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MAY 2020

ABB Ability™ Smart Sensors

Equipment that lets you know when it's time for a service

ABB

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Introduction and presentation instructions

Quick instructions

- **Mute your mic** to limit background noise

- **Use chat window** to ask questions which we will take at the end of the call

- In your question tell me **your company name** so I can mention on my reply for others to know

- **E-mail** me for follow-up discussions

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Overview

Digital added value

ABB Ability™ Smart Sensor
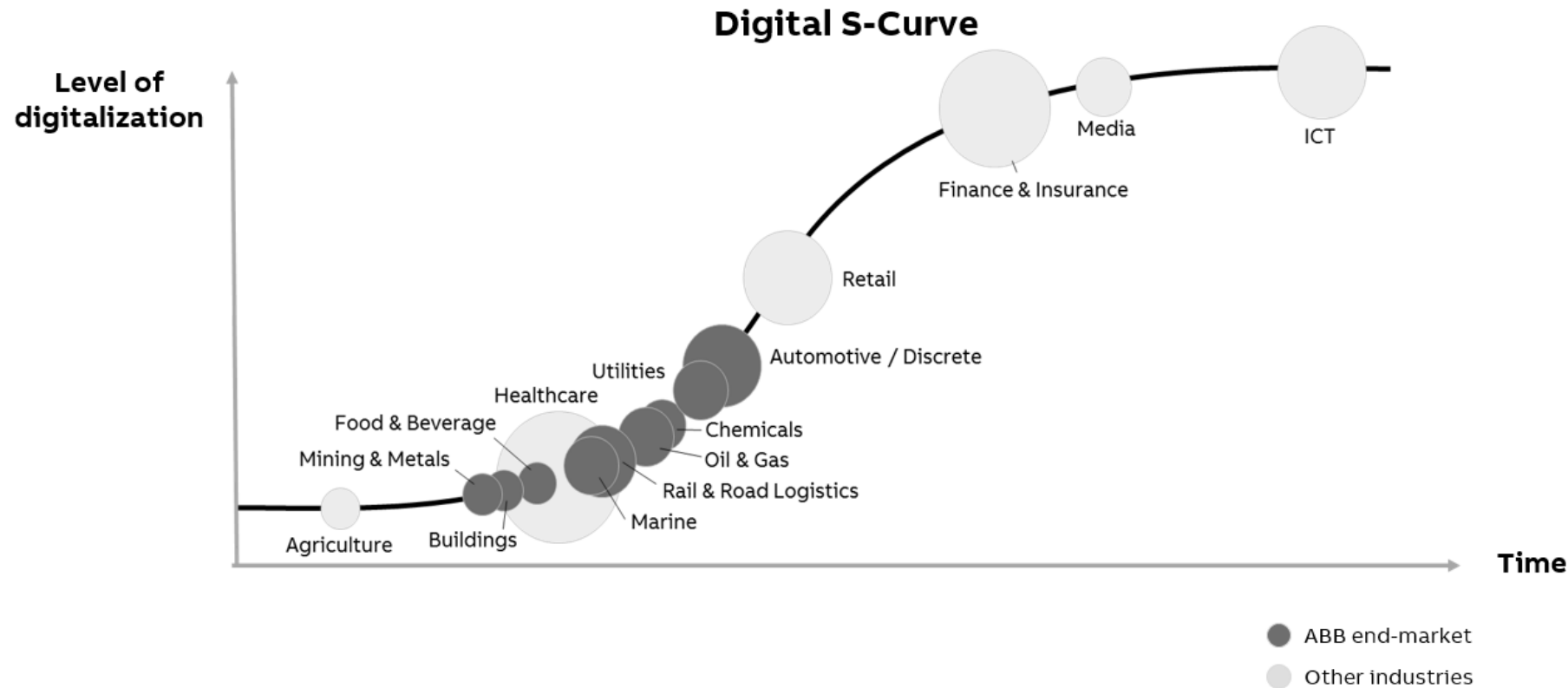
- for motors

Use cases

Selected references

Present a live case – Portal and ABB Ability APP

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Digitalization

Industrial markets primed to adopt digital technologies

For most of us, the digital journey lies ahead

Digital S-Curve

Level of digitalization

ICT

Media

Finance & Insurance

Retail

Automotive / Discrete

Utilities

Healthcare

Food & Beverage

Chemicals

Oil & Gas

Rail & Road Logistics

Marine

Mining & Metals

Buildings

Agriculture

Time

- ⬤ ABB end-market
- ◯ Other industries

Remember how the hotels were laughing at the booking portals 10 years ago.

Now they lost a large chunk of their market to Airbnb and others like them.

And they have lost ownership of the rest of their market to booking.com, tripadvisor and similar digital service providers.
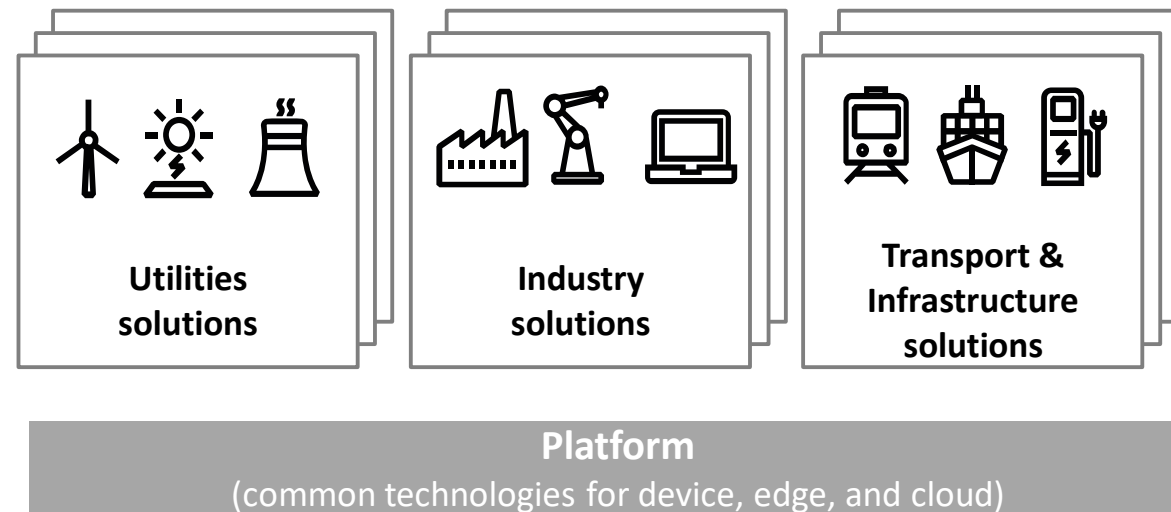
ABB Ability™ solutions and platform

ABB Ability™

Our platform is a set of enabling technologies that lets ABB build these solutions more quickly and efficiently.
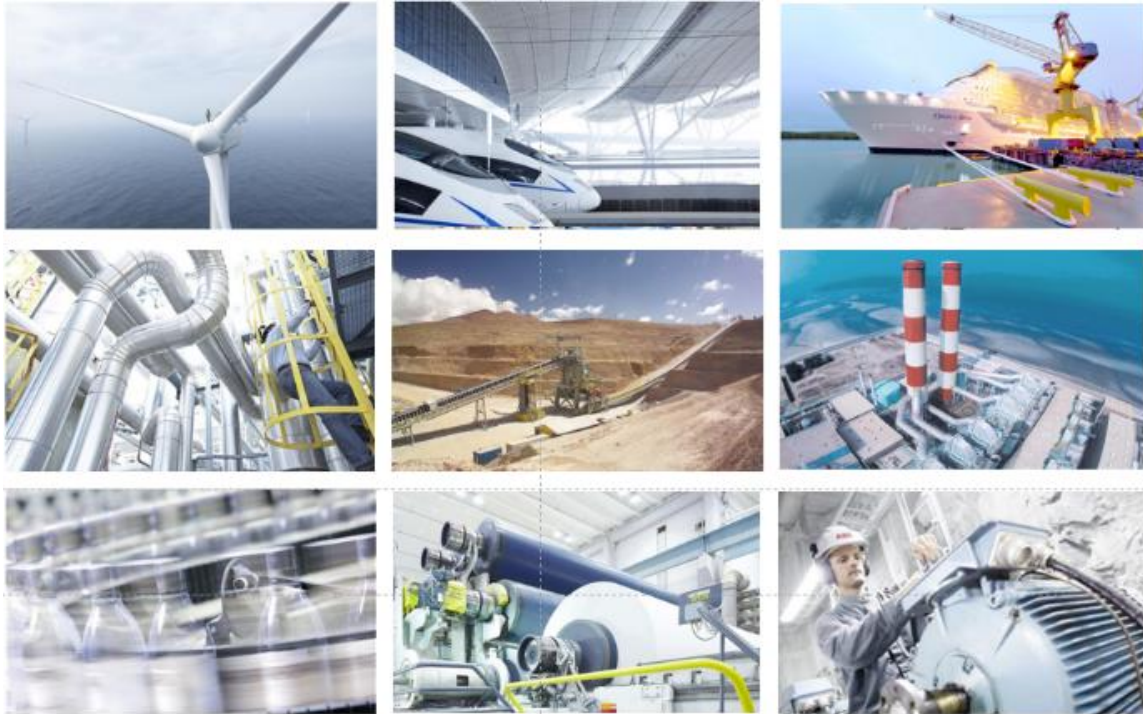
We are building the platform from best-in-class industry technologies, such as:

- Microsoft's Azure cloud services

- HPE/Aruba infrastructure

- IBM Watson's machine learning and AI

Utilities solutions

Industry solutions

Transport & Infrastructure solutions

What
Delivers customer benefit (uptime, speed, yield…)

Platform
(common technologies for device, edge, and cloud)

How
Provides ABB with efficiency and scale

Microsoft

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Digital added value

The Internet of Things has much more on offer than mere preventive maintenance

- **Manage and minimize risks.** Prevent plant downtimes, improve occupational safety, resolve warranty claims and avoid penalties for delays.

- **Eliminate inefficiencies.** Save energy, reduce labour cost, use resources efficiently, manage lack of skills and generational gaps. Optimize along the value-added chain, what to purchase, how to use, when to replace.

- **Optimize investments**. Accurately engineered plants requiring less redundancies and fewer spare parts and run longer.

- **User experience.** Offer people a more satisfying way to do things. Flexible configurable functionality, easily scalable fleets, pay-per-use. Easy to use, easy to share.

- **Disruption/Defense.** Attack competitors by doing things in a different way with less risk, higher efficiency and better user experience. Alternatively, defend against someone doing it to you.

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ABB Ability™ Smart Sensors for remote condition monitoring

Enables your equipment to perform its own health check

Smart Sensor for motors

Smart Sensor for pumps

Smart Sensor for mechanical products

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ABB Ability™ Smart Sensors for remote condition monitoring

Enables your equipment to perform its own health check

Smart Sensor for motors

Smart Sensor for pumps

Smart Sensor for mechanical products

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ABB Ability™ Smart Sensor for motors

Motors that let you know when it's time for a service

– The ABB Ability™ Smart Sensor regularly measures key health and operating parameters.

– It has a memory for one month. Within that month the data is collected, either manually with a smart phone or automatically via a gateway.

– The data is analyzed by ABB's powerful algorithms.

Intended use

– Industrial AC motors, induction or synchronous

– Continuous or intermittent duty

– Frame sizes: 42-7000 (NEMA), 56-500 (IEC)

– Fixed speed or variable speed

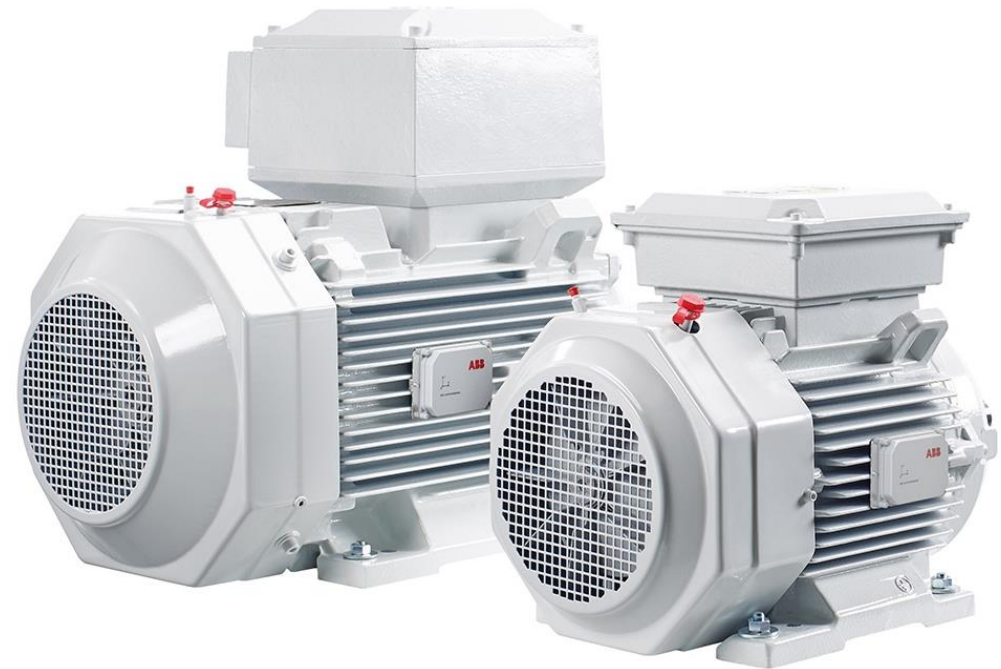– **New or existing motors from ABB or other manufacturers**

ABB Ability™ Smart Sensor for motors

Monitored parameters

Health parameters

– Overall condition

– Overall vibration

– Bearing condition

– Misalignment

– Skin temperature

Operating parameters

– Vibrations
(radial, tangential, axial)

– Speed

– Operating hours

– Number of starts

– Supply frequency

– Output power

– Regreasing count-down

ABB Ability™ Smart Sensor for motors

Benefits

- **Process optimization**
  - Energy savings
- **Higher availability** of equipment and processes
  - Maintenance can be planned in advance, preventing unexpected downtime
- **Reduced maintenance costs**
  - Save time and effort of maintenance engineers with early warning system
- **Longer equipment lifetime**
- **Improved safety**
  - The sensor enables easy access to motors in locations that are difficult or dangerous to access
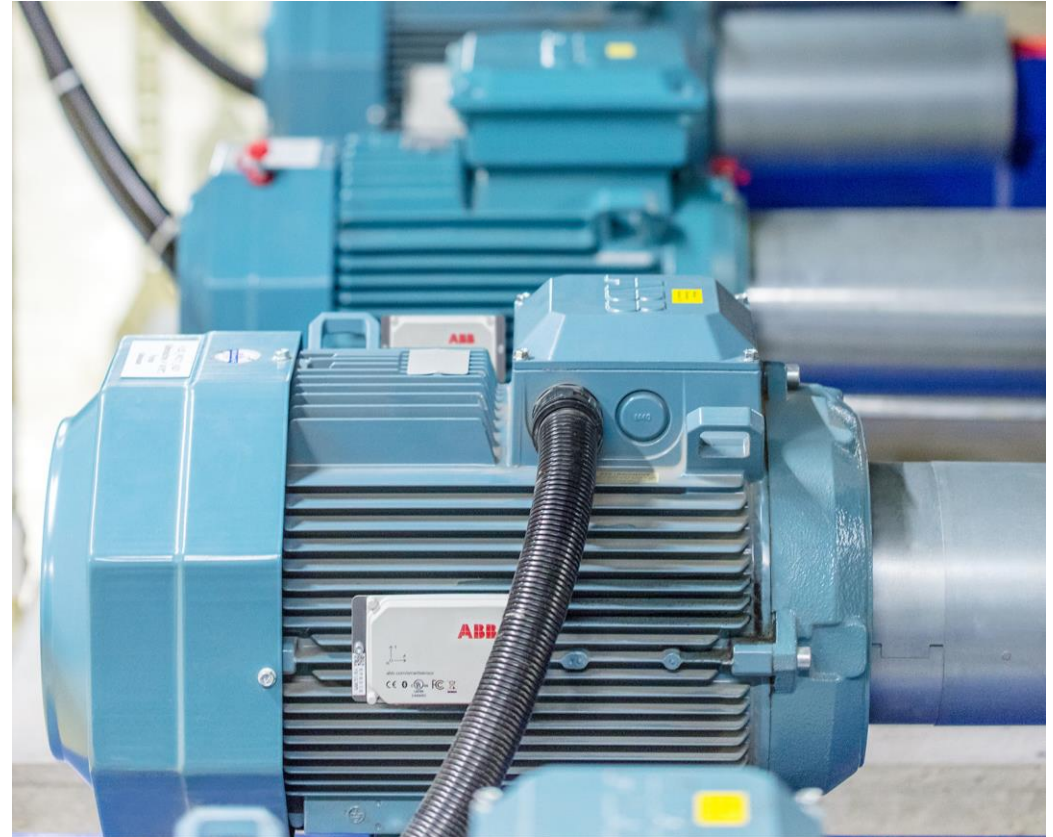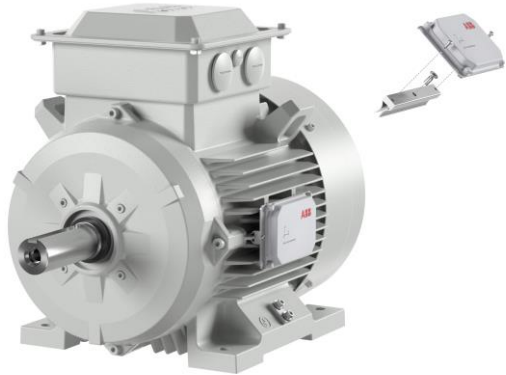 - Maintenance inspections can be done from a distance

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ABB Ability™ Smart Sensor for motors

Easy to use

Installation

– Sensor is simply attached to a motor's frame with a clamping bracket and 3 screws or adhesive putty

– No wiring required

Commissioning

– Commissioning and registration of the sensor/motor via the ABB Ability™ Smart Sensor app takes only a couple of minutes

– User registration and group management can be done by authorized users via the web portal

Monitoring

– Users can check the status of their equipment at any time via the ABB Ability™ Smart Sensor app or web portal

– The app includes a 'traffic light' display for a quick overview of all the equipment that is being monitored

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ABB Ability™ Smart Sensor for motors

Hardware

Certified*
- IP66
- CE, FCC, IC, RCM, EAC, UL, C-UL
- Bluetooth
- Country-specific certifications

Range**
- With mobile phone: 1 - 10 m
- With gateway: approx. 50 m

Sensor in flight mode at delivery

MEMS **Multi-Sensor System** inside

Built-in batteries
Not exchangeable
Design life 5 years

Firmware with FOTA
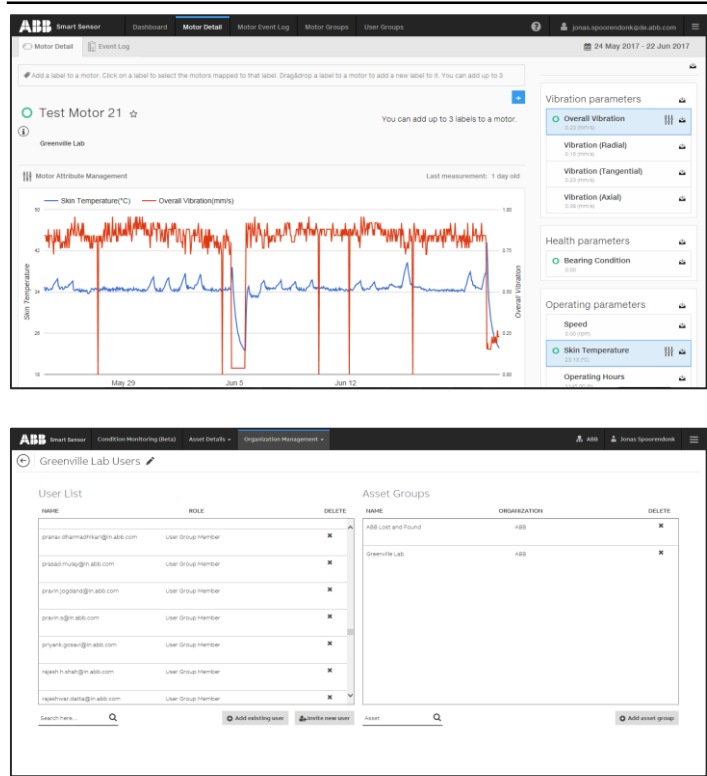(Firmware Over-The-Air,
i.e. updates via smartphone or
gateway)

The sensor mount is **installed** on the
cooling ribs of the motor with a
clamping bracket.

No machining or electrical wiring
required

Bluetooth®
low energy technology

* Certification for hazardous area in progress
** Can vary in an industrial environment depending on the facility layout

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ABB Ability™ Smart Sensor for motors
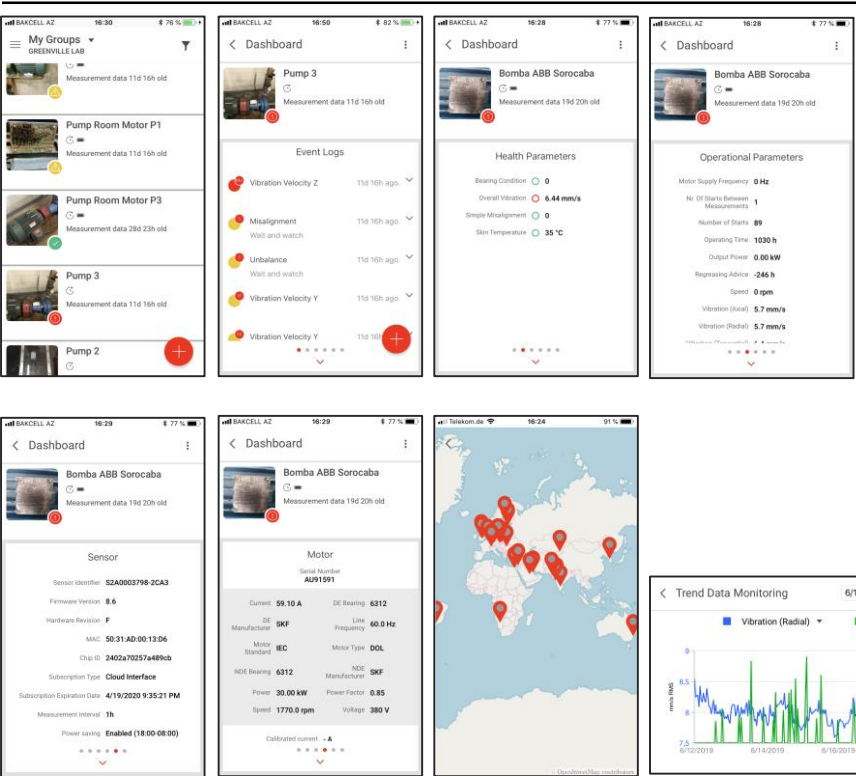
Web portal and app

Web portal

The portal is used to

– show trends and historical data

– manage user access rights

– set alerts and alarm

App

– The app gives easy over-views of the status of the assets

– It is useful for a technician on the move in a factory

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Use cases

ABB Ability™ Smart Sensor

Basic use case – condition monitoring

Imagine owning a fan and motor mounted in the ceiling …

Without sensor

Nobody ever goes near that motor.

You will be surprised when it fails, then you will:

– Pull the spare motor out of your warehouse

– Find an electrician and beg him to come

– Get the mobile lift in place

It will take at least one day to replace the motor, even if you have a spare in stock.

If the process or the driven equipment was damaged by the unexpected motor failure, time and cost can be multiplied by ten.

With sensor

Nobody ever goes near that motor.

You will get a warning in your Smart Sensor app before anything has happened, then you will:

- Order a new motor from your nearest ABB Value Provider

- Book the mobile lift for Tuesday

- Technician comes Tuesday with motor

- Process run down and run up in an orderly fashion

Within two hours it is replaced.

Without a spare motor in stock and without an electrician on standby.

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Selected references

Olam International, Asia

Supplier of food and industrial raw materials

Who is the customer?

- Olam International is a supplier of food and industrial raw materials

- Olam has around 30,000 motors across 70 factories globally. Their reliability and performance is critical for a smooth production
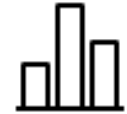
What did they buy?

- ABB Ability™ Smart Sensors for LV motors (approx. 100)
- Olam first installed the ABB Ability™ Smart Sensor for motors at its cocoa factory in Singapore, followed by its dairy processing plant in Malaysia and its sugar refinery in Central Java, Indonesia.

Why did they buy?

Availability   **Productivity**

- In the past, the monitoring of a motor was a manual process, consuming time and labor

- The sensors monitor motors remotely, enabling predictive maintenance, substantially reducing downtime and extending equipment life.

- The savings from preventing only one motor failure has already recovered Olam's investment in equipping smart sensors on a number of motors at its factories

https://new.abb.com/news/detail/6529/global-agribusiness-reduces-motors-downtime-with-abb-smart-sensors

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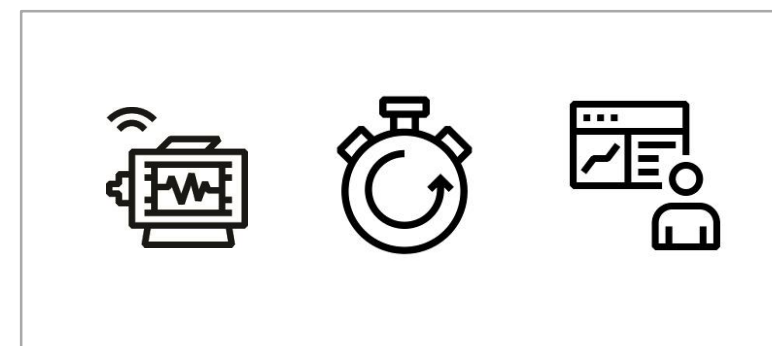# Pågen AB, Malmö, Sweden

Bakery

Who is the customer?

- Pågen AB is the leading bakery in Sweden
- Family owned since 1878 with around 1500 employees
- Bakeries are located in Malmö and Gothenburg
- Revenue: 300 MUSD
- High grade of automation
- 2018 investment of 60 MUSD to expand capacity

What did they buy?

- First ABB Ability™ Remote Assistance Level 1 Service contract in Sweden with ABB Ability™ Condition Monitoring for LV motors
- 12 Ability™ Smart Sensors and 2 gateways

Why did they buy?

- Replace hand held vibration measurements 4 times/year with ABB Ability™ solution for condition monitoring
- Updates 1 time/hour, remote connection
- First problem, high vibrations, discovered within **48 hours** from startup
- Defective fan replaced as planned maintenance without loss of production