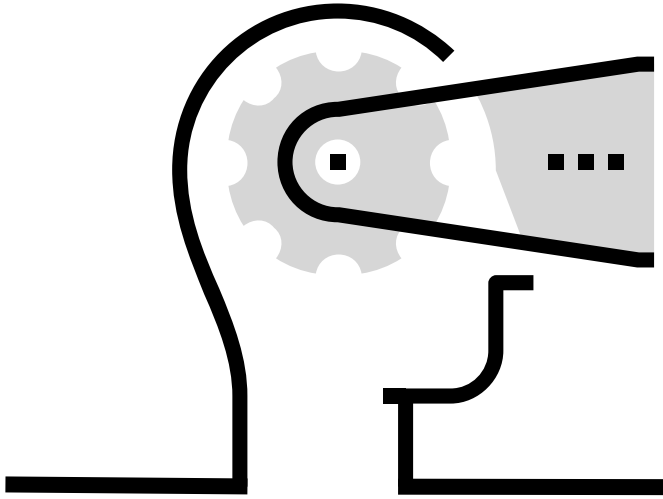
*"Large-scale transformations are **complex** and change is **difficult to manage successfully**."*
Intel 2018-2019

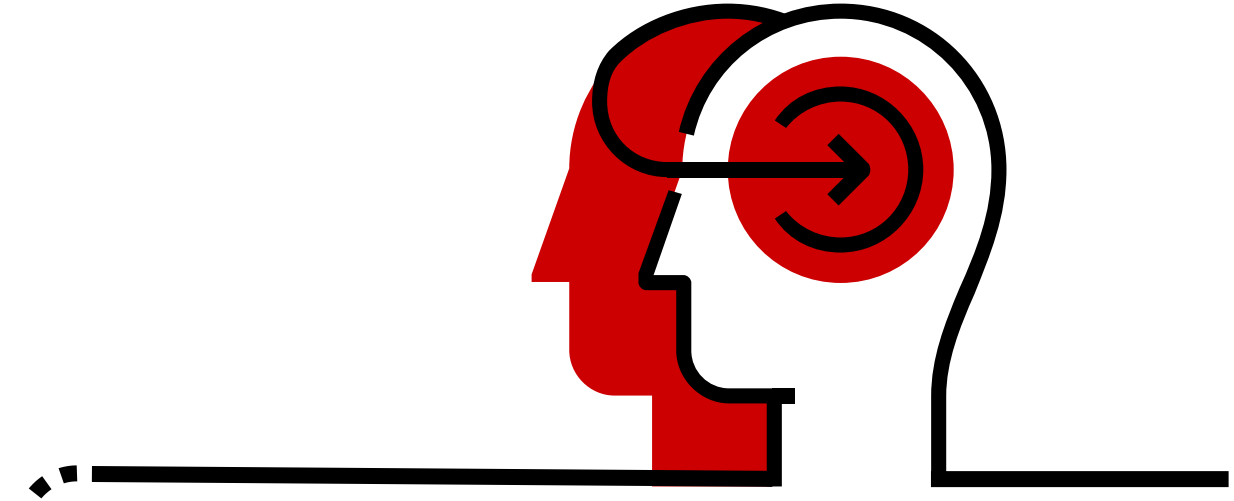
*"**78% of enterprises fail to scale and sustain** their digital transformation initiatives."*
Everest Group Digital report 2018

*"There is a **wall between digital dabbling and digital scaling**."*
Gartner

Note: n = 3,025; Desire: determining why you want to be digital and which outcomes to seek; Designing: determining what digital business means for you and what your main capabilities will be (may have pilot running); Delivering: Implementing changes to become a digital business; Scaling: focused on scaling up the reach and impact of digital business to broad range of customers across multiple business lines/functions with a wide range of outcomes; Harvesting: Digital initiative mature, harvesting benefits
Source: Gartner 2018 CIO Agenda: Industry Insights Overview report; Bain IOT customer survey (2016), N=533; Bain IOT customer survey (2018), N=627

# Why?





## EXPERIMENTATION

### in industrials is easy

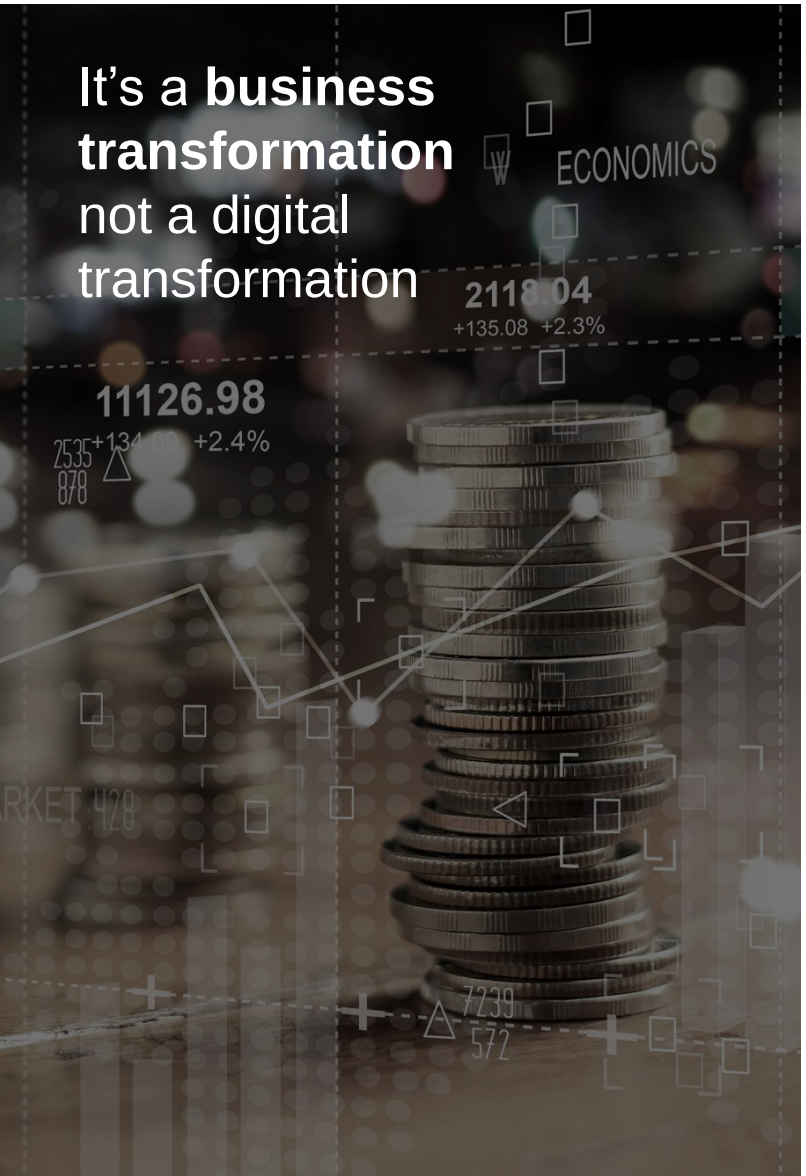
| | |
|---|---|
| **More focus** | Focused goal, scope and time horizon |
| **More support** | Leadership and team support 'designed in' from Day 1 |
| **Less resources** | Discretionary, ring-fenced funding and team |
| **Better resources** | Led by highly-motivated, change-oriented 'champions', often 'the best', and with dedicated time |

## TRANSFORMATION

### in industrials is hard

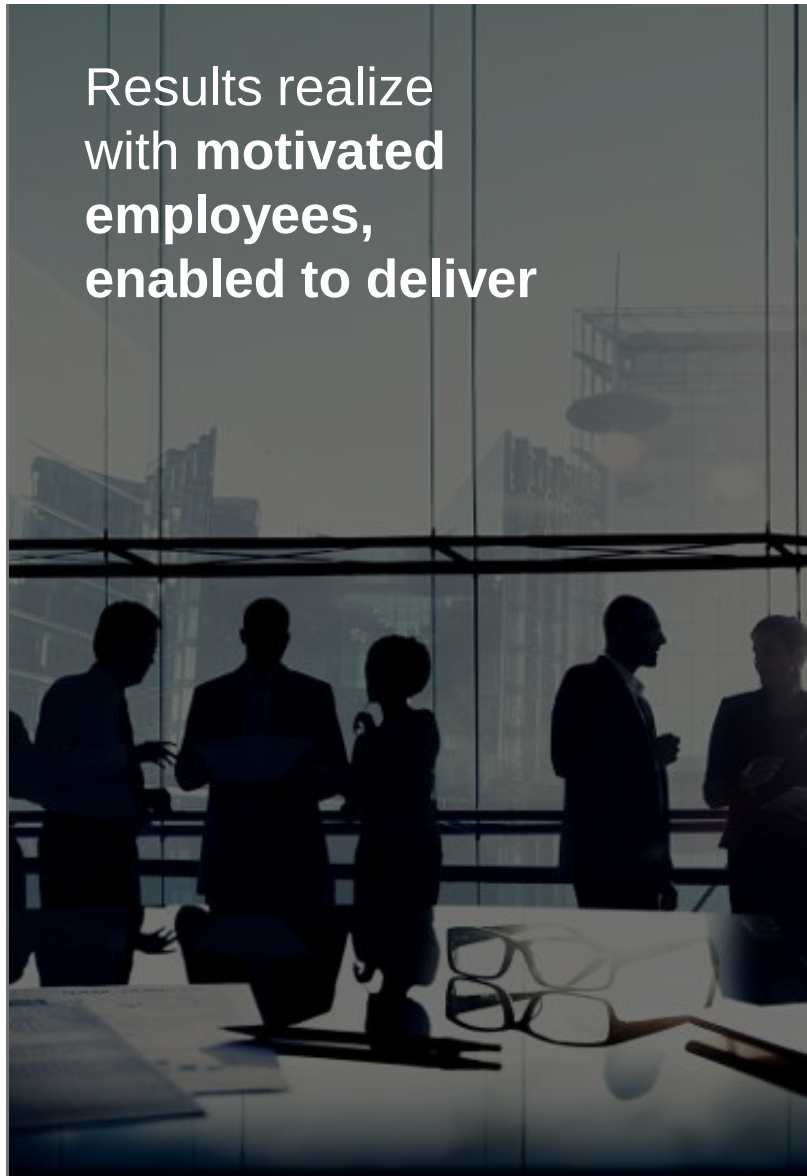
| | |
|---|---|
| **Nuances matter** | Different problems, assets/equipment, business units, process and people readiness levels |
| **Varied sponsorship** | Different leaders with different perspectives on the need & solutions |
| **Change resistance** | (Rational) pride for what has been done and fear of impact on self |
| **Resources scarcity** | New skills not easily available and funding is a larger capital decision |
| **Dynamism** | Multiple known and unknown constraints and changing goal posts and solutions |

# Core beliefs on Digital Transformations in Process Industry




It's a **business transformation** not a digital transformation

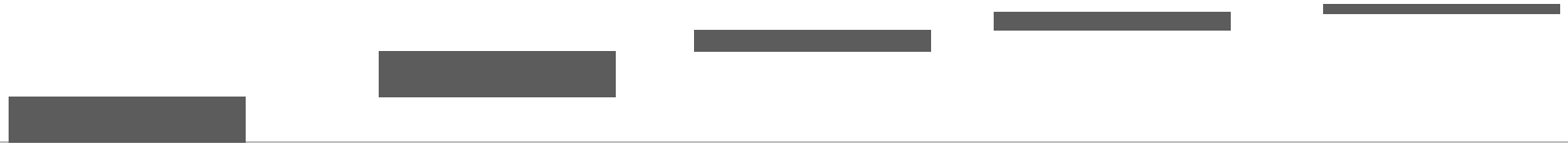
**Pattern recognition** is the essence of scaling



Results realize with **motivated employees, enabled to deliver**

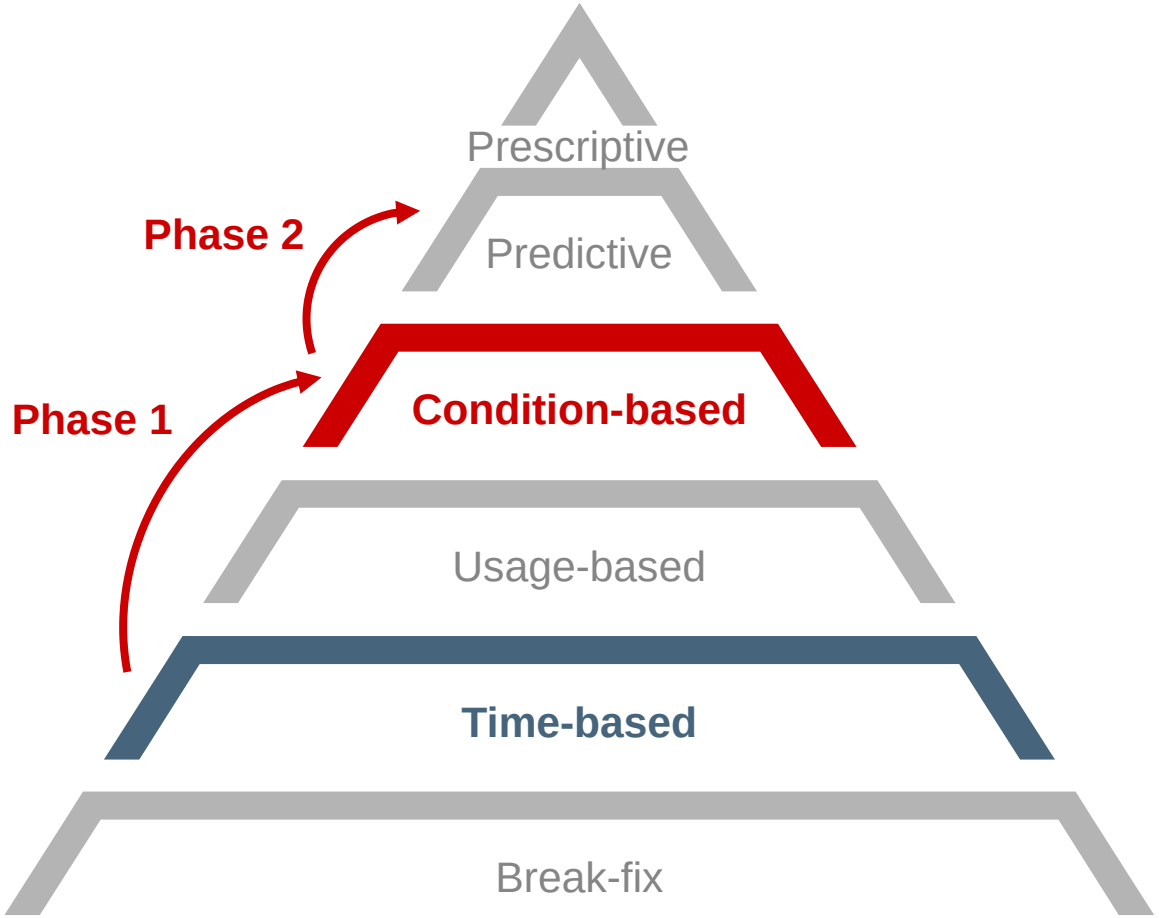
# Example: Clarity on where to play – Strategy

| | | | | | |
|---|---|---|---|---|---|
| Ambition | Lower cost for ourselves and improve customer outcomes through innovating the way we convert raw materials to valuable chemicals products | | | | |
| Goals | ROIC: From x% to y% | Quality volume growth: +x% | Employee NPS: >x% | LTIR: <x% | |
| Value engines | Asset management | Safety and compliance | Customer relevance | | |
| Strategic digital priorities | Predictive process automation optimization, and control | Proactive and predictive asset health management | Digitalization and optimization of shutdown | A smart, digital, mobile seamlessly connected workforce | Streamlined, simplified, automated business support processes |
| Financial profile | | | | | |



# Example: 19 days early prediction of failure, changed business process and 3% EBITDA improvement

**Moved from time-based to predictive over 6 months**



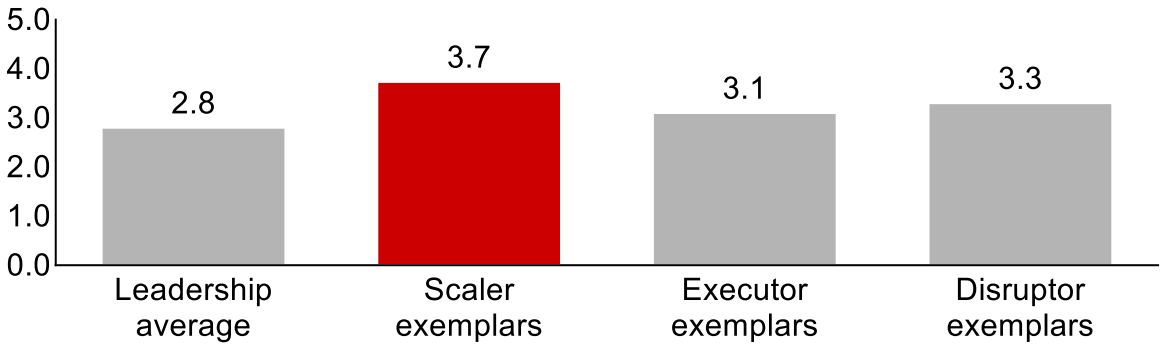

**Changed operating and maintenance behaviours**

- Improved operating behaviours
- Informed trade-off decisions on maintenance and operations
- Increased maintenance scoping accuracy
- Improved Root Cause Analysis (RCA) and results embedding

# New talent needed – e.g. scalers look different

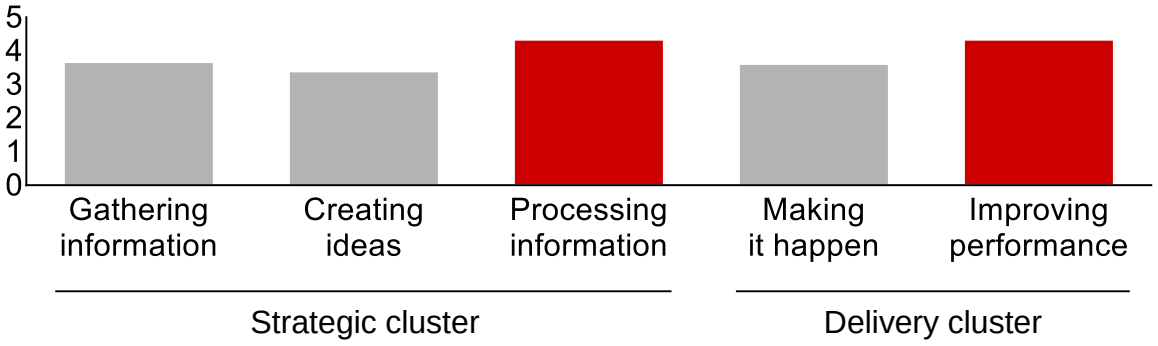
## 1 Scalers are all-rounders

Average score across 11 behaviours (1-5)



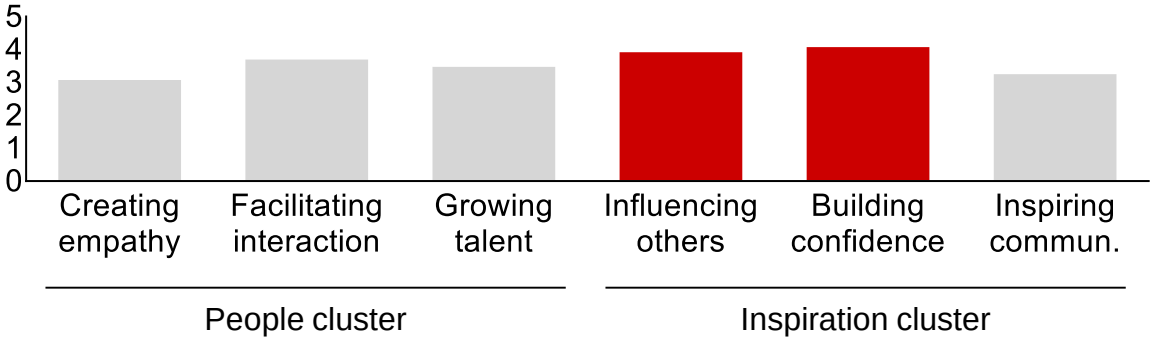

## 2 Scalers have spikes on Processing Information and Improving Performance

Average score 1-5 study group



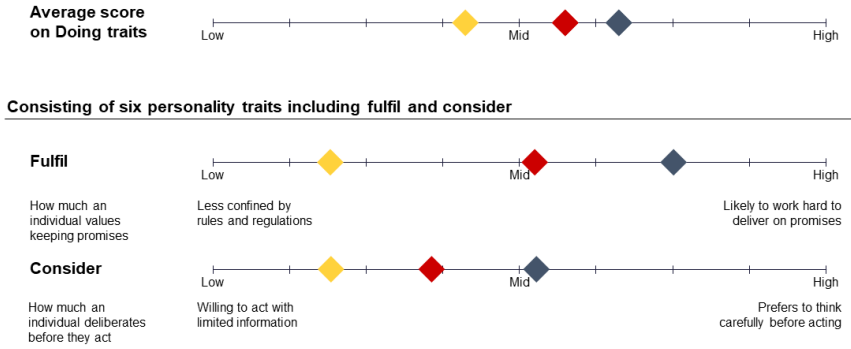

## 3 Scalers are highly influential through actions and building confidence

Average score 1-5 study group



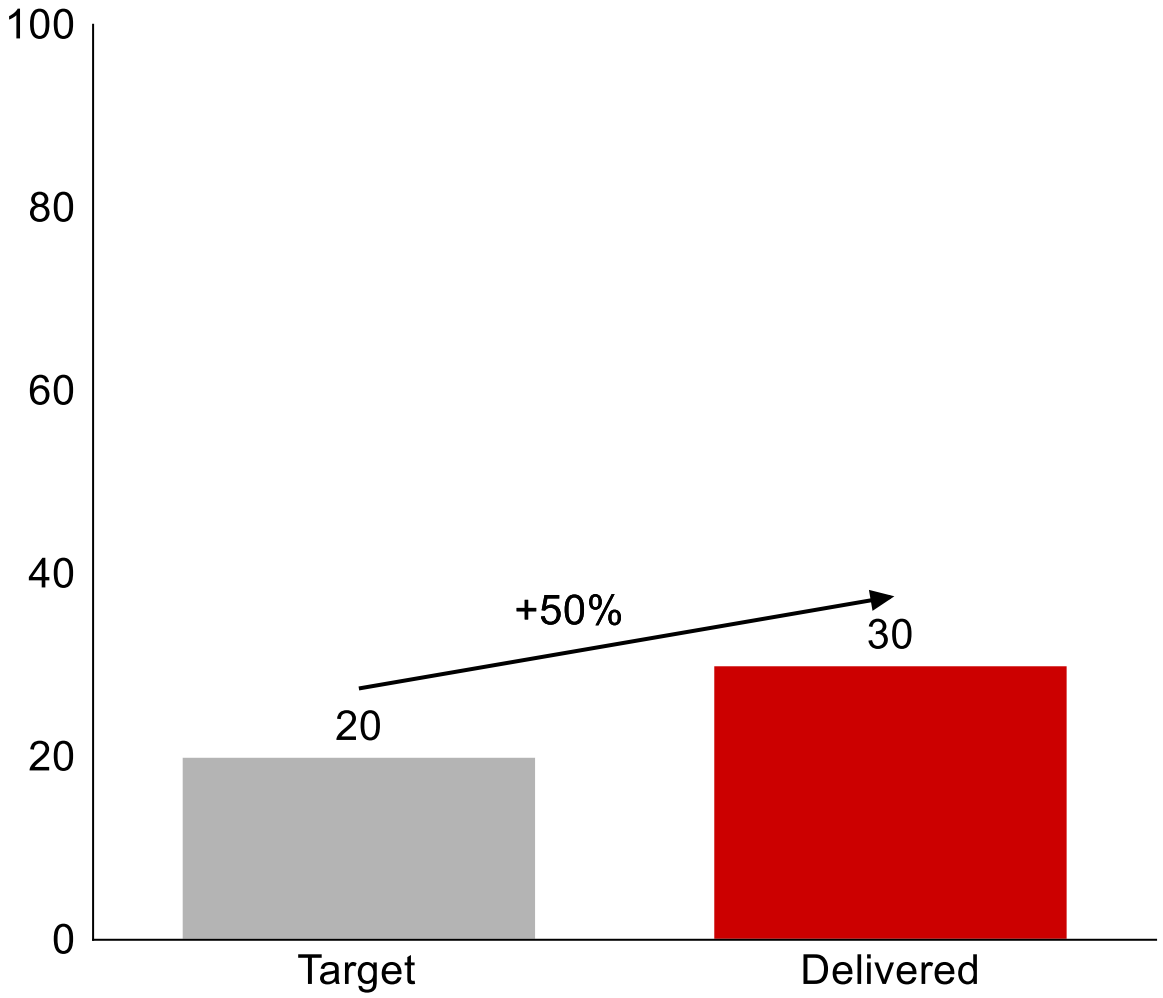

## 4 The scalers act as the HOW taking ideas of the disruptors and installing the structure needed for Executors to fulfil

**Conscientiousness** (or Doing personality traits) reflects a person's **self-control, organization**, and **drive to achieve**

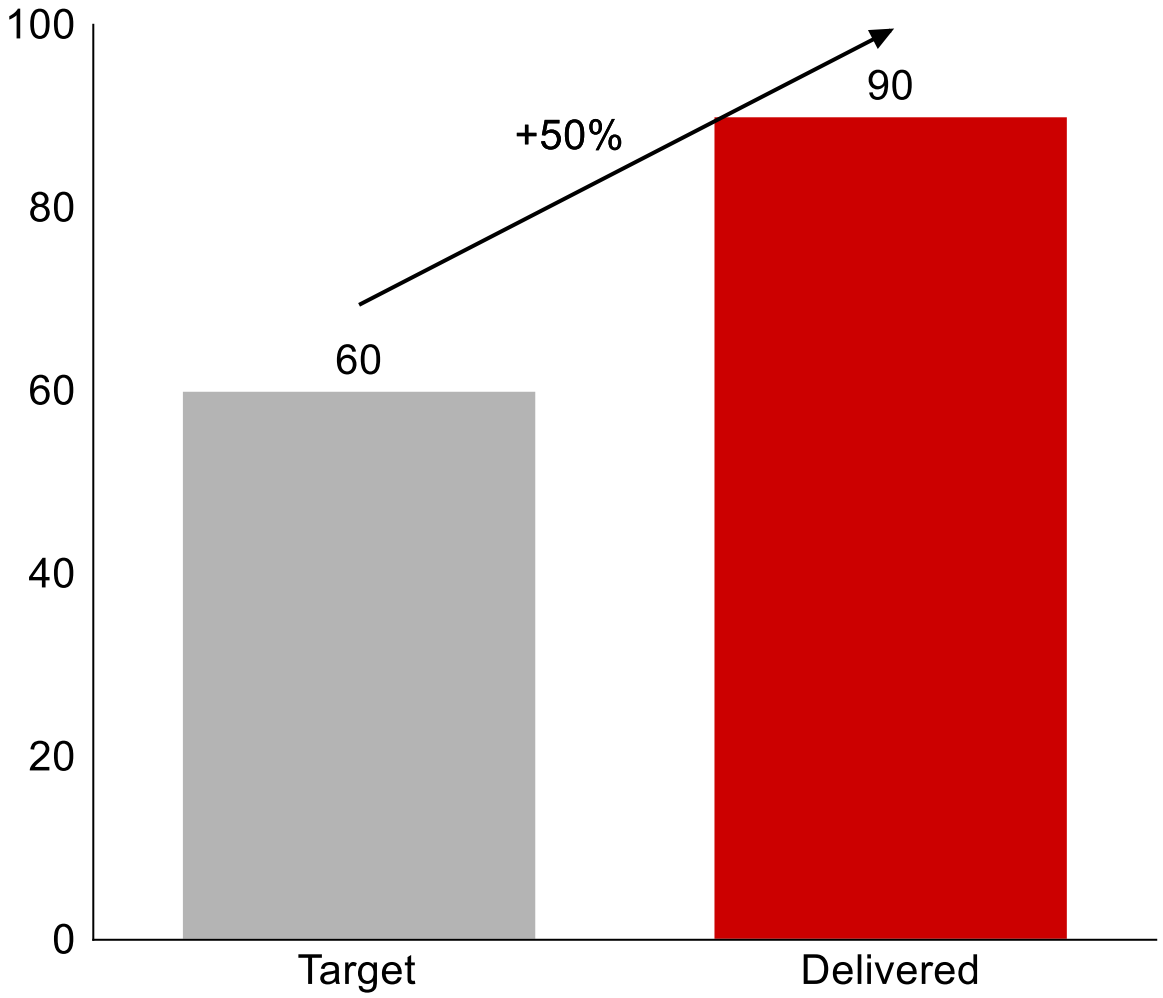


# Example: Companies that organize well deliver outsized financial results

**In-year P&L EBITDA impact (€ M)**




**3-year P&L EBITDA impact (€ M)**



# What the best Industrials companies do

01 **Solve the business problem first**

02 **Bring people along the journey**

03 **Focus on scaling from day 1**

04 **Partner, whilst retaining independence**

05 **Deploy digital solutions that’s right for you**