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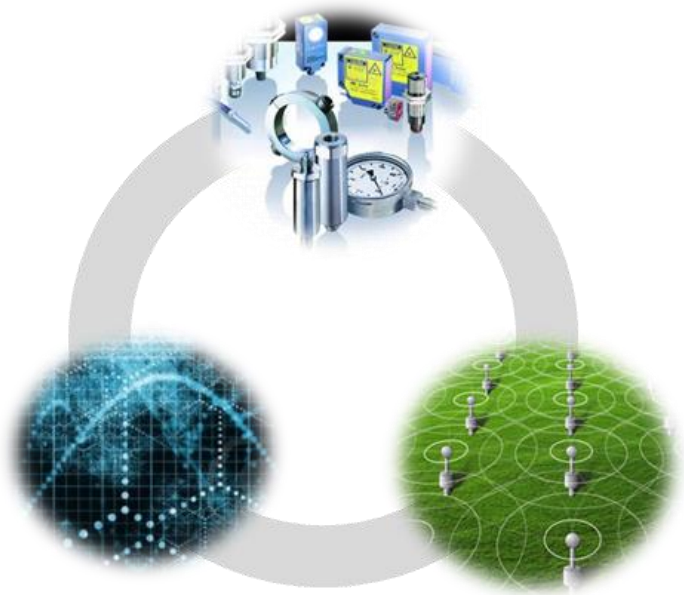
Driving Unconventional Growth through The Industrial Internet

Prith Banerjee
Managing Director
Global Technology R&D
Accenture

High performance. Delivered.

What is the Industrial Internet?

Sense and Act
through sensors and actuators



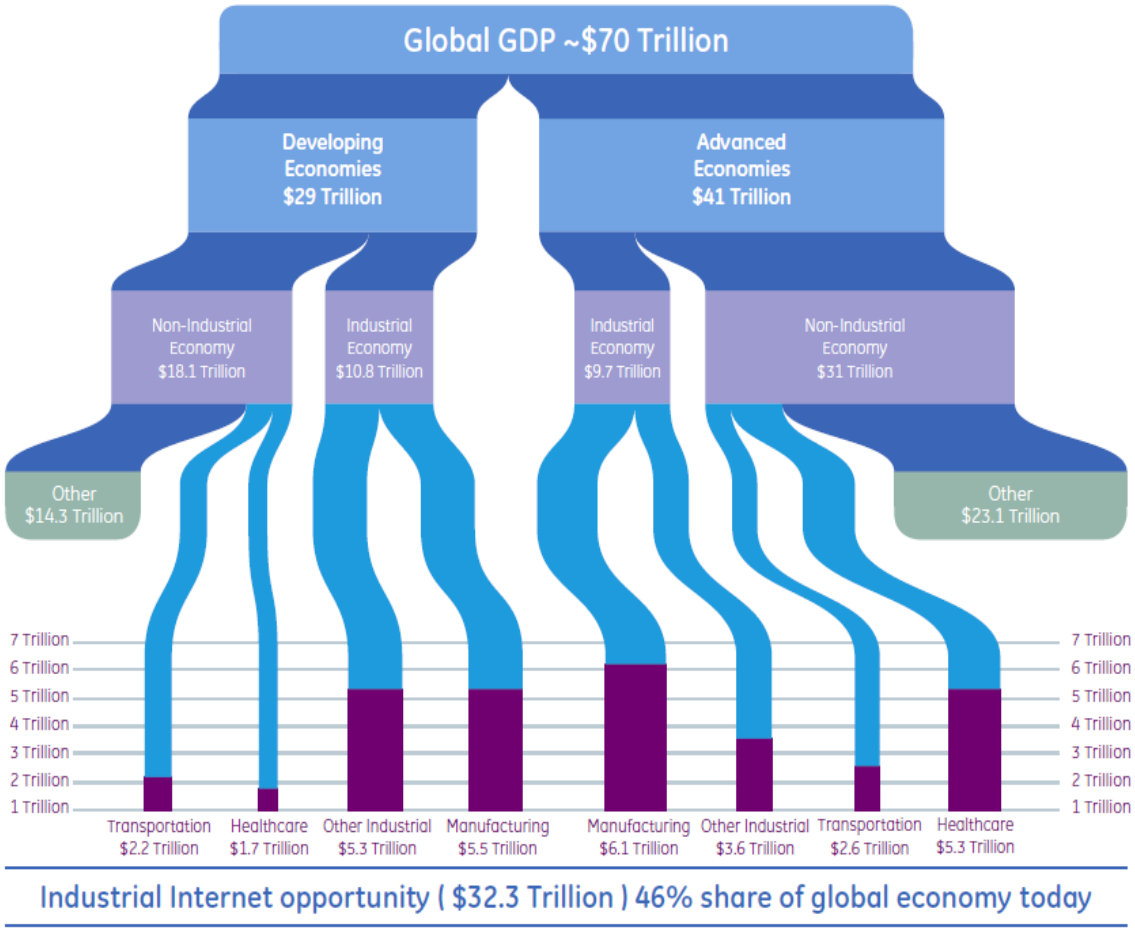
Analyze and Visualize
utilizing Big Data and Analytics

Communicate
through a wide variety of networks

"The industrial Internet is the universe of intelligent industrial products, processes and services that communicate with each other and with humans over the Internet"

Intelligent Product, Environment and Services

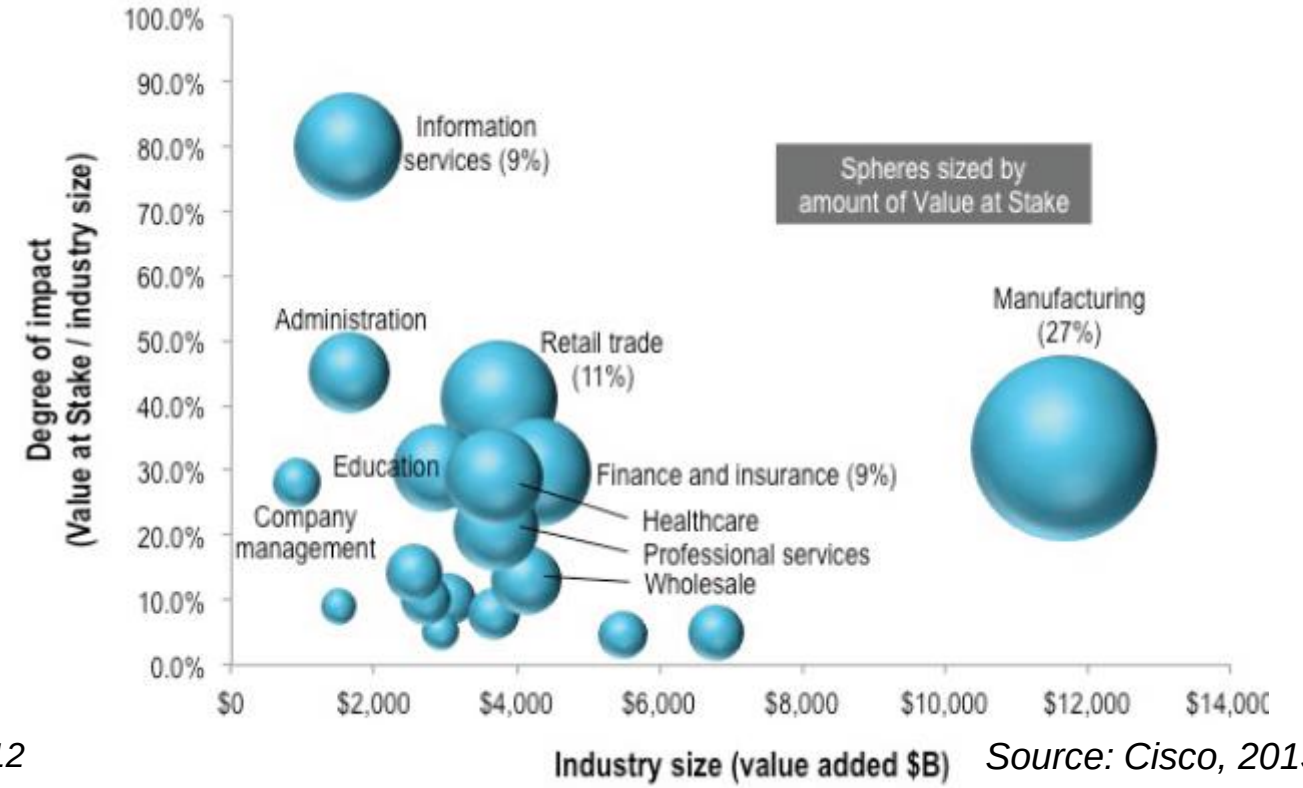
The benefits of Internet of Things are in the trillions of dollars



Source: World Bank 2011, GE 2012

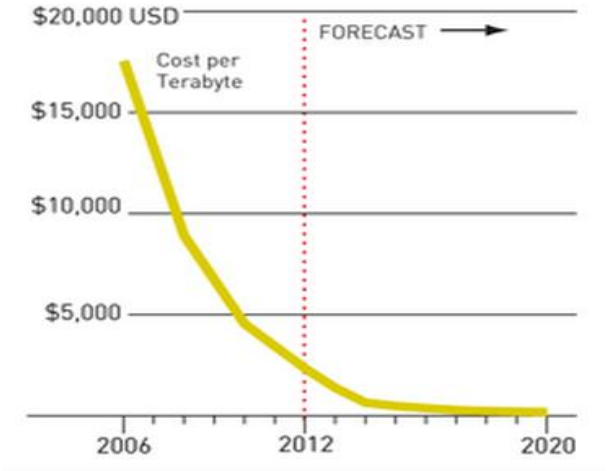
Forbes

CES LIVE: Cisco's Chambers Says Internet of Everything, $19 Trillion Opportunity, Is Next Big Thing



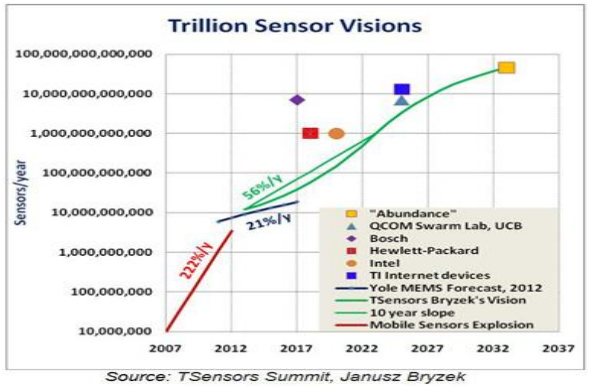
Source: Cisco, 2013

Internet of Things is not new, so why now?



Cloud Storage

Inexpensive & abundant storage enables aggregation of data streams from a variety of sources

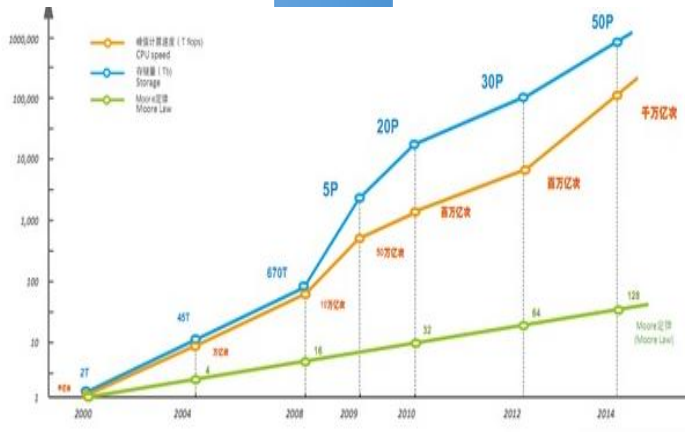


Source: TSensors Summit, Janusz Bryzek

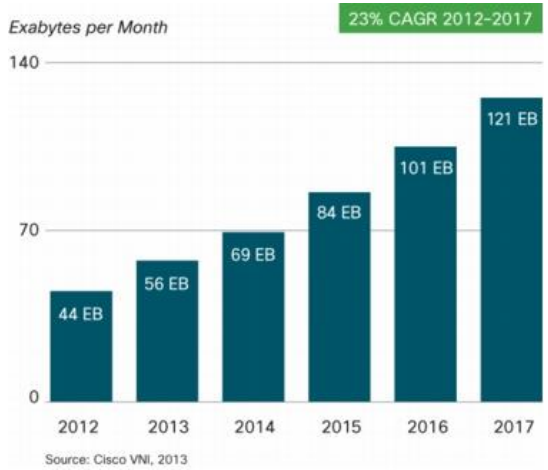
Embedded Sensors

Powerful but miniaturized sensors becoming universal connectors between physical & digital world

Industrial Internet



Source: BGI



Ubiquitous connectivity

Ubiquitous connectivity extended to physical products, infrastructure & things

Real-time Analytics

A combination of cloud and edge analytics enables real-time response to cyber-physical systems

Accenture's Investment in Industrial Internet

taleris

OMNETRIC Group

it's possible!
evopro

i4C
INNOVATION POWERED BY ANALYTICS

WORLD ECONOMIC FORUM
COMMITTED TO IMPROVING THE STATE OF THE WORLD

industrial internet CONSORTIUM

Plattform INDUSTRIE 4.0

Smart Service Welt

MICHELIN

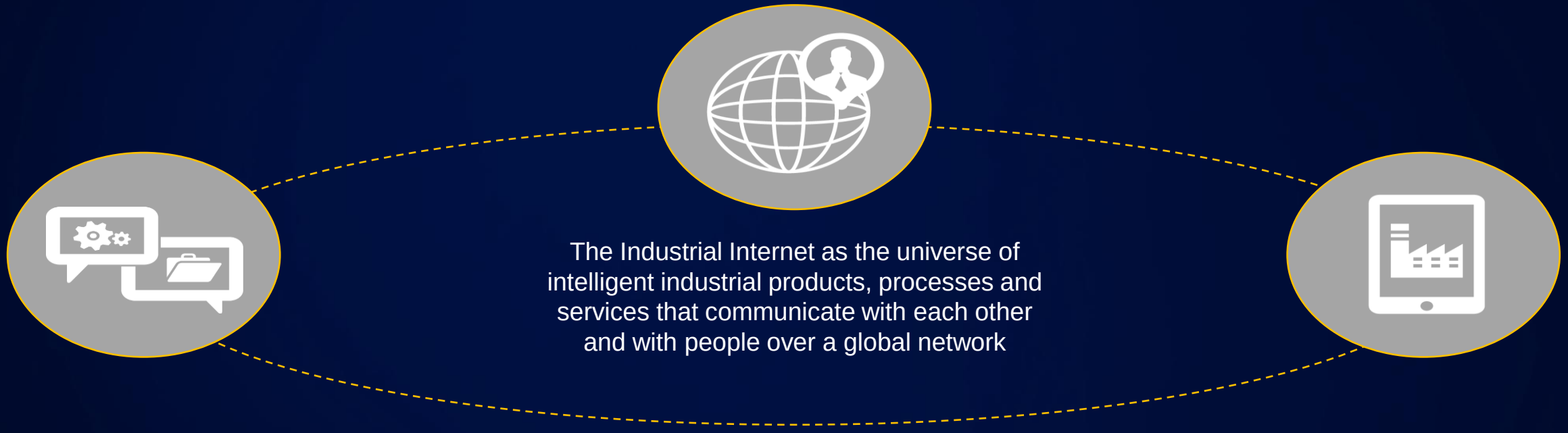
MAGNETI MARELLI

Thames Water

MARATHON

Driving Growth from the Industrial Internet
(Point of View Published Sep. 2014)

The Industrial Internet has been heralded primarily as a way to improve operational efficiency. But in today's environment, companies can also benefit greatly by seeing it as a tool for finding growth in unexpected opportunities.

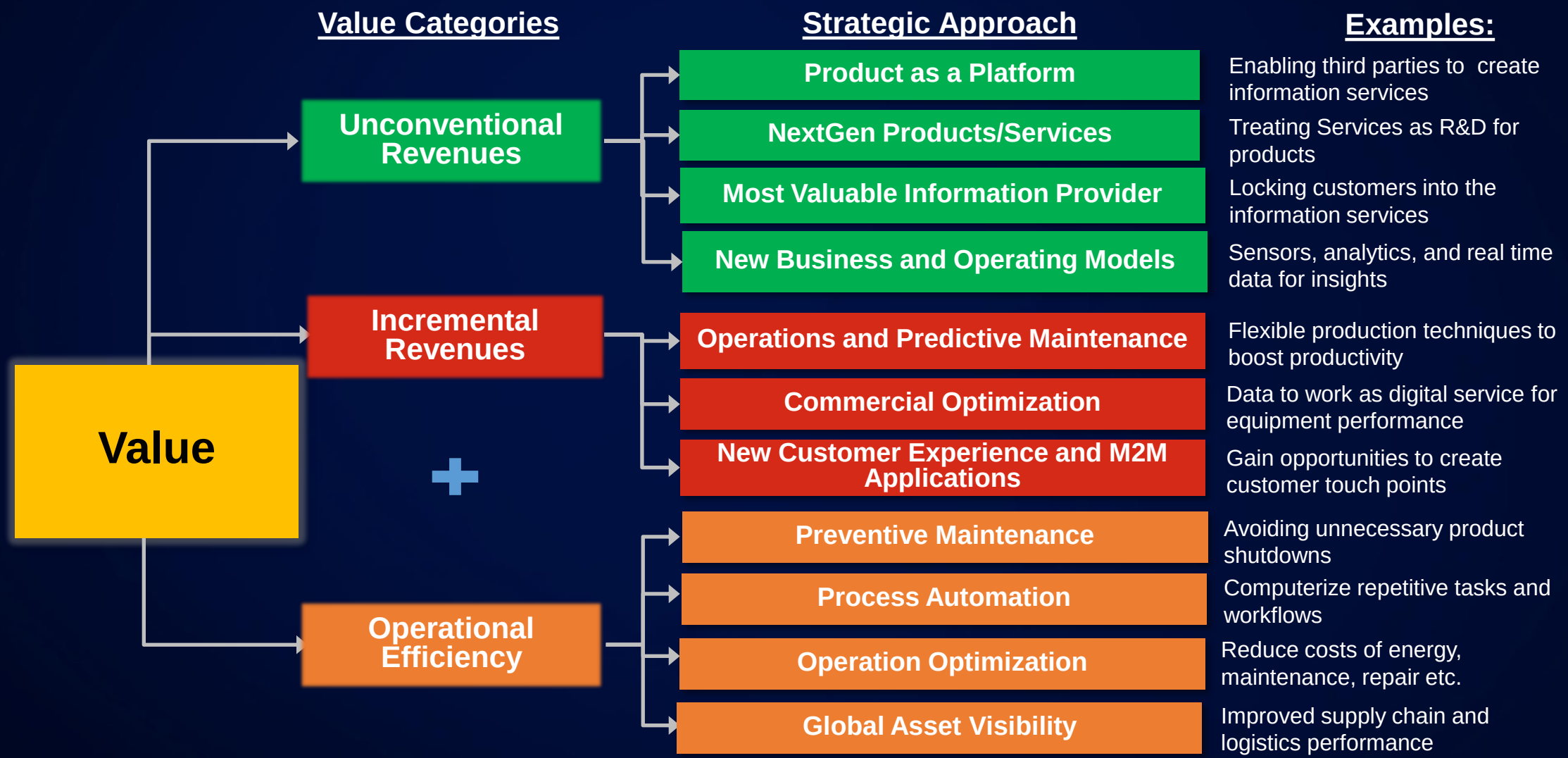


The Industrial Internet as the universe of intelligent industrial products, processes and services that communicate with each other and with people over a global network

Operational Efficiency
Automation, more flexible production techniques and predictive maintenance

Top-Line Growth
New digital products and services, and generate entirely new sources of revenue

The Industrial Internet will enable the capture of significant value – of which operational efficiency is only a small part



Four steps to exploit revenue-generating opportunities

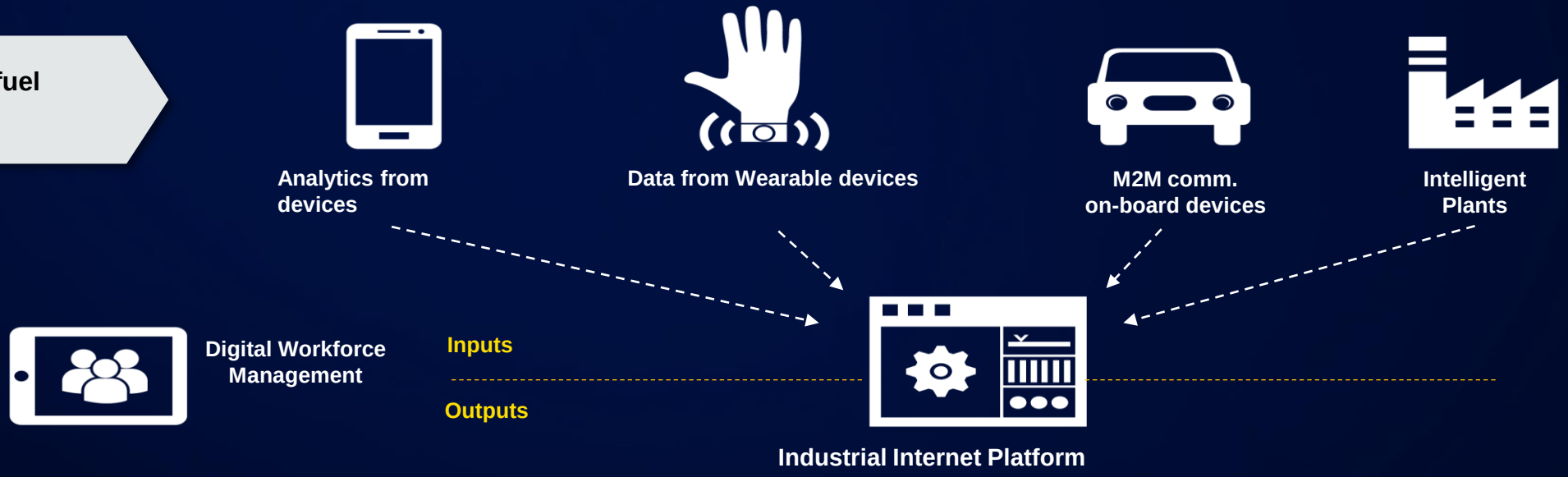
1. Innovate through **Product-Service Hybrids**

2. Be the **most valuable information provider**

3. Intelligent technologies

4. Create the **Industrial Internet workforce**

Intelligent technologies will fuel innovation



1. Innovate through product-service hybrids

Product Makers

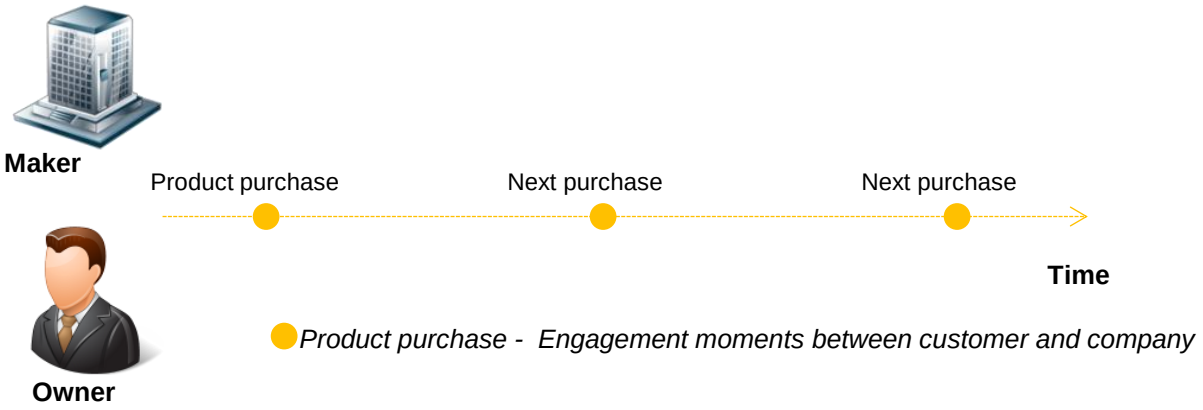
- Product as a Platform
- NextGen Products/Services
- Most Valuable Information Provider
- Data Analysis & Recommendations

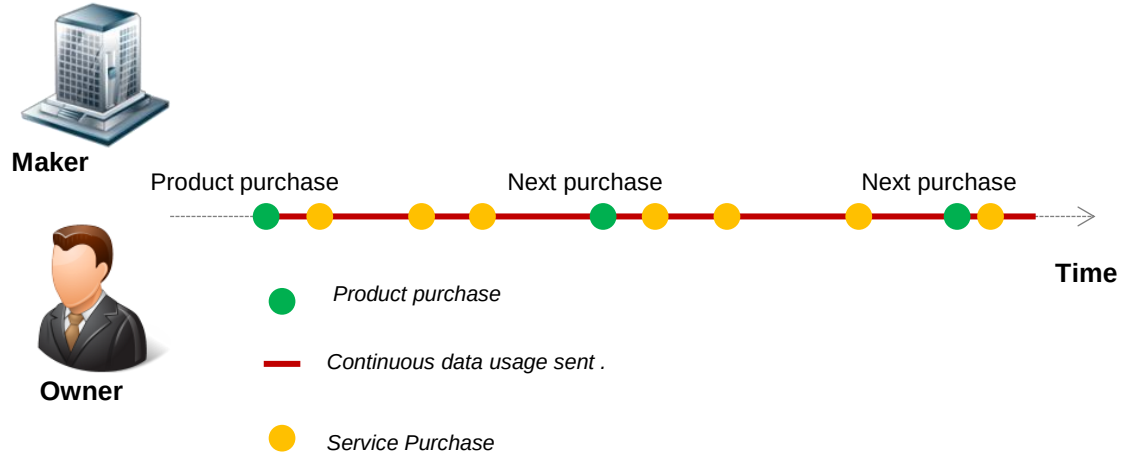
Owners / Operators

- Preventive Maintenance
- Automation
- Operation Optimization Services
- Reduce Resource cost

- Boost Productivity
- Improve Equipment Performance
- Increase Customer trust & loyalty

Product-Service Hybrids will be a primary enabler of new value for product owners / operators and makers





Issues

- **Few point of contacts** between company and the client. Limited to purchase moments and infrequent maintenance engagements
- Very **little insight** into the client needs and behavior.
- High **risk of attrition** due to inadequate value proposition to the client.

Outcomes

- **Continuous engagement** with client, even post purchase, through **digitization of consumption**
- **Deep insight** into client needs and behavior
- Increase **customer lock-in** through personalized offerings
- **Address new customer segments** through new services in a **test & learn** approach
- Build a **Direct to consumer** relationship

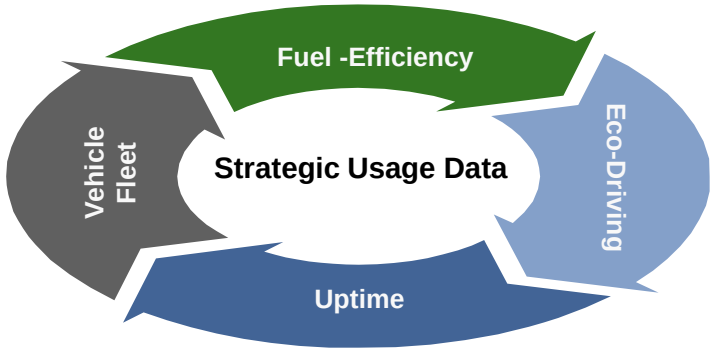
Michelin move to Service vision
Tire Manufacturer Business-as-a-Service ecosystem

To get stronger and faster in the Services business

- *Convergence of interest*
- *Able to support ambitious growth over the next 10 years*
- *Global footprint*

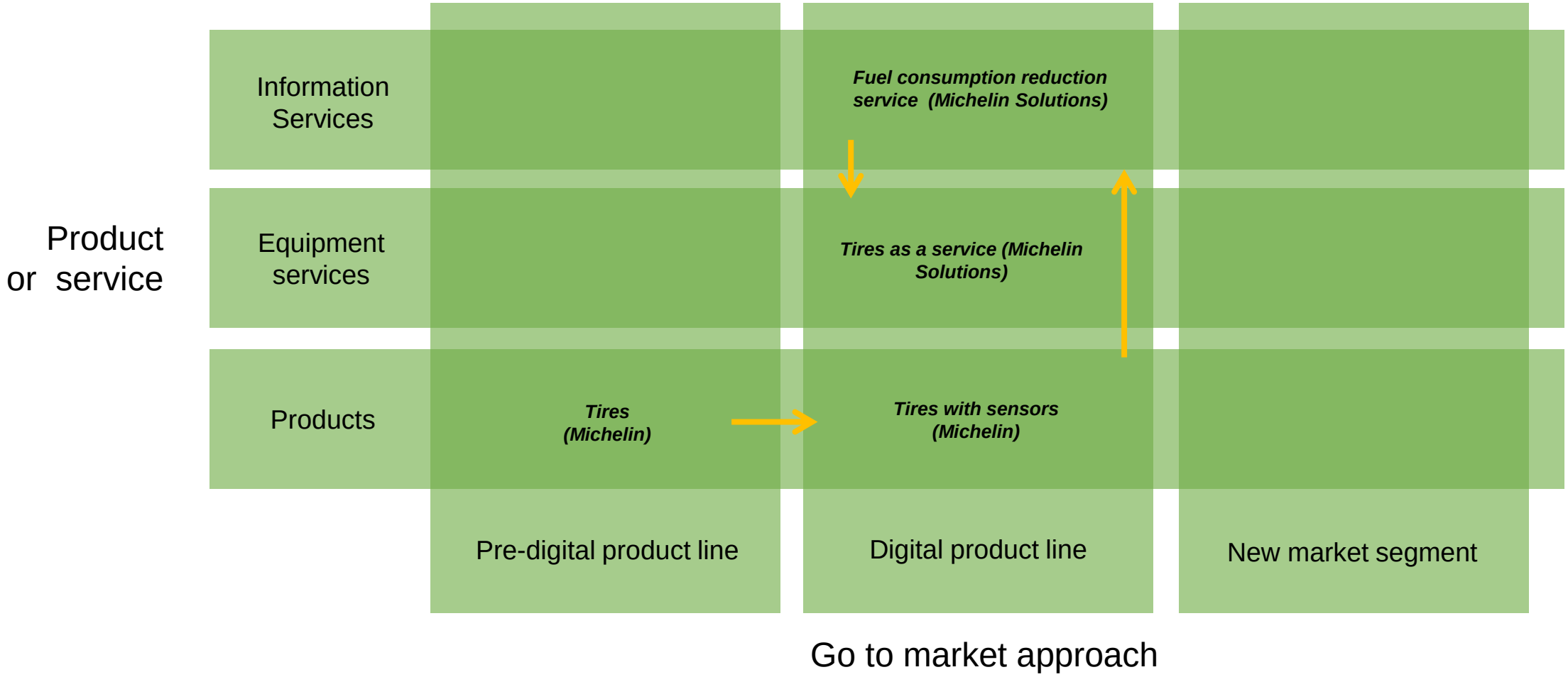
1 Scale up existing Tire-as-a-Service business

2 Bring new services to the market



3 Federate an ecosystem of business partners

Michelin is helping truck fleet managers reduce fuel consumption and costs, and allowing them to pay for tires on a kilometers-driven basis.

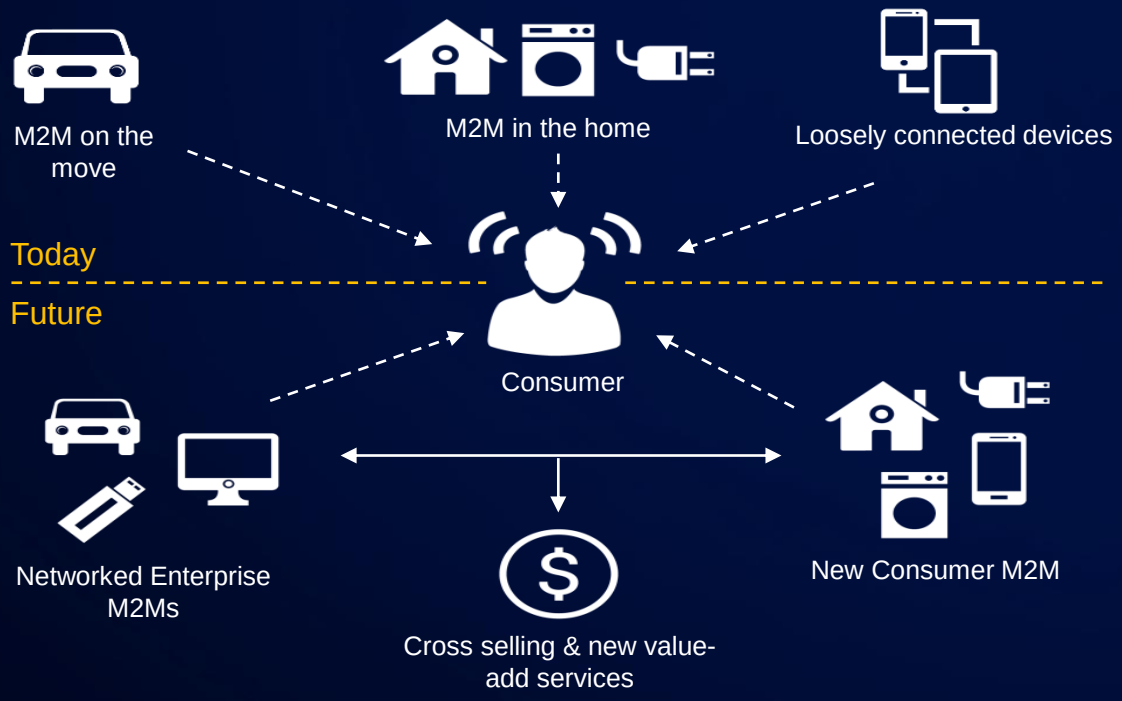


2. Be the VIP – Most Valuable Information Provider

Sell products, and your customers interact with you only when they have a problem.

Sell services, and you gain multiple opportunities to create customer touch points, build trust and become the preferred provider for new services.

Make the consumer aware of their "Internet of Things" and then work with the ecosystem partners to drive next generation customer experiences.

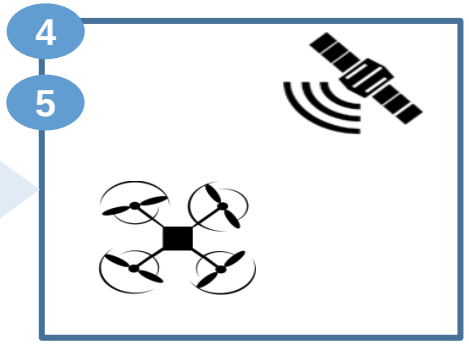


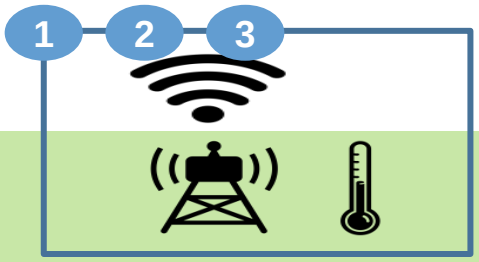
- Increase ability to have context rich interactions within value chains
- System offers analytics on large real-time data for diagnostic and recommendation
- Share data with partners for value –added services across the eco-system e.g. carrier, vehicle and payment services

Precision farming requires information about soil chemistry, location, weather to optimize yield per acre or hectare.

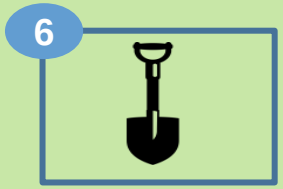
Behind the scene John Deere's digital services strategy:

4. **Imagery** from satellites allows farmers to divide land into micro-fields, enabling precision
5. **Drones** will be a cheaper alternative that also scout fields and check plant health

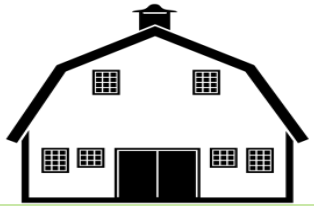




1. **Weather Base Station** collects on-site weather data, transmitted wirelessly
2. **Field Probe** collects soil moisture data, transmitted to base station
3. **Weather Data** provides site-specific weather data, but without direct measurement

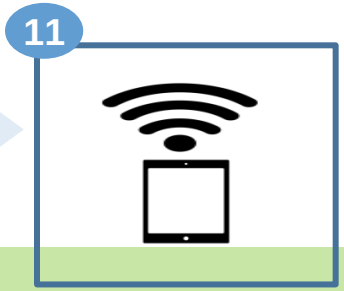


6. **Soil Sample** collected by agronomist determines composition and nutrient level of the soil, collected every 3 years



7. **Tractor Sensor** measures seed inputs
8. **Sprayer Sensor** measures fertilizer/pesticide inputs
9. **Harvester Sensor** measures crop yield
10. **Telematics** measures machine location, performance

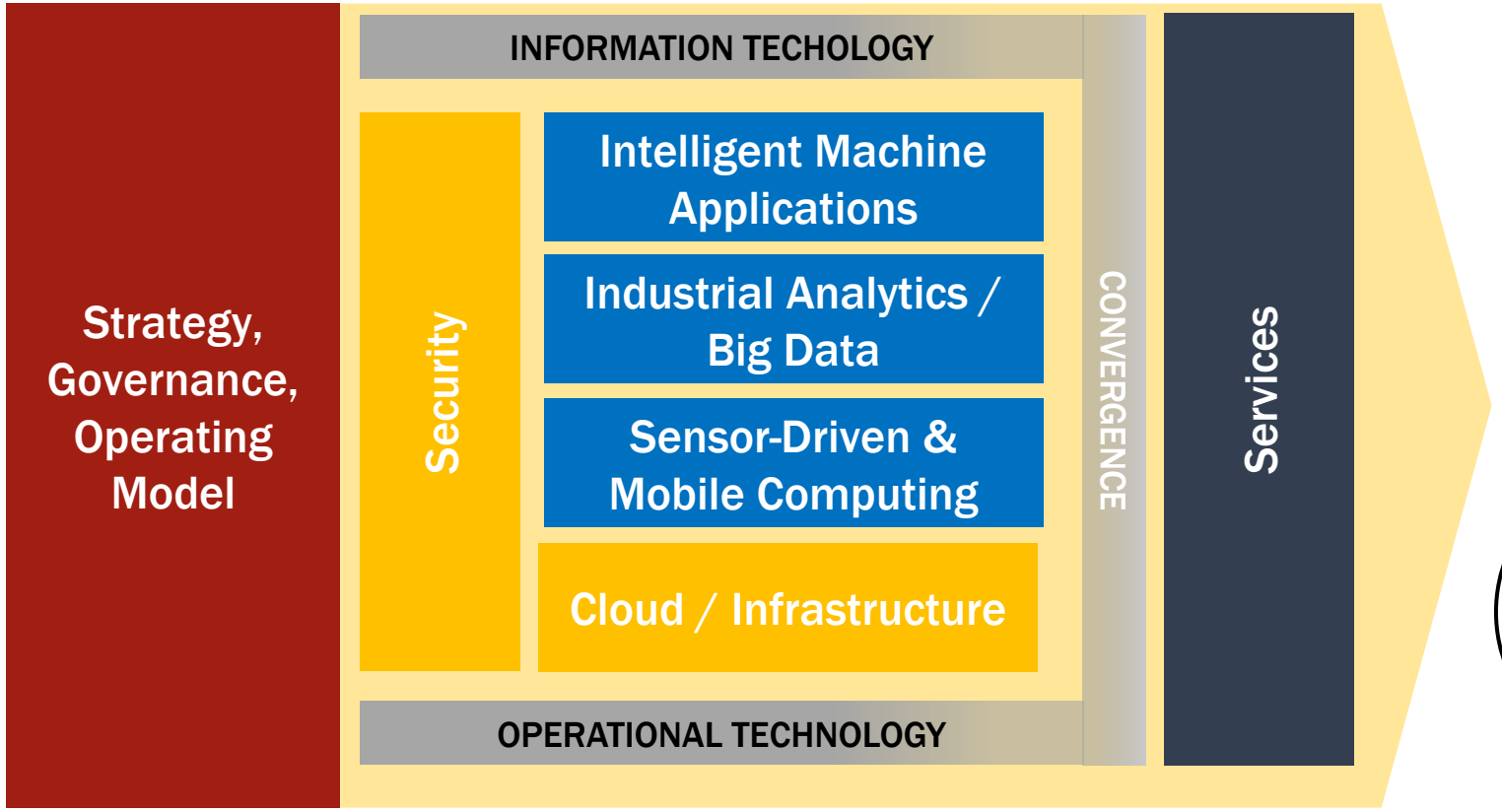
11. **Mobile/Computer** allows farmer to input information about their farming decisions

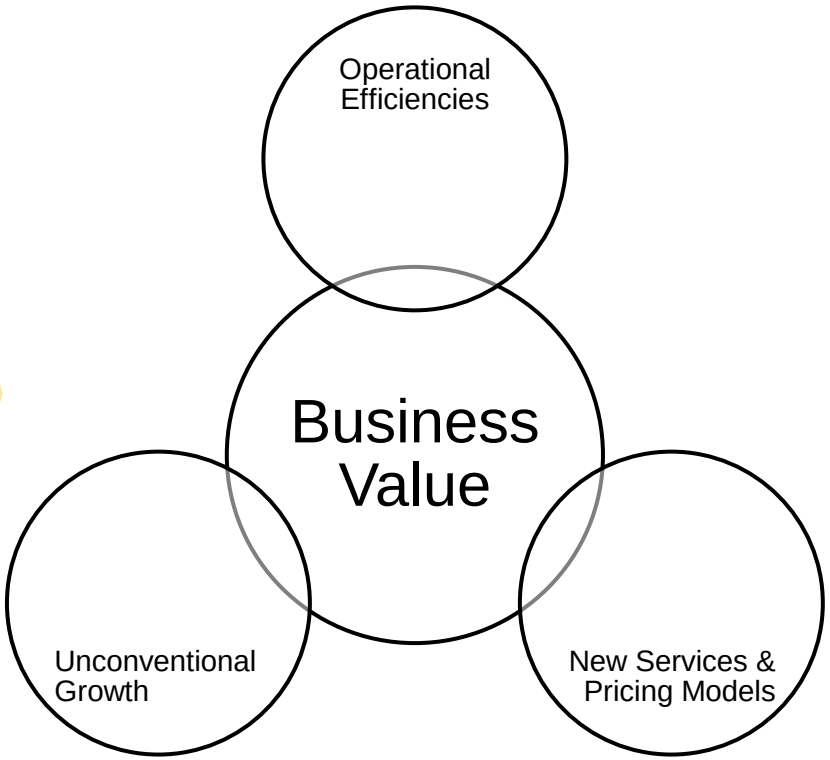


3. Intelligent Technologies that will fuel innovation

Innovation is critical to developing and delivering differentiated new product-service hybrids that drive growth. To reap the full benefits of the Industrial Internet, companies will need to excel at exploiting these technology capabilities: sensor-driven computing, industrial analytics and intelligent machine applications.

IOT / Industrial Internet Capability Model





4. Integrate Digital and Human Labor

While the adoption of the Industrial Internet will accelerate and expand the use of digital labor (in the form of automation using intelligent software and robots), greater returns and productivity gains will come from augmentation, which seamlessly blends digital and human labor in task-specific environments

Examples

Self-driving cars create an entirely different kind of commute and driving experience

Adaptive robots working side-by-side with people on the factory floor

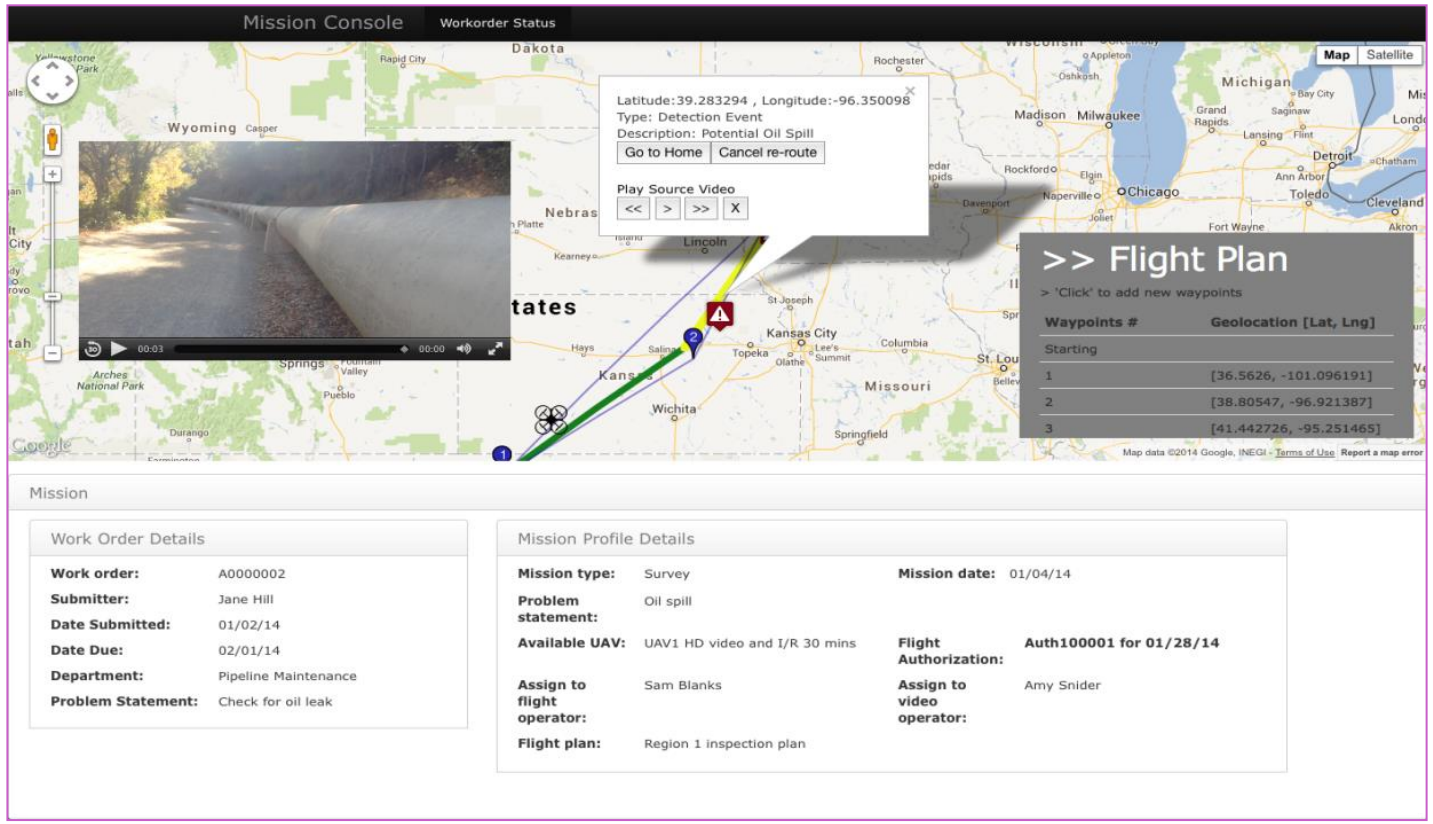
Remote operation of mining equipment from the Command Center

Robotics As Digital Labor: Reduce the Time to Location and Risk Exposure at location

Flexible Solutions

Customizable solutions that achieve your business goals:

- design missions to satisfy your business needs
- select type of UAV, number of UAVs and identify vendor
- determine the right set of sensors to meet the mission objectives
- customize analytics engine for your use case
- deploy flexible solutions through integration with any Industrial Internet platform

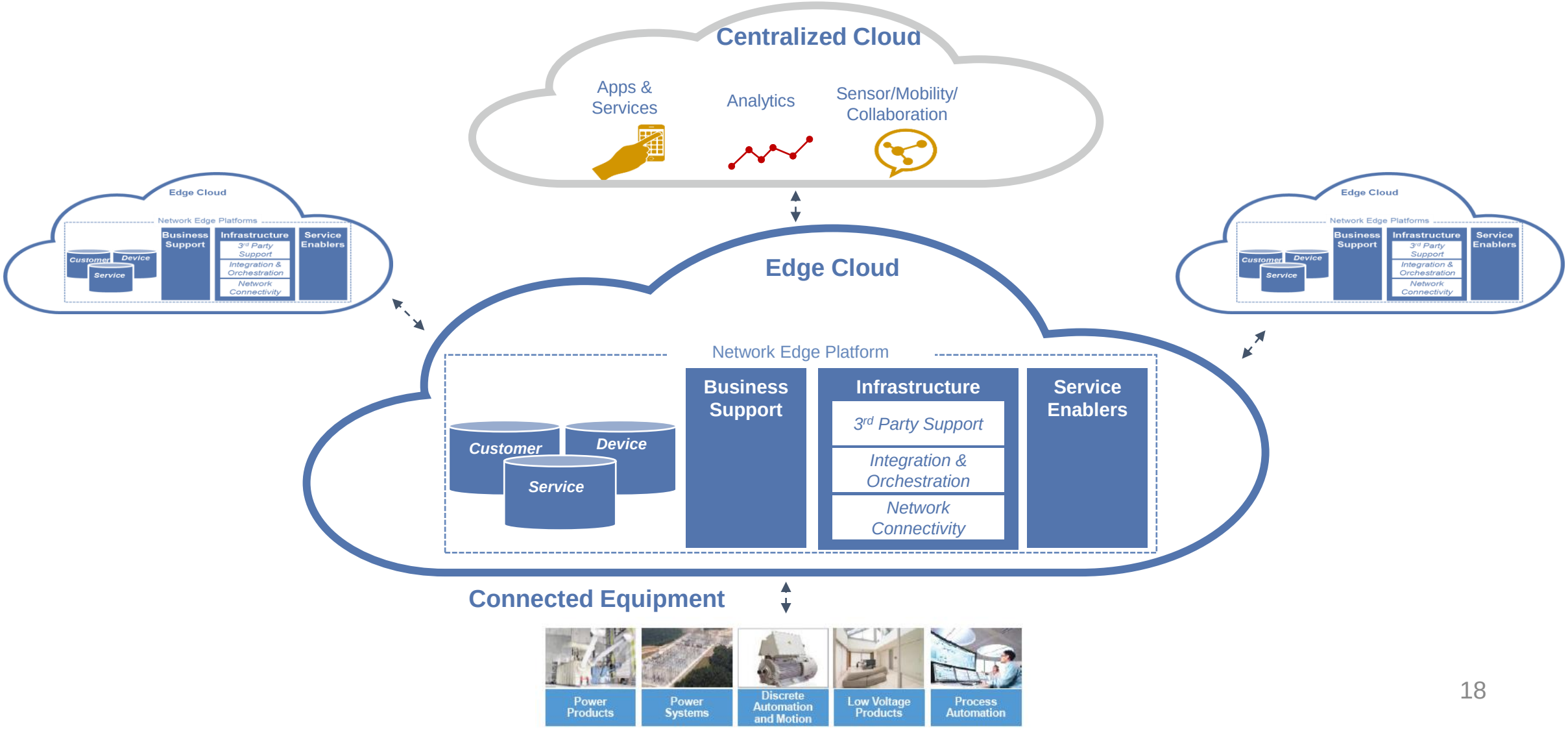


Illustrative Console: Fleet Management of UAVs for Asset Monitoring

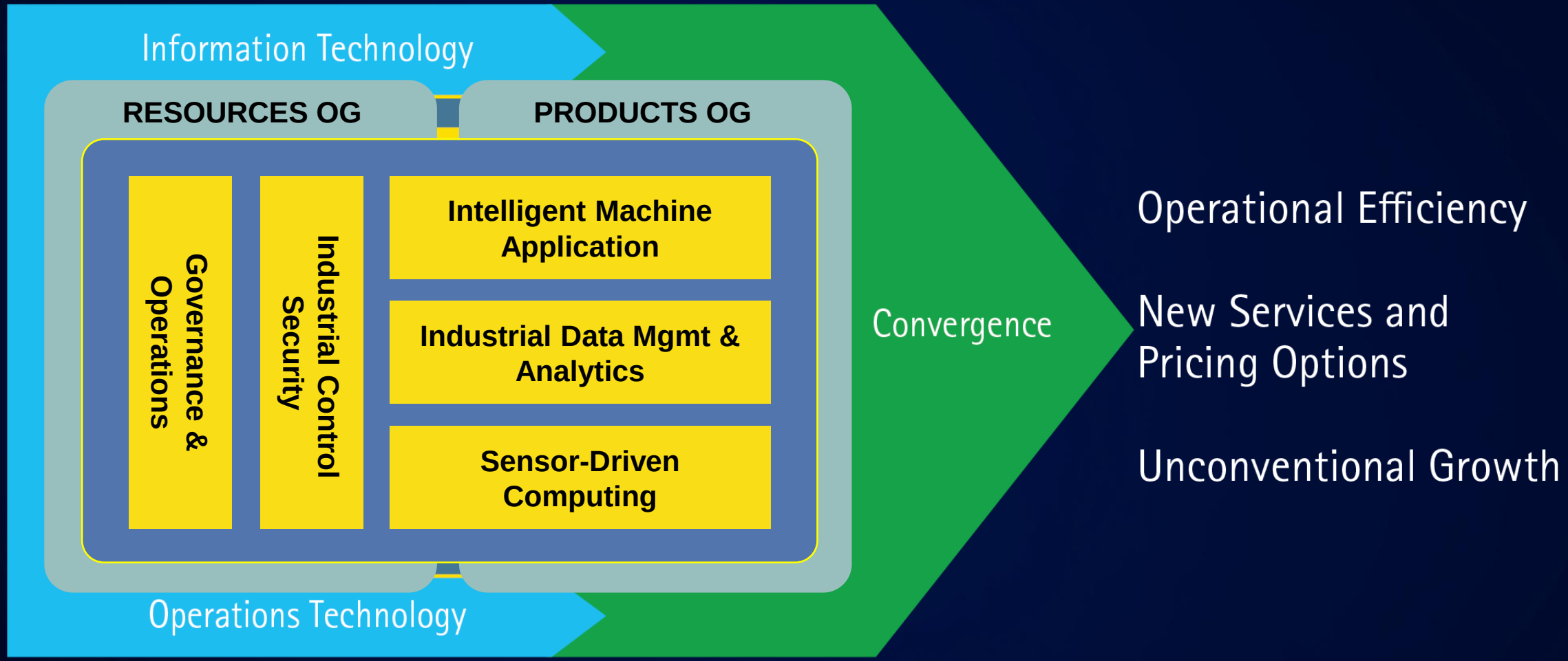
Assets such as Oil & Gas pipeline can be remotely monitored, using sensors on UAVs, to detect intruders, pipeline leaks, etc.

Product-Hybrid Services Delivery Vision

End-to-End View of a Connected Services Solution



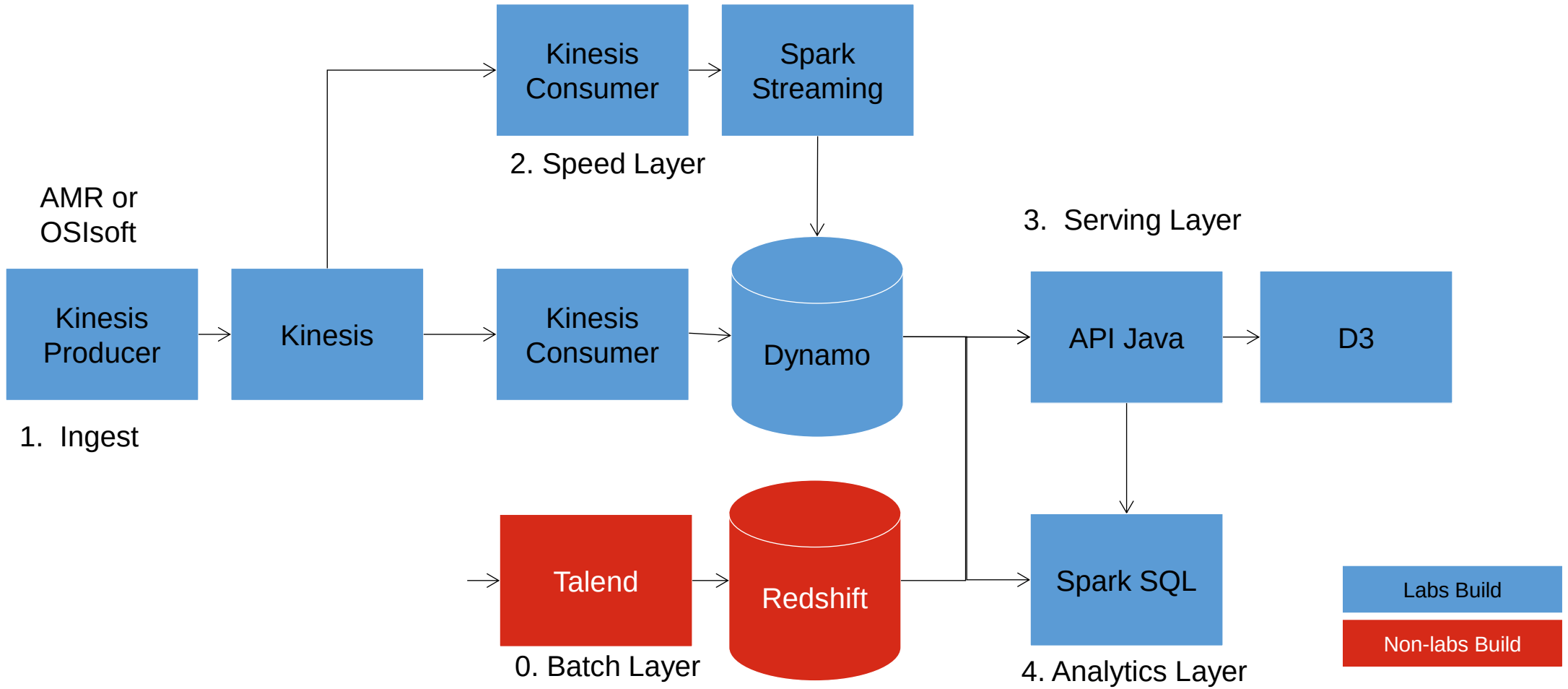
Accenture Tech Labs IIoT Platform



Platform Candidates: Accenture DCPP, Amazon, Microsoft ISS, SF, SAP HANA, ***Open Source***

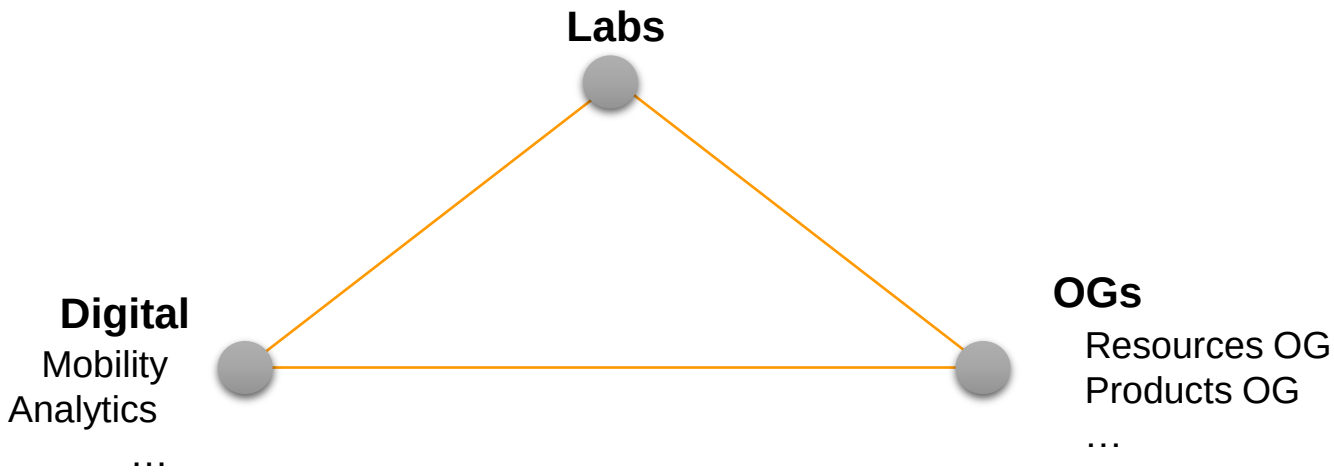
Example Platform: Industrial Data Management & Analytics

Labs Team augments existing Analytics as a Service Platform's batch capability (0) to handle streaming time-series at scale—ingest (1), near-real time analyze (2), serve and visualize (3), and analytic modeling (4).



Working with Clients on IIoT Solutions

Operating Model



Resources

AIR LIQUIDE, bhpbilliton, devon, RioTinto

Products

Heineken, MARRIOTT, PENSKE Truck Rental, SIEMENS

CMT

BOEING, QUALCOMM, intel, comcast, at&t

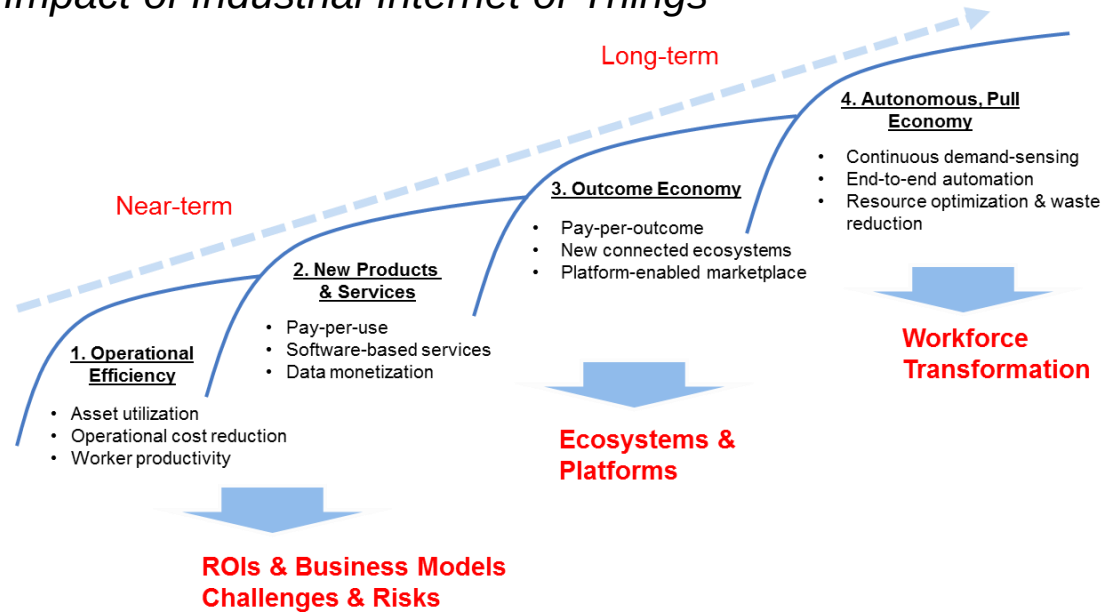
H&PS

SINGAPORE

Ford, VISA, CARGOTEC, PHILIPS, WVUHS West Virginia United Health System

World Economic Forum

Impact of Industrial Internet of Things



Final Report Structure

Executive summary

1. **General findings**
   - The state of the market
   - Key opportunities and benefits
   - Major challenges, barriers and risks
   - What lies ahead
2. **Convergence of the outcome economy**
   - From connected products to software-based services
   - The emergence of the outcome economy
   - Delivering outcomes through connected ecosystems and platforms
3. **Shift towards an integrated digital and human workforce**
   - Addressing skill shortage through intelligence augmentation
   - Attracting new talent by creating an adaptable workplace
   - Creating new jobs in digital industries
   - Training and reskilling for digital industries
4. **Implications to manufacturing**
   - Beyond automation: the emergence of smart factories
   - From customized products to outcome-based services
   - Preparing for a digital manufacturing workforce
5. **Recommended actions for stakeholders**

Standards Bodies and Consortia

- Industrial Internet Consortium founded in March 2014 by AT&T, GE, Intel, Cisco, IBM
  - www.ii**consortium**.org/
  - 85 member companies with an emphasis on industrial applications
  - Accenture joined as member in June 2014
  - The main aim of the IIC is to define **an open architecture** that will ensure **extensibility** and **interoperability**,and a **test bed** to prove the architecture and test implementations

- AllSeen Alliance founded by Qualcomm in Feb 2014
  - https://www.**alljoyn**.org/
  - About 60 member companies focusing on consumer applications and device level interconnection standards (Qualcomm, Panasonic, Sharp, LG, Electrolux, CISCO, HTC)

- Open Internet Consortium founded in July 2014 by Broadcomm and Intel
  - **www.open**interconnect.org/
  - About 10 member companies focusing on consumer applications and device level interconnection standards (Broadcomm, Intel, Atmel, Dell, Samsung, Windriver)

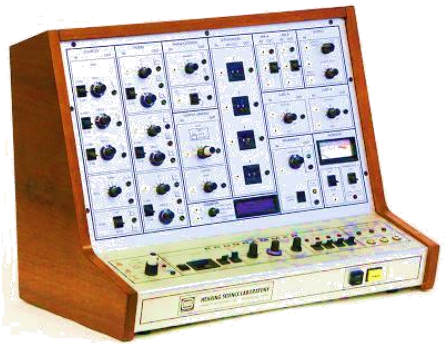
Challenges and Opportunities

Unreliable Infrastructure

Data & Infrastructure Interoperability

Volume of Data

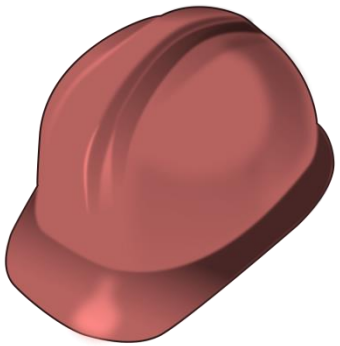
Real-time Analytics



Modernization of legacy systems

Cyber-Security Concerns

Data Sharing & Privacy Concerns



Labor/Skill Shift Concerns

High performance. Delivered.

QUESTIONS?

POV can be downloaded from

http://www.accenture.com/us-en/technology/technology-labs/Pages/insight-industrial-internet-of-things.aspx