



SEPTEMBER 2017

# Trends in Automation

ABB Users Group: Tri-Cities

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# Agenda

Industry Challenges

Digital Technologies

Trends in Industrial Automation

Project Execution

The Digital Revolution

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# Industry Challenges

## Basic end user challenges haven't changed much

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- Unscheduled downtime
- Legacy assets / lifecycle cost
- Retiring workforce / knowledge transfer
- IT & OT groups function as silos
- Economic factors

## But there are other factors now

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- Technology is changing fast
- Skills requirements are also changing
- New workers want to work differently

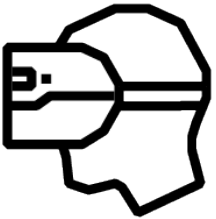


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# Digital Technologies

Driving innovation

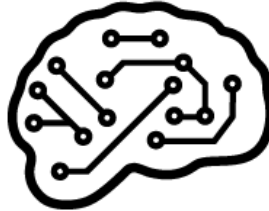
Virtual/ augmented  
reality



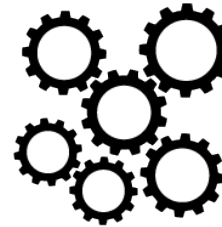
Software-defined  
machines



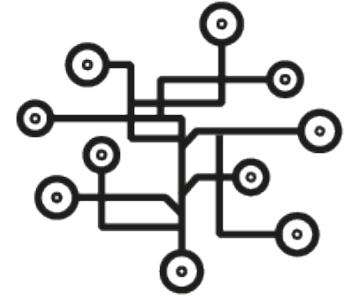
Machine learning



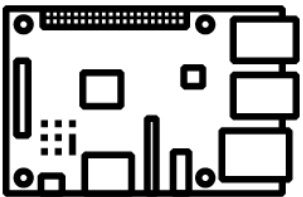
Time-sensitive  
networking



Big data



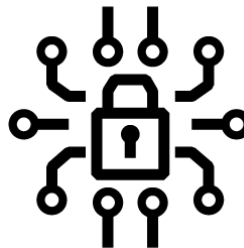
Inexpensive computing



Cloud computing



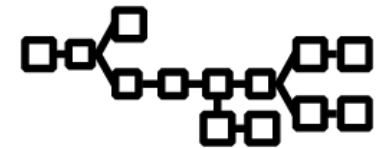
Cybersecurity



Connectivity



Blockchain



# Trends in Industrial Automation

## Automation industry is evolving quickly

- IT / OT convergence
- Commercial product adoption in automation
- Open, standards based and interoperable systems
- Lean automation architecture
- Portable applications
- Procedural automation
- Modularization
- Project Execution
- Industrial Internet of Things (IIoT)



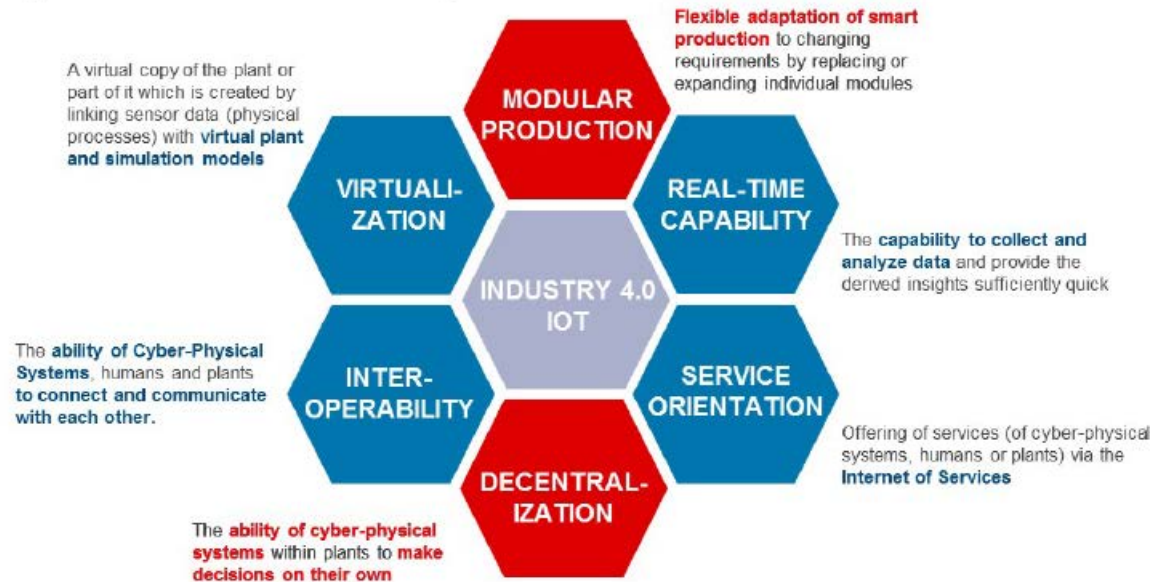


# Trends in Industrial Automation

## Modularization

### NAMUR

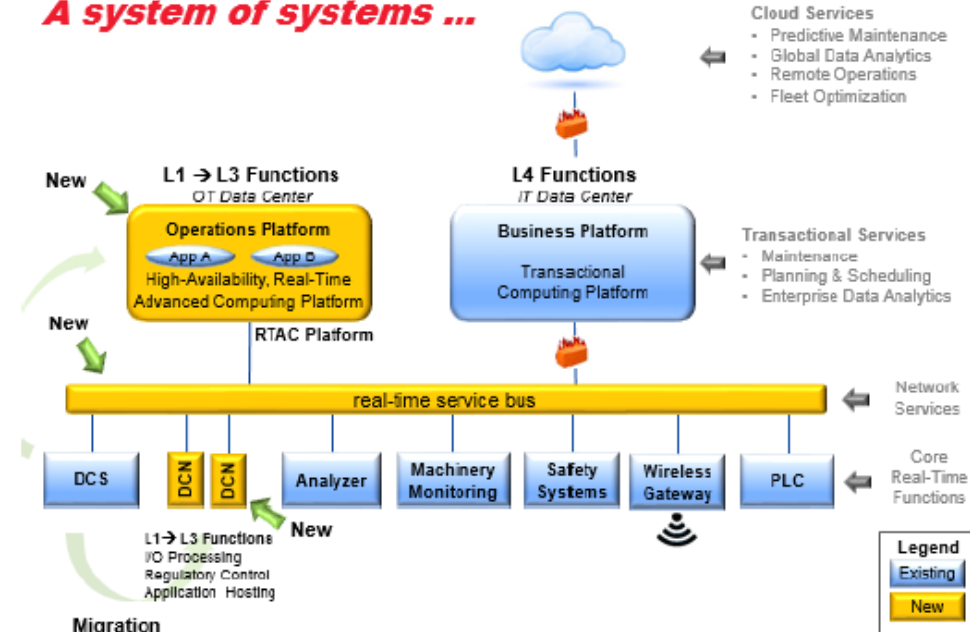
#### Modular Production and Decentralization are Key Elements of Industry 4.0 and IOT



Key Elements of Industrie 4.0 and IoT (Source: NAMUR)

### The Open Group / ExxonMobil

#### A system of systems ...



ExxonMobil's Open System Architecture Vision (Source: ExxonMobil)

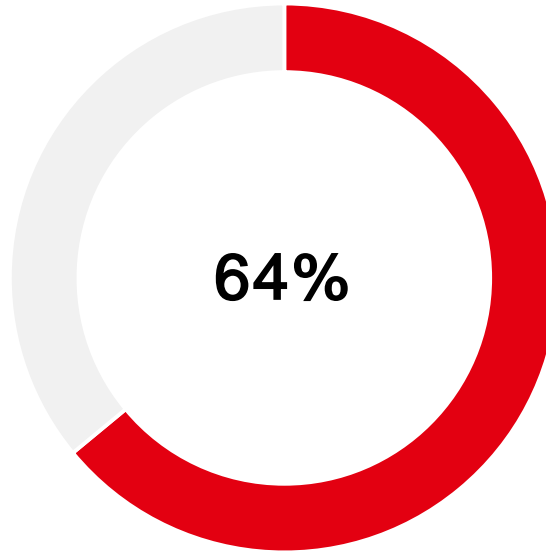
# Project Execution

What is the problem?

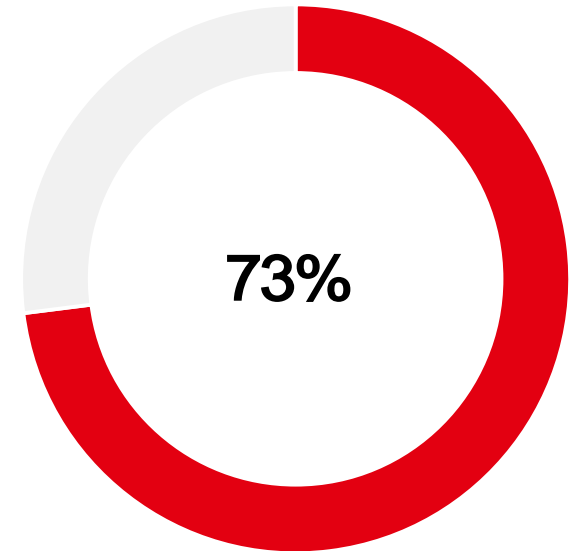
Oil, gas and chemicals projects have been engineered the same way for decades.

**New approaches are required and expected to drive significant project and lifecycle savings.**

**64% of projects today are facing cost overruns\***



**73% are reporting schedule delays\***

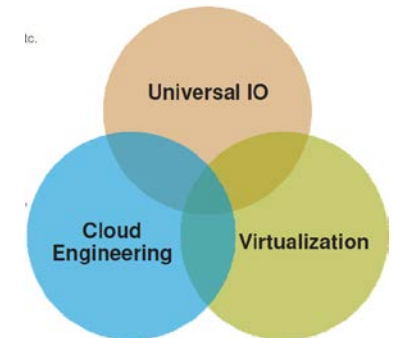
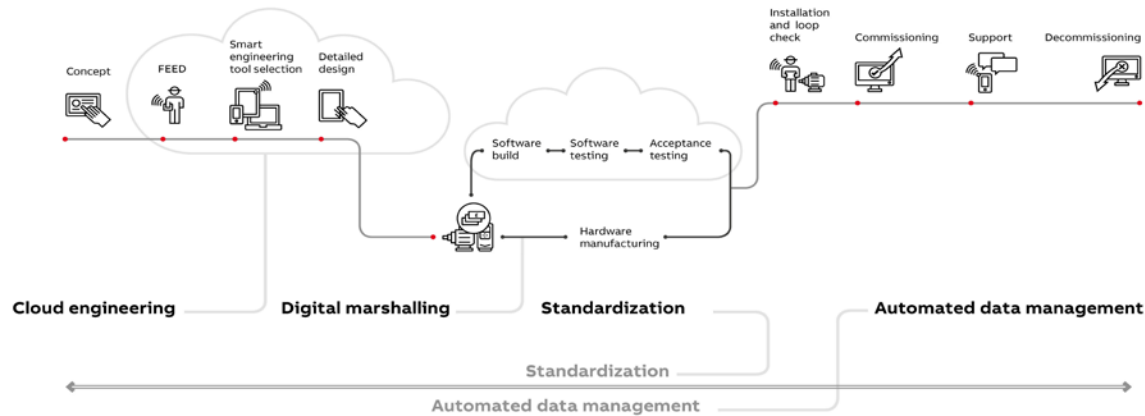


# Project Execution

## Things need to be done differently

- Large greenfield projects
- Leverage new technologies
- DCS vendors / EPC's focus on Project Execution

## ABB Intelligent Projects





# The Digital Revolution

## Digitization of Industry

- Cloud & Fog computing
- Advanced Analytics
- Artificial Intelligence
- Edge Devices
- Digital Twins
- Augmented Reality / Virtual Reality
- “... as a Service” / Business models
- Mobility
- Rise of system integrators and application developers
- Hybrid IIoT approach (Edge + Cloud)
- Driving new skill areas in industry



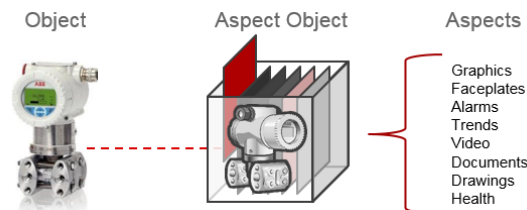
### Virtual Reality

VR in control room design



### Augmented Reality

Ramp Handling at Changi Airport



### Digital Twins

Digital representation of a physical object



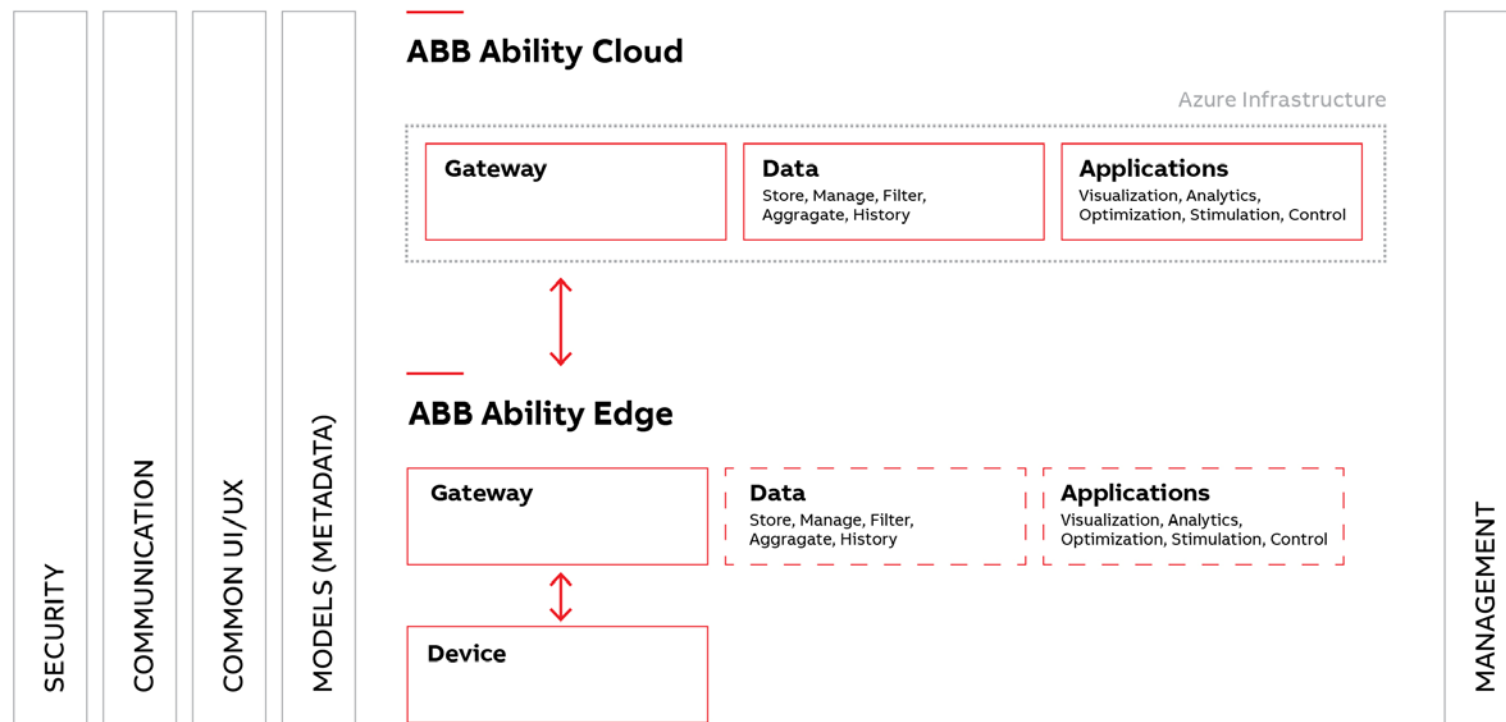
### Machine Learning

Targeted herbicide spraying

# The Digital Revolution

## ABB Ability™ Platform

At the core of ABB's digital solutions

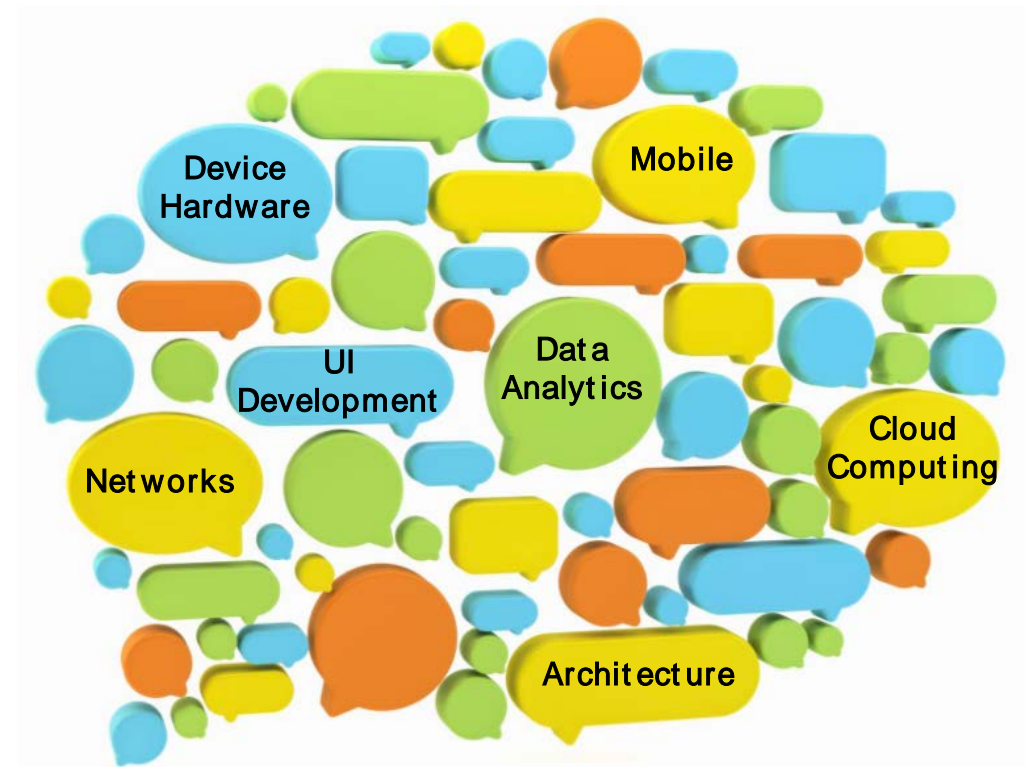


# The Digital Revolution

The future will be different

## Random thoughts

- Digital transformation will be critical to success
- But digital is only part of the story...
- There are still challenges to overcome:
  - Cyber security
  - Data security
  - Confidentiality / privacy
- IIoT is NOT one size fits all
- Humans will still play a critical role:
  - Knowledge capture
  - Data only produces insights, people take action
  - Technology and skill sets will change
- Things will be done very differently



**ABB**

# How is Collaborative Operations different from our digital offerings?

Digital offerings produce actionable insights; Collaborative Operations amplifies actions *through people*

