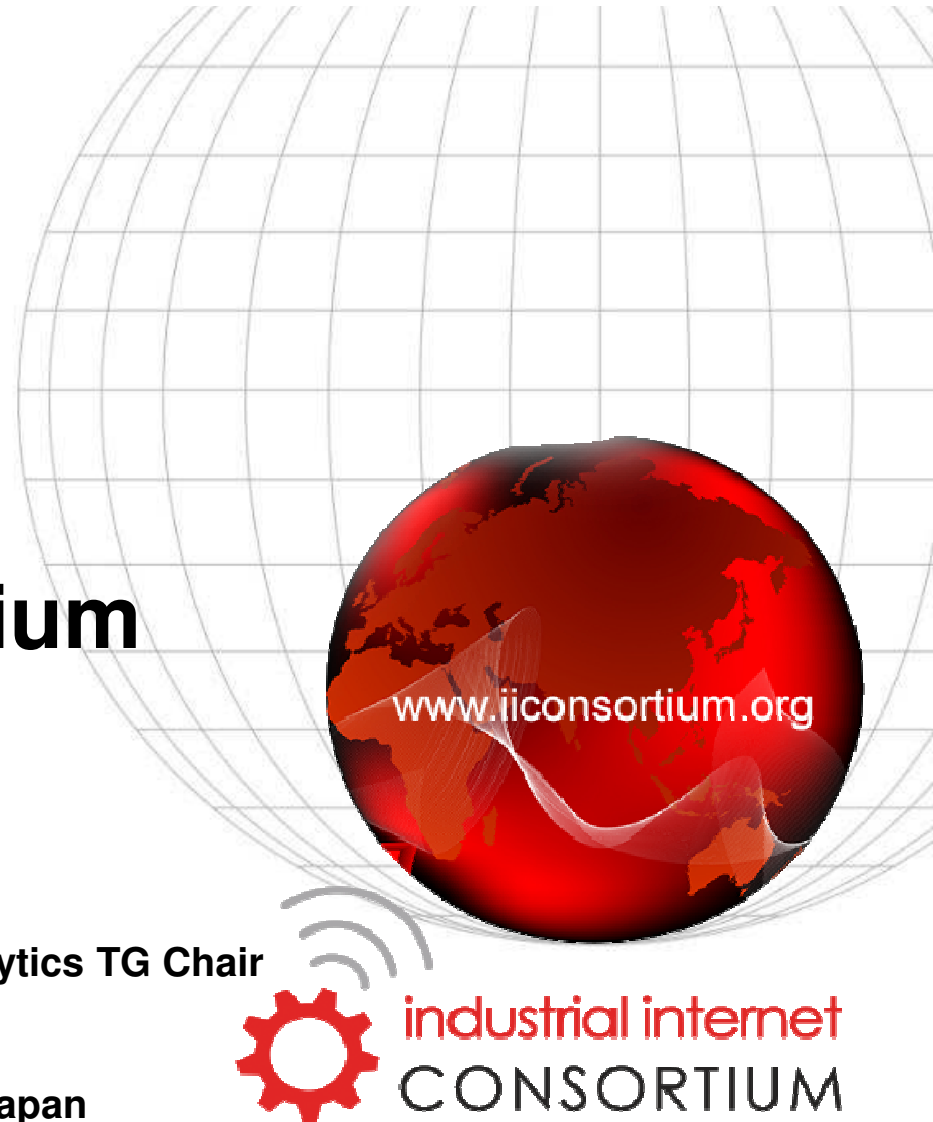


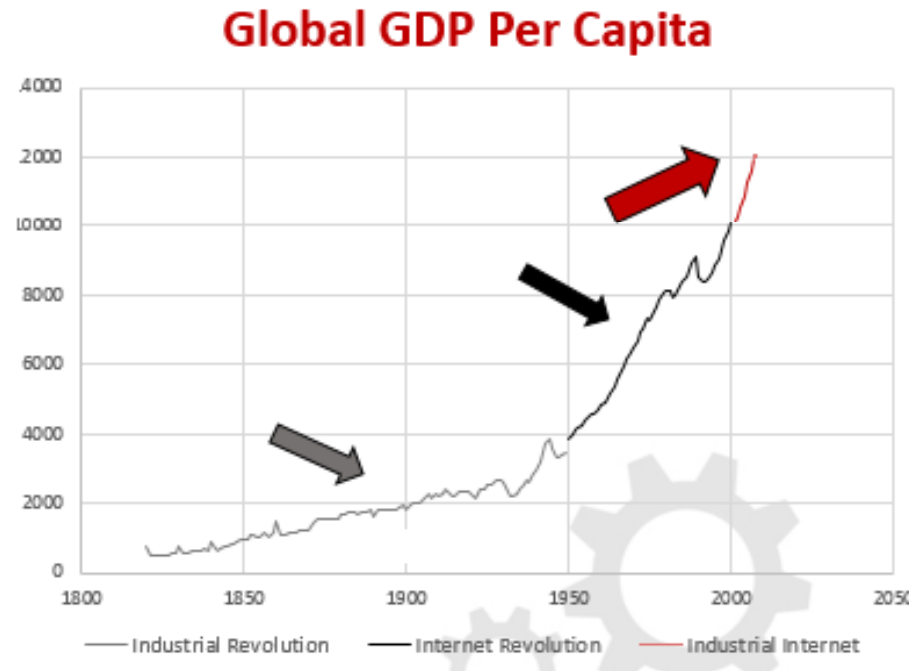
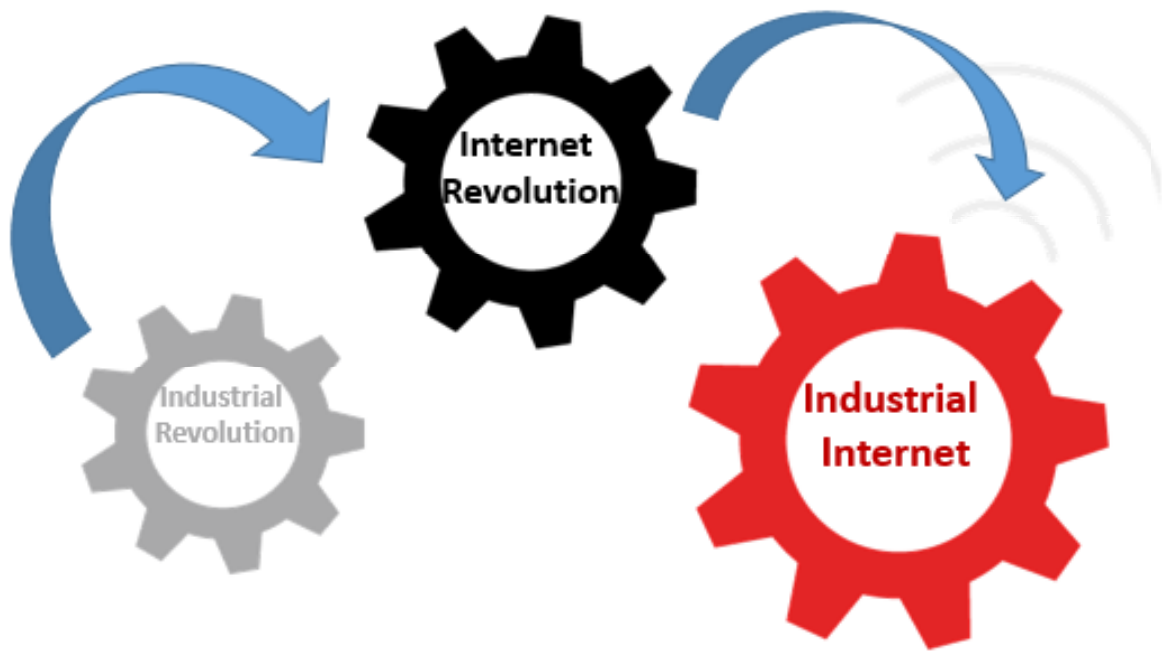


Overview of the Industrial Internet Consortium

Wael William Diab
IIC Liaison WG Chair, Technology WG Chair, Industrial Analytics TG Chair
IIC SC Member (Alternate)
Senior Director, Huawei
IoT International Symposium 2017, 29 March 2017, Tokyo, Japan



The Industrial Internet is leading the next economic revolution



GDP data extracted from the Futurist 2007



“3D Platform – The Internet of Things”

November 2016



The worldwide IoT market will grow to \$1.7 trillion in 2020

The installed base of consumer IoT devices exceeds the installed base of smartphones and tablets combined by 2020

Home automation and control represents 35% of the consumer IoT installed base by 2020



The Measurable Outcome will be in the Trillions of Dollars

GE: **\$32.3 trillion opportunity** representing 46% share of GDP today.

Cisco: Internet of Things (IoT) will **increase private sector profits 21%** and add \$19 trillion to the global economy by 2020

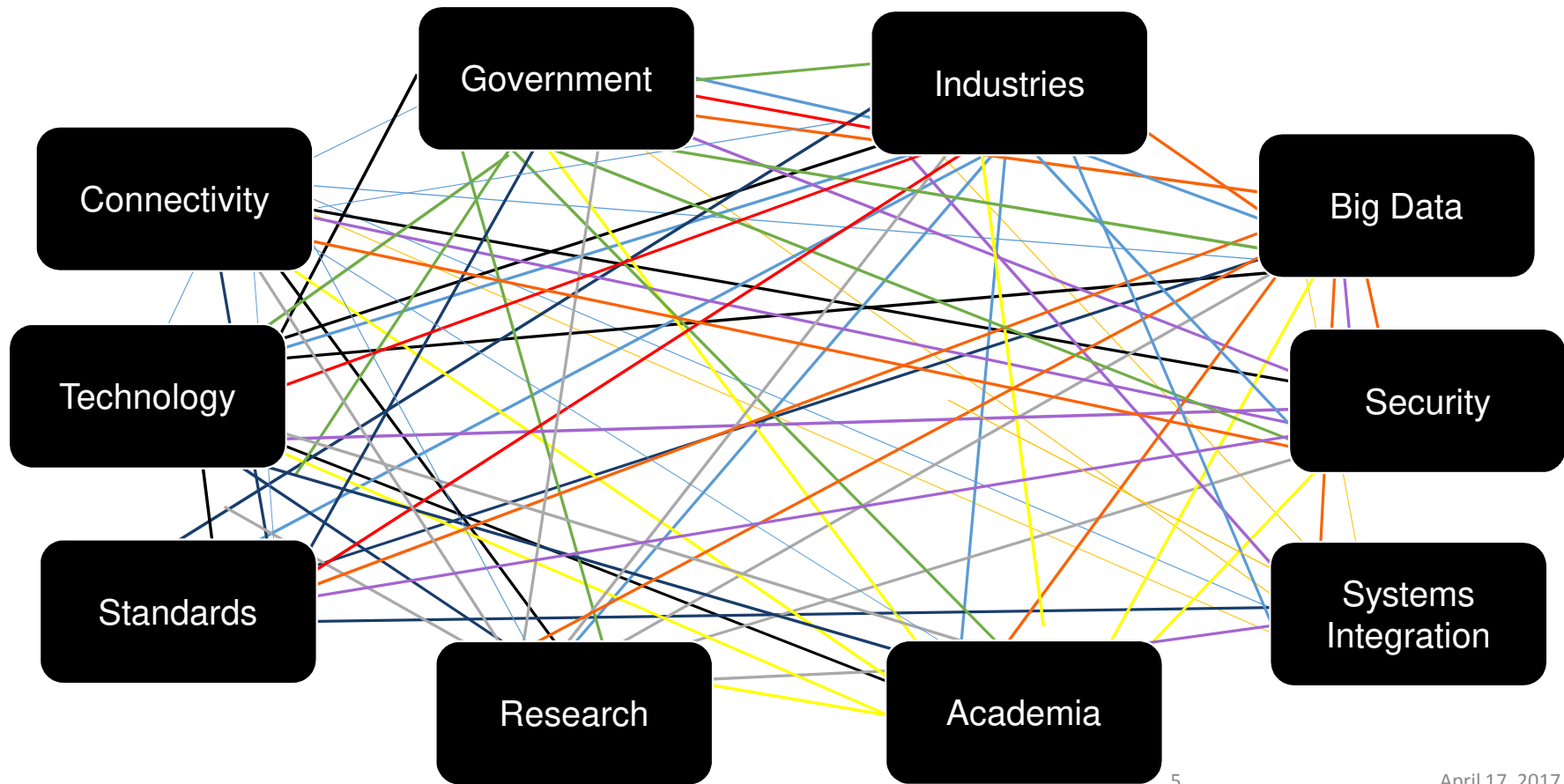
Gartner: IoT product and service suppliers will generate **incremental revenue exceeding \$300 billion** in 2020.

McKinsey Global Institute: **\$36 trillion operating costs** of key affected industries could be impacted by IoT

The convergence of *Internet of Things, Industrie 4.0, Cyber-Physical Systems* presents an enormous opportunity.



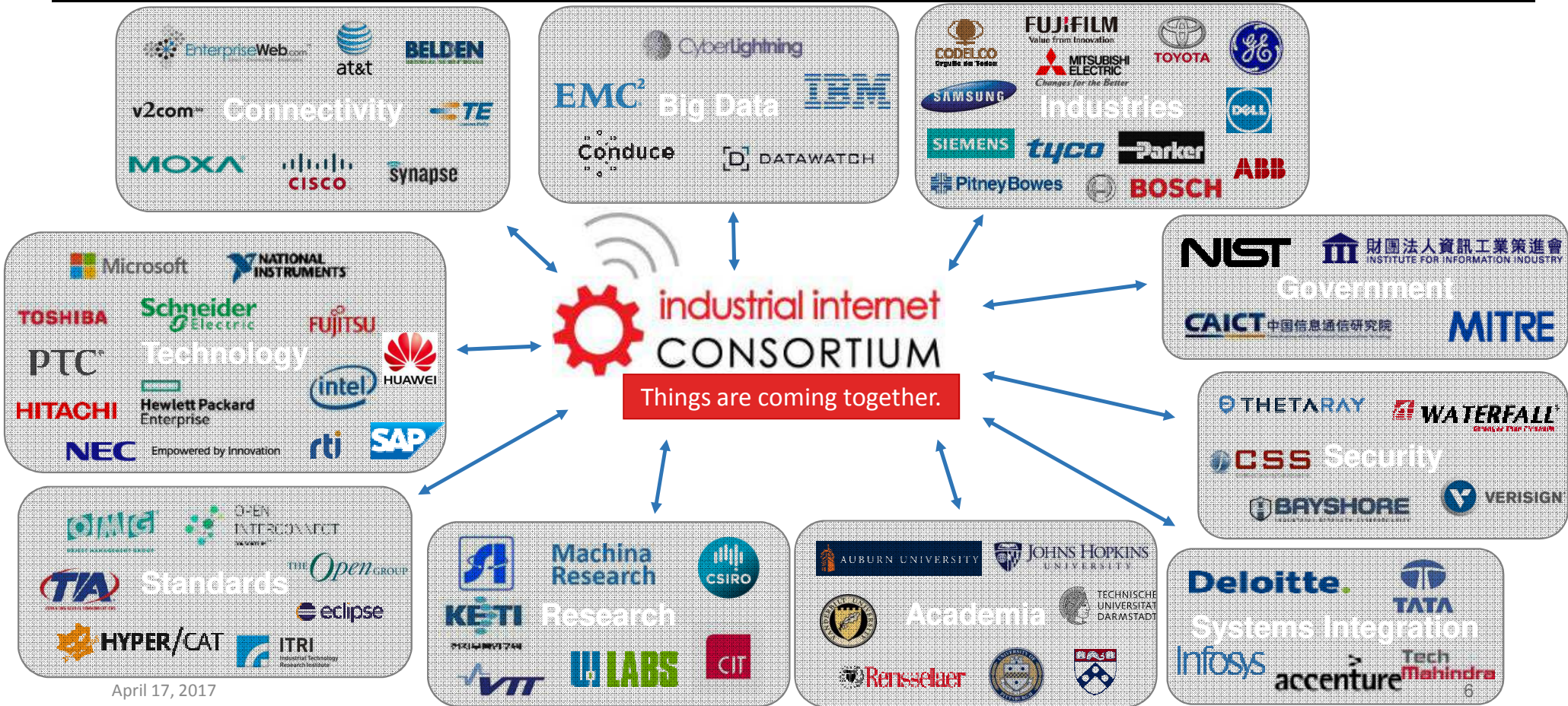
Yet there are current roadblocks to widespread adoption





The IIC Global Ecosystem of Stakeholders:

Things are coming together



April 17, 2017



Industrial Internet Consortium Vision & Mission

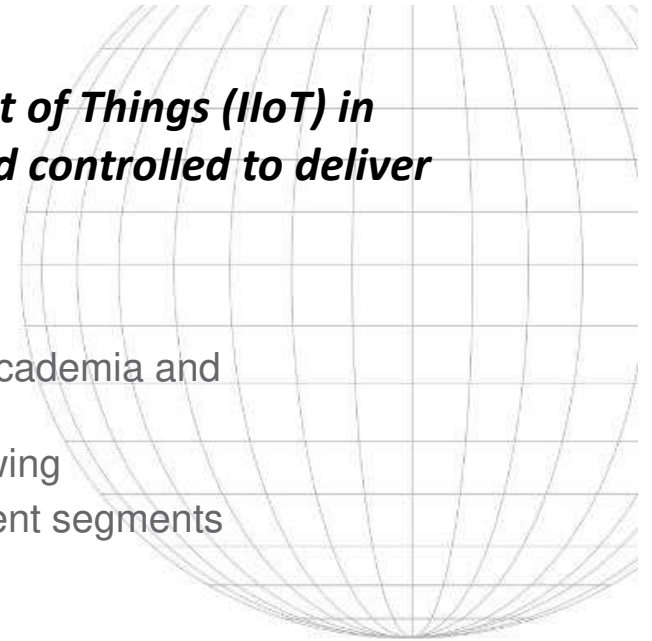


Vision: *The Industrial Internet Consortium (IIC) is the world's leading organization transforming business and society by accelerating the Industrial Internet of Things (IIoT).*

Mission: *Our mission is to deliver a trustworthy Industrial Internet of Things (IIoT) in which the world's systems and devices are securely connected and controlled to deliver transformational outcomes.*

An open, neutral “sandbox” where the IIoT Ecosystem of global industry, academia and government meet to collaborate, innovate and enable.

- More than 250 organizations from more than 30 countries and growing
- 27 active testbeds all over the world from more than a dozen different segments
- 2015 Reference Architecture; second version in development
- 2016 Security Framework Published in September
- Business Strategy & Solutions Lifecycle Accelerating
- Steering Committee Expansion

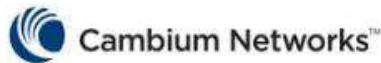


Founders, Contributing Members, & Large Industry Members

IIC Founding and Contributing Members



Small Industry Members



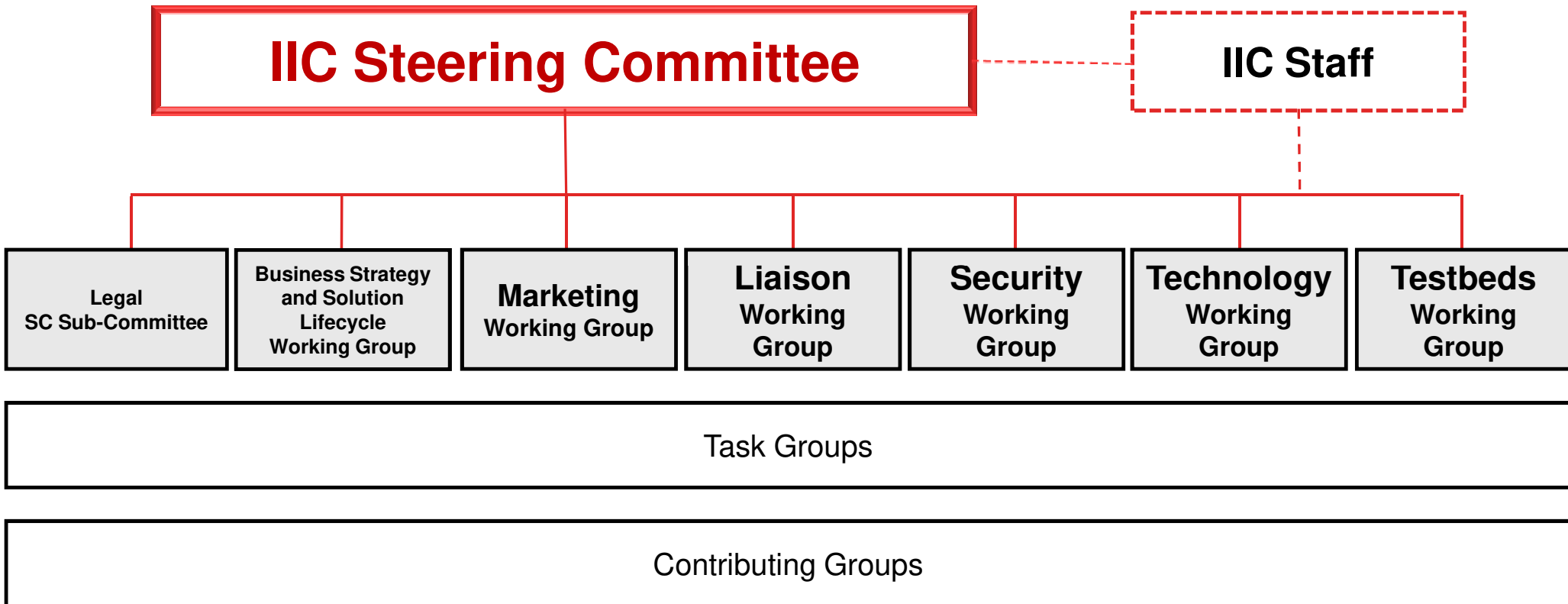
Small Industry Members



Nonprofit, Academic, & Government Members

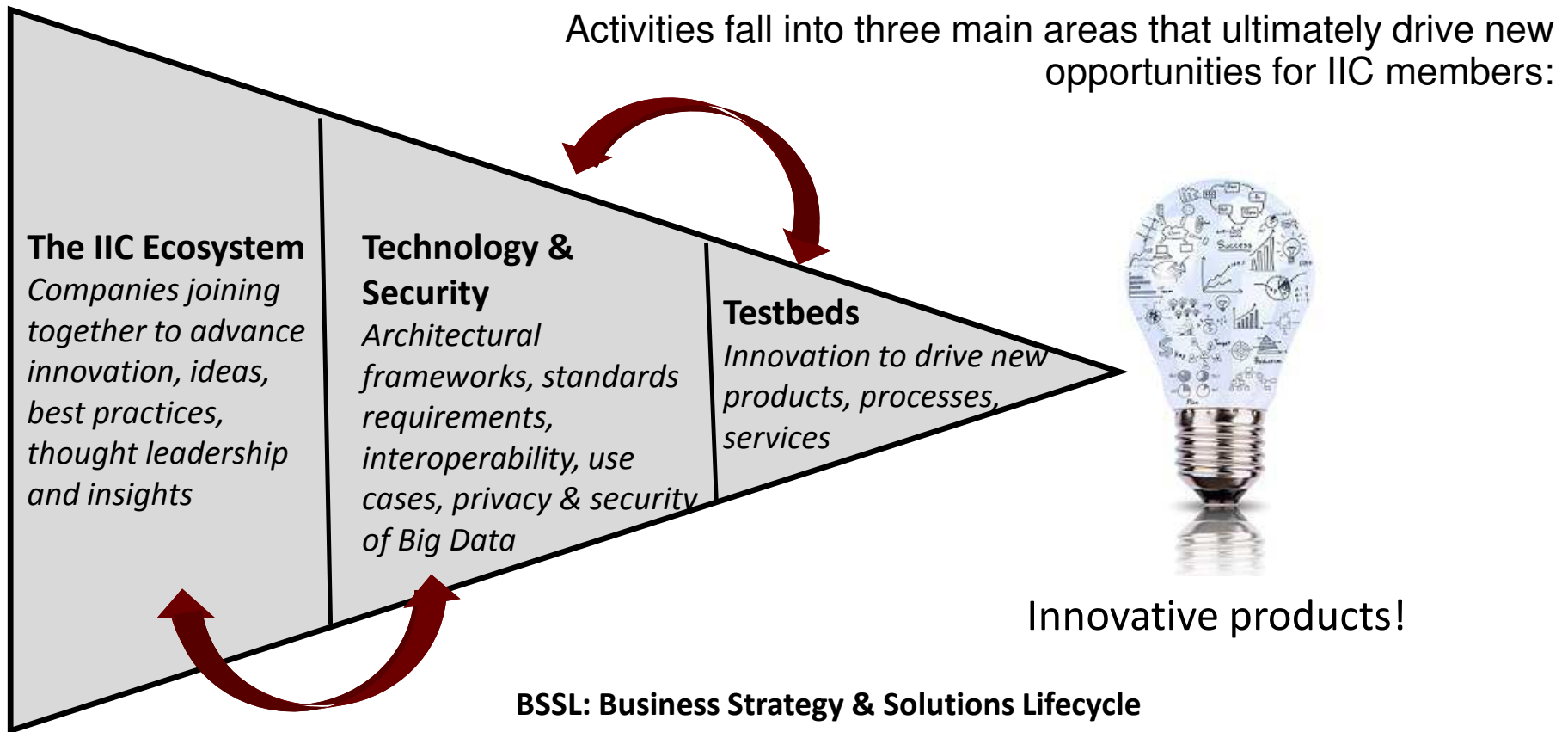


How We're Organized



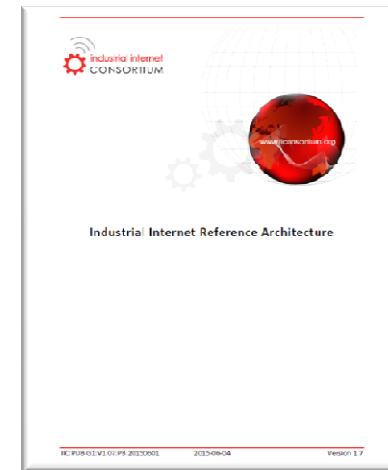


IIC Core Focus Areas



Globally Impactful Deliverables

Reference Architectures and Frameworks



White Papers and Journal of Innovation

- Landing page: <http://www.iiconsortium.org/white-papers.htm>
- Example of a recently published technical white paper

Industrial Analytics: the Engine Driving the IIoT Revolution

http://www.iiconsortium.org/pdf/Industrial_Analytics-the_engine_driving_IIoT_revolution_20170321_FINAL.pdf

April 17, 2017

Current Publicly Announced Testbeds



Asset Efficiency Testbed



Condition Monitoring Testbed



Connected Care Testbed



Edge Intelligence Testbed



FA PaaS Testbed



FOVI Testbed



High-Speed Network Testbed



Industrial Digital Thread Testbed



INFINITE Testbed



Intelligent Urban Water Supply



Microgrid Testbed



Precision Crop Management Testbed



Security Claims Evaluation Testbed



Smart Airline Baggage Management



Smart Energy Management Testbed



Smart Water Management Testbed



Time-Sensitive Networks Testbed



Track and Trace Testbed

What is an IIC Testbed?

CONTROLLED EXPERIMENTATION PLATFORM

*~conforming to an IIC technical references,
where solutions can be deployed and tested in
environments resembling real-world conditions*

Explore untested technologies or existing technologies
working together in an untested manner

Create innovative new products, services, and business practices

Generate requirements and priorities for standards organizations

Business Model,
Project Mgmt,
Practices



Project
Specifications
& Reports



Architecture
& Design



Testbeds
& Projects



Testbed Results

Innovation

- What innovations have been realized? Any industry impact?
- What best practices have been learned

Standards

- What noteworthy standards does the testbed employ? Their purpose?
- What noteworthy standards is the testbed influencing? Which SDOs?
- What gaps have been identified that should become a future standard?

Technical References

- What changes would you like to see in IIC Technical References?
- What influence has the testbed had on IIC Technical References?

The IIoT Ecosystem: Criticality of Liaisons

IIC has more than 22 existing liaisons and currently has 28 more in flight!

That's impressive for an organization that had its 3rd birthday on March 27th, 2017!

Below is a sample of the ecosystem that IIC is creating in the industry

OPEN
CONNECTIVITY
FOUNDATION™

CAICT
中国信息通信研究院
China Academy of Information and Communications Technology

THE *Open* GROUP

IoT Acceleration
Consortium

ISO JTC1 IEC
INFORMATION TECHNOLOGY STANDARDS

LoRa™

ETSI

OMG
OBJECT MANAGEMENT GROUP

IEEE

OASIS

tmforum
connecting digital ecosystems

broadband
forum

GS1

SGIP

eclipse

DIN

ZigBee™
Alliance

UPnP™
FORUM

kantara
INITIATIVE

OSGi™
Alliance

QuEST®
FORUM

TRUSTED
COMPUTING GROUP®

Building Coalitions to Address the IoT Ecosystem

IIC Vision: The Industrial Internet Consortium (IIC) is the world's leading organization transforming business and society by accelerating the Industrial Internet of Things (IIoT).

IIC Mission: Our mission is to deliver a trustworthy Industrial Internet of Things (IIoT) in which the world's systems and devices are securely connected and controlled to deliver transformational outcomes.

LWG Mission: The IIC Liaison Working Group

- ***Facilitates external interactions with the goal of building relationships for IIC***
- ***Coordinates internal stakeholder requests and interest with external organizations***

Building Coalitions to Address the IoT Ecosystem

Liaison Working Group *Strategic* Objectives

- **Build** and coordinate **collaborative**, working relationships inclusive of **government** organizations, formal **standards** development organizations and **open source industry** organizations
- Working with peer working groups, identify gaps in the **portfolio** of IIC and create then leverage relationships for IIC
- Make **strategic recommendations** to IIC Steering Committee to grow ecosystem

Example areas of *collaboration*

- **Joint workshops** conducted with partners
 - E.g. IIC:ITAC (Japan), IIC:CAICT (China) , IIC:I4.0 (Germany)
- **Technical workshops** e.g. recent technology and security workshop with NIST
- Liaison partnerships with organizations focusing on **verticals**
- Liaison partnerships with global **SDOs focused on IoT technologies**
 - E.g. ISO/IEC JTC 1/WG 10 (IoT), IEEE P2413 and 802.24 etc.
- Liaison partnerships with global **SDOs focused on related areas**
 - JTC 1/WG 9 (Big Data)



Building Coalitions to Address the IoT Ecosystem

Liaison Working Group Coordination Objectives

- Coordinate and work with internal stakeholder groups
- Coordinate with the IIC Marketing Working Group on press coverage related to liaison agreements
- Coordinate with the IIC Steering Committee Legal Sub-Committee and IIC council for review of agreements when needed

Liaison Working Group Operational Objectives

- Act as the central point within IIC for communicating with partner organizations
- Evaluate benefits to the IIC of a proposed liaison
- Identify internal stakeholder groups (e.g. IIC task groups and/or working groups) that would benefit for a proposed liaison
- Draft liaison agreements with candidate partner organizations. The Agreements developed by the Liaison Working Group may
 - Enable IIC and its liaison partner pursue related and mutually beneficial goals (e.g., exchange of information, definitions, testbeds, use cases, demonstration projects, technical specifications, standards and harmonize architectures)
 - List collaboration areas
 - Document the commitments from both organizations
- Make recommendations for approval to the IIC Steering Committee on proposed liaison agreements
- Direct both internal and external communications regarding the focus of the liaison

The IIC and standards organizations

The IIC is ***not*** a standards organization.

Requirements are different for the Industrial Internet compared to consumer IoT.

The IIC will:

- establish a reference architecture
- evaluate existing standards against it
- identify requirements, and
- propose these requirements to standards organizations

Business Strategy and Solution Lifecycle



Business Strategy



Solution Lifecycle



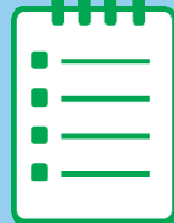
Project Toolkit

IIRA

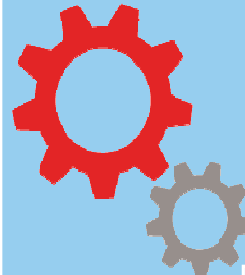
Security Frameworko



Requirements for Standards



Topics and Themes



Business Model, Project Mgmt, Practices



Project Specifications & Reports



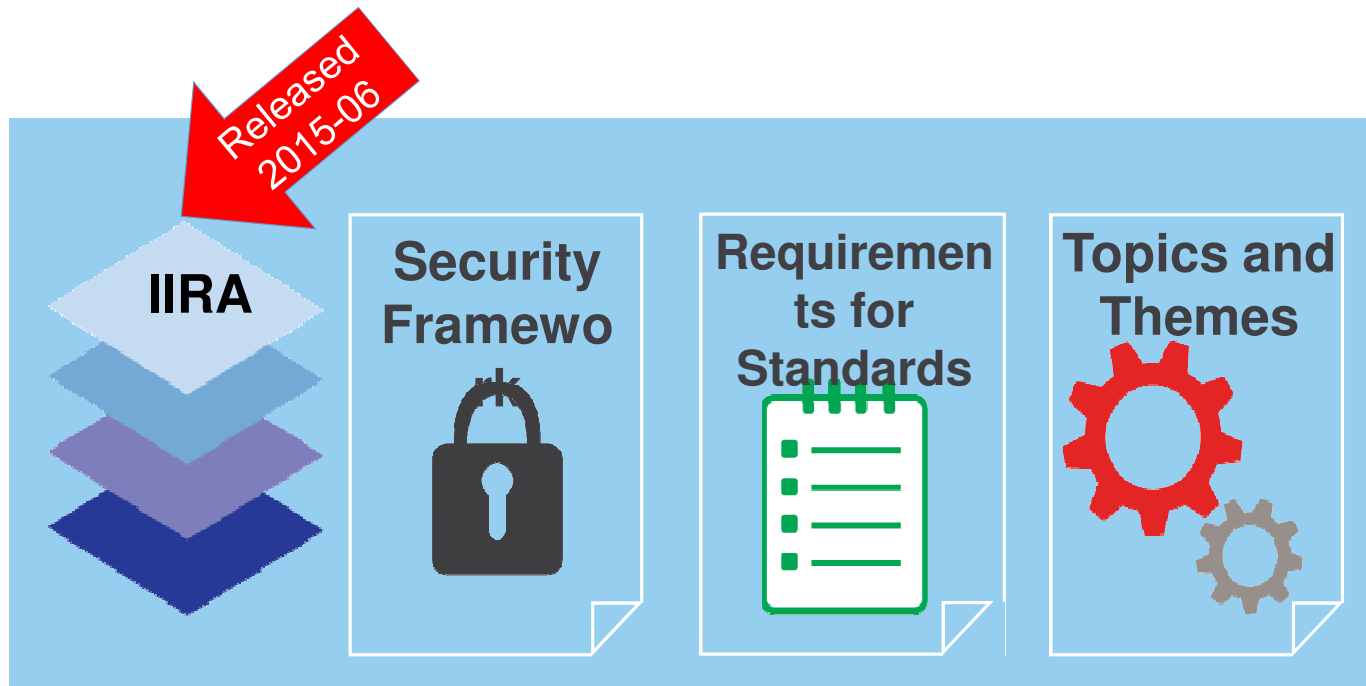
Architecture & Design



Testbeds & Projects

IIC
General IIoT Ecosystem

IIoT Technologies







Architecture Description for IIC

Built on Top of ISO/IEC/IEEE 42010:2011

Stakeholders

 Biz decision makers
System Engineers
Product Managers

 System Engineers
Product Managers
System Architects

 Architects
Engineers
Developers

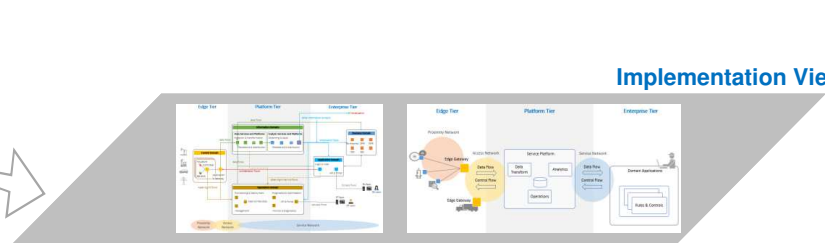
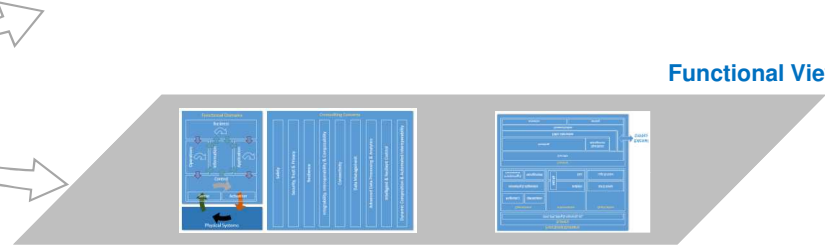
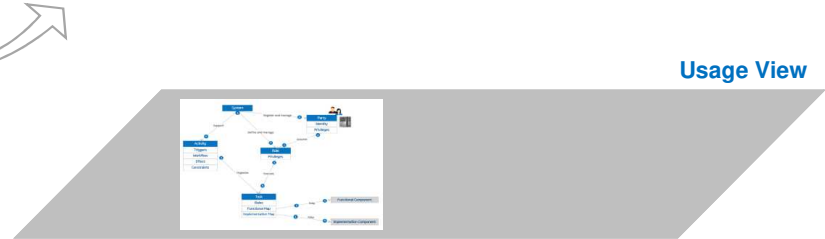
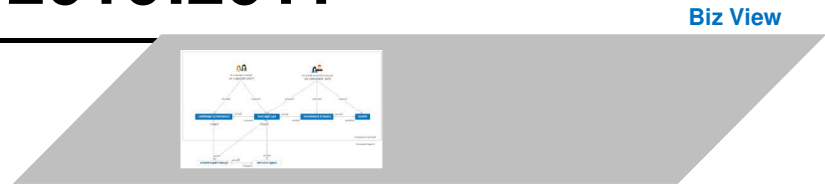
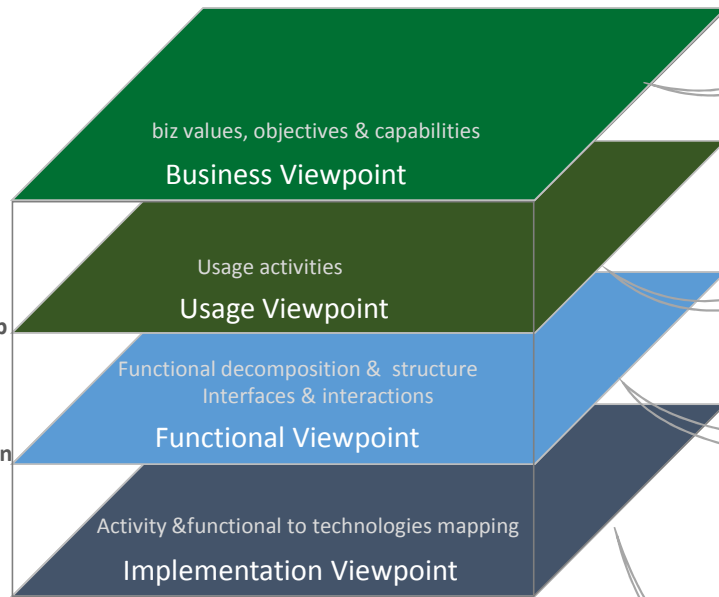
 Integrators
Deployment
Operations

Why

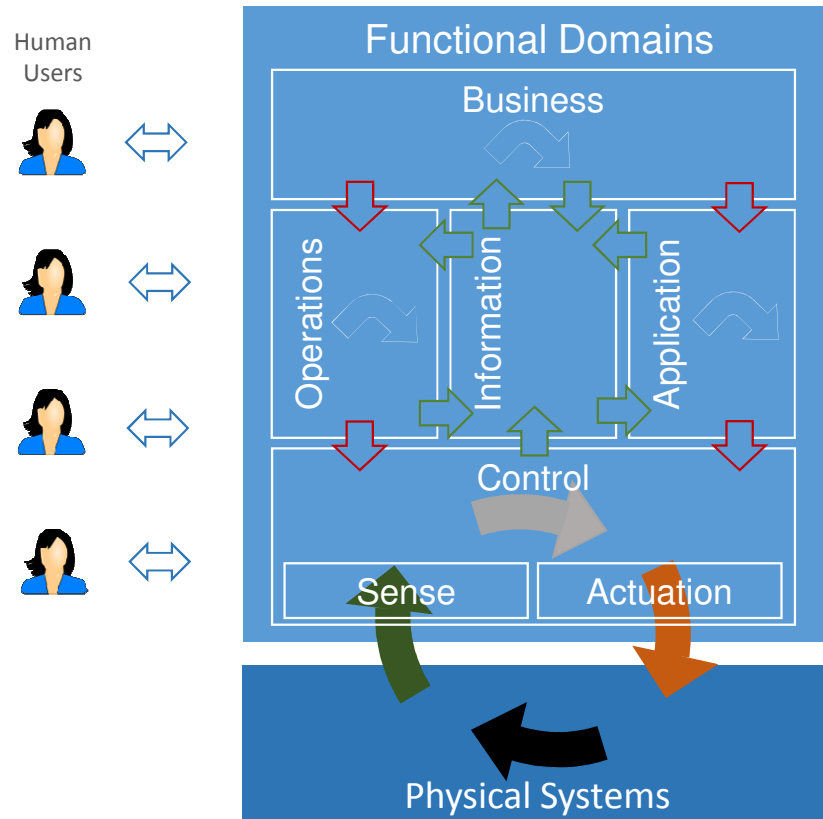
What

Noun

How

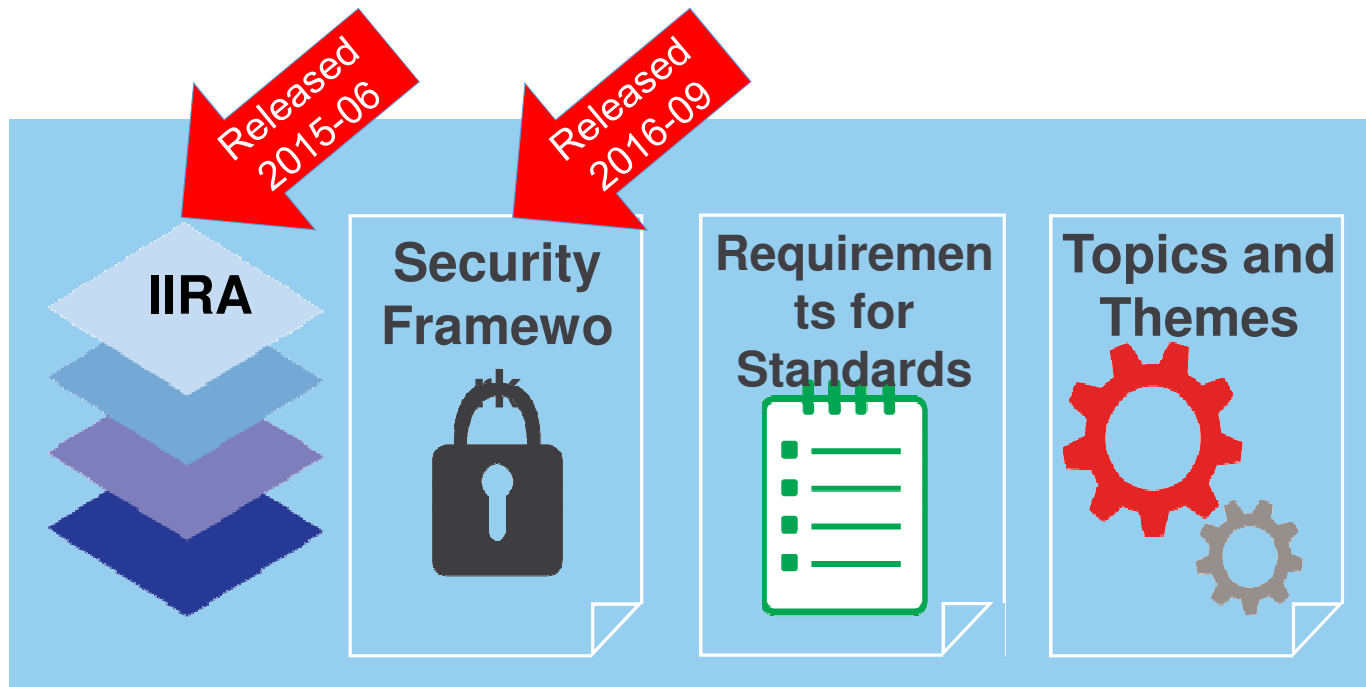


Functional Viewpoint – System decomposition

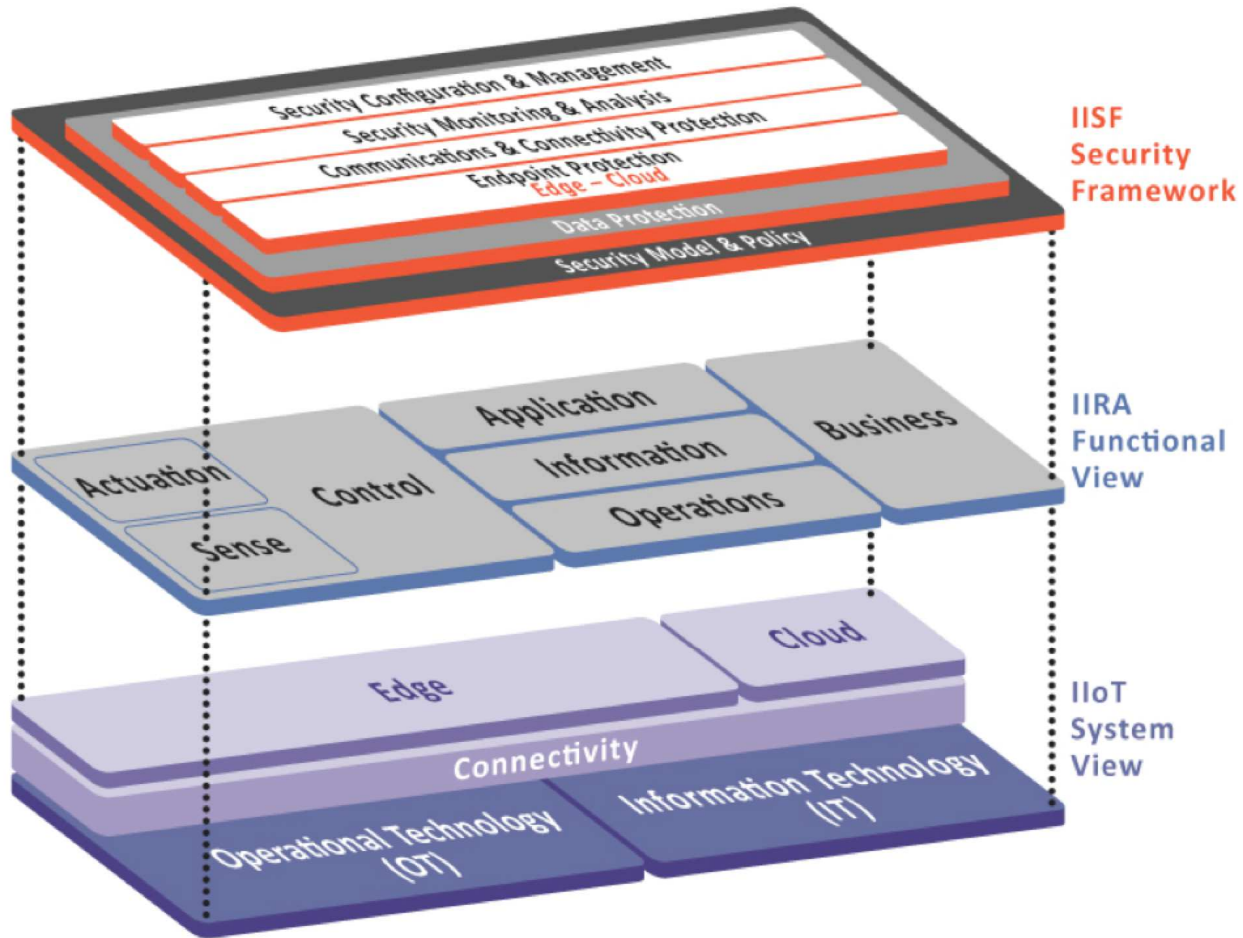


Green Arrows: Data/Information Flows; Grey/White Arrows: Decision Flows; Red Arrows: Command/Request Flows

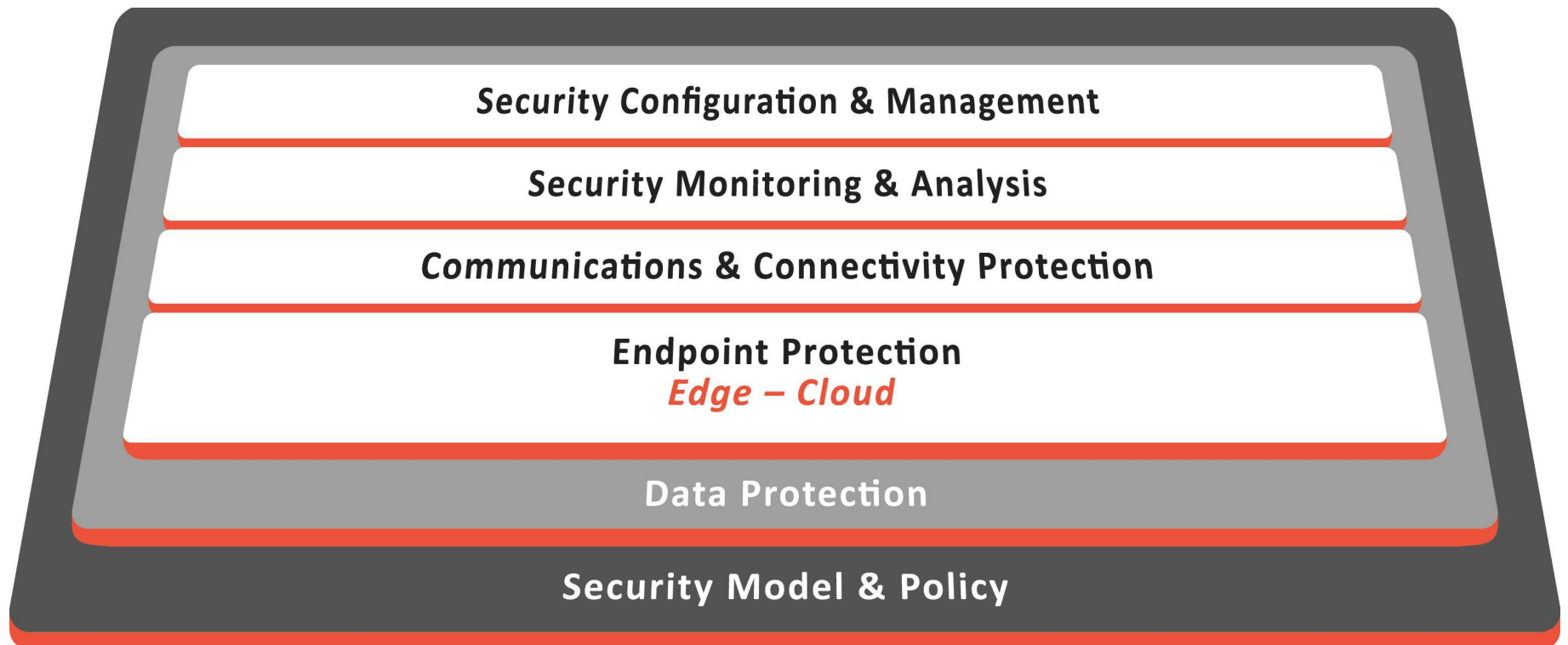
IIoT Technologies



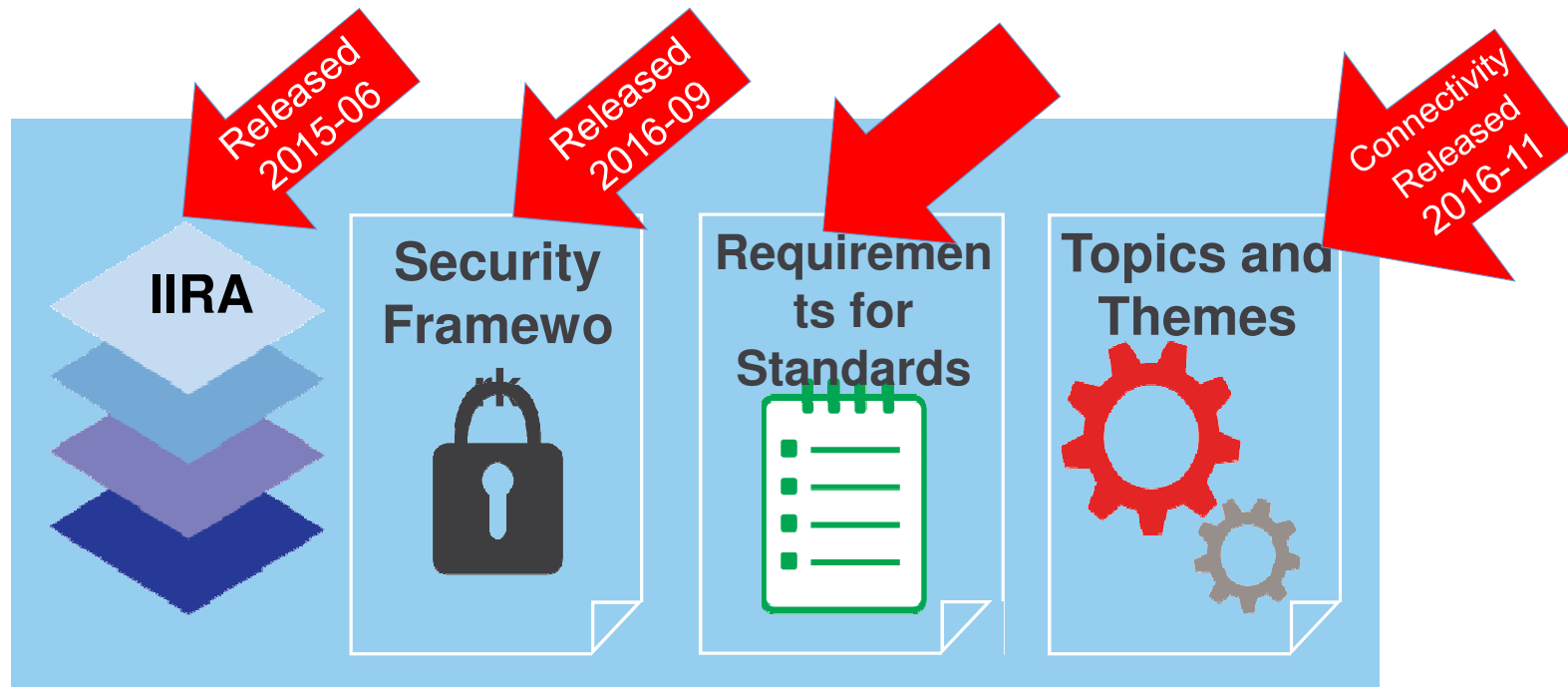
IIoT Security Application



IloT Security Building Blocks and Techniques



IIoT Technologies





Business Strategy and Solution Lifecycle



Business Strategy



Solution Lifecycle

Market Context

IloT Strategy

IloT Business Model Innovation

Ideation

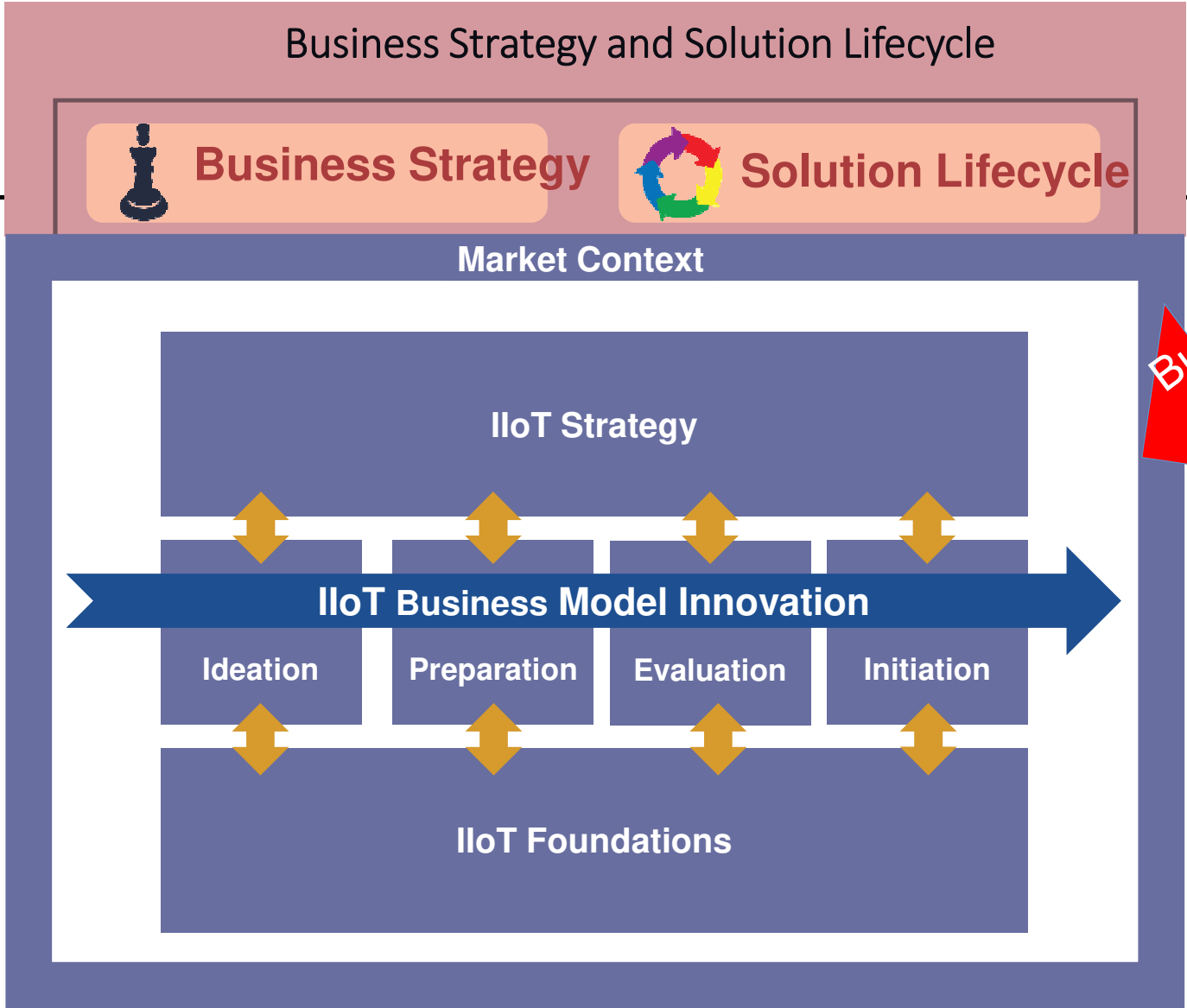
Preparation

Evaluation

Initiation

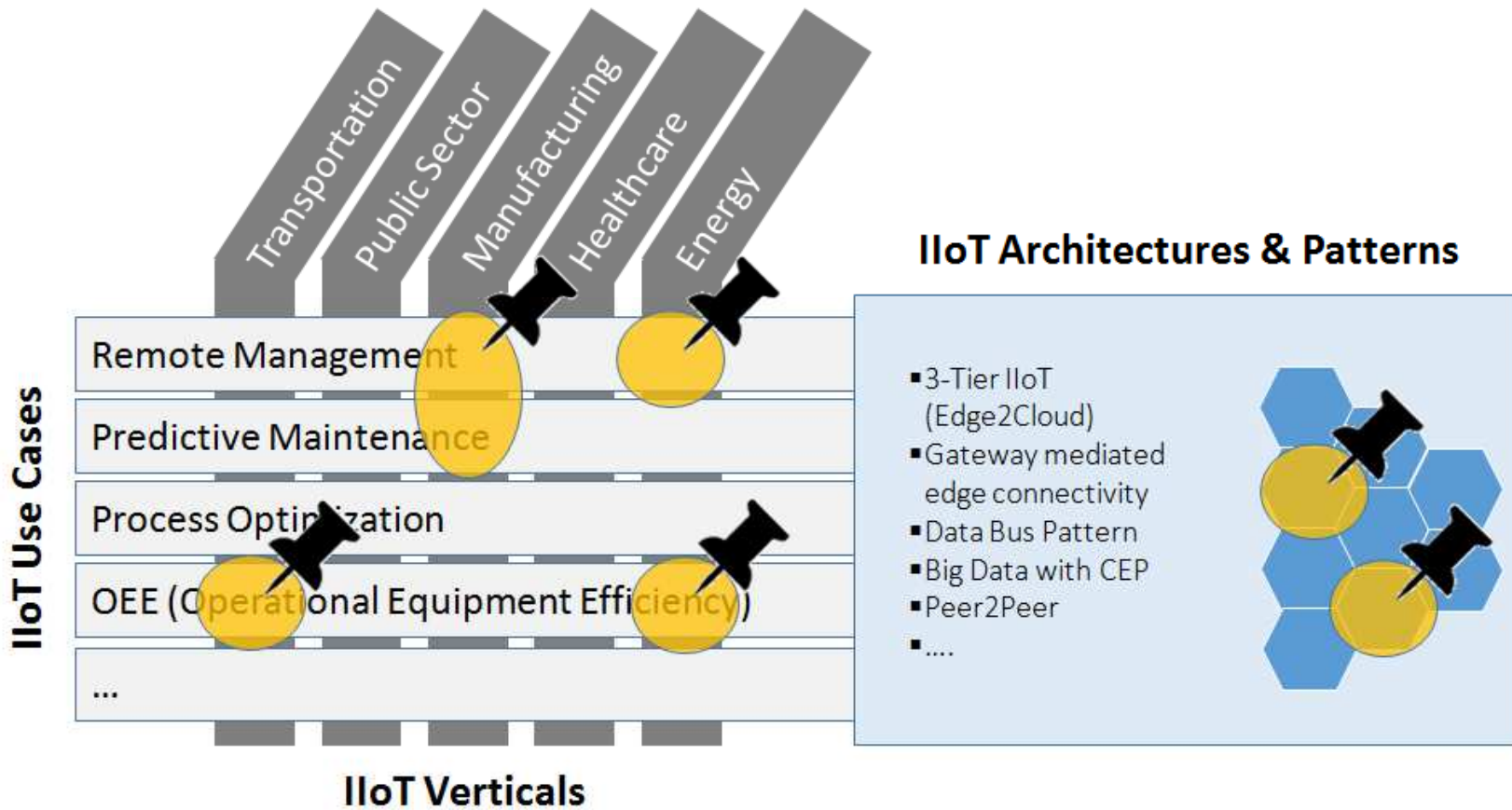
IloT Foundations

**Business Strategy
Released 2016-**





Industrial Internet Interoperability Coalition (I3C)





Thank you!

