IOT SOLUTIONS WORLD CONGRESS

Overcoming The IIoT Challenges of Condition Monitoring & Predictive Maintenance

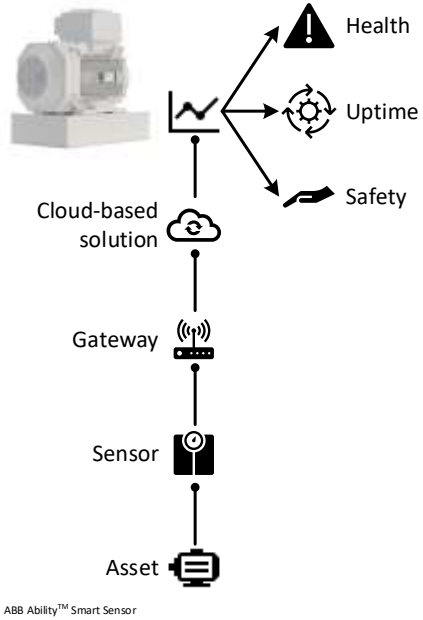
Presenters: Sven Koos, R&D Head of Software Development, ABB
Van Krueger, VP. of U.S. Operations, Cassia Networks

Agenda

- Targets and challenges for asset monitoring and predictive maintenance
- Requirements for a scalable, flexible and secure connectivity solution from sensor to cloud
- Business models for asset monitoring in Industry X

Targets and challenges for asset monitoring and predictive maintenance

Ensuring uptime and reducing safety hazards of installed base



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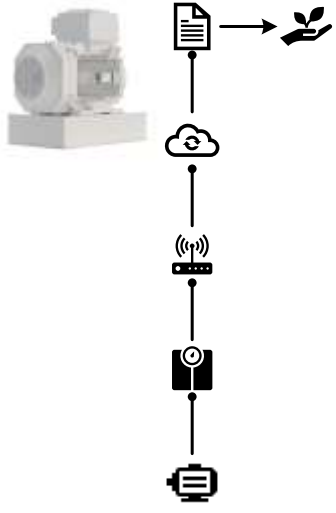
Targets and challenges for asset monitoring and predictive maintenance

Saving energy



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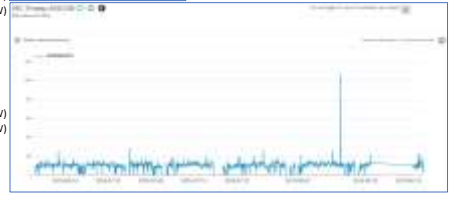
Energy assessment and motor replacement proposal

Användare			
Plats			
Mätningar			
Start	2019.06.19 15:00		
Stopp	2019.08.21 07:00		
Tid	1504	timmar	
Tid stopp	145	timmar	
Op. %	90%		
Antagande			
Tid per år op.	7915	timmar	
Energi	0.7	SEK/KWh	
Mätningar			
Max Effekt	280	kW	
RMS Effekt	93.7	kW	
Beräkningar			
Verkningsgrad	92.40%	(93,7 kW)	
PF	0.7	(93,7 kW)	
Skenbar effekt	133.9	kVAs	
Reaktiv effekt	95.6	kVAr	
Förluster	56368	kWh/år	
Förluster	39457	SEK	
Alternativt 250 kW, DOL IE4, SH355			
Verkningsgrad	96.30%	(93,7 kW)	
PF	0.69	(93,7 kW)	
Skenbar effekt	135.8	kVAs	
Reaktiv effekt	98.29	kVAr	
Förluster	27442	kWh/år	
Förluster	19209	SEK	

Motor MC pump 651030

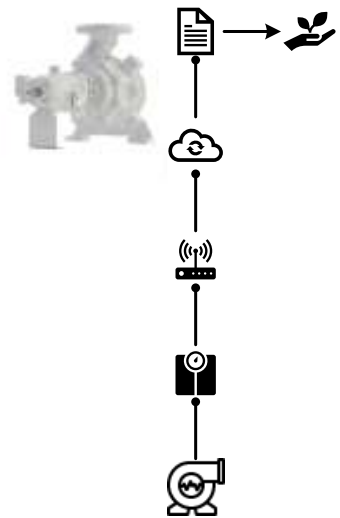


Märkskylt

Märke	Strömberg	
Ålder	>33	år
LCA	Obsolete	
Verkningsgrad ny	94.00%	(EN/IEC 60034-2-1:2(
Antal omlindningar	0	
Rev.verkningsgrad	94.00%	

Targets and challenges for asset monitoring and predictive maintenance

Saving energy



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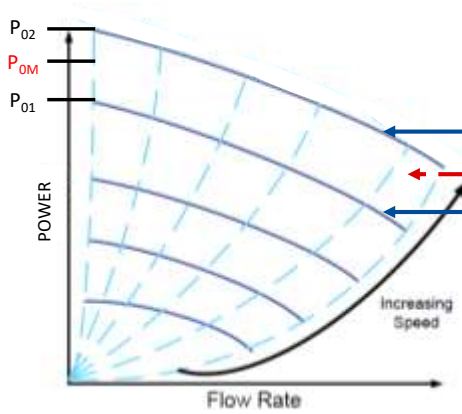
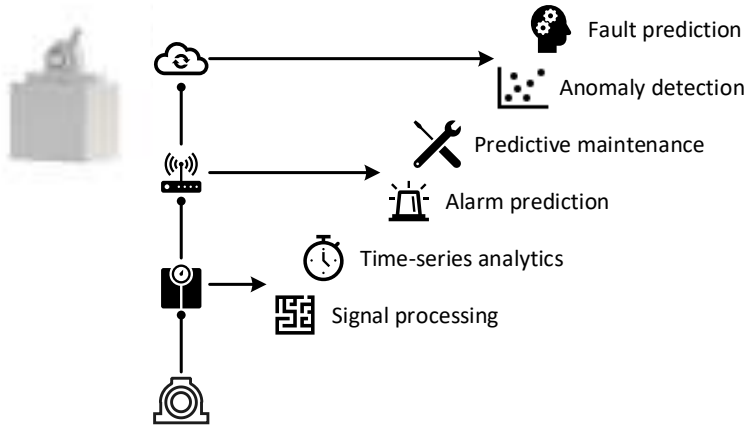
Operating point vs. efficiency curve of a pump



Shaft speed :	**1210 rpm**
Flow rate :	106 m3/h
Differential head pressure :	19.5 m
Pump efficiency :	55.2 %
Pump absorbed power :	10.2 kW
NPSH3% :	2.28 m
% of the best efficiency flow :	55 %

Targets and challenges for asset monitoring and predictive maintenance

Analyzing data



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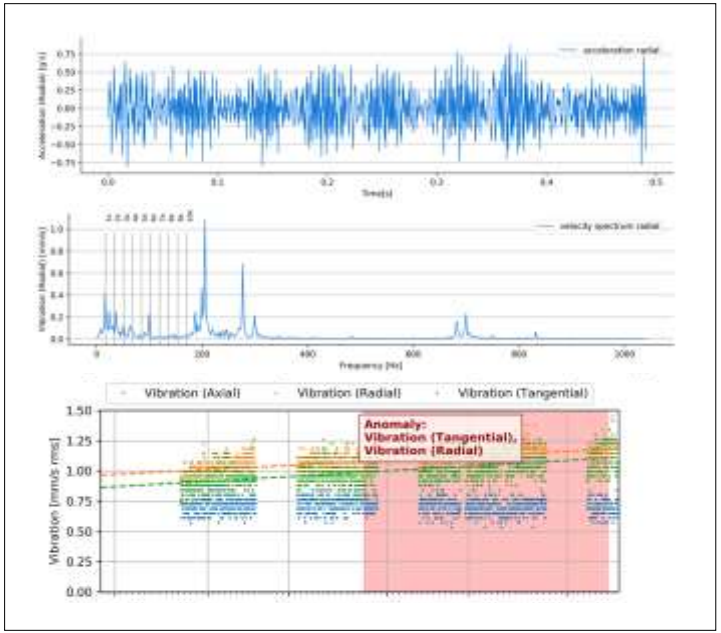
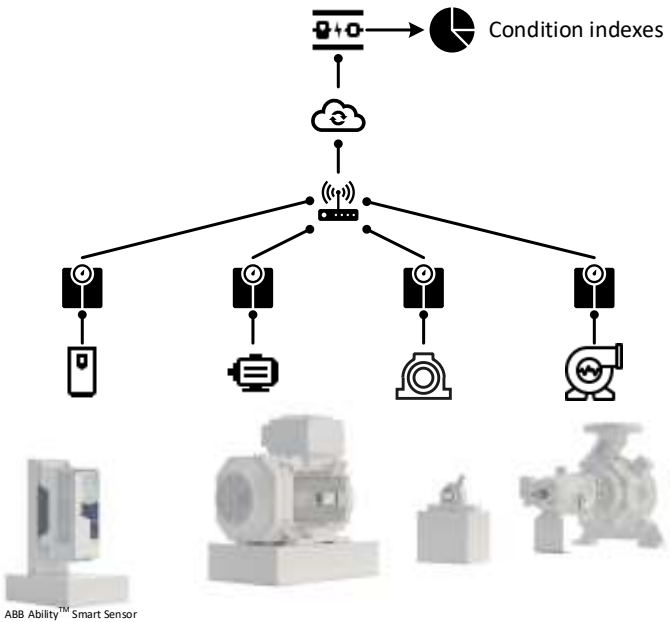


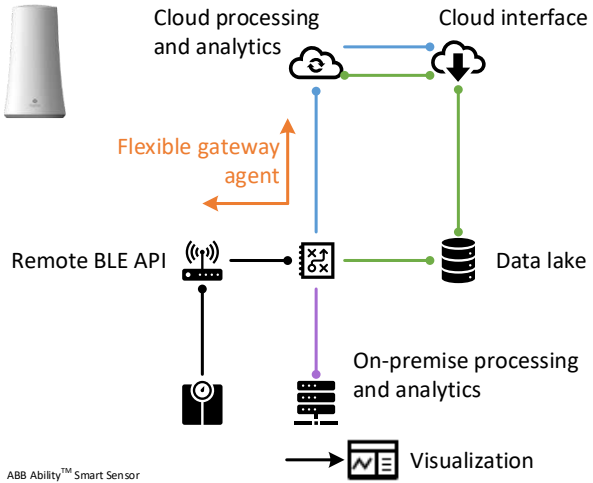
Targets and challenges for asset monitoring and predictive maintenance

Monitoring of the entire powertrain



Targets and challenges for asset monitoring and predictive maintenance

Managing the data path



Requirements for Scalable, Flexible and Secure Connectivity

Why Bluetooth  for Device Connectivity?

- Low power
- Low cost
- Open protocol
- Universally available
- Shorter Deployment Cycle

Bluetooth Low Energy Limitations

Poor Range

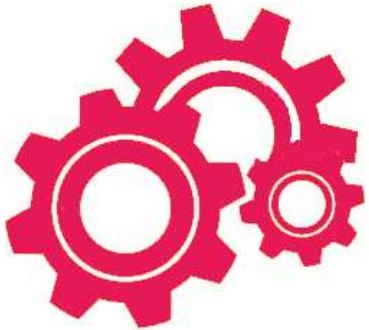
One-to-One Pairing

No Remote Control

Not Easy to Manage

Advantages of using a Bluetooth IoT Gateway

Scalable



Flexible

Secure

Scalability

Range:
Bluetooth 4.x – up to 300 meters
Bluetooth 5 – up to 1 kilometer

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Connectivity:
Bi-directional - up to 40 Devices

Vibration

Safety

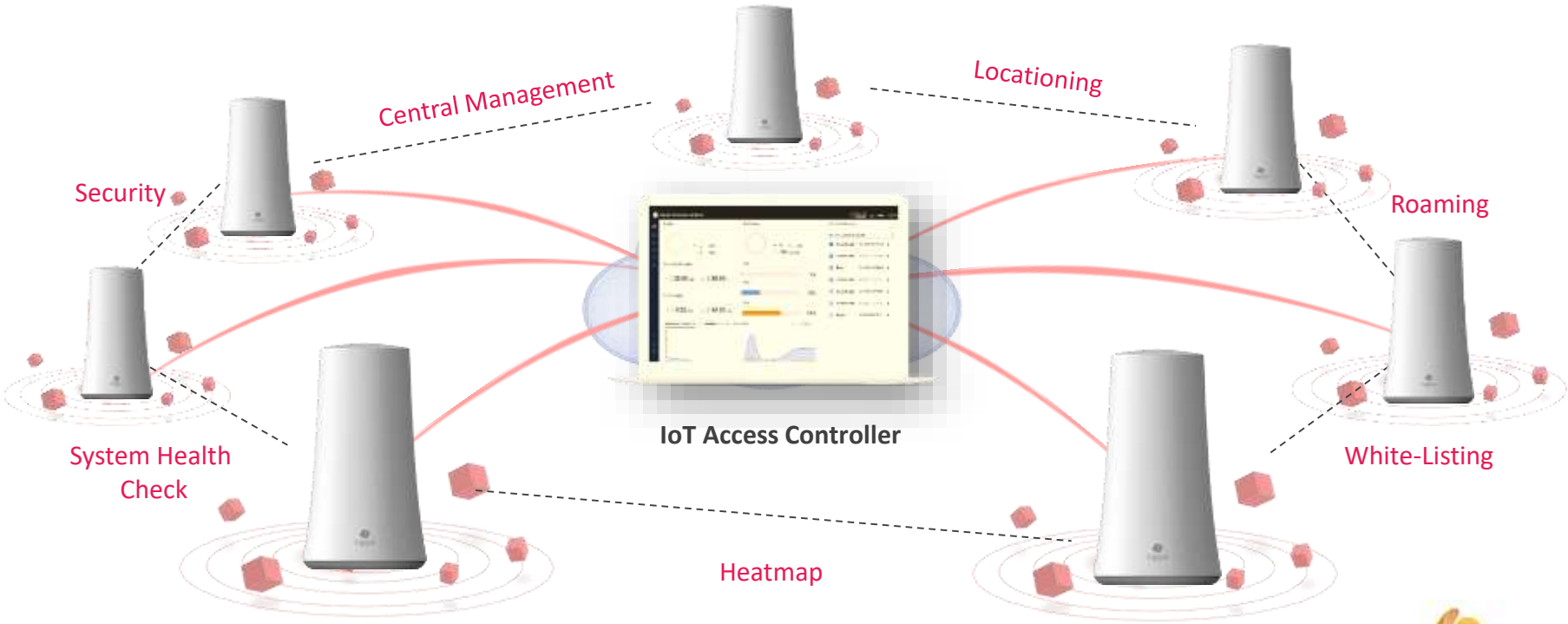
Temperature

Flow

Assets

Lighting

Remote Control: East Setup & Management



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Flexibility

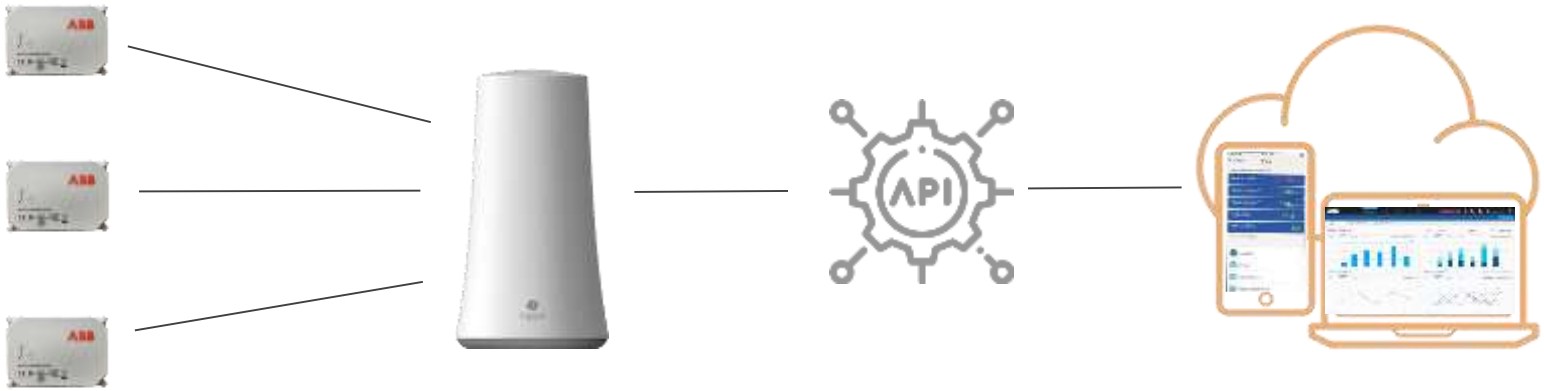
Network Access

Ethernet

Wi-Fi

Cellular Modem

RESTful API's



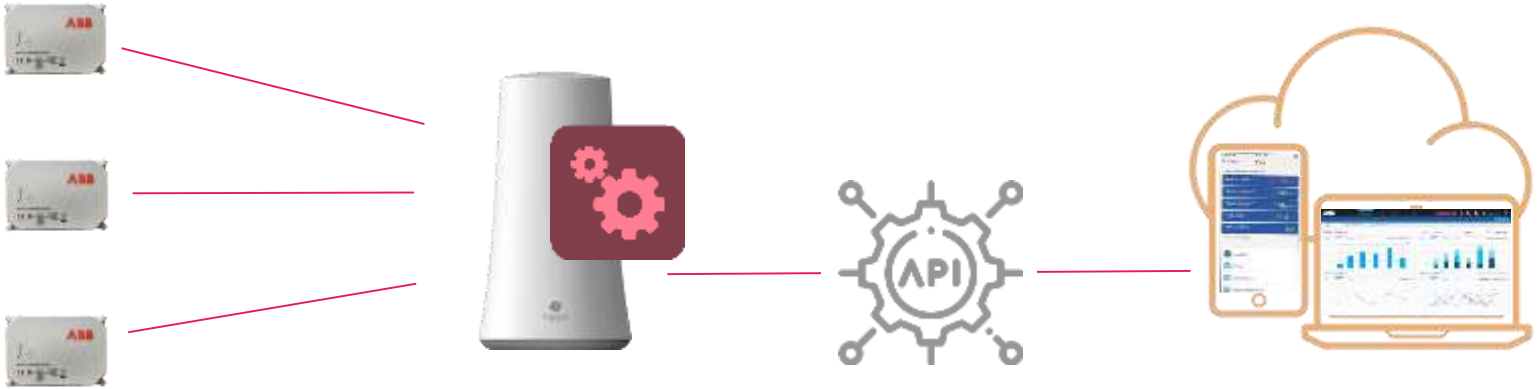
Bluetooth Low Energy Devices

Gateway

RESTful API's

Mobile App, Cloud or Local Server

Edge Processing



Bluetooth Low Energy Devices

3rd Party Applications

RESTful API's

Mobile App, Cloud or Local Server

Security

User and Device Access

- Password protected access to web consoles
- Role-based permissions
- Encrypted storage of passwords
- White listing of routers and end devices

Bluetooth Low Energy Secure Pairing

Just Works

Passkey Entry

Legacy OOB

Security OOB

Numeric Comparison

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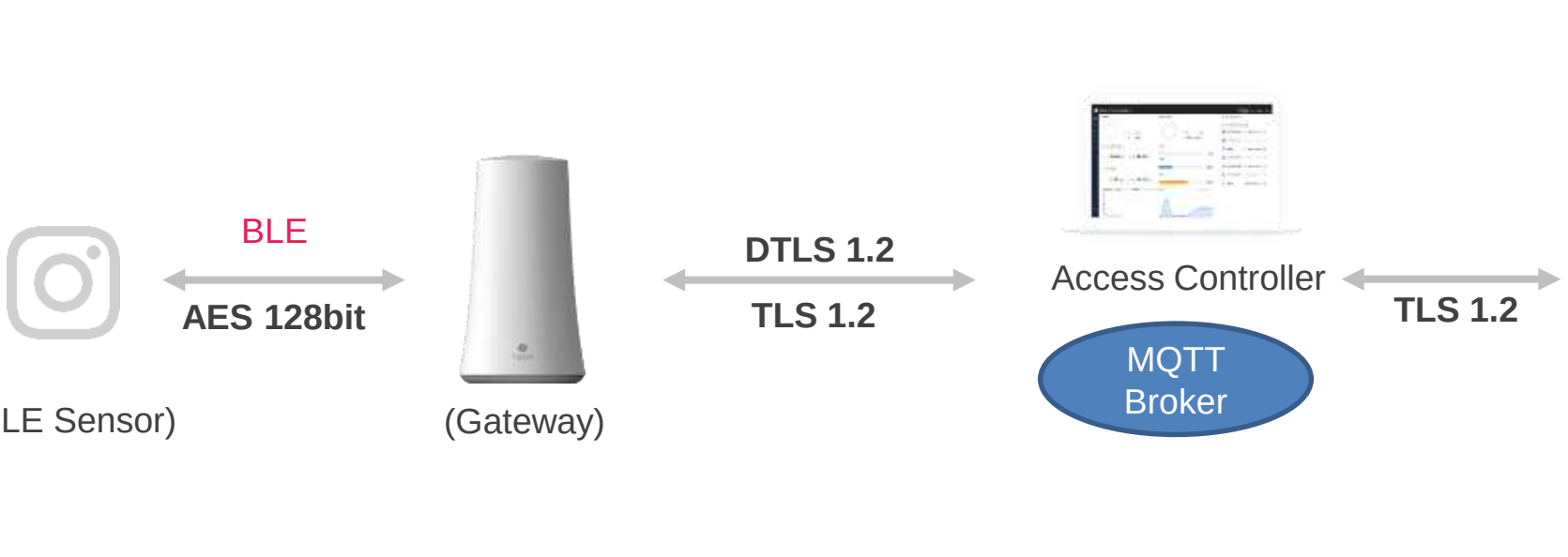
End-to-End Encryption



Business Models for Asset Monitoring in Industry X

Business models for asset monitoring in Industry X

Condition monitoring as a service

Installation, surveillance, service, replacement, energy upgrade, etc. 7/24. Quarterly follow up with customer on uptime improvements, disturbances, energy consumption, etc.	Level 5	ABB owns assets and stock.
Bi-annual common assessment on events, faults, uptime, dimensioning, LCA and CoO by local ABB unit	Level 4	Lease or buy sensors and subscription
ABB Center of Competence surveillance, call customer and provide remote support. / Alarm level calibration	Level 3	Lease or buy sensors and subscription
ABB provides 4 health and condition reports yearly. Customer enables access to condition monitoring data. / ABB monitors gateway and sensor functionality and notifies customer.	Level 2	Lease or buy sensors and subscription
ABB provides circular economy by recycling of sensors. / Local ABB unit provides remote commissioning support.	Level 1	Buy sensors and subscription

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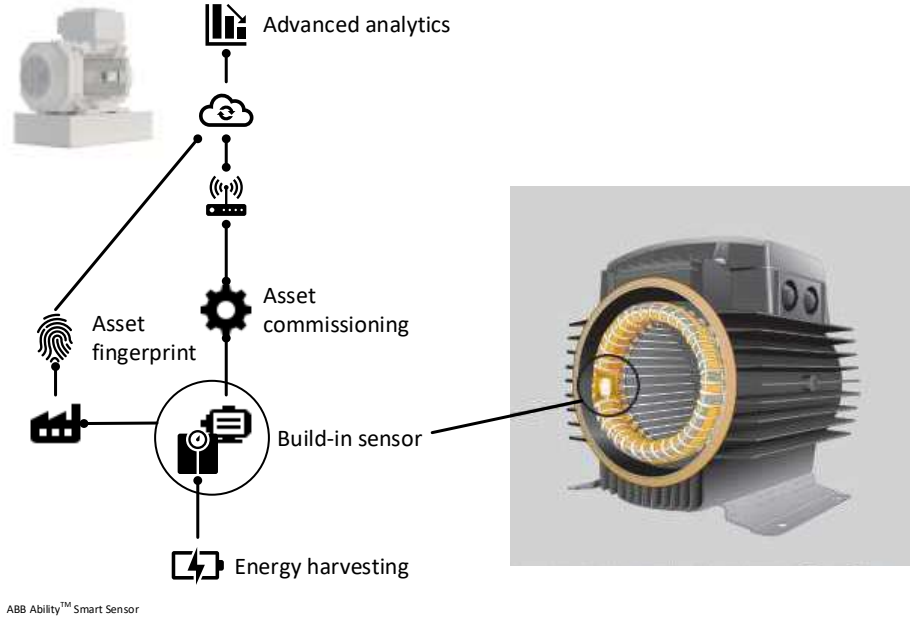
Business models for asset monitoring in Industry X

Asset – sensor bundle as a service



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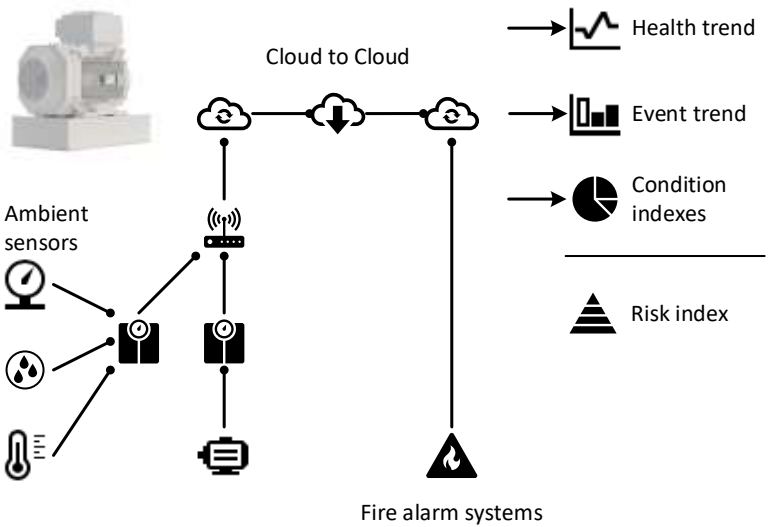
Business models for asset monitoring in Industry X

Asset insurance as a service



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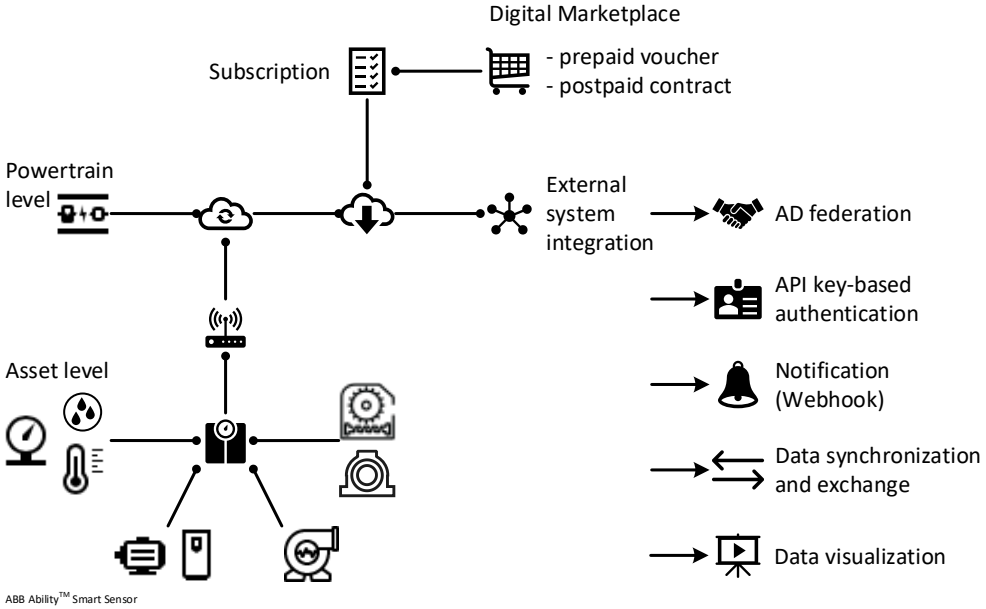
Business models for asset monitoring in Industry X

Integration services



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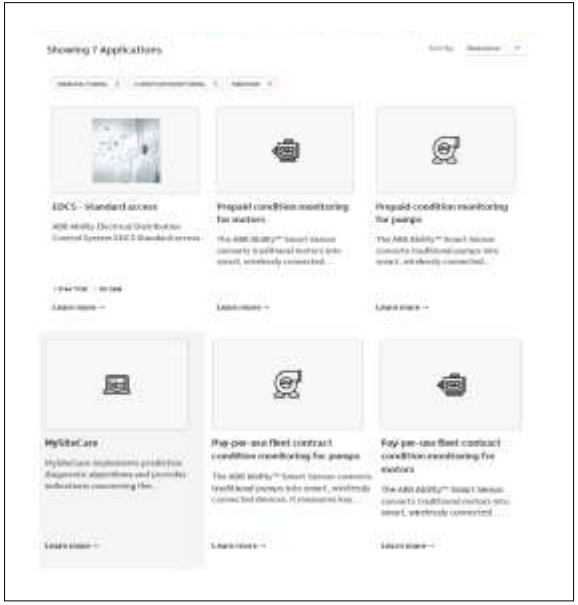

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Thank You!

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SAVE THE DATE
29 - 31 October 2019

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