

The Connected Enterprise

# TRENDS & TECHNOLOGIES

Production Demand

Smart Manufacturing Initiatives

Convergence

The Enablers

## Government Coalitions

Visions for fueling manufacturing leadership



The **Connected Enterprise** is the Future of Smart Manufacturing by **Rockwell Automation**

## Industry Consortia

Assemble and promote best practices



## Technologies

Innovations that redefine and create new value opportunities



**AVAILABLE** Today and **FOUNDATIONAL** to Achieving These Visions...

## Industry Standards

Drive interoperability and commonality



**SMART**  
**MANUFACTURING**  
ENABLED BY  
**THE CONNECTED ENTERPRISE**

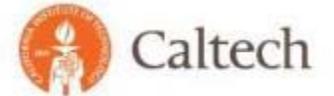
# Smart Manufacturing

... is a *highly connected, knowledge-enabled* industrial enterprise



... where all business and operating actions are *optimized* to achieve enhanced **Productivity**, **Sustainability** and **Economic performance**

Rockwell Automation is a founding member of the **Smart Manufacturing Leadership Coalition**  
(partial list of members)



*The Connected Enterprise is a way to deliver the Smart Manufacturing*

# From Industry 1.0 to Industry 4.0

## First Industrial Revolution

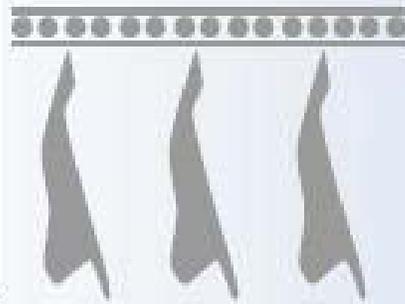
based on the introduction of mechanical production equipment driven by water and steam power



First mechanical loom, 1784

## Second Industrial Revolution

based on mass production achieved by division of labor concept and the use of electrical energy



First conveyor belt, Cincinnati slaughterhouse, 1870

## Third Industrial Revolution

based on the use of electronics and IT to further automate production



First programmable logic controller (PLC) Modicon 084, 1969

## Fourth Industrial Revolution

based on the use of cyber-physical systems



Degree of complexity



1800

1900

2000

Today

Time

The World is  
**CHANGING**

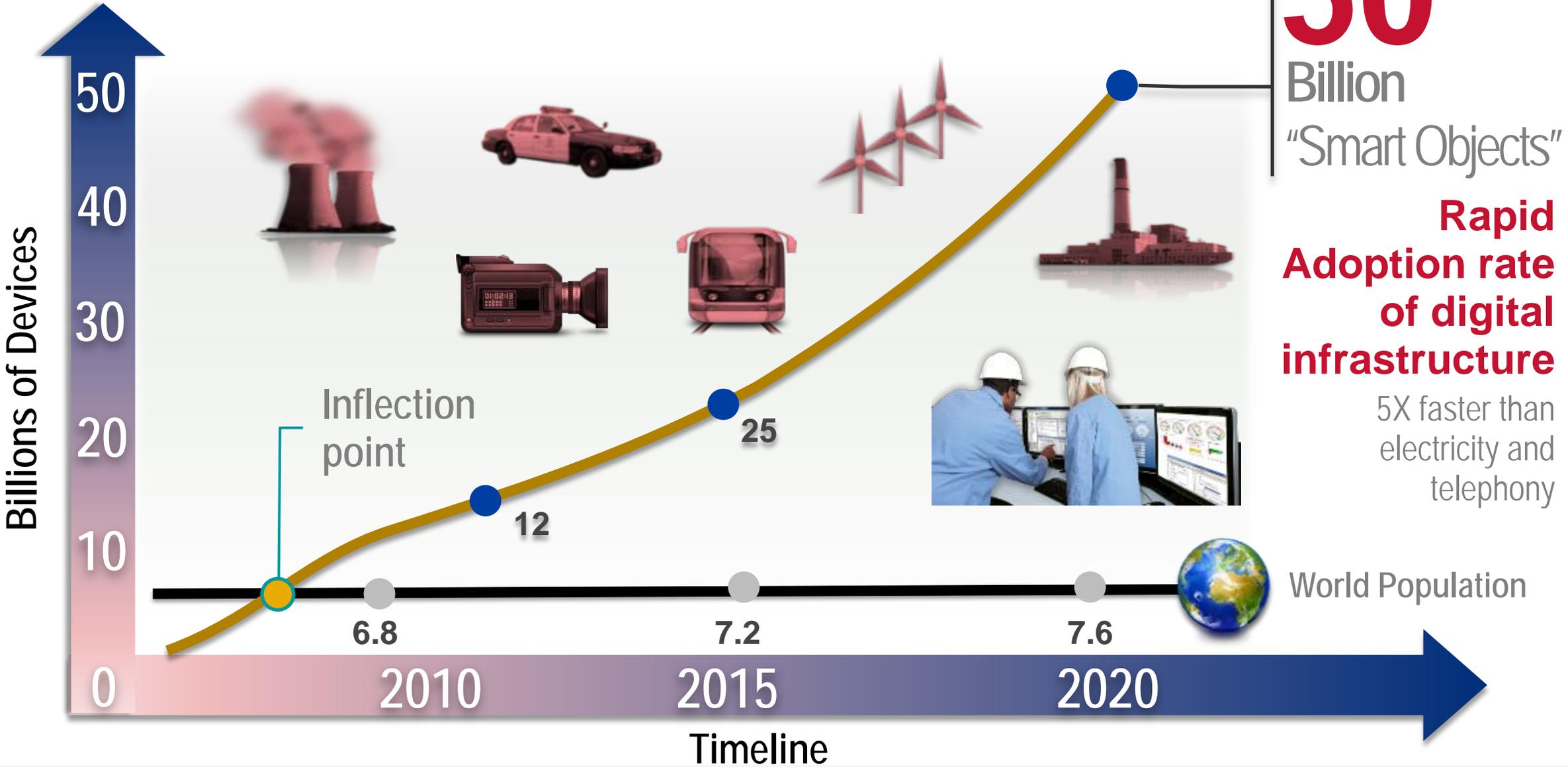
Connecting the  
unconnected Things ...

... an  
**Entire  
Internet  
of Things**

**THE  
NEXT  
BIG  
THING**

# The Internet of Things (IoT)

... Will Connect Everything to Everything



# IoT VALUE AT STAKE: \$14T

Between 2013 – 2022

**INDUSTRIAL**  
Internet of Things  
\$3.8 Trillion



Retail Trade	11%
Information Services	9%
Finance & Insurance	9%
Manufacturing 	27%
Others (Healthcare, Education, etc ...)	44%

SOURCE: CISCO

# The industrial IoT

**Manufacturing \$3.8T**

**Asset Utilization \$675B**

**Employee Productivity \$675B**

**Supply Chain Logistics \$729B**

**Productivity investments \$1T**

**Innovation \$810B**



SOURCE: CISCO

# The Evolution of the Internet of Things

EVERYTHING

Business and Societal Impact

## Connectivity

Digitize Access to Information

- Email
- Web Browser
- Search

## Networked Economy

Digitize Business Process

- E-commerce
- Digital Supply Chain
- Collaboration

## Immersive Experience

Digitize Interactions (Business & Social)

- Smart Things
- Mobility
- Analytics
- Cloud

## Internet of Everything

Digitize the World

Bringing together to make connections more relevant and valuable than ever before:

- People
- Process
- Data
- Things

Intelligent Connections

# The Internet of Everything

... is a Networked Connection of People, Process, and Technology

## People

Connecting people in more relevant, valuable ways



## Process

Delivering the right information to the right person or machine at the right time



... to achieve **Operational Excellence**

## Technology

### Data

Leveraging data into more useful information for decision-making



### Things

Physical devices and Objects connected on the IP Network (up to Internet) to each other for intelligent decision-making

# THE CONNECTED ENTERPRISE

enables Industrie 4.0 for you thanks to the Internet of Things

Headquarters

PRODUCTIVITY

SUSTAINABILITY

SECURITY

AGILITY

Supply Chain

Smart Grid

Distribution Center

Customers

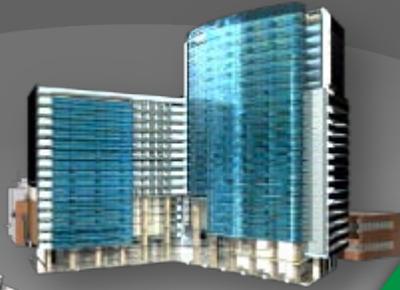
- Supply Chain Integrated
- Collaborative, Demand Driven
- Optimized for Rapid Value Creation
- Compliant and Sustainable

**Rockwell  
Automation**

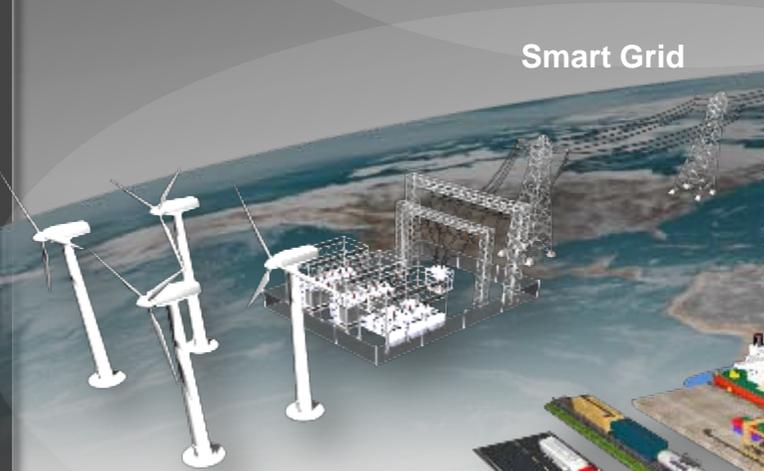
# THE CONNECTED ENTERPRISE

*Optimized for Rapid Value Creation*

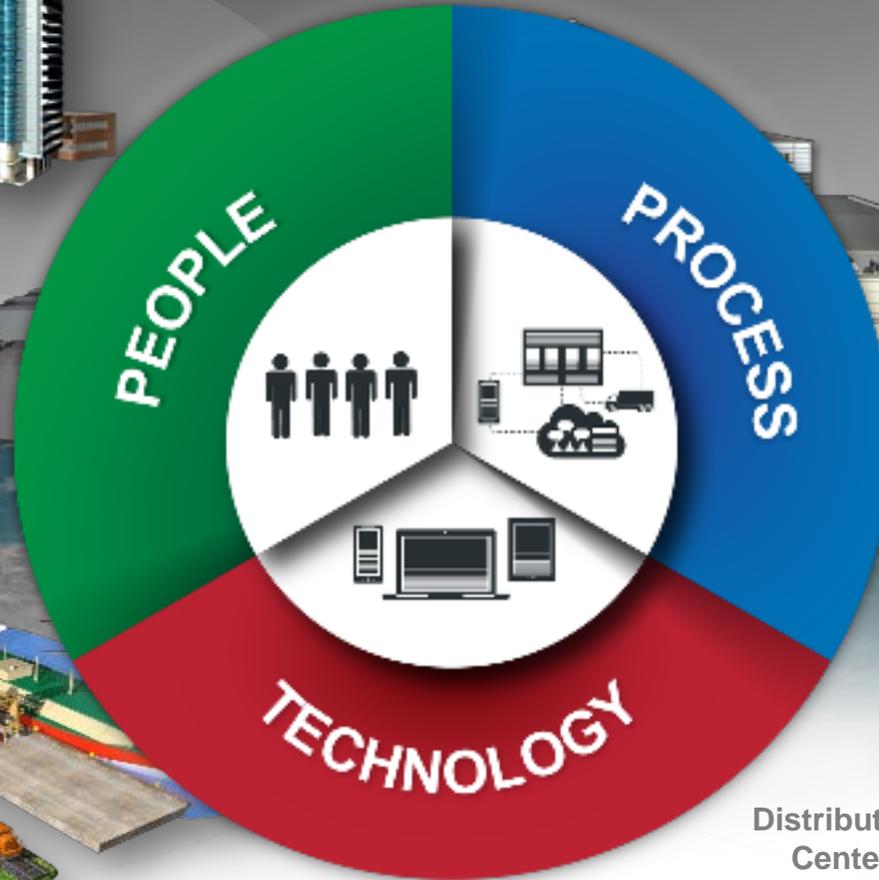
Headquarters



Smart Grid



Supply Chain



Distribution Center



Customers



**Rockwell Automation**

# THE CONNECTED ENTERPRISE

*Connects the PEOPLE ...*

People

**Knowledge & experience**  
*will shrink significantly* over the next **5** years

**Knowledge Transfer**

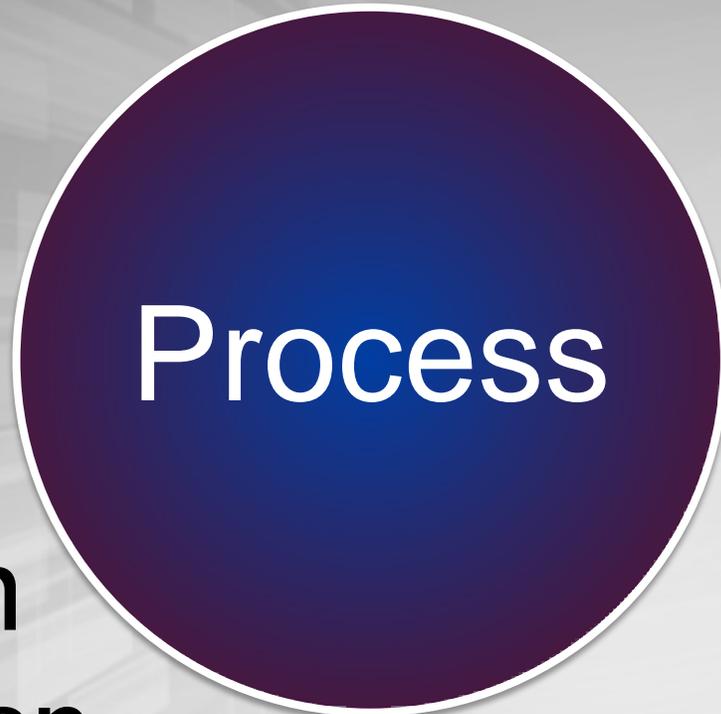
Machines & technologies are more sophisticated and the availability of qualified people *is becoming a challenge*

**Organizational collaboration**

becomes increasingly important - *break down the silos* between departments

# THE CONNECTED ENTERPRISE

*Improves the PROCESS ...*



## Quality Management

Quality assurance and *control of processes & products* to achieve *consistent quality*

**Less** human **effort** and **time**

to produce, at *lower costs* and *fewer defects*

## Coordination

**& organization** of procurement, conversion, distribution, and *use of energy*

## Driving quality

that strives for *near perfection*

# THE CONNECTED ENTERPRISE

*Enabling the TECHNOLOGY ...*

**Mobility** is not only about the device, it's about people being mobile and accessing applications and data *anytime* and *anywhere* they need it

The **real-time data** in industrial control systems is rich in important information such as *energy efficiency & asset health*

Allows **collection of data** from *remote and field-based assets*

**&**

Enables the move of **IT applications** off-premise and host at *remote data centers*

**Technology**

# THE CONNECTED ENTERPRISE

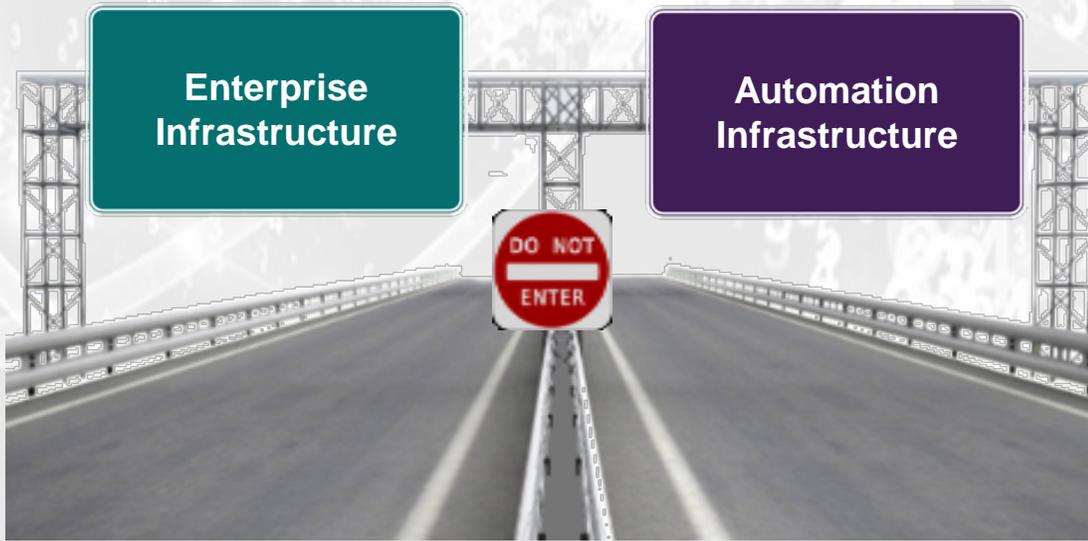
## starts with Network Convergence

A Common Secure Ethernet Infrastructure

### Industrial IoT

TRENDS & TECHNOLOGIES

Integration  
Security  
Network management  
Mobility



**CONVENTIONAL**  
SEPARATE IT & AUTOMATION



**INDUSTRIAL IOT**  
ONE UNIFIED INFRASTRUCTURE