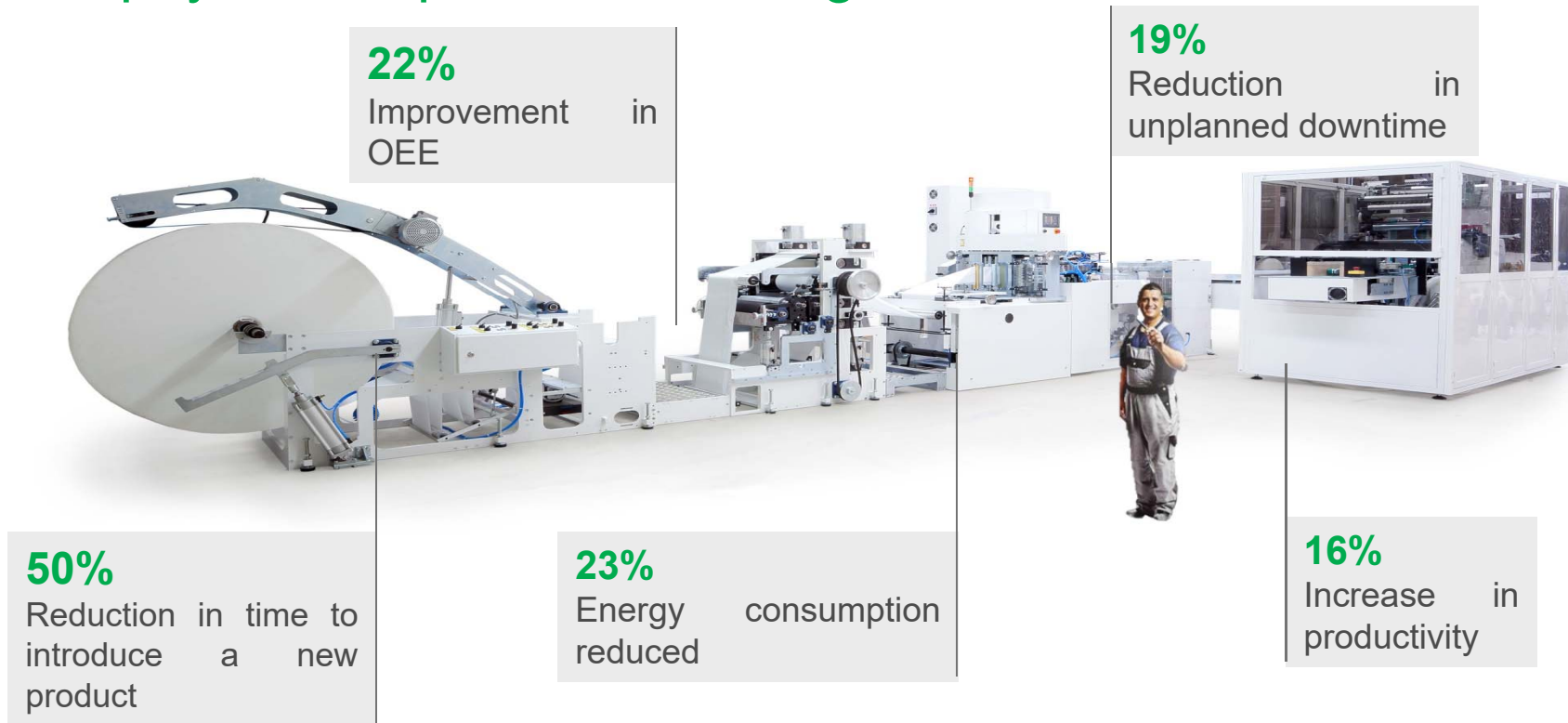# IHS Markit

2019
Analytics in manufacturing:
Lessons learned from those that are doing it

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OSIsoft PI World

IIoT payback is possible for range of KPIs

22%
Improvement in OEE

19%
Reduction in unplanned downtime

50%
Reduction in time to introduce a new product

23%
Energy consumption reduced

16%
Increase in productivity
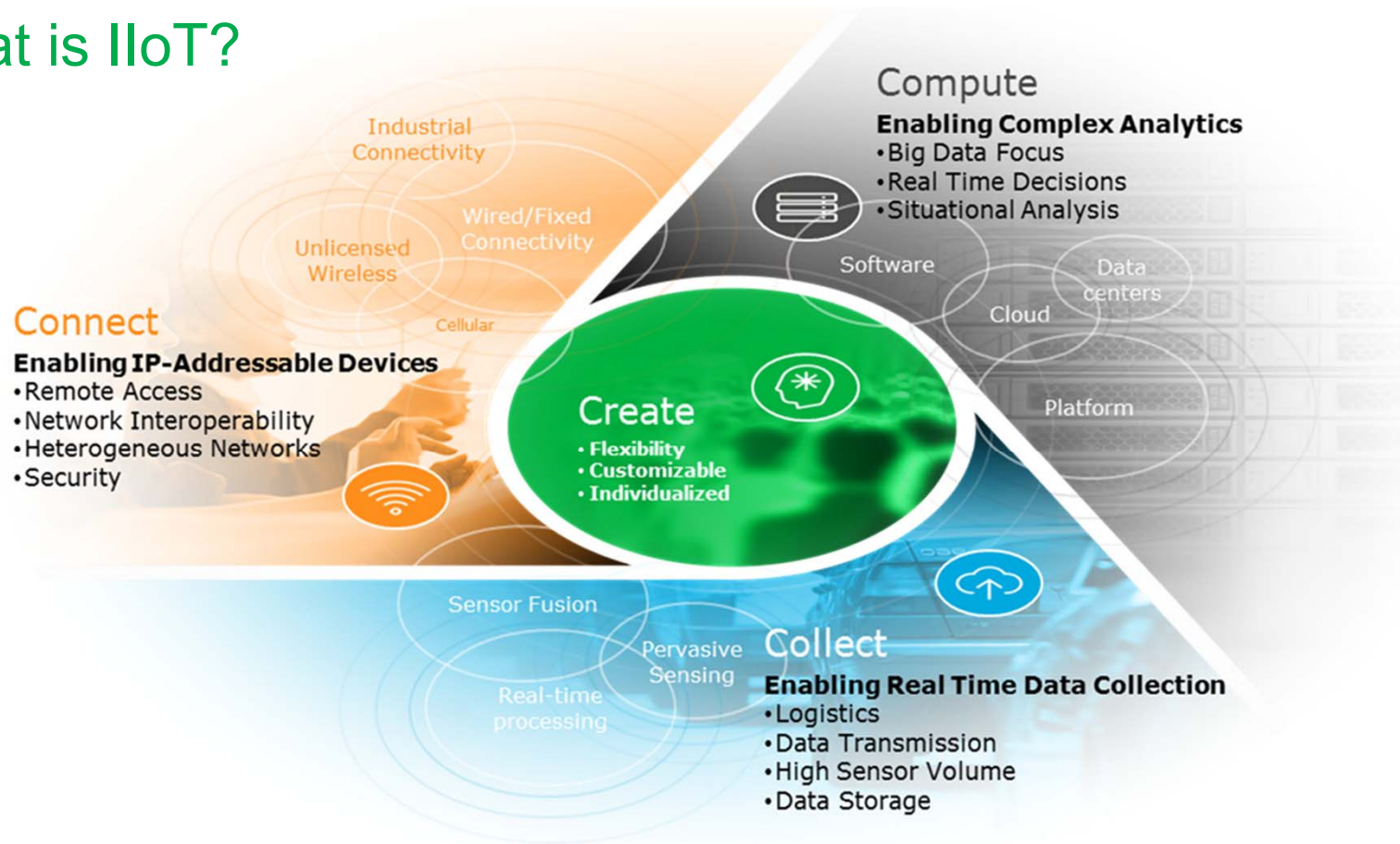
IoT Servitisation - the new business model

"Industrial companies are in the information business whether they want to be or not." – Jeff Immelt (former GE CEO)

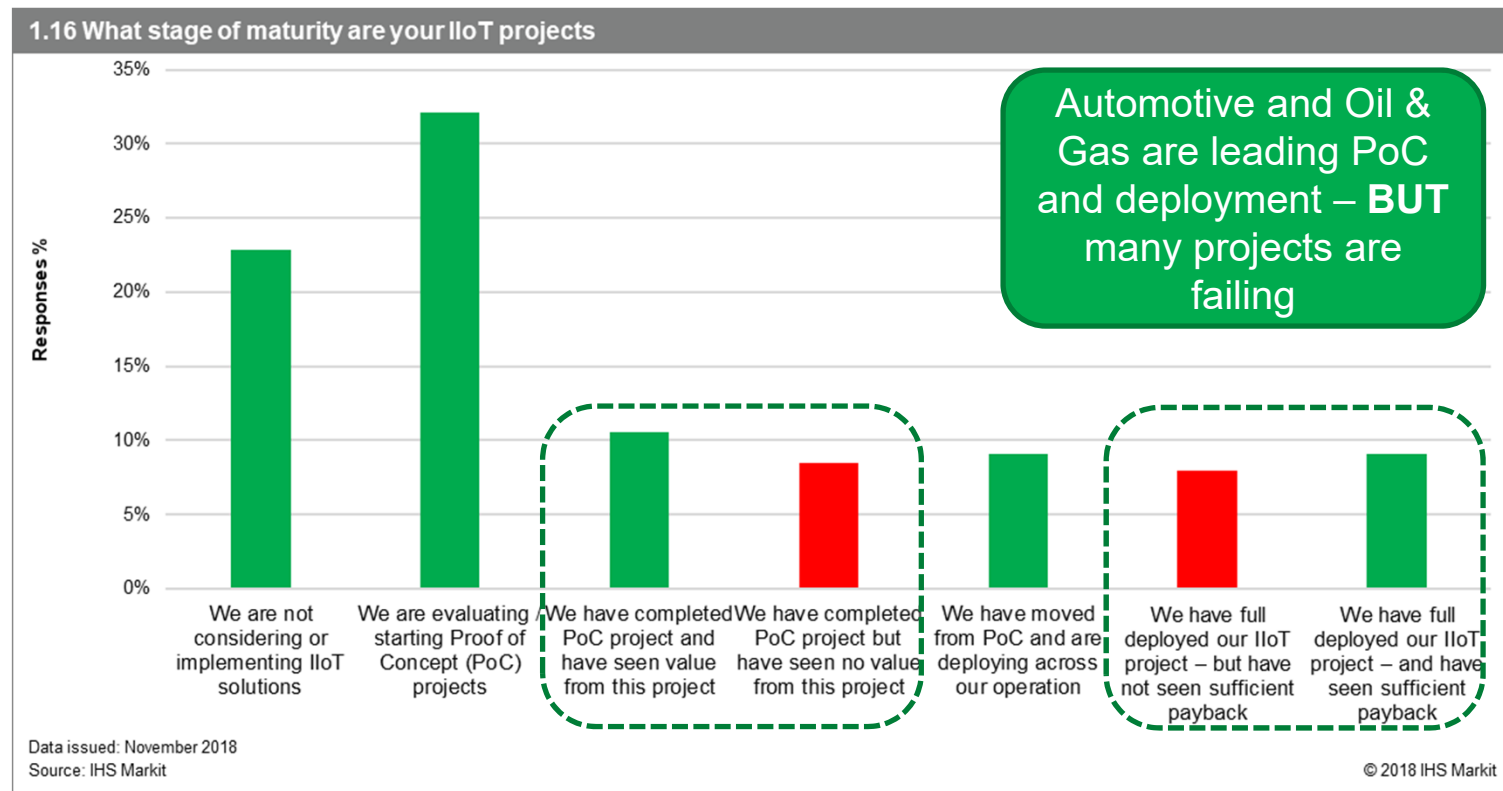**Shift of business from selling hardware to selling service**

- **Subscription service**
- **Razor blade model**
- **Outcome based model**
- **Profit sharing model**

What is IIoT?

Connect
Enabling IP-Addressable Devices
- Remote Access
- Network Interoperability
- Heterogeneous Networks
- Security

Industrial Connectivity
Wired/Fixed Connectivity
Unlicensed Wireless
Cellular

Compute
Enabling Complex Analytics
- Big Data Focus
- Real Time Decisions
- Situational Analysis

Software
Data centers
Cloud
Platform

Create
- **Flexibility**
- **Customizable**
- **Individualized**

Sensor Fusion
Pervasive Sensing
Real-time processing

Collect
Enabling Real Time Data Collection
- Logistics
- Data Transmission
- High Sensor Volume
- Data Storage

IIoT is still in its early days, and project failure is common

1.16 What stage of maturity are your IIoT projects

Automotive and Oil & Gas are leading PoC and deployment – **BUT** many projects are failing

Responses %

- We are not considering or implementing IIoT solutions
- We are evaluating / starting Proof of Concept (PoC) projects
- We have completed PoC project and have seen value from this project
- We have completed PoC project but have seen no value from this project
- We have moved from PoC and are deploying across our operation
- We have full deployed our IIoT project – but have not seen sufficient payback
- We have full deployed our IIoT project – and have seen sufficient payback

Data issued: November 2018
Source: IHS Markit

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Process industries are more advanced in uptake – but rate of failure for deployments is a concern

What stage of maturity are your IIoT projects at

- Oil & Gas
- Industry Average

IIoT project failure rate >50%

Responses %

35%
30%
25%
20%
15%
10%
5%
0%

Not considering IIoT solutions | Evaluating / starting Proof of Concept (PoC) projects | PoC project has failed | Succesful PoC project | Moving from PoC to deployment | Deployed IIoT project has not seen sufficient payback | Deployed IIoT project has seen sufficient payback

Source: IHS Markit

IIoT Readiness – by industry sector

IIoT Readiness

- Networking & Infrastructure
- Data handling
- Skills & Collaboration
- Software integration
- Cybersecurity
- Governance

IIoT Readiness score by industry sector

Responses %

- Automotive
- Chemicals
- Consumer Packaged Goods
- Life Science (incl. Pharmaceutical)
- Mining
- Oil & Gas
- Power Generation

Source: IHS Markit

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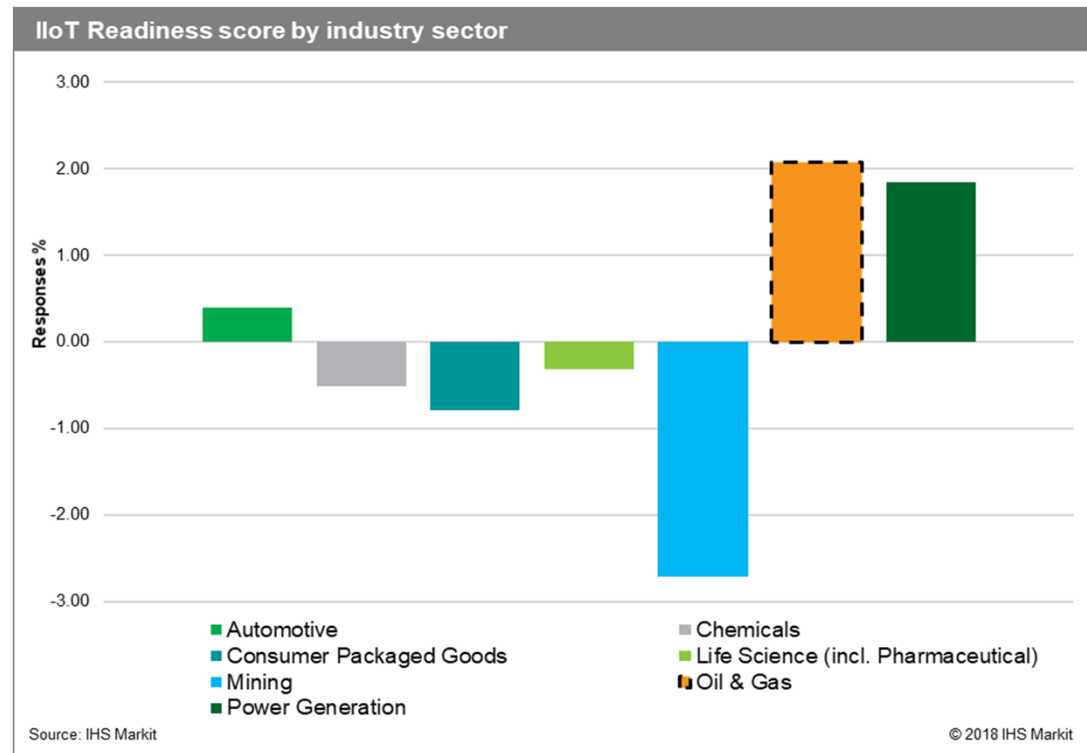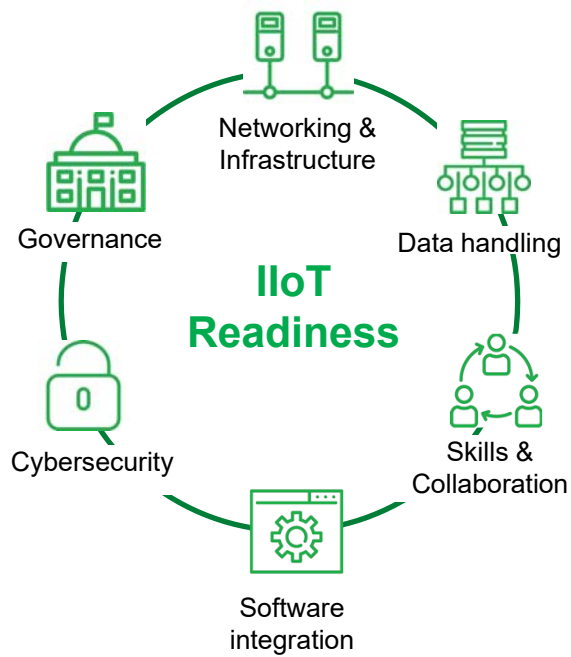
Poll Question

What are the main challenges you see in introducing IIoT solutions

- Legacy equipment

- Data management

- Data analytics

- Employee skills and knowledge

Challenges traverse products, processes and people

Legacy equipment and infrastructure

Single most important

Both ability to collect and to derive meaning from data

2 of the top 4 challenges

Lack of employee skills and knowledge

Most common

Companies ranked top 4 challenges faced in IIoT implementation

Connectivity and legacy products

LV motor drives

81.5% enabled
60.5% new nodes connected

MV motor drives

84.3% enabled
88.7% new nodes connected

Servo drives

85.2% enabled
97.9% new nodes connected

Stepper drives

49.2% enabled
53.4% new nodes connected

Motors

4.7% enabled
11.2% new nodes connected

Pumps & compressors

0.1% enabled
2.8% new nodes connected

IPCs

100% enabled
94.5% new nodes connected

Motion controller

90% enabled
71.8% new nodes connected

Generators & turbines

43.9% enabled
96.8% new nodes connected

Switchgear

0.8% enabled
54.2% new nodes connected

PLCs

81.9% enabled
93.3% new nodes connected

Operator terminals

83.6% enabled
90.0% new nodes connected

Remote I/Os

94.1% enabled
82.1% new nodes connected

Sensors

24.6% enabled
7.7% new nodes connected

Machine vision

100% enabled
100% new nodes connected

DCS

96.4% enabled
81.1% new nodes connected

Discrete machine-safety

31.7% enabled
67.0% new nodes connected

Process controller

16.0% enabled
48.9% new nodes connected

Process safety

100% enabled
100% new nodes connected

RTU

100% enabled
94.2% new nodes connected

Process Instrumentation

85.4% enabled
13.5% new nodes connected

How to deal with data?

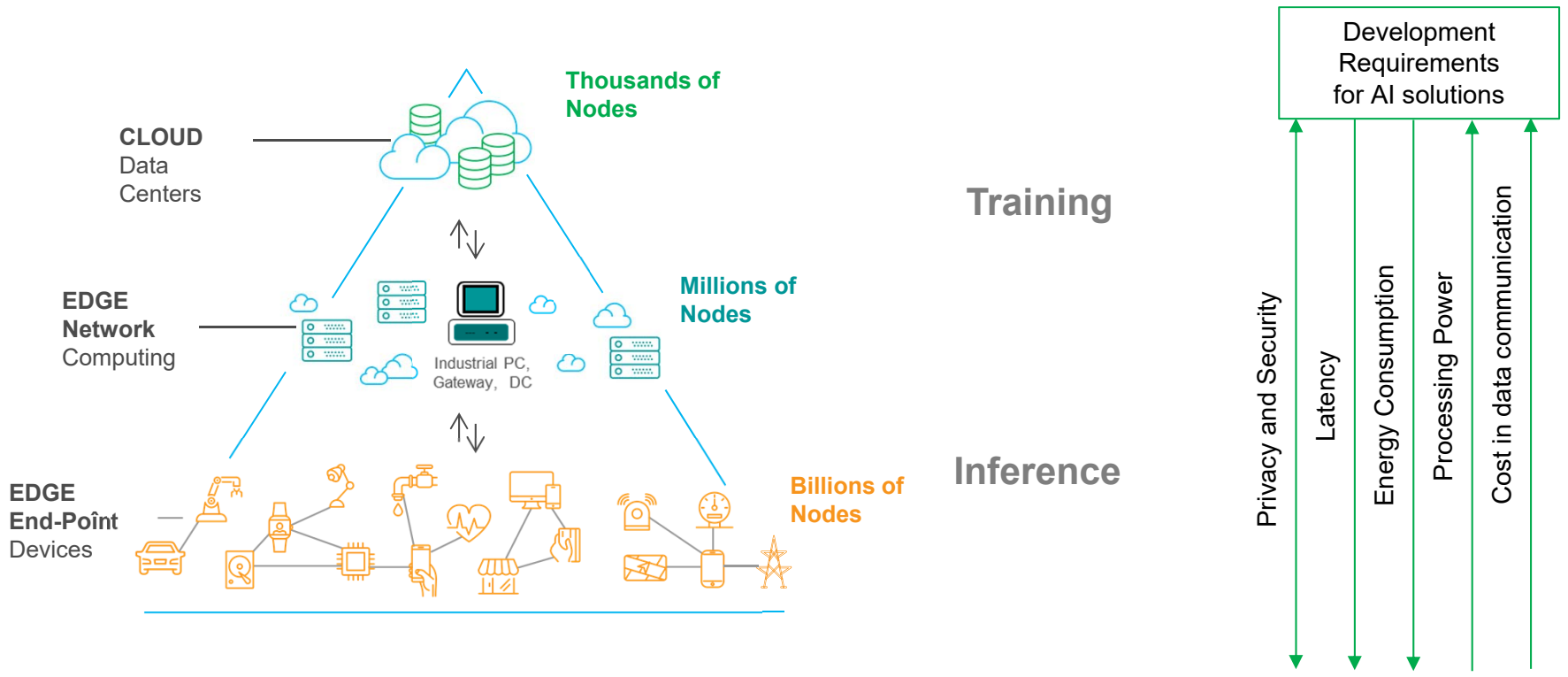**Abington Library**

2 employees

11,070 books

Library of Congress

3200 employees

160,000,000 catalogued items

How to deal with data?

Data collection and analytics can have more than one home

CLOUD Data Centers

Thousands of Nodes

Training

EDGE Network Computing

Industrial PC, Gateway, DC

Millions of Nodes

EDGE End-Poînt Devices

Billions of Nodes

Inference

Development Requirements for AI solutions

Privacy and Security

Latency

Energy Consumption

Processing Power

Cost in data communication

The people are often critical point of failure

Chief scout Oakland A's:

"Baseball isn't just numbers. *It's not science*. If it was anybody could do what we do, but they can't cause they don't know what we know.

They don't have our *experience* and they don't have our *intuition*."

6S for IoT implementation

- **Specify -** Lead with application not technology

- **Success –** Measure to identify improvement

- **Start Small -** Proof of concept projects then scale

- **Senior support -** Need Exec-level sponsorship of projects

- **Shared responsibility –** Collaboration across functional teams

- **Support staff –** Involve employees and provide training and support

QUESTIONS?

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