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# Creating value with digital solutions

## Introduction



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**Dr. David Lincoln**  
Digital Leader  
Measurement & Analytics  
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**David Lincoln**, ABB Digital Lead for Measurement and Analytics, drives digital transformation for ABB's wide-ranging sensing business which includes analyzer, instrumentation and force measurement solutions.

Previously, David oversaw service Technology, productization and product management for this business. As Technology Manager, he set up the Measurement and Analytics development center in China and supported its growth for five years.

David holds a Master's degree in Mechanical Engineering from the University of Manchester in England and a Ph.D from Cardiff University in Wales. He is based in the UK.





DAVID LINCOLN, JULY 2019

# Digital solutions for measurement devices

Measurement made easy for Food & Beverage



# Agenda

- 1 Introduction
- 2 Market drivers
- 3 Measurements in F&B
- 4 Solution examples
- 5 Key takeaway
- 6 Q&A





# How to make a great loaf of bread

The key to success

1

Recipe (Procedure)

2

Ingredients

3

Equipment

4

Skill

4

Environment





# How to be successful making 140,000 loaves each day

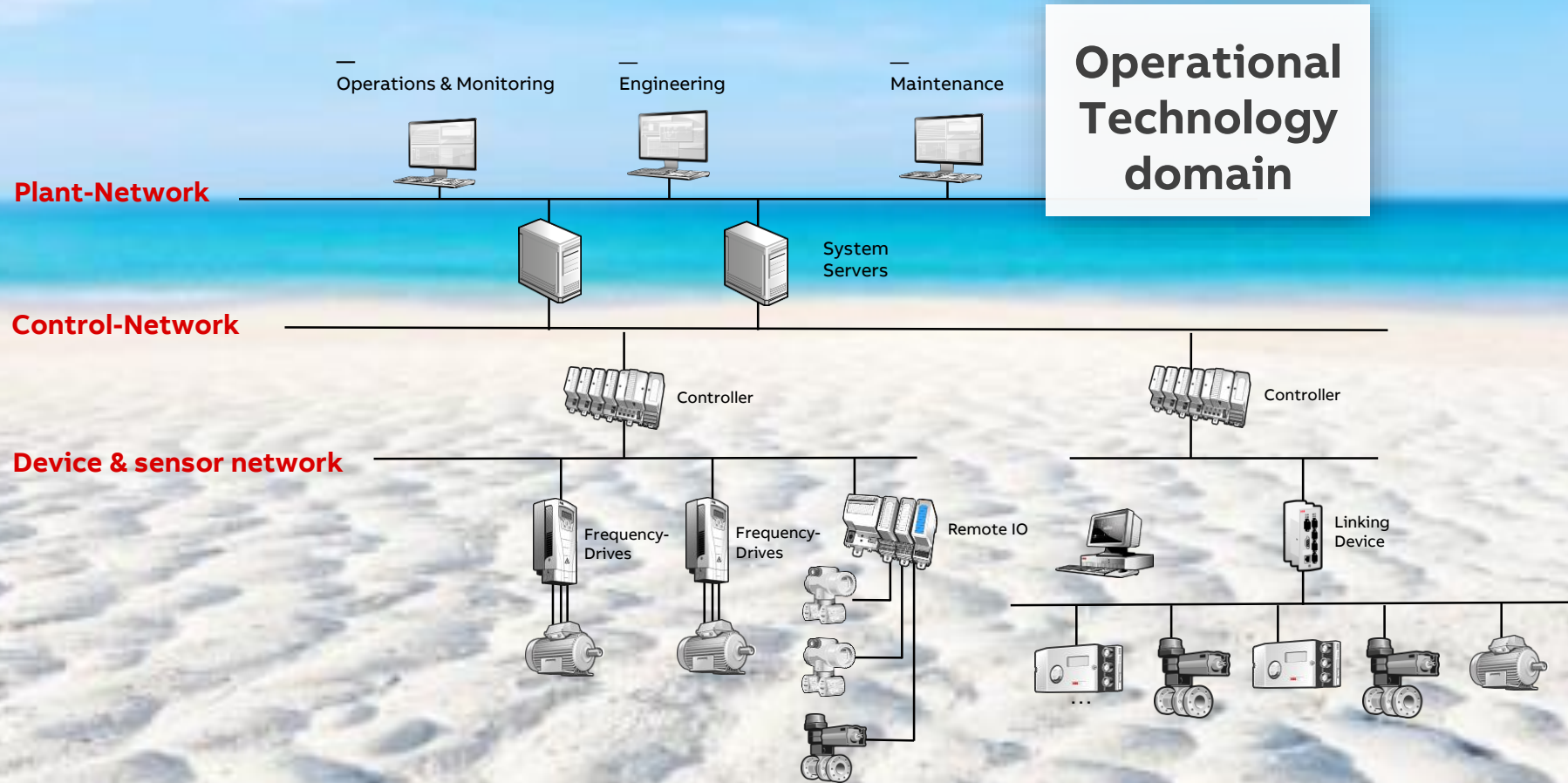
## The key to success

- Recipe (procedure)
- Ingredients
- Equipment
- Skill
- Environment
- Productivity
- Quality
- People
- Regulations

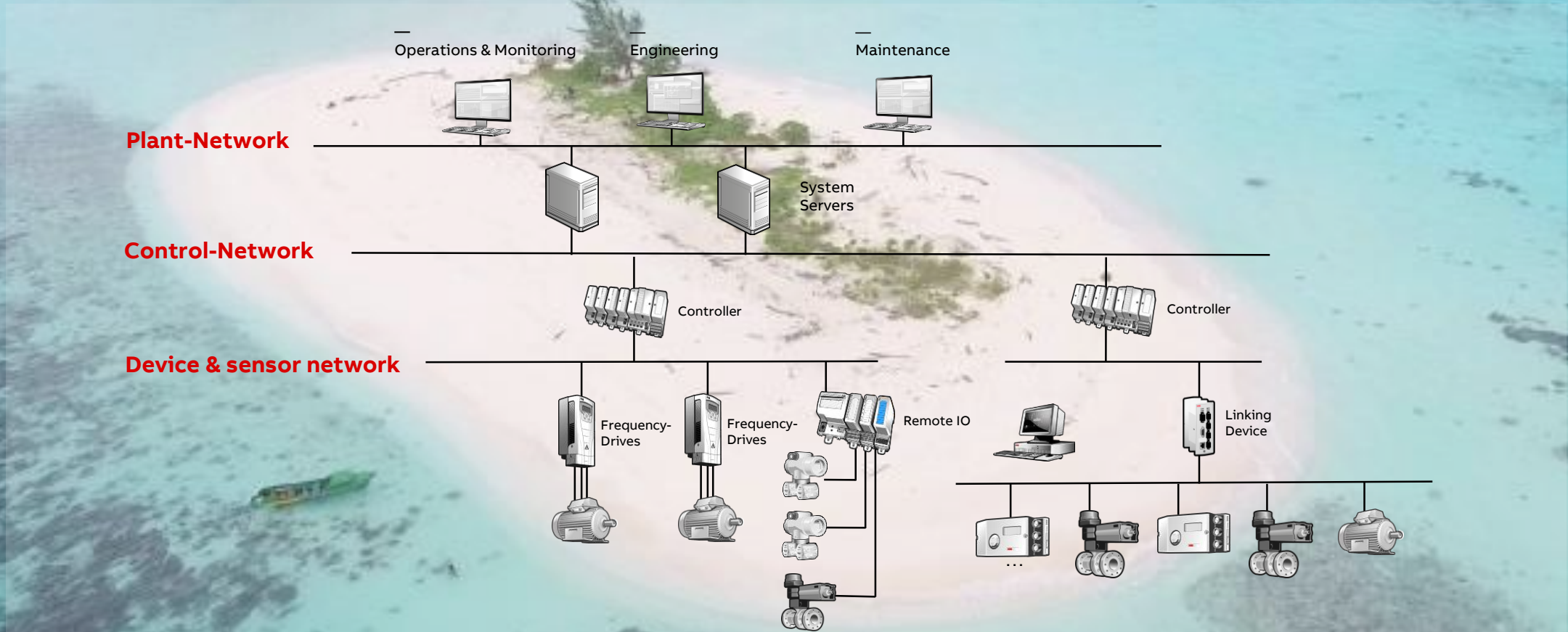




# Volume production is dependent on automation systems containing sensors and controllers

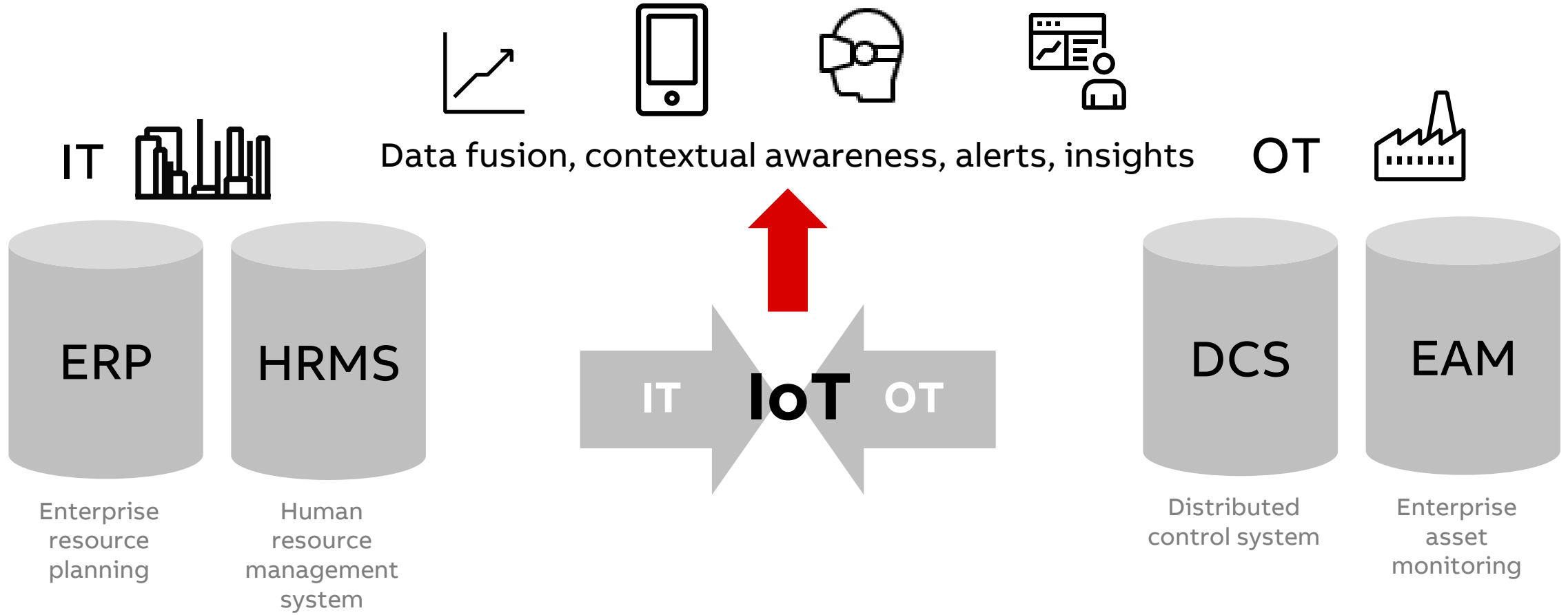


# A Digital wave of disruption has started to erode the island view





# Information Technology and Operational Technology are converging



# Penetration of digital technologies is fast paced

2005



Two days after pope John Paul II. died

2013



His successor Benedikt XVI. retired and a new pope was elected



# Industrial markets primed to adopt digital technologies

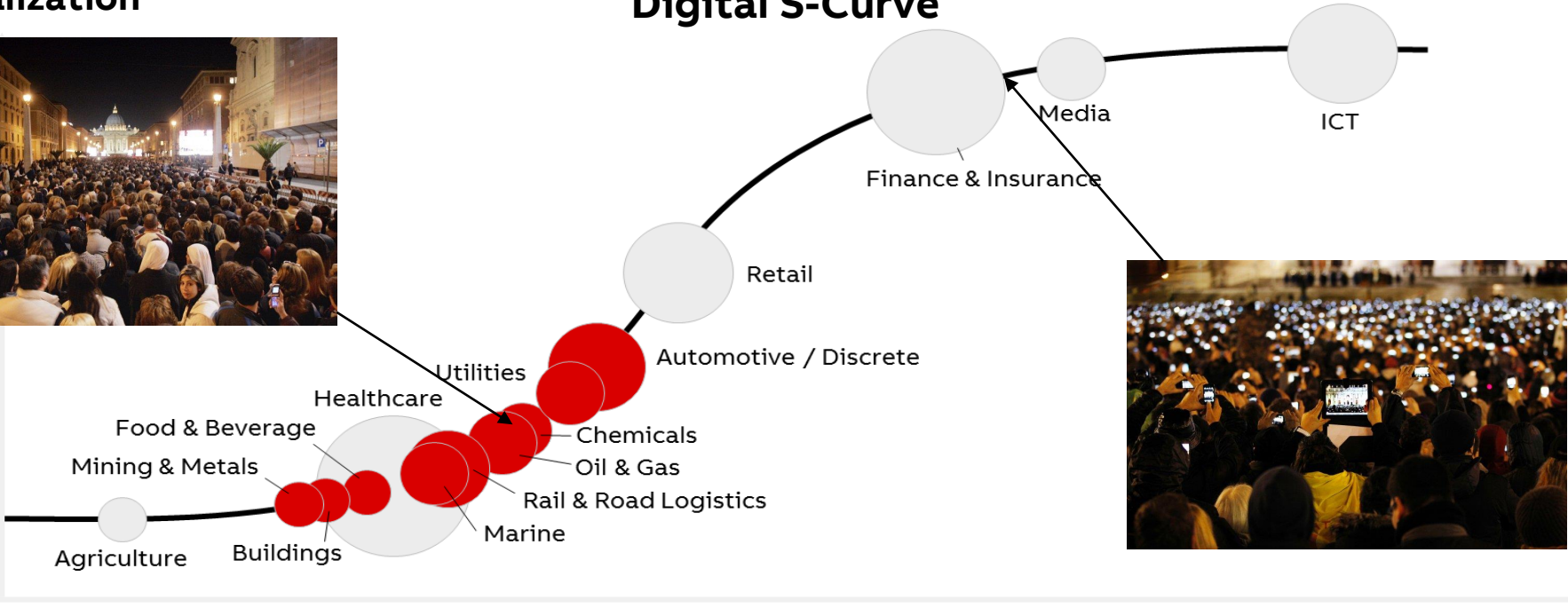
Computing + connectivity + cloud + analytics set to unlock value

Innovations

Level of digitalization



Digital S-Curve



- 1 Touch screen
- 2 Camera
- 3 App store
- 4 3G > Streaming
- 5 Tablet
- 6 Sensing (GPS...)

Time

# Industrial markets primed to adopt digital technologies

Computing + connectivity + cloud + analytics set to unlock value

Innovations

Level of digitalization

Digital S-Curve

Food & Beverage

- 1 Predictive maintenance
- 2 Autonomous production
- 3 Block chain traceability
- 4 Sustainable products
- 5 Alternative protein sources
- 6 3D printing

Time



# Digital solutions can be targeted to specific customer needs



## Connectivity



“I run many sites and need quick access to a range of productivity data 24/7”



## Skills



“My team keep retiring, I need simple solutions to ensure new starters can maintain and operate the plant effectively



## Productivity



“I need ways to increase output using my limited engineering resources and budget”



## Regulatory



“I need safety related data available when I need it without having to look through paper records”

# ABB Digitally enabled smart devices for Food and Beverage processes

## Evaporator

Flow meters, pressure, temperature, Conductivity, pH, Recorders, Controllers, Actuators, Level, Positioners

## Storage silos

Flow meters, temperature, Recorders, Controllers, Level

## Water Treatment

Flow meters, pressure, temperature, Conductivity, pH, Recorders, Controllers, Actuators, Level, Positioners

## Filling line (Bottles / cans)

Flow meters, Recorders, Controllers

## Retort control

Pressure, Recorders, Controllers, Actuators, Positioners

## Mixing / blending vessels

Flow meters, temperature, Recorders, Controllers, Level

## Heat exchangers

Pressure, temperature, Conductivity, Recorders, Controllers

## Cold storage

Temperature, Recorders, Controllers

## Control room

Recorders, Controllers

## Pasteurizers

Flow meters, temperature, pressure Recorders, Controllers, Positioners

## Clean in place station

Pressure, conductivity, pH, Recorders, controllers, Positioners

## Boilers

Flow meters, pressure, temperature, Conductivity, Oxygen, emission monitoring, pH, Sodium, Silica, Recorders, Controllers, Actuators, Positioners



# ABB Digitally enabled smart devices for Food and Beverage processes

## Flow



## Positioners



## Pressure



## Recorders | Controllers



## Temperature



## Water analysis



## Level



## Gas analysis incl. CEMS



# Alcohol blending measurement solution

Delivering Regulatory adherence | Improved quality | Increased productivity

## Customer need

- **On-line measurement** of alcohol concentration
  - **Today using manual** portable meter
  - Manual measurement and recording every 4 hours
- **Regulations** | QMS require online measurements and storage of data for 2 years minimum

## ABB Solution

**FCB450 Coriolis Mass flowmeters** with integrated DensiMass<sup>1</sup> software for measurement of Mass Flowrate, Density, Temperature, Concentration

**Paperless Recorder RVG200** analyzing blend data

- Concentration
- Temperature
- Mass flowrate
- Density
- 24 channels recording data logging for up to 6 bottling lines.

### Data manager Pro Software

Remote back-up of data, analyzes alarms / trends

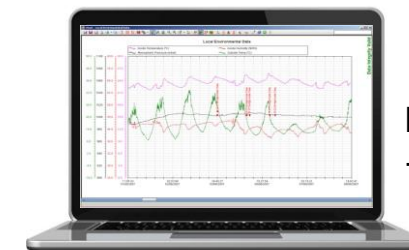
## Physical + digital Solution



Measurement +  
Densi-mass software



Blend data analysis +  
Data recording



Remote data back-up  
+ data analysis



# Alcohol blending measurement solution

Much more than just a measurement

## Online device management

### ABB Ability™ Field Information Manager\*

- Configuration
- Commissioning
- Maintenance



Productivity

## Device health and accuracy check

### ABB Ability™ Verification for measurement devices\*

- Maintenance
- Troubleshooting



Productivity

## On-site self-support

### My Measurement Assistant\*

- Step-by step assistance
- Downloadable action reports

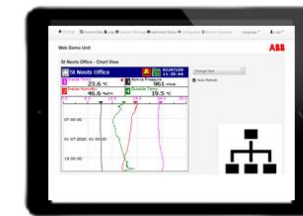


Skills

## Remote data access

### Web server\*

- Access diagnostics and performance data via any internet browser
- Ethernet enabled

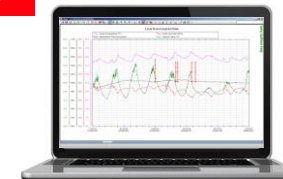


Connectivity

## Data manager Pro

### Data analysis software

- Manage, analyze and store data archives



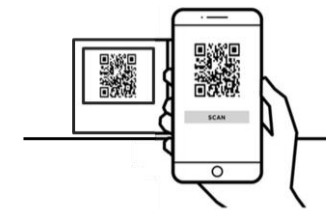
Regulatory

Productivity

## Fast fault diagnosis and tech support

### Dynamic QR code technology\*

- Share device ID + system health data via QR codes
- Email or use ABB's My Installed Base app to receive support

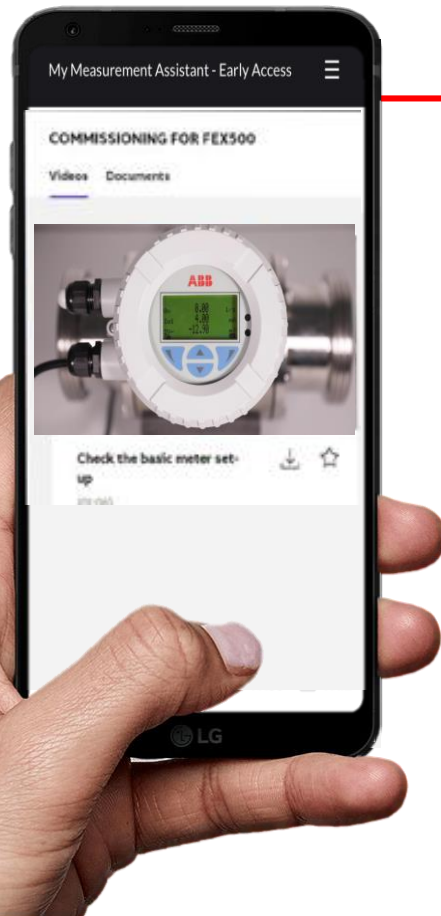




Skills

# Up-skilling operators & maintainers with Guided self-service support

My Measurement Assistant



**Free tool**



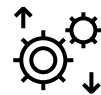
Video tutorials



Checklists



Contact us



Spare parts catalog



Error code checking



**Access the web-app today**

<https://my-measurement-assistant.marketplace.abb.com>



Coriolis flowmeter



Hygienic Master



Process Master



Vortex/Swirl Master



Pressure



Temperature



Positioners



Thermal mass flow

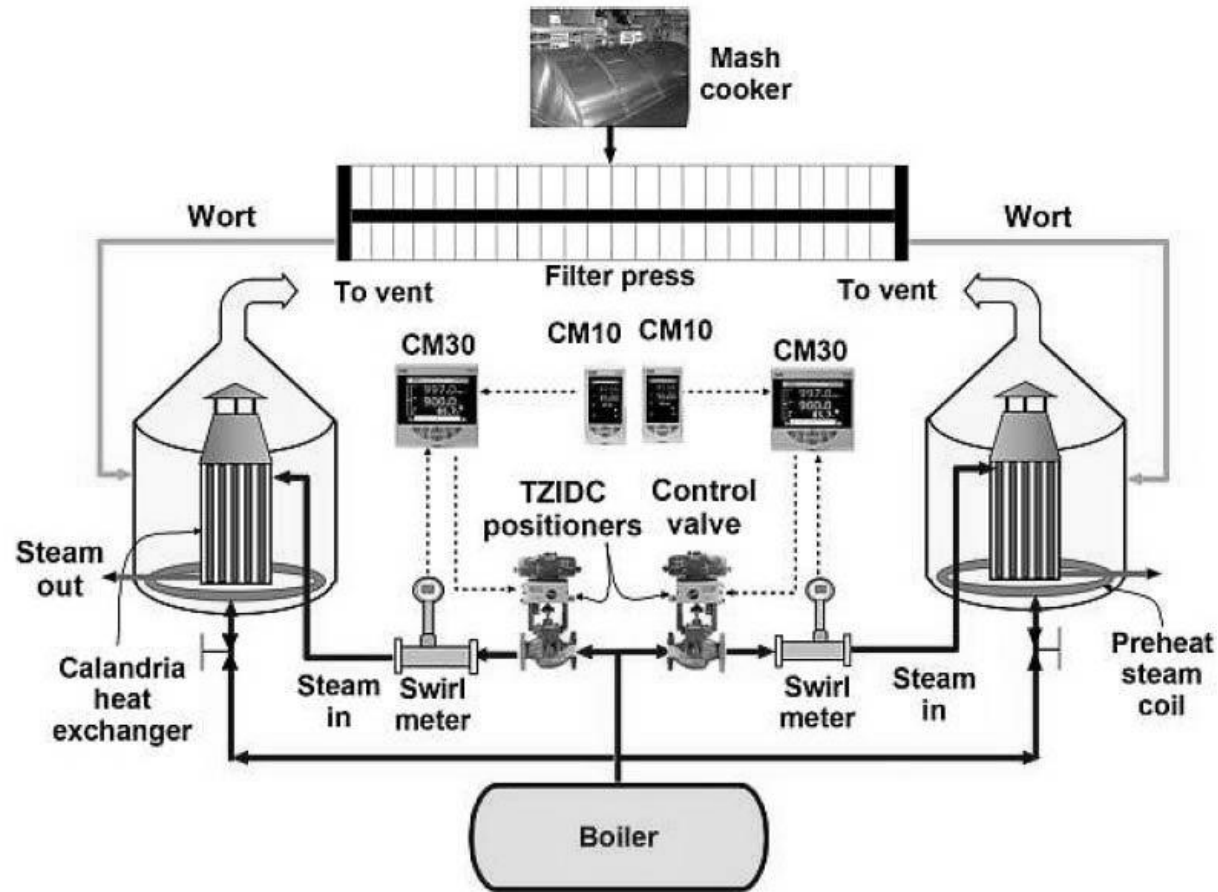
Released

Q3-2020



# Beer brewing operation

Delivering highest possible measurement accuracy in challenging application



## Process

Measure and compute mass flow rate of steam control heat for boiling the wort\*



## Challenge

Avoid expense of re-piping the brew house to achieve higher accuracy



## Solution

ABB's swirl flowmeters allow **highest accuracy** with lowest inlet and outlet sections



Suite of high value apps to lower cost of ownership and enhance productivity

# Smart device surrounded with Digital solutions that address customer needs

## Online check of device health and accuracy

### ABB Ability™ Verification for measurement devices\*

- Maintenance
- Troubleshooting



## ← Productivity →

## Online device management

### ABB Ability™ Field Information Manager\*

- Configuration
- Commissioning
- Maintenance



Swirl flow meter

## On-site support

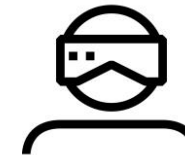
### My Measurement Assistant\*

- Step-by step assistance
- Downloadable action reports
- Access the app now



## Augmented / Virtual Reality support

### ABB Remote Insight



## ← Skills →



# ABB Ability™ Verification for measurement devices

The best possible check of measurement accuracy, without removal from the process



Productivity



Free  
Software\*



Test  
reports



Predictive  
maintenance



Flexible license  
options



Coriolis  
flowmeter



Electromagnetic  
Flow meter



Vortex/Swirl  
Master



Thermal mass  
flow



Level



Pressure



Temperature



Positioners

Easy to  
use

Fast

Reduces  
downtime

Helps with  
Quality control

Released

Q3-2020

# Customer expectations are changing

Typical buying journey example

1

**Awareness**

1

Reliable, accurate measurement

2

Total cost of ownership

3

Is my asset future proof?

2

**Education**

3

**Decision**



**I need Level measurement during mixing to improve product quality**



# Customer expectations are changing

Typical buying journey example

1

Awareness

2

Education

3

Decision

1 Reliable, accurate measurement

2 Total cost of ownership

3 Is my asset future proof?

## LLT100

Lasers are changing  
level measurement



**I need perfect measurement, low cost of ownership and security that my Level solution will still be relevant in 6 years time**

# Customer expectations are changing

Typical buying journey example

1

Awareness

2

Education

3

Decision

## I choose this Level solution

1 Reliable, accurate measurement

2 Total cost of ownership

3 Is my asset future proof?



### Device health and accuracy testing

#### ABB Ability™ Verification for measurement devices

- Commissioning
- Maintenance



### Laser level

#### ABB LLT100

- Detect any liquid without calibration
- Narrow beam, filtering of blade interference if required



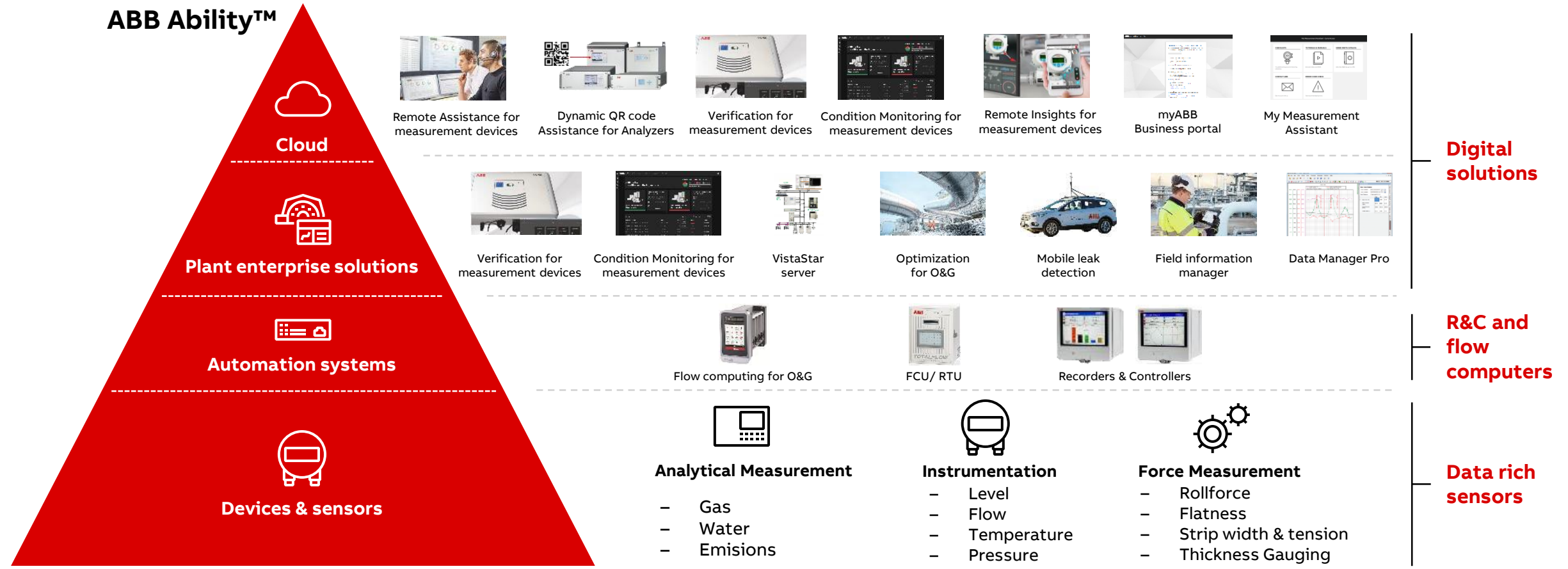
### Device management

#### ABB Ability™ Field Information Manager

- Configuration
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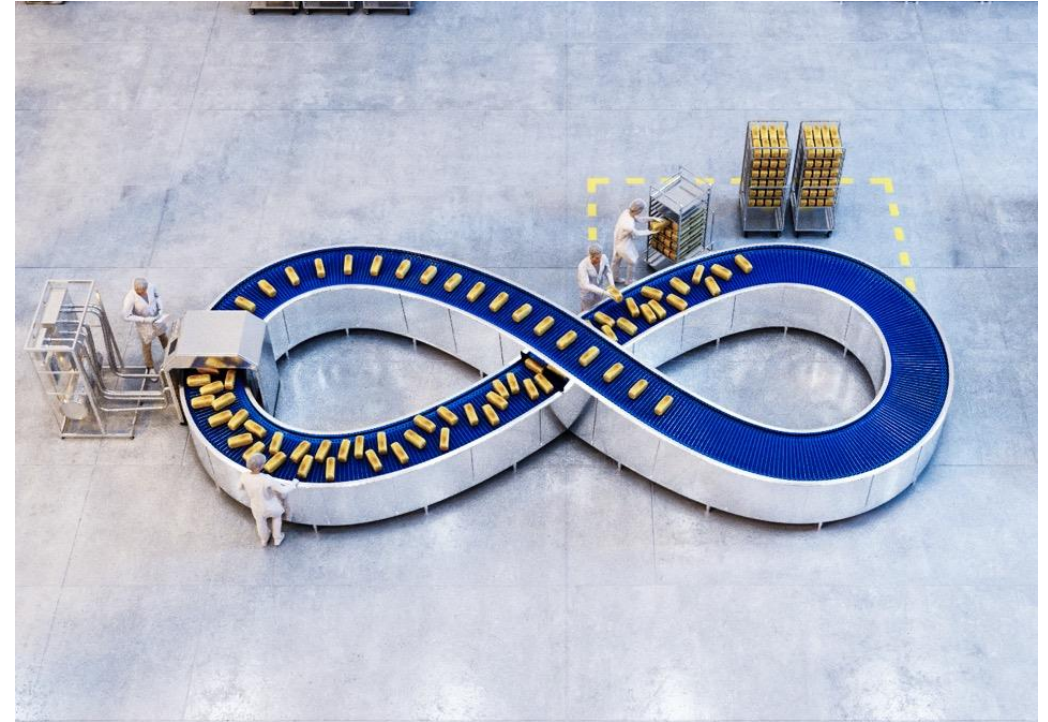


# All Manufacturers investing heavily in SW above the device level



# Key takeaways

- 1 Digital creates new value opportunities often without significant customer investment
- 2 Solutions can target specific customer needs
- 3 Solutions are more and more a combination of the physical devices and software
- 4 Talk to ABB today about your solution needs for tomorrow and let's co-innovate



Infinite possibilities in future



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