# Digitalizzazione dell'Industria manufatturiera

## Soluzioni per una manutenzione intelligente

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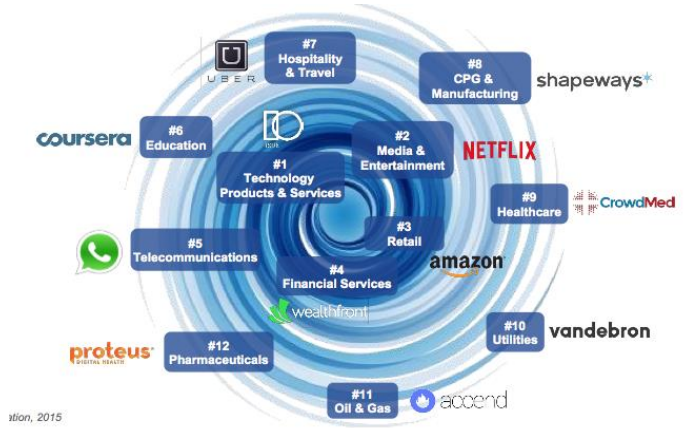
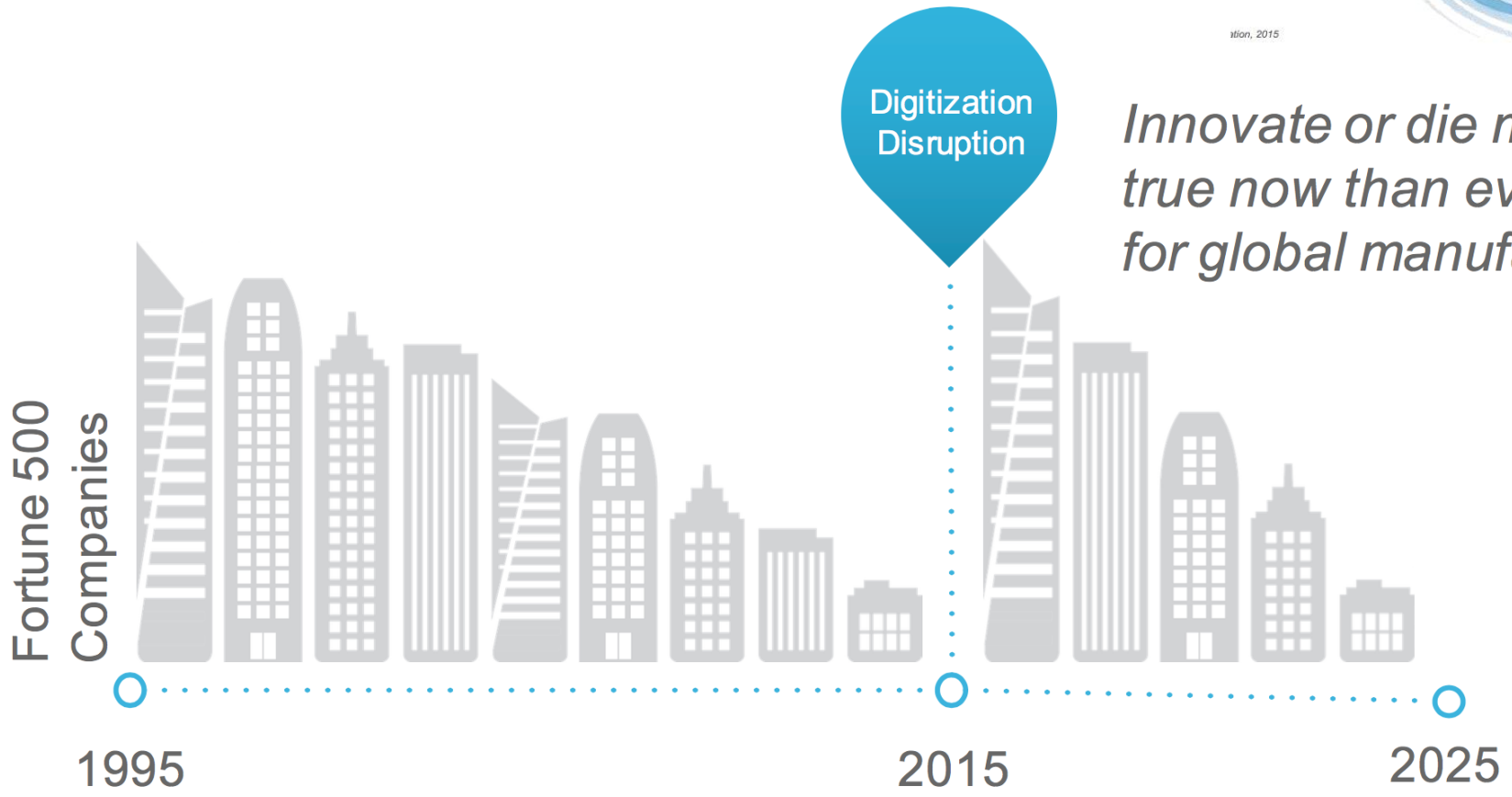
# Digitization

## Disrupt or Be Disrupted




*Innovate or die more true now than ever before for global manufacturers*

# Industry 4.0

# =

# Digital Transformation of Manufacturing

The use of technology  to radically improve operations.

# Digital Manufacturing Driving Business Outcomes

## Reduced Downtime

48%

Unplanned downtime down from 11% to 5.8%

## Reduction in Defects

49%

Defect rate down from 4.9% to 2.5%

## New Product Introduction

23%

New product introduction cycle time reduced from 15 to 11

## OEE Improvement

16%

Average OEE improved from 74% to 86%

## Improved Inventory

35%

Inventory turns increased from 14 to 19

## Reduction in Energy Use

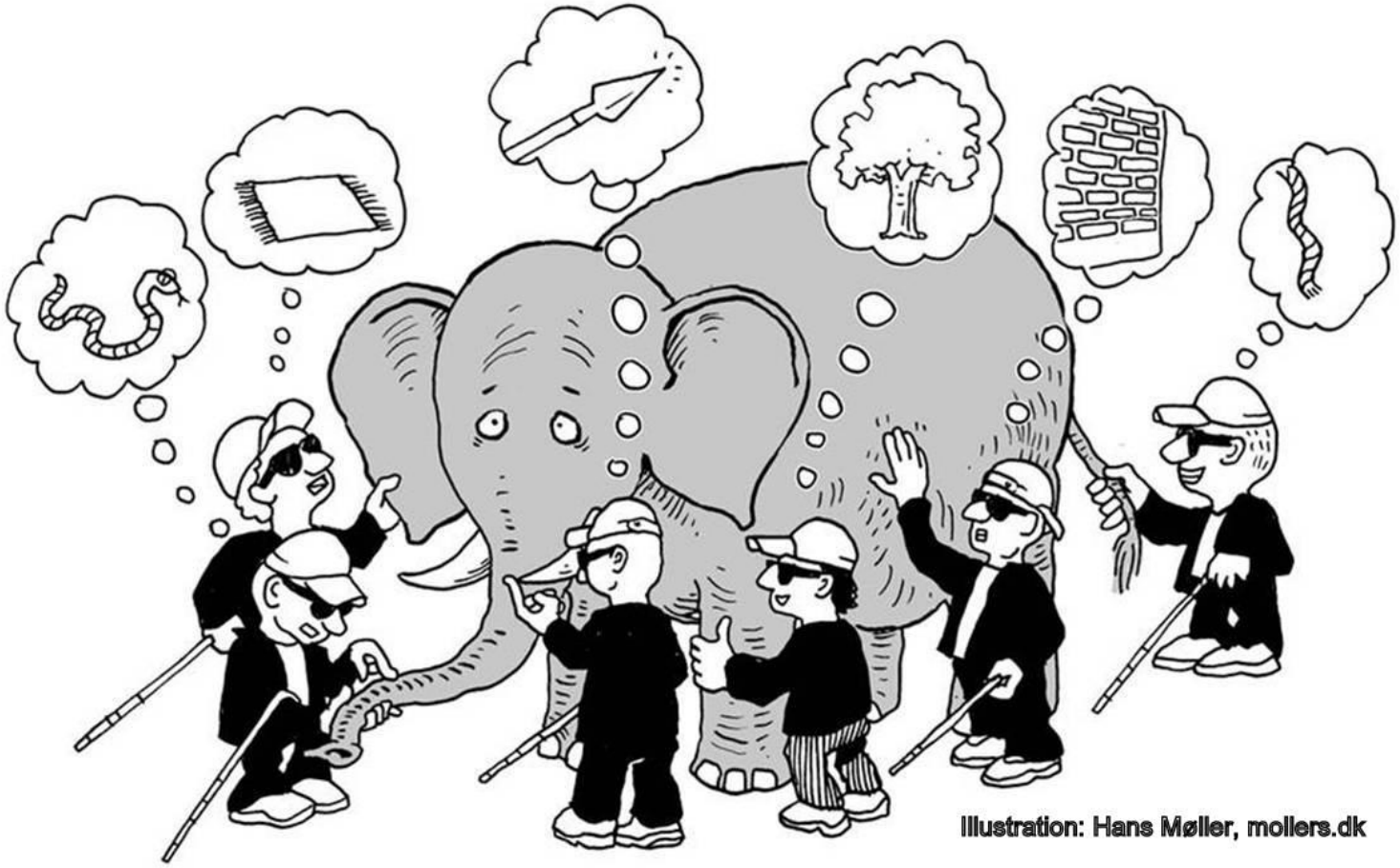
18%

Annual energy cost down from $8.4M to $6.9M

SCM World

Source: SCM World/Cisco “Smart Manufacturing & the Internet of Things 2015” survey of 418 Manufacturing Business Line Executives and Plant Managers across 17 vertical industries.

# What’s IoT? What’s Industry?

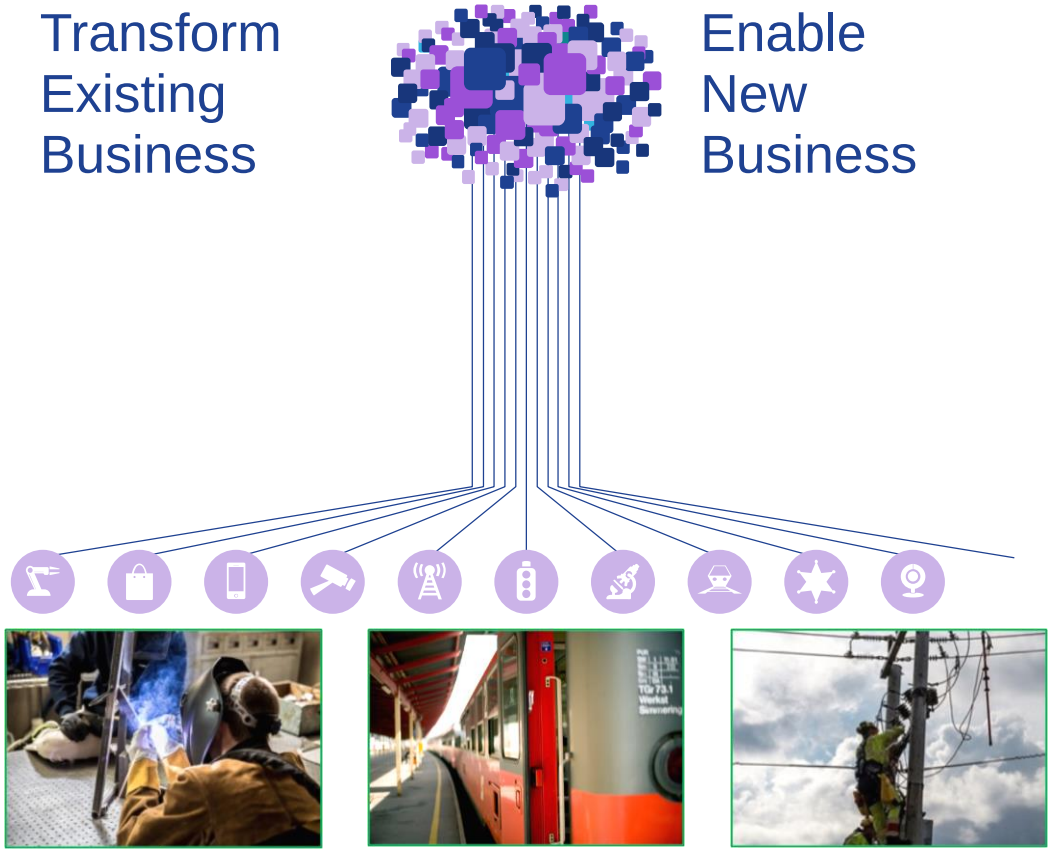


# A Common View of IoT

APPLICATIONS:
IoT Unlocks Digital Business Value

Transform Existing Business

Enable New Business

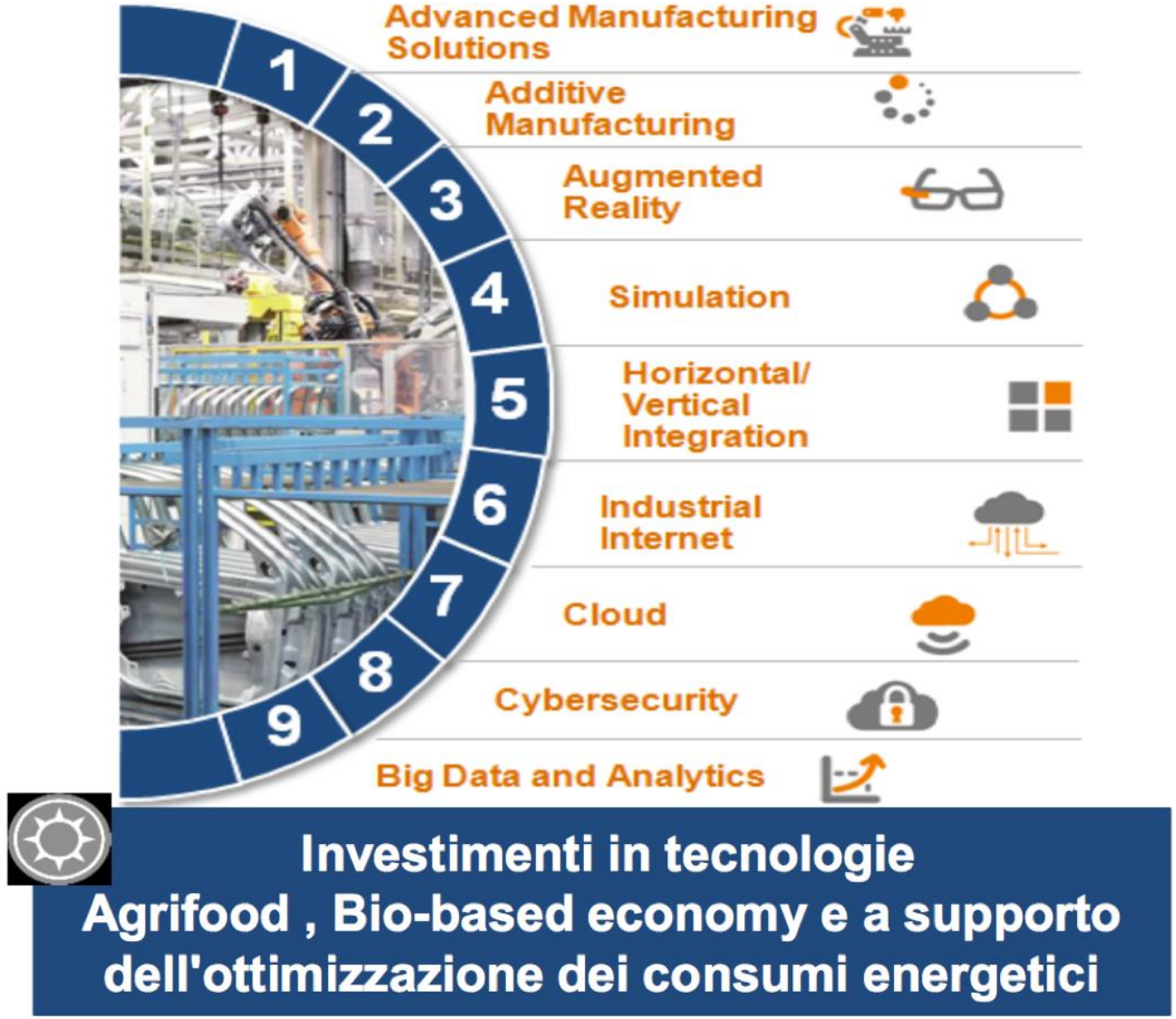


Source – McKinsey: The Internet of Things: Mapping The Value Beyond The Hype

**Where Is the Value**

- 50 billion smart devices by 2020
- Convergence across organizations (IT, OT, HR)
- <1% of data currently used; more can be used for optimization and prediction
- Interoperability across siloed systems required to capture IoT value

# Industry4.0: The power of combination



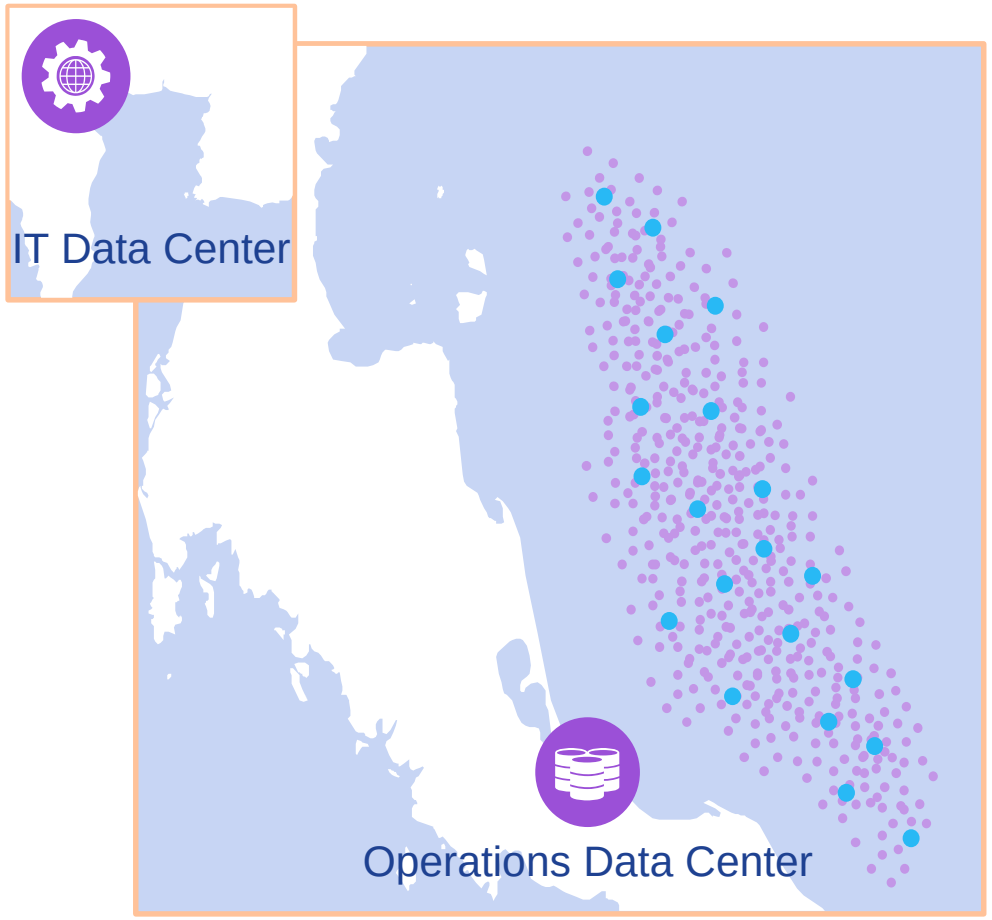
# The Real World

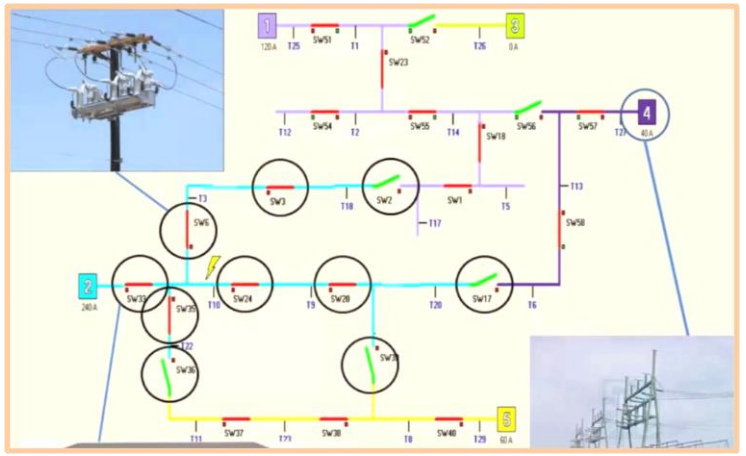
Data Constraints

- Acoustic and temperature sensors: 1 GB/day each
  Latency Constraints

Smart grid fault restoration

- Response latency of < 50 ms



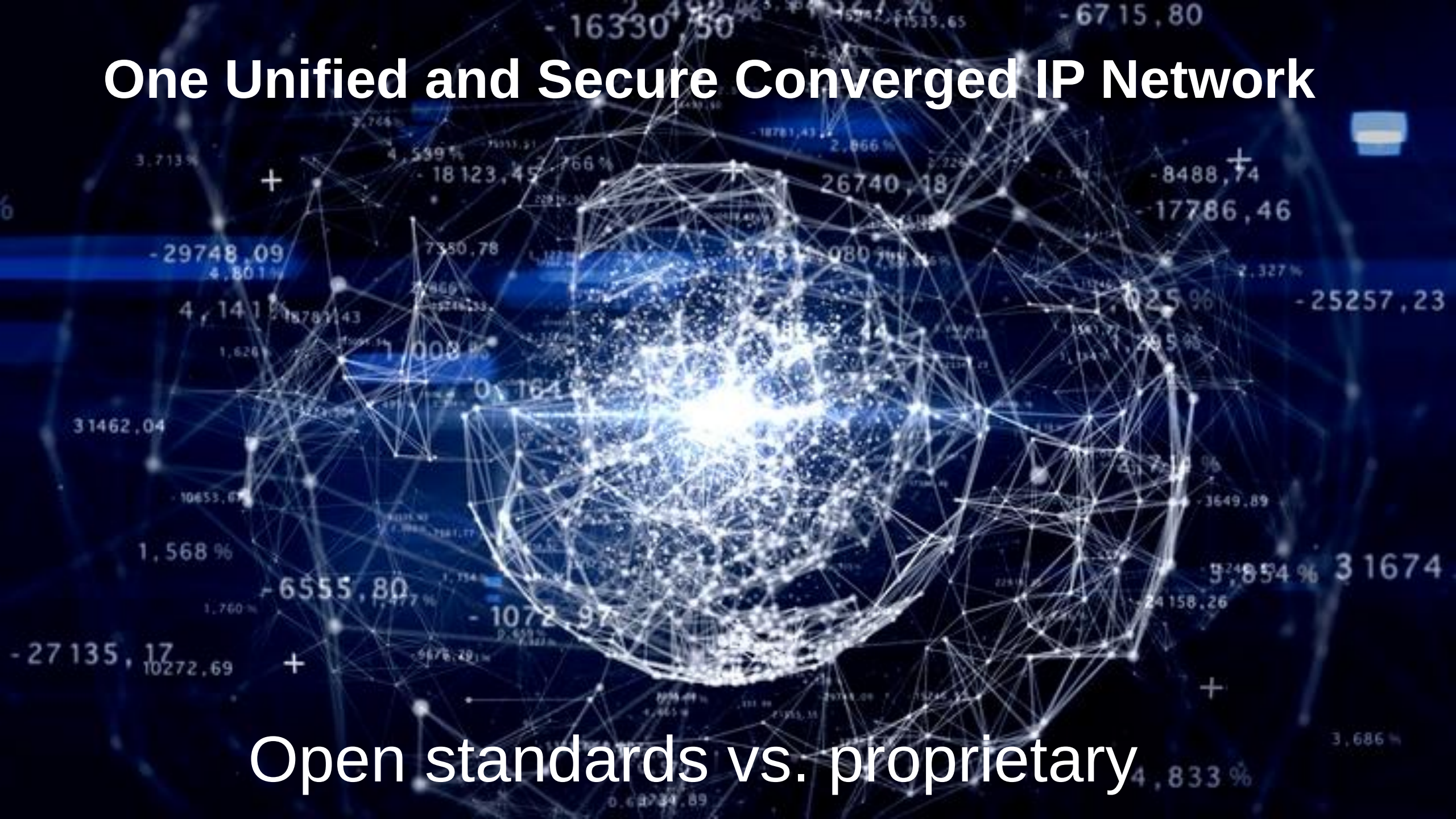
# Cisco Industry 4.0:  Strategy Execution

Build

Partner

Co-Develop

# One Unified and Secure Converged IP Network



Open standards vs. proprietary

# The Connected Factory

Factory Analytics and Big Data

Factory Virtualization

Factory Wireless

Factory Network

Factory Compute

Connected Assets

Connected Machines

Factory Collaboration

Factory Security

# Digital Manufacturing Journey

TODAY

Plant partially connected:

Single layer LAN
Low segmentation
Low security
Low Security
Proprietary silos

1

Factory Network:

Open standard-basesd
Integrated
Secure
Centrally managed

2

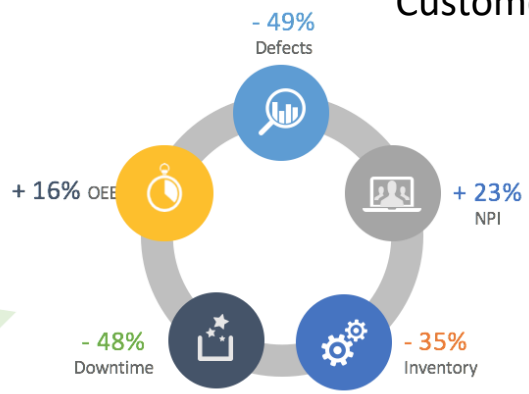
Advanced services:

Collaboration
Asset tracking
Safety
Analytics

3

Digital Supply Chain

Production
Logistic
Suppliers
Sales
Customers




| Off-Line | Connected Factory | Connected Enterprise | Supply Chain Orchestration |
|---|---|---|---|
| | Factory Network | Analytics & Big Data | Supply Chain Collaboration (SXP) |
| | Factory Security | Virtualization & Compute | Design Collaboration |
| | Factory Wireless | Connected Machines | |
| | | Factory Collaboration | |
| | | Location Services | |

# Architecture 4.0 – Factory Network

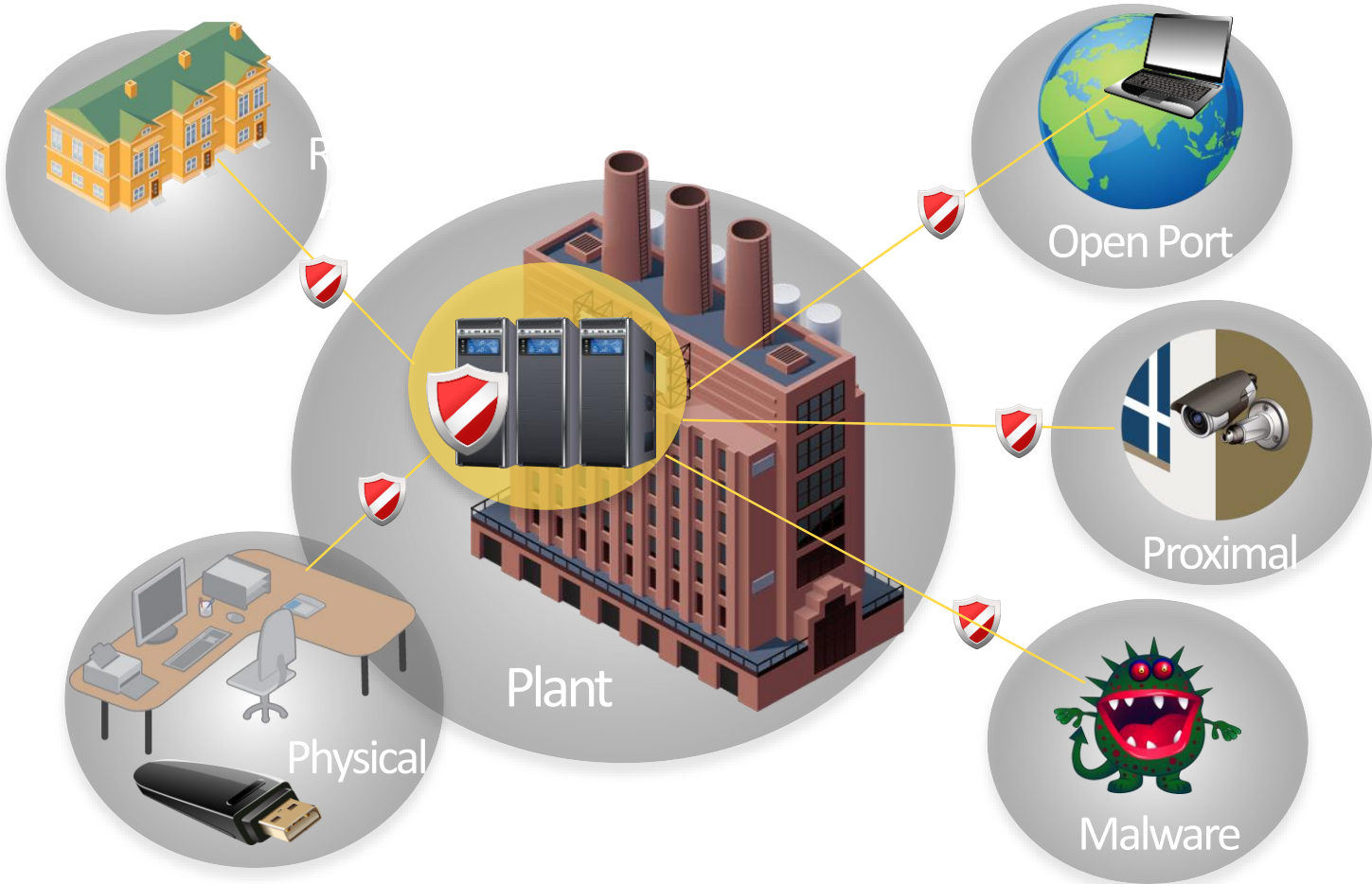
## Foundation between Automation Layer and Enterprise Network

- 1 Network
  - Open, Standard-based, Secure, Scalable
- Integrates Manufacturing Systems + Business networks
- Enables real time visibility to business applications
- Reduce downtime
- Improved OEE and productivity
- Increase safety

Case history

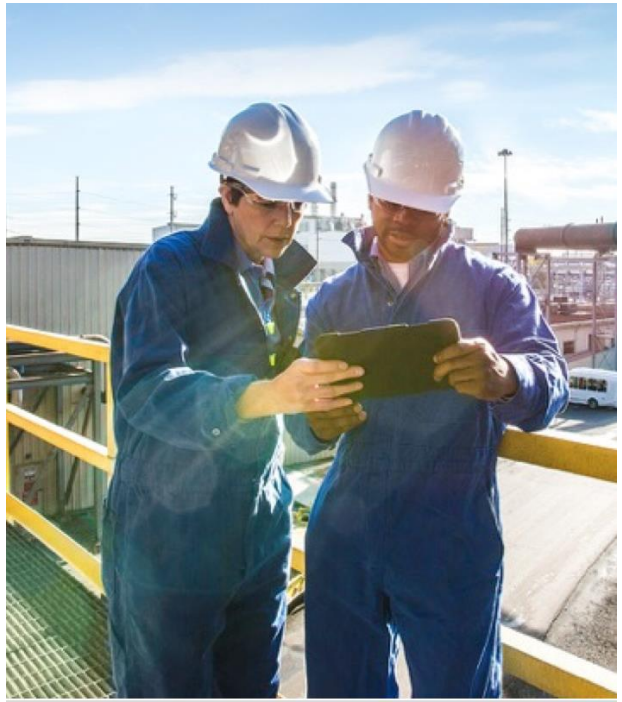
# Security 4.0

- Plant safety, availability, integrity, intellectual property defense
- Business continuity
- Quick crisis management and response
- Security North-South
- Security West-East



# Mobility 4.0

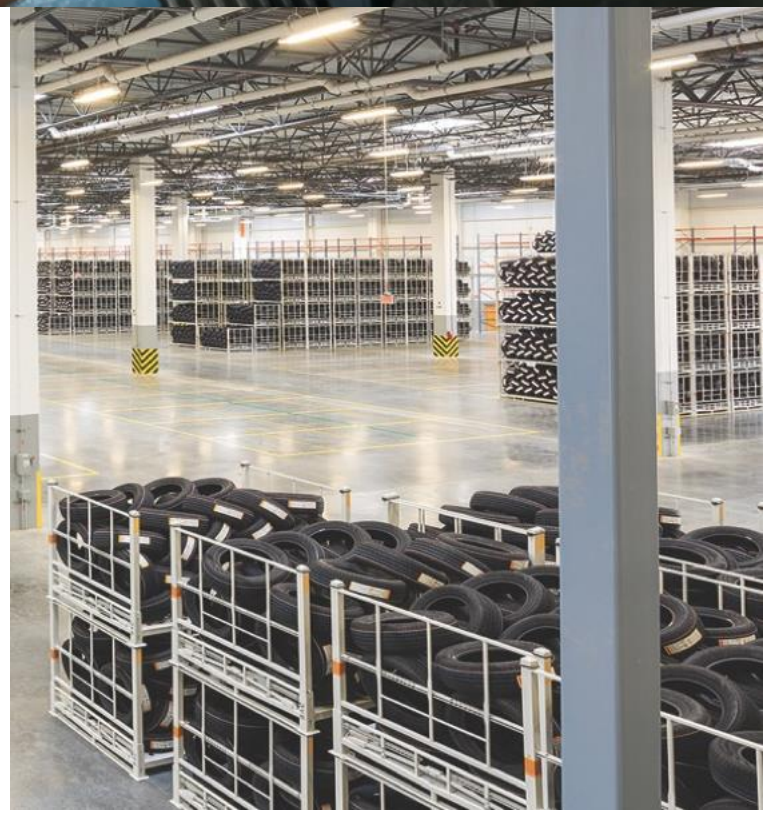
- Faster Assembly Line, Material Flow Efficiency
- Enable BYOD/Mobile workforce productivity
- One network for Barcode readers, VoIP and VoIP picking, Data, Video, Collaboration
- Locate people in case of emergency to Improve Safety, Avoided incident management costs and penalties
- Physical Access Security, Movement of contractors and visitors
- Locate technicians based on skills
- Integrated Maintenance and Improved



Case history

# Asset 4.0

- Real time Equipment and Asset visibility, location, condition
- Track supplies in transit
- Inventory accuracy
- AGV control
- Improved equipment utilization
- Real time push notification



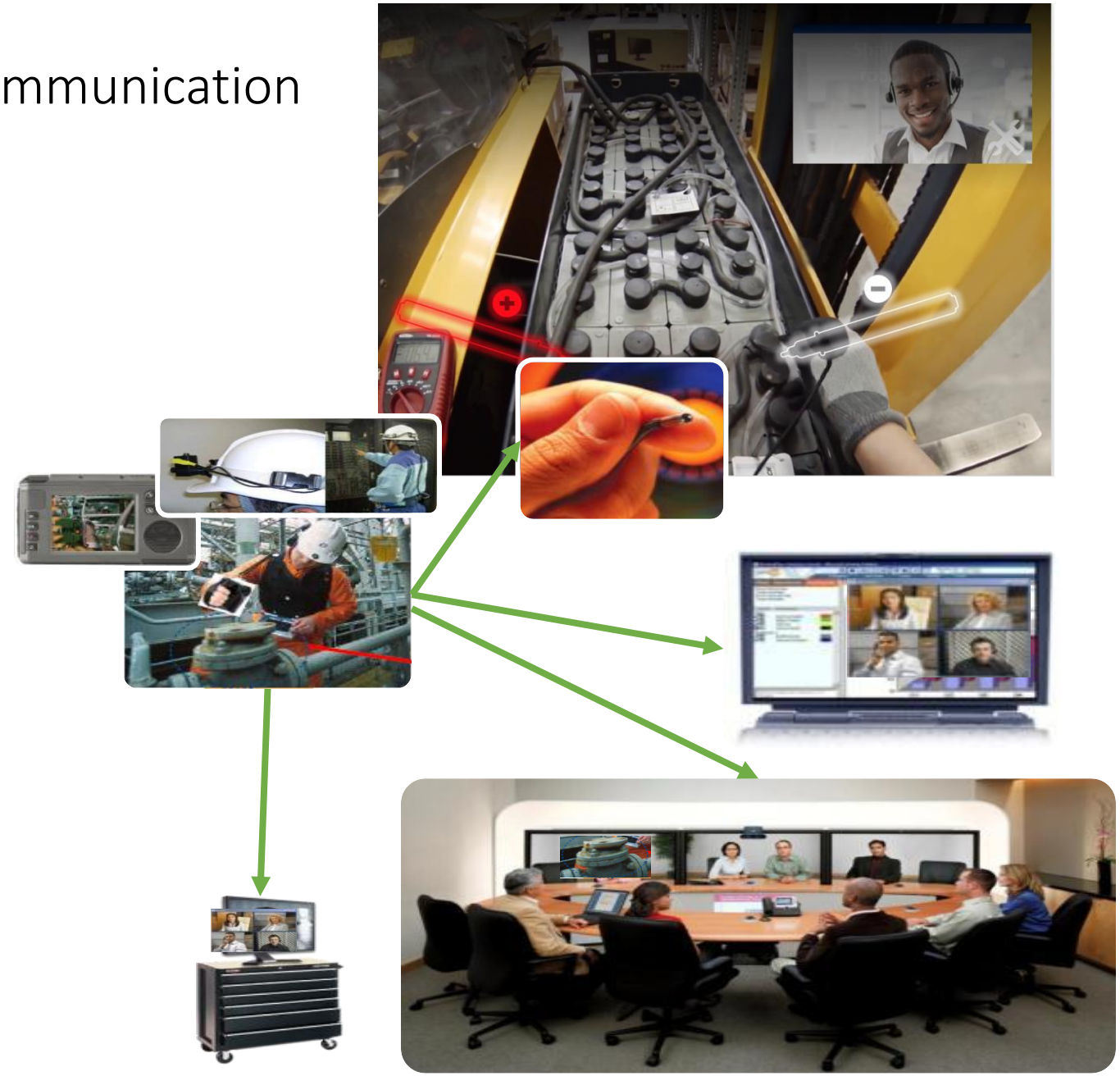
Case history

# Collaboration 4.0

## Real-time location-based profile-based Communication

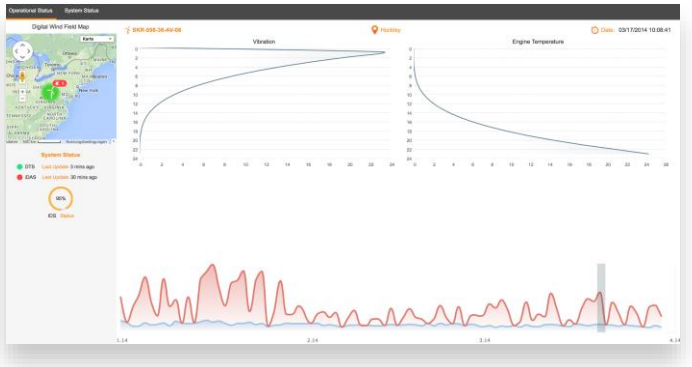
- Workforce Management to Improve Safety and Physical Access Security
- Locate and contact nearest people with specific skills
- Voice commands for pickup
- Real-time push notification
- Real-time dialogue with the machine or Remote expert for Maintenance

Case history

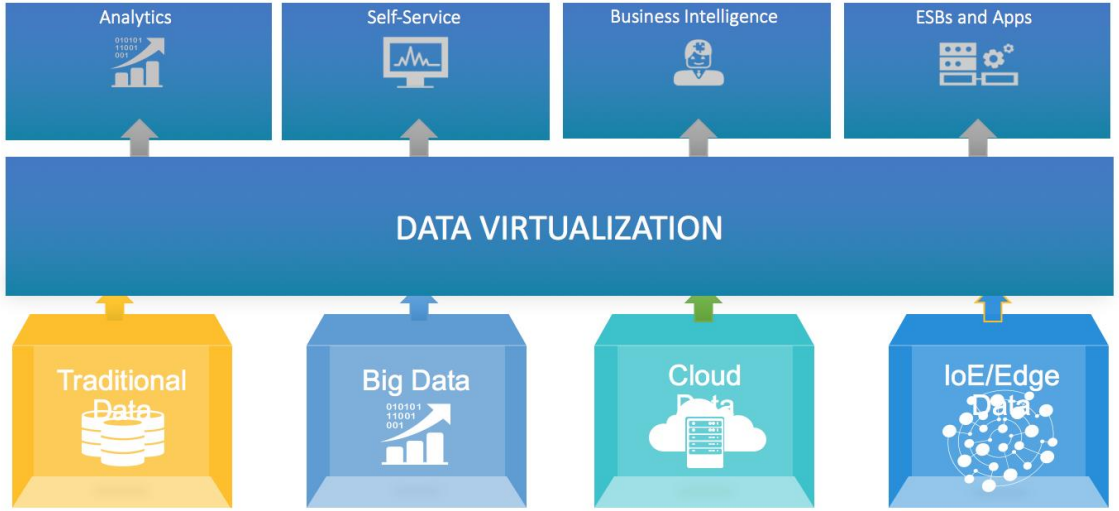


# Virtualization 4.0

## and Fog Computing to enable Edge Analytics



- Enables monitoring, analyzing and reporting, all on a single platform
- Support analytics for IoT environments, handles massive volumes and high velocity of data, enabling analytics at the edge



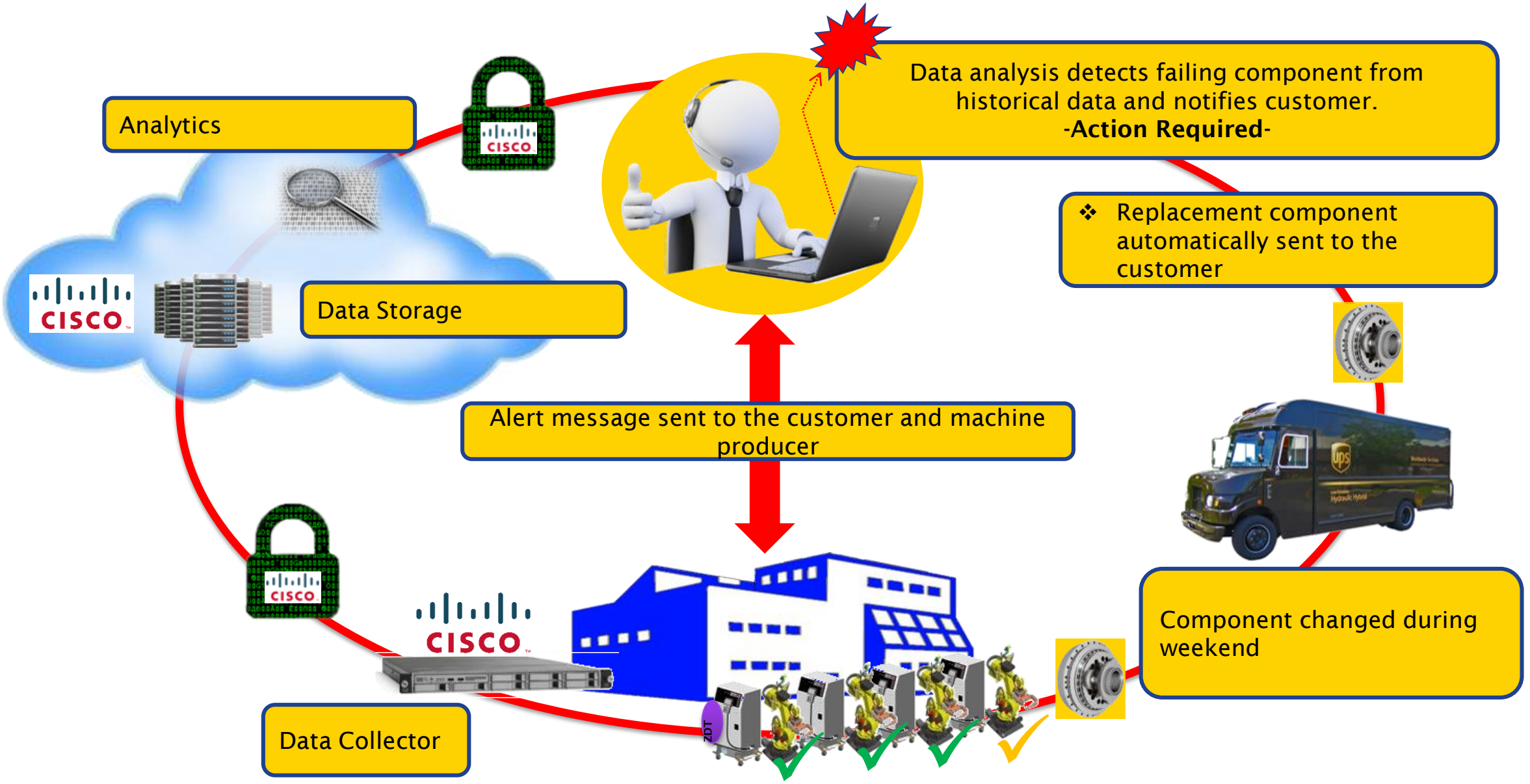

Analyze Data in the 'Right' Place by Distributing Analytics from Cloud to Edge

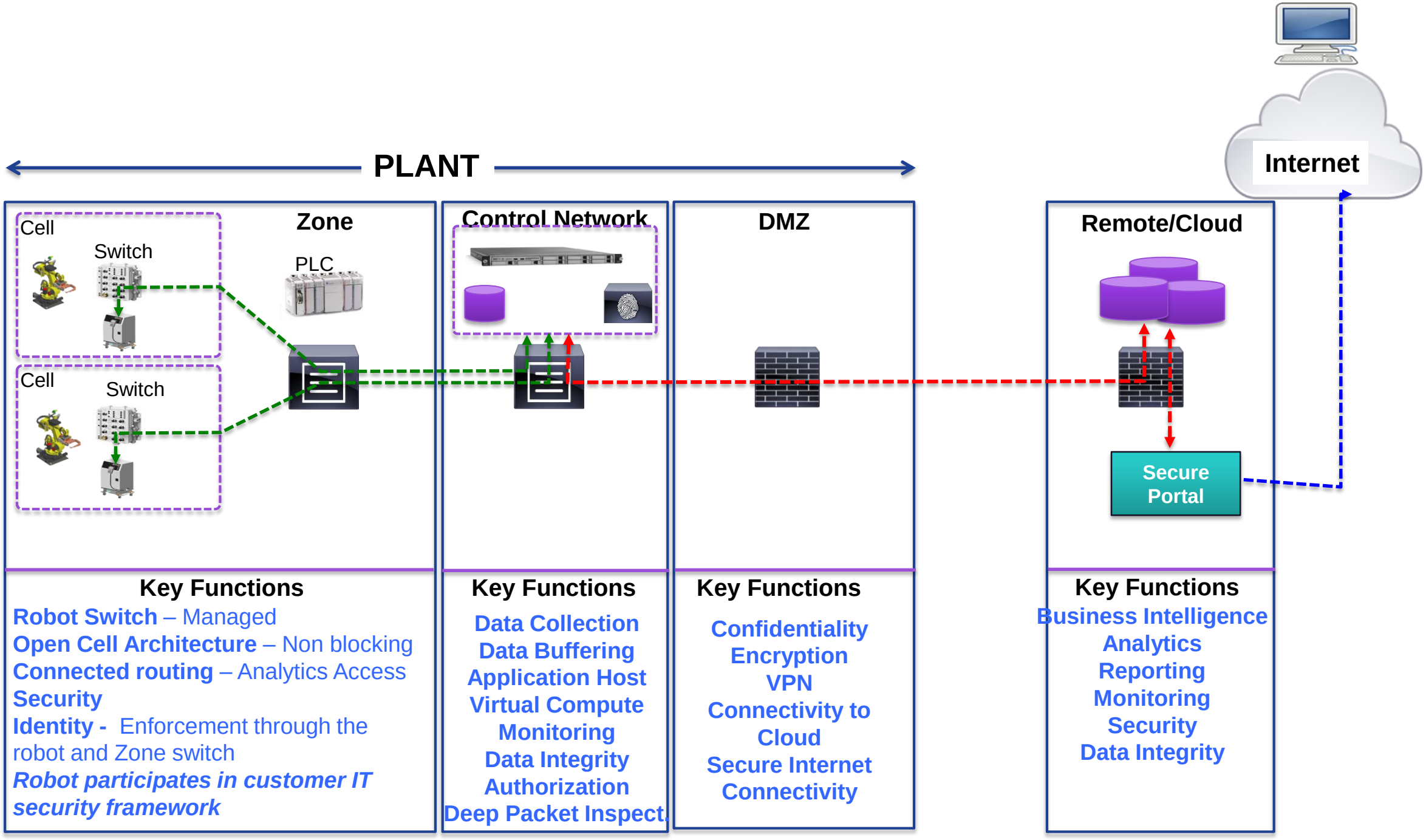
# Connected Machine / Connected Products

## Business model shift from Product to Services

- New revenue stream thanks to new services (predictive maintenance, zero downtime, machine running, Data Analytics, remote support)
- Machine-As-A-Service
- Time to market, Innovation, quality assurance
- Real-time inventory

# Predictive Maintenance at work




PLANT
Internet
Cell
Switch
Cell
Switch
Zone
PLC
Control Network
DMZ
Remote/Cloud
Secure Portal
Key Functions
Robot Switch – Managed
Open Cell Architecture – Non blocking
Connected routing – Analytics Access
Security
Identity - Enforcement through the robot and Zone switch
Robot participates in customer IT security framework
Key Functions
Data Collection
Data Buffering
Application Host
Virtual Compute
Monitoring
Data Integrity
Authorization
Deep Packet Inspect.
Key Functions
Confidentiality
Encryption
VPN
Connectivity to Cloud
Secure Internet Connectivity
Key Functions
Business Intelligence
Analytics
Reporting
Monitoring
Security
Data Integrity

la marzocco

# linea pb

Solenoid Valve

Solid State Relay

Flow Meter
0

Temperature
98.40°C

Load Cell
6.80

Solenoid Valve

Solid State Relay

Flow Meter
0

Temperature
188.00°C

Load Cell
0.00

Solenoid Valve

Solid State Relay

Flow Meter
0

Temperature
188.00°

Load Cell
0.00

Solenoid Valve

Solid State Relay

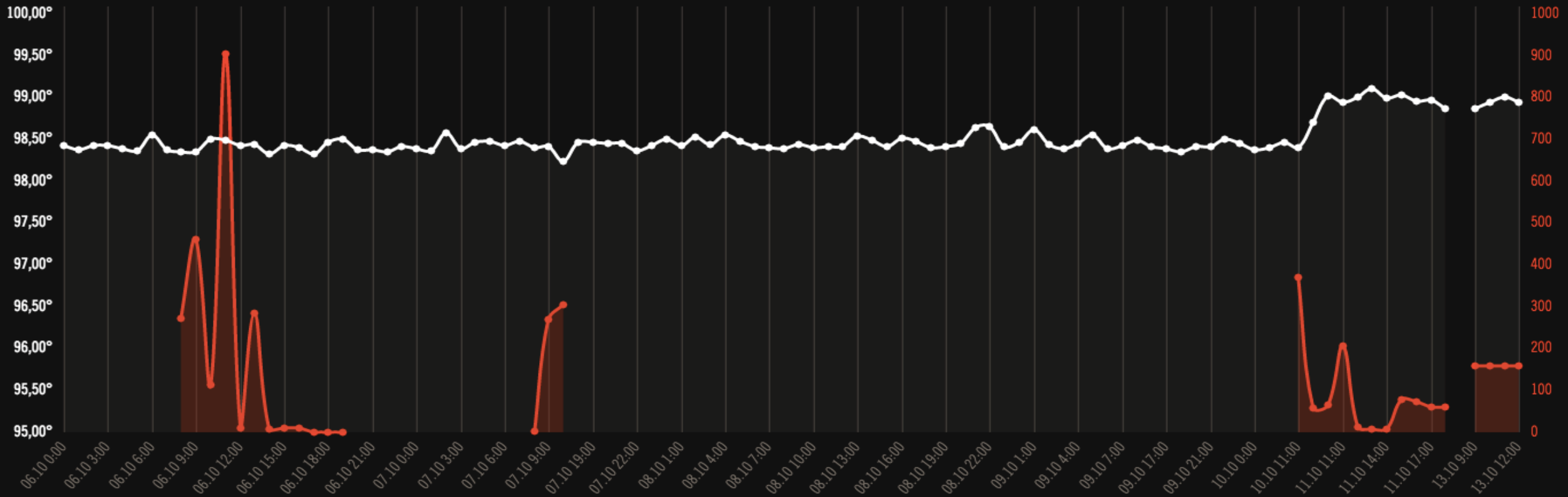
Temperature
124.20°C

# history

06.10.2016 - 13.10.2016

Coffee Boiler 1 Temperature

Flow Meter 1

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# Why Cisco?

Strong Ecosystem
Technology Partners
System Integrators
Startup

Validated Designs
Proven and tested architectures to reduce deployment risk, speed time to market and reduce time for PoC

One Unified Converged IP Network
Open standards vs. proprietary
Reduced TCO, simplified management

End-to-end network that enables more than Just connectivity

Computing from Edge to Cloud
Supports Big Data and Analytics
Centralized management of everything
Security across entire platform
Built for the future and flexible growth