

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)



ELECTRIC POWER
RESEARCH INSTITUTE



Caltech



Carnegie Mellon

NIST
National Institute of
Standards and Technology
U.S. Department of Commerce

UCLA



CORNING

**Rockwell
Automation**

The Connected Enterprise is a way to deliver the Smart Manufacturing

From Industry 1.0 to Industry 4.0

First Industrial Revolution

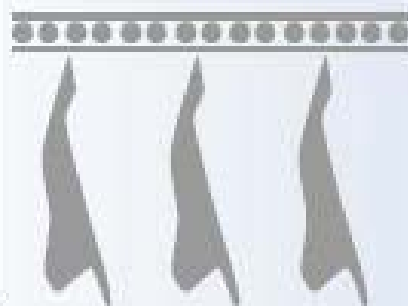
based on the introduction of mechanical production equipment driven by water and steam power



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

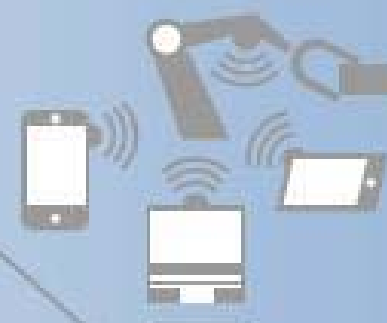
based on the use of electronics and IT to further automate production



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

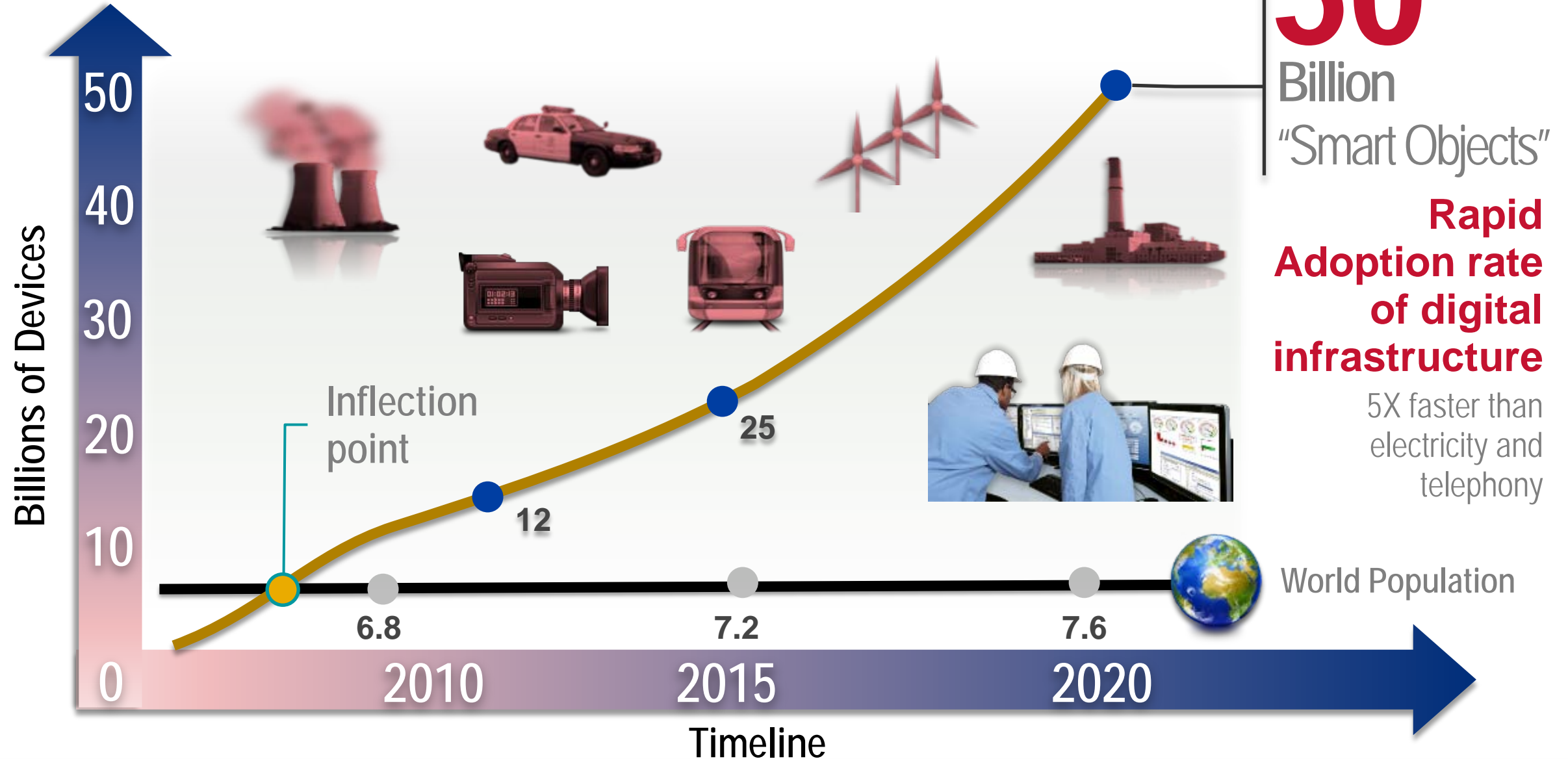
Connecting the
unconnected Things ...

... 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

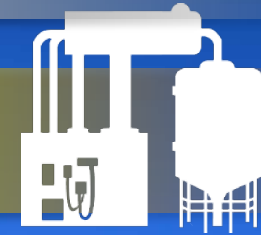


Retail Trade 11%

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**

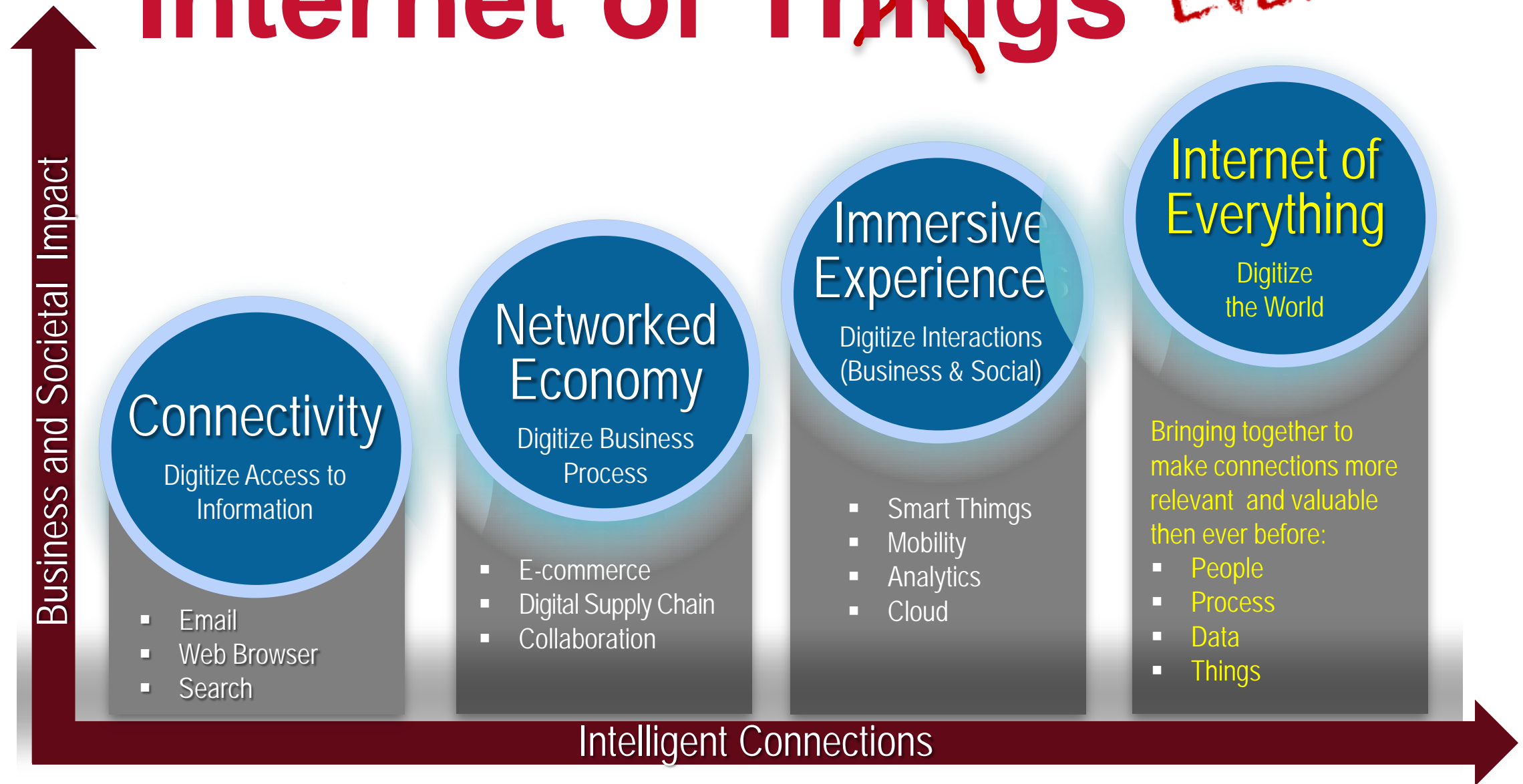
Productivity investments **\$1T**

Innovation **\$810B**



SOURCE: CISCO

The Evolution of the ~~Internet of Things~~ **EVERYTHING**



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

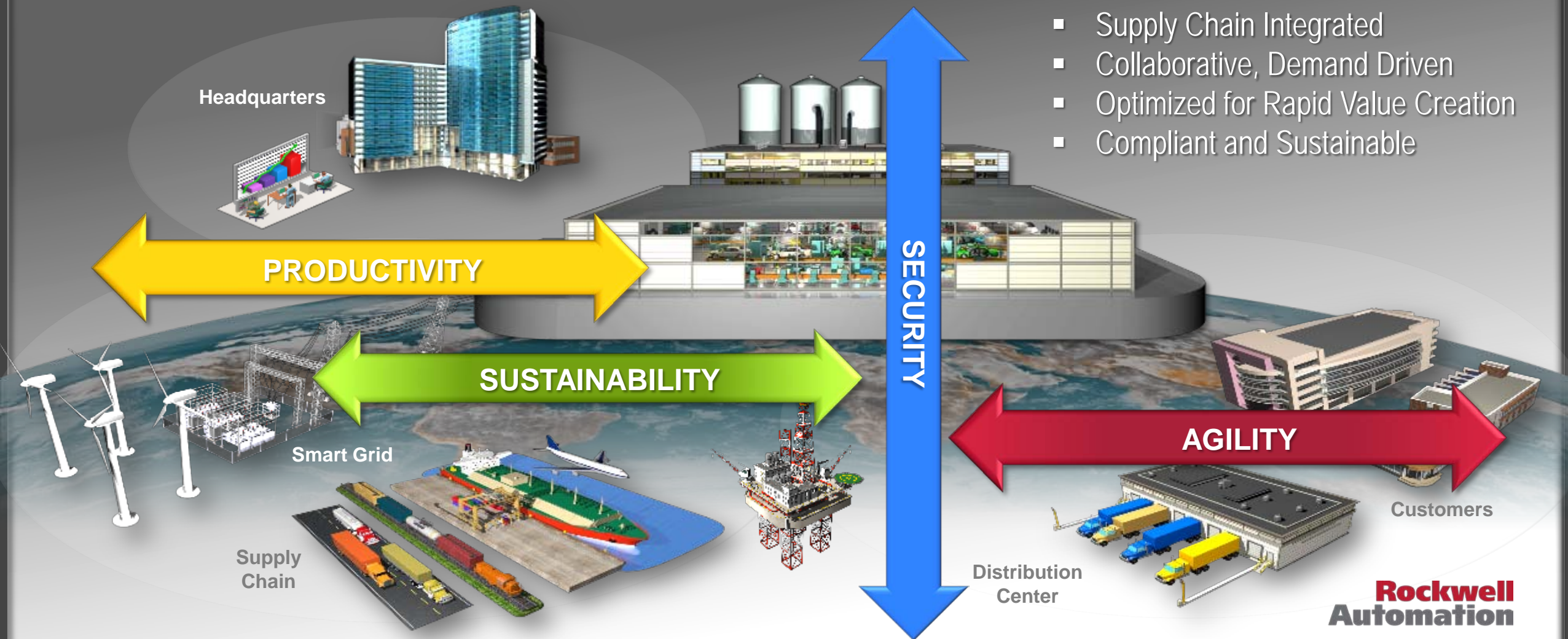


Things

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

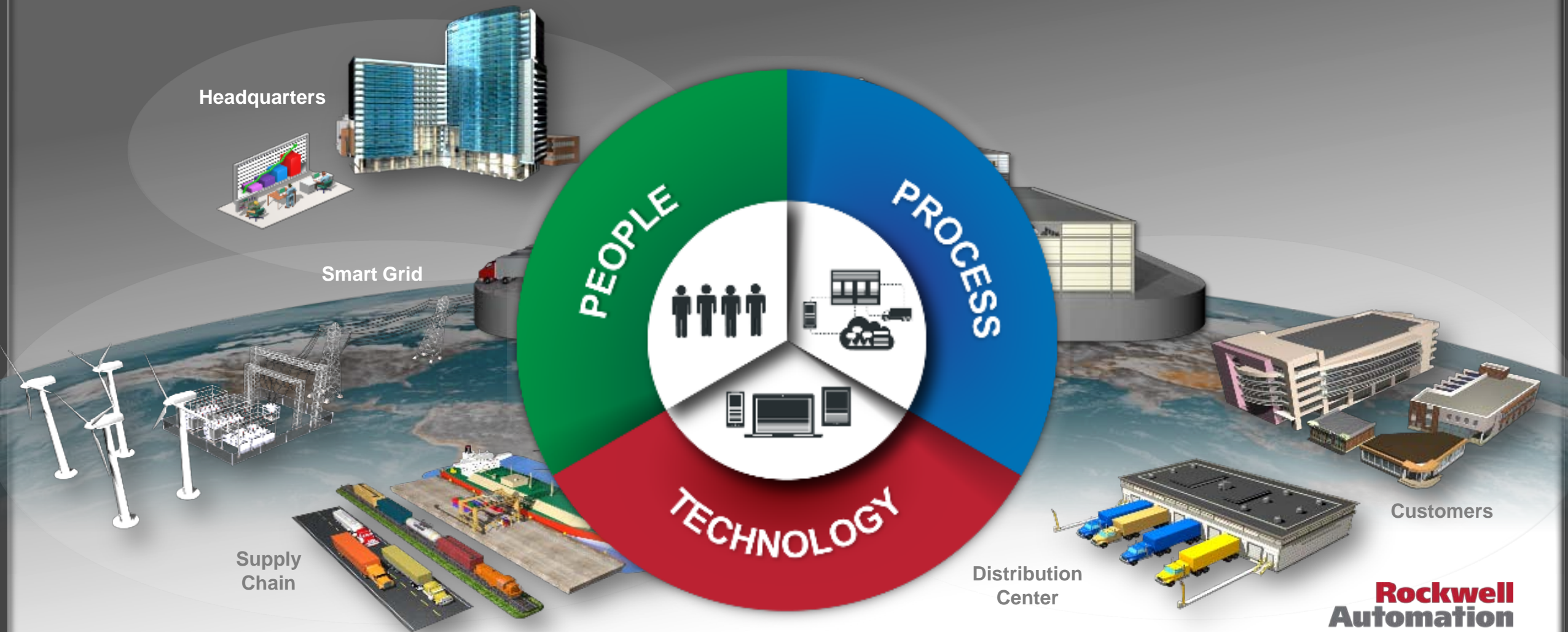
THE CONNECTED ENTERPRISE

enables Industrie 4.0 for you thanks to the Internet of Things



THE CONNECTED ENTERPRISE

Optimized for Rapid Value Creation



**Rockwell
Automation**

THE CONNECTED ENTERPRISE

Connects the PEOPLE ...



People

Knowledge Transfer

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

Knowledge & experience

will shrink significantly over the next **5** years

Organizational collaboration

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

THE CONNECTED ENTERPRISE

Improves the PROCESS ...



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

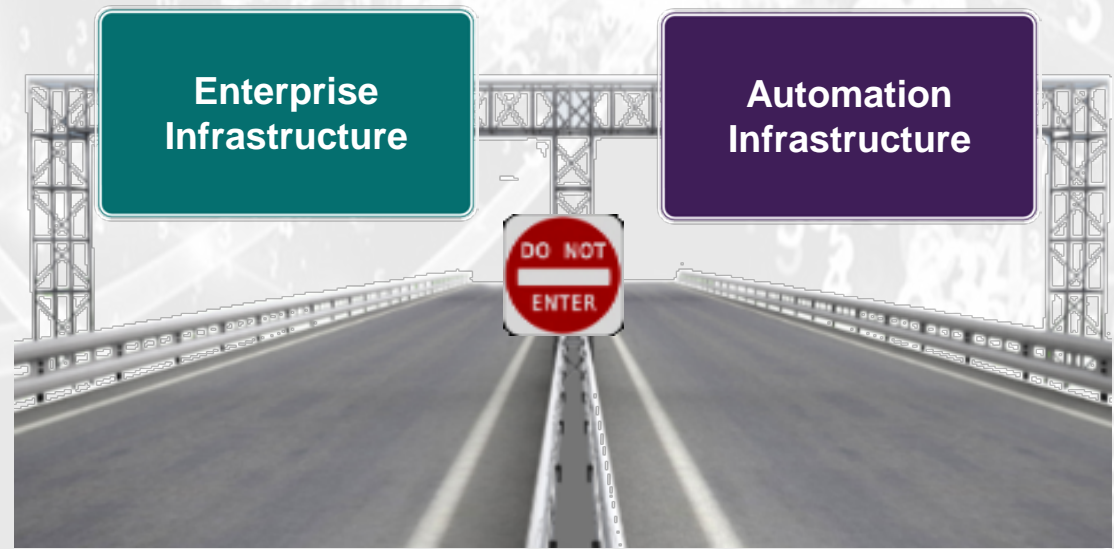
starts with Network **Convergence**

A Common Secure Ethernet Infrastructure

Industrial IoT

TRENDS & TECHNOLOGIES

Integration
Security
Network management
Mobility



CONVENTIONAL
SEPARATE IT & AUTOMATION



INDUSTRIAL IOT
ONE UNIFIED INFRASTRUCTURE