
From Data to Value

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AssetScan
The power of analytics. Delivered.

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VertiAI

Complex to Simple

Data

Sensors, Hardware, Things,
Cloud, Platform,
Ecosystem, Analytics

Value

Where is the value and how
can we provide it?

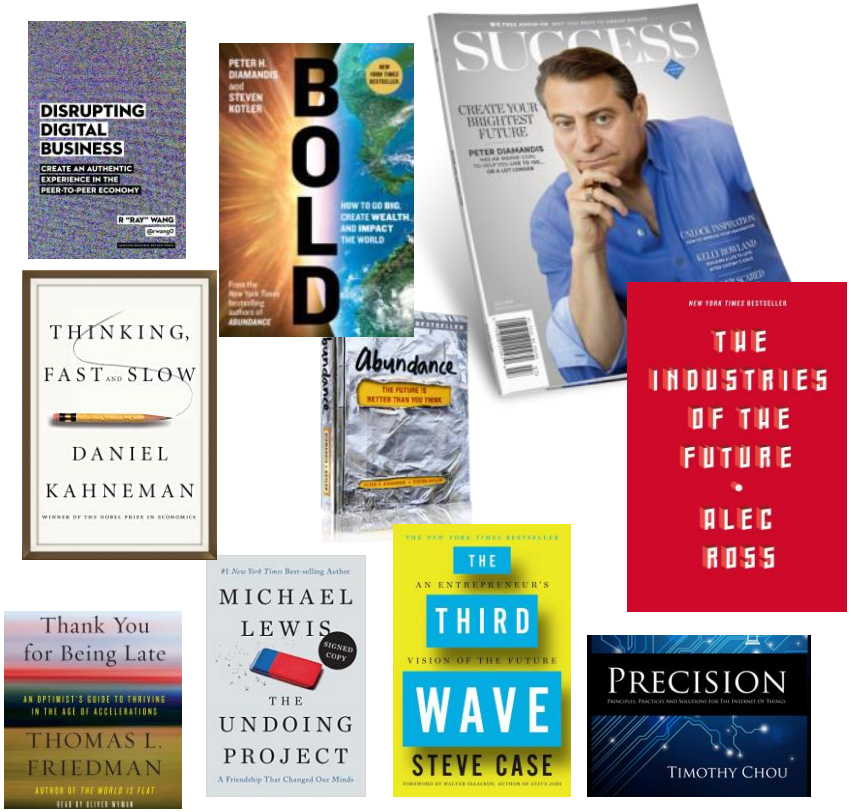
Data-driven Strategy for Business Outcomes

- Digital Transformation
- Journey in Industrial Internet of Things
- IT/OT Roles and Need to Converge
- Subject Matter Expertise, Data Science and Business Models
- Rethinking the Definition of Value

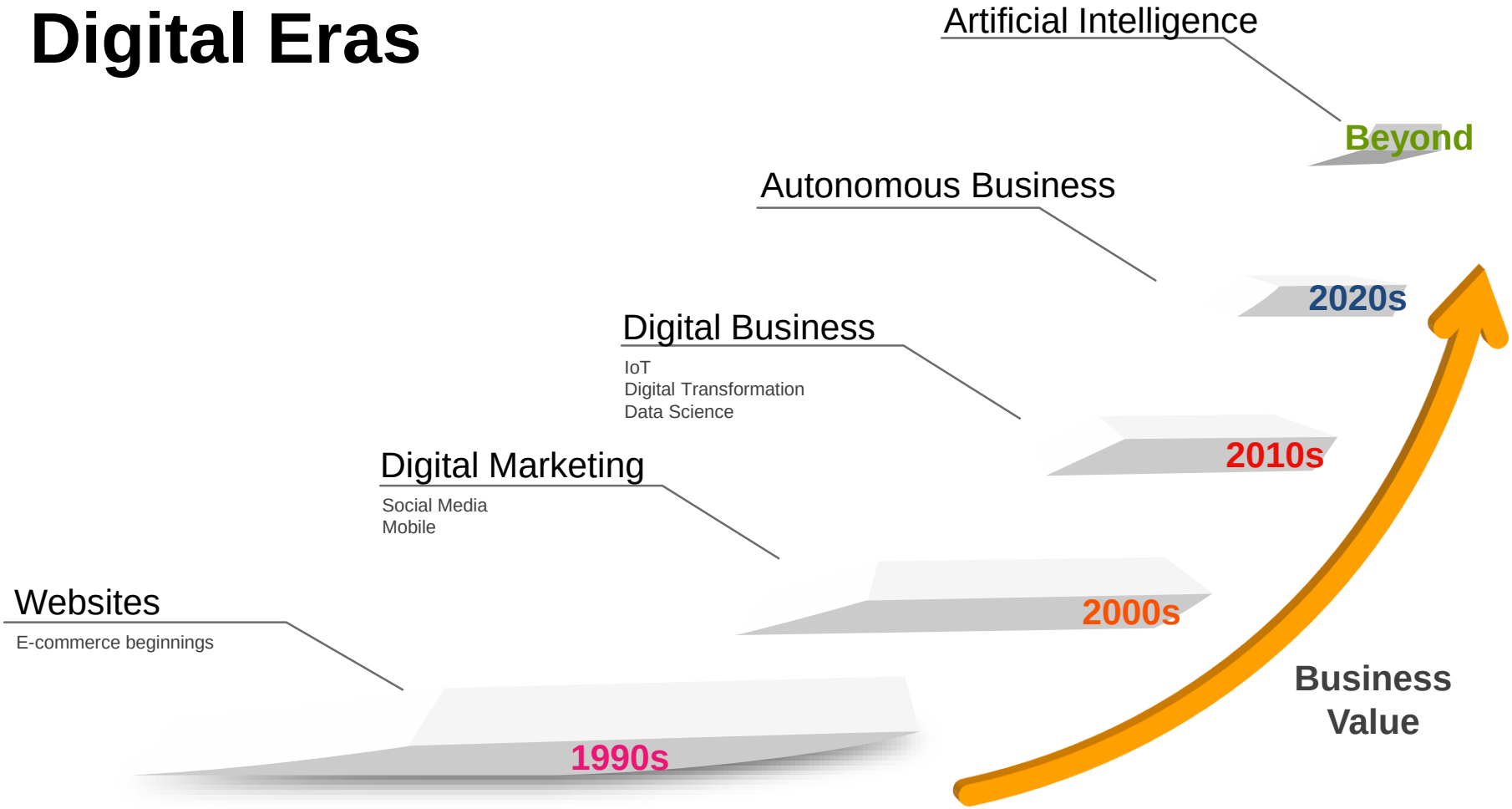
Finding Meaning and Mindset

- Ideas From Billionaire Mindsets and Where You Fit In
  - Agility trumps size
    - Kodak went bankrupt in 2012 and Instagram was bought by Facebook for $1 billion with only 13 employees

- Disrupt Yourself, or Someone Else Will
  - Estimated that 40% of the Fortune 500 companies will be gone in 10 years
  - Digitizing a service (think AirBnB and Uber)
  - Digitizing maintenance that leads to efficiency gains, savings on breakdowns and costly downtime ~ if maximized = competitive advantage



Digital Eras

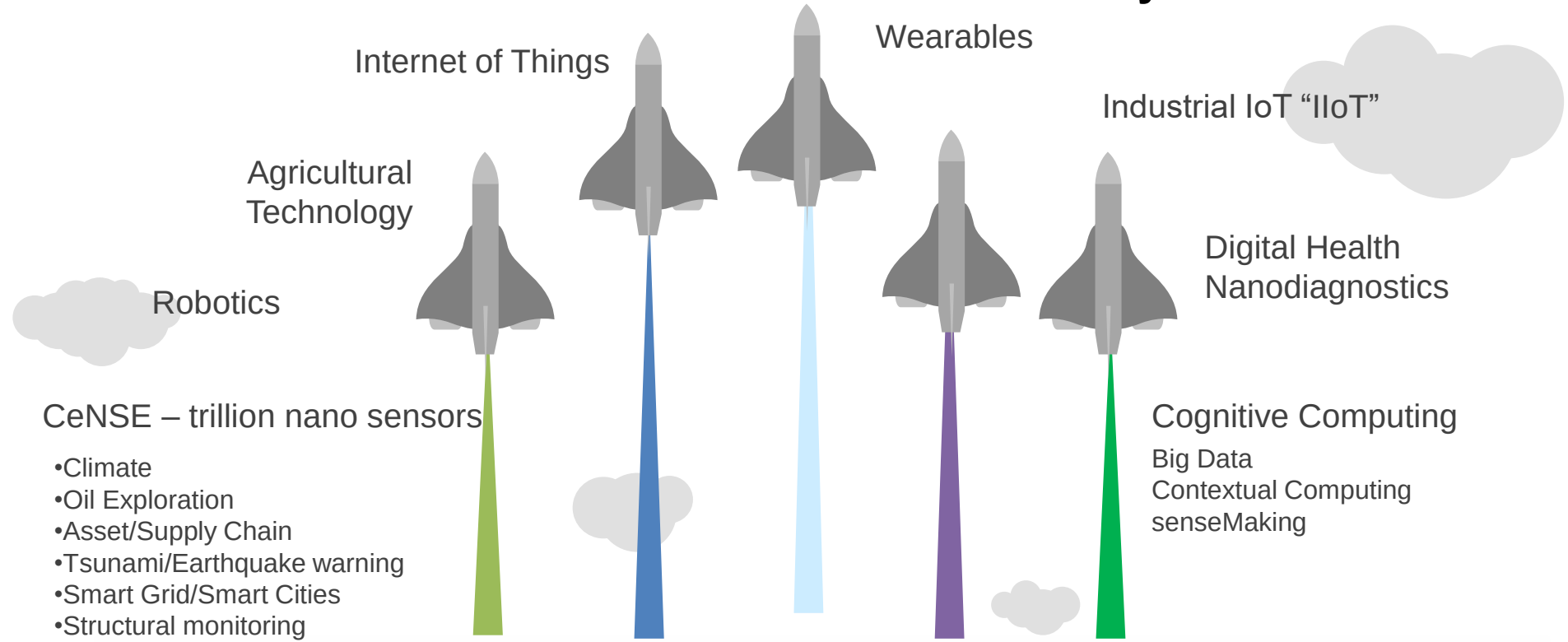


Exponential and Enabling Technologies

- Technology to Change the World and Create the Next Billion-Dollar Organizations
  - Computational systems/infinite and cloud computing
  - Networks and sensors
  - Artificial intelligence
  - Robotics
  - Digital Manufacturing
  - Medical technology/nanodiagnostics/digital health/biotechnology = DNA sequencing, genome mapping, CRISPR, preventative vs. reactive medicine and making 100 the new 60

"Cheap sensors are enabling the little guys", Microsoft IoT Executive

Global Innovation driving demand for smart systems or "Fourth Industrial Revolution" Industry 4.0



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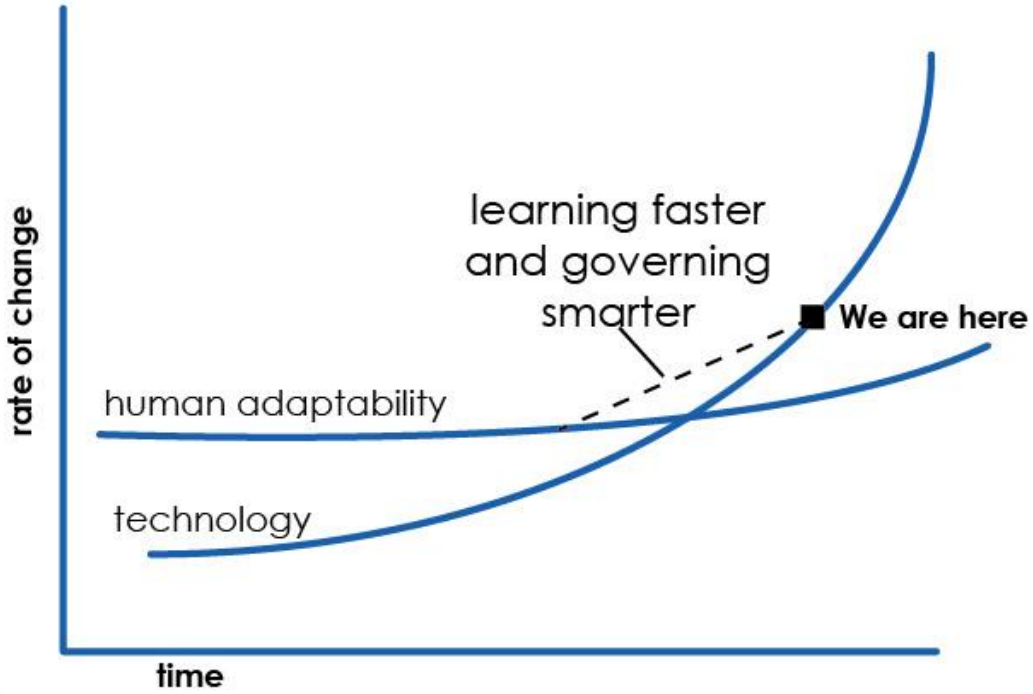
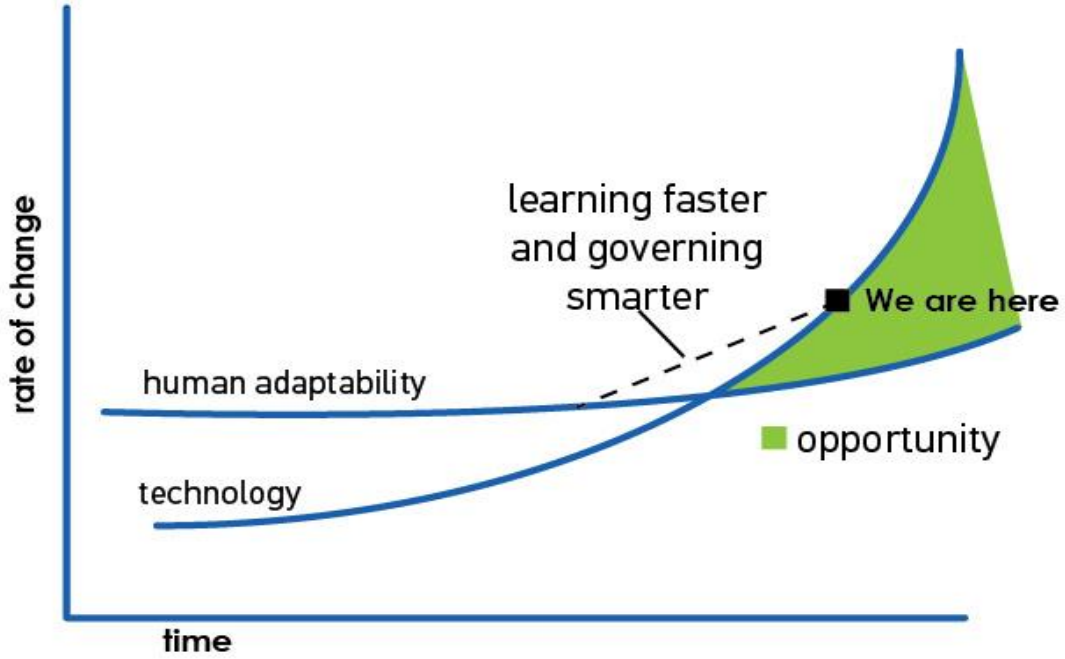
Technology Adoption Drag…



Technology Adoption Drag…presents opportunity



DIGITAL TRANSFORMATION

Digital Transformation

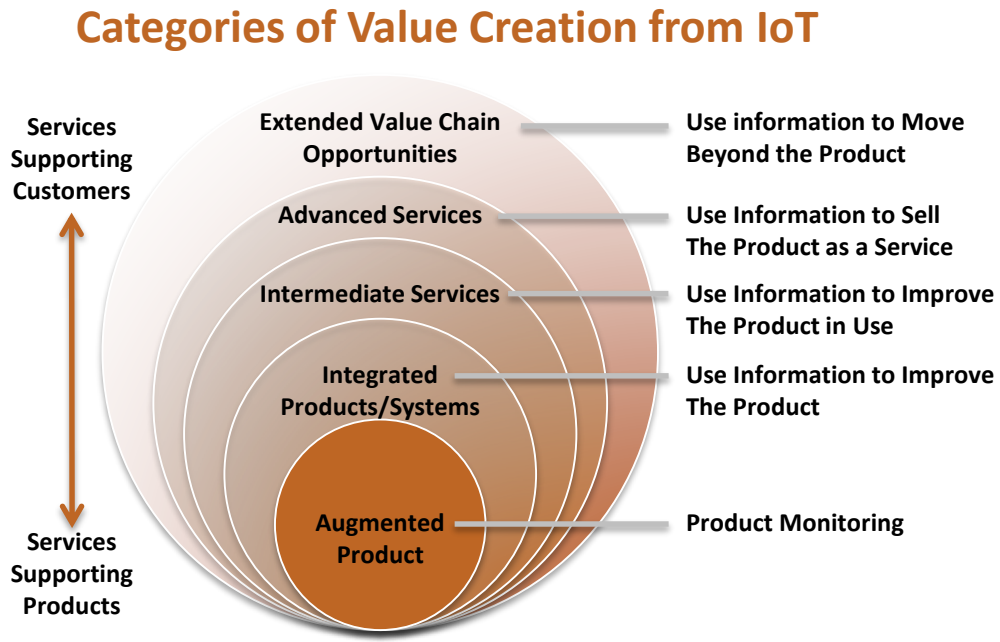
- Digital Business is the creation of new business designs blurring the digital and physical worlds

- New business designs refer new kinds of products and services, business models, industry models as well as new ways creating value for customers

Digital Business Examples

- BJP, India's largest political party, used holograms to project a virtual version of its leader to election rallies
- Carmakers betting big on new forms of mobility innovation and one day, autonomous cars
- Zappos, a retailer that believes it can take a 3D scan of your foot and provide a better shoe
- Seoul National University Hospital is managing better outcomes for diabetes patients by remote monitoring of glucometers in their own homes

Example: GoodYear Tire

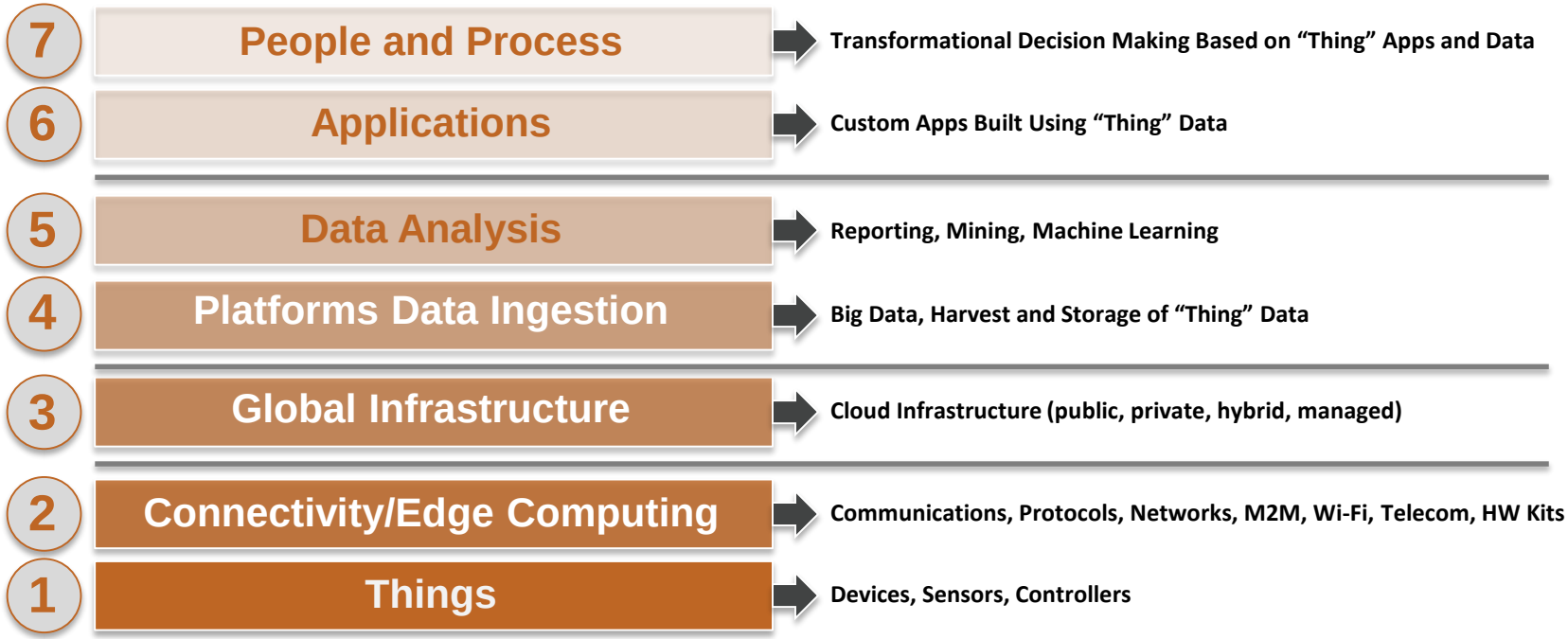


- ServiTIZE the Product
- Service-led Competitive Strategy
- Participate in a Larger Value Chain/Stream
- Value-based Pricing in an Otherwise Commodity, Cost-Plus Environment
- Must Understand the Customer's Business Process and Determine the Right Business Model

Source: Goodyear Global Innovation Dept.

Challenge: Lots of Pieces and Parts

7 Layers of the Internet of Things (IoT)



IOT is Creating New Space for Value Creation

THE WALL STREET JOURNAL.

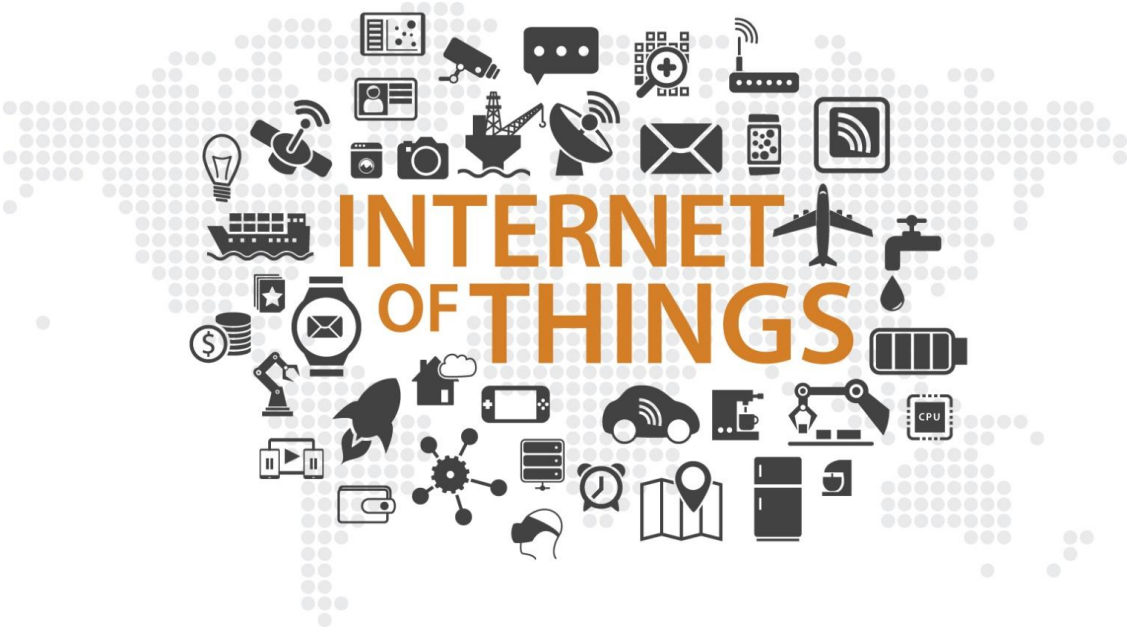
Home World U.S. Politics Economy Business Tech Markets Opinion Arts Life Real Estate

TECH | KEYWORDS

The Internet of Things Is Here, and It Isn't a Thing

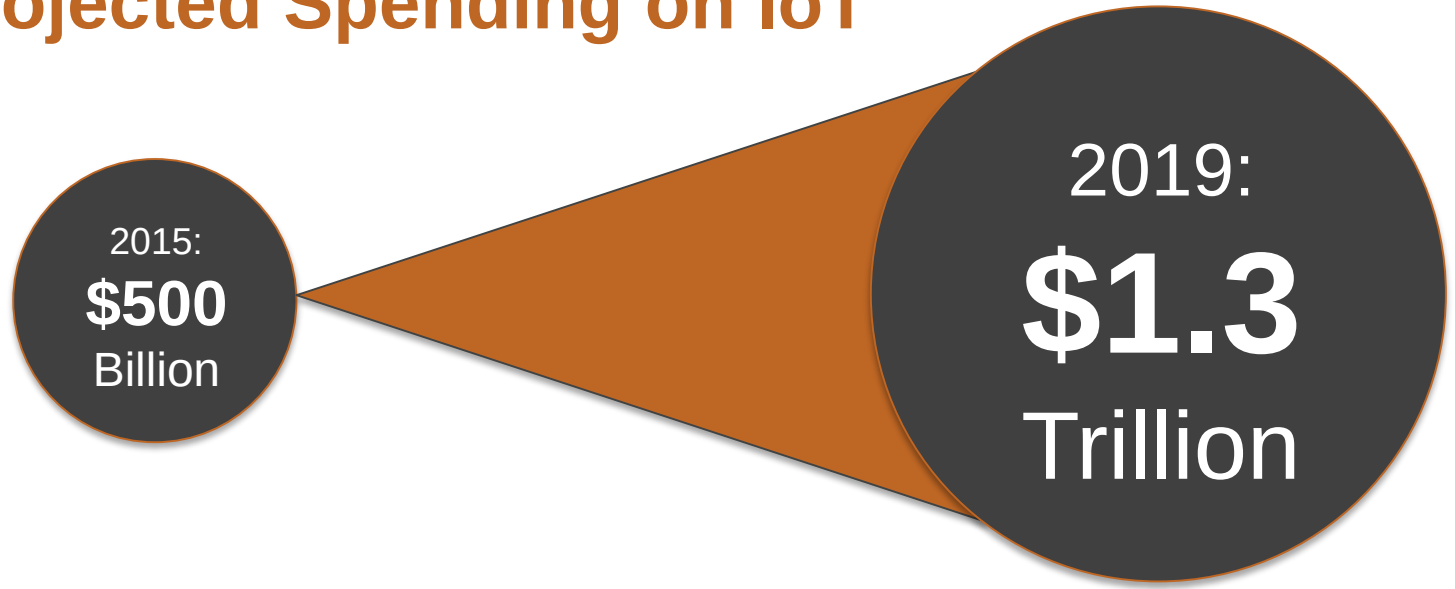
Selling services via connected devices is how many companies have created businesses

The Internet of Things is Everywhere



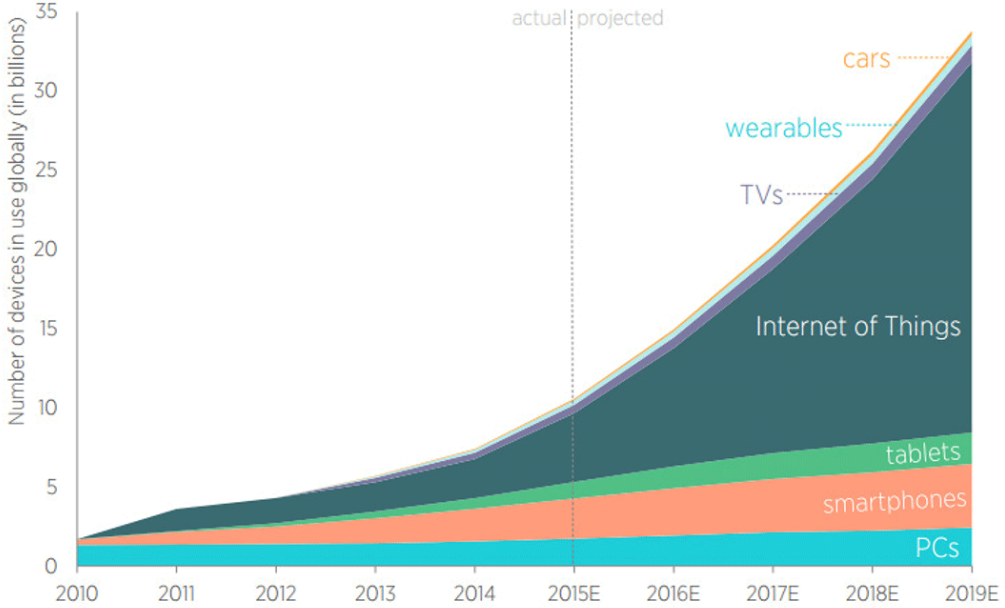
Trillion Dollar “Mega-Trend”

Projected Spending on IoT



IoT: Explosive Growth Occurring

Figure 2. The Internet of Everything: Devices in Use Globally



Source: John Greenough, "The Internet of Everything 2015," *Business Insider Intelligence*. Produced by Adam Thierer and Andrea Castillo, Mercatus Center at George Mason University, 2015.

IoT: What is the growth really?

B x P x T

IoT: What is the growth really?

B x P x T is:

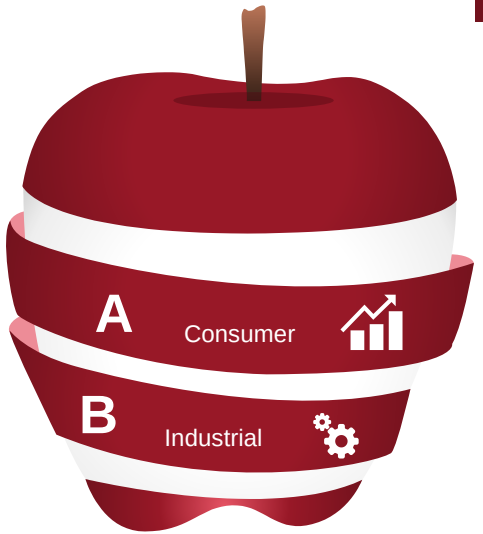
- Businesses x People x Things
  - Estimated 130 million enterprises
  - 3 billion people on internet and growing
  - 2020 25 billion things will be connected to Internet

What do we mean by IoT?

A

Consumer Mass Adoption

Amazon Alexa, Echo
iWatch/Smart Watch
Connected Home
Fitbit
Connected Car



B

Industrial IoT or IIoT Scalable Business and Historical with TankScan

Monitoring Machines
Location GPS
Condition Monitoring
Digital Plant
Predictive Analytics
Digital Twin

What is the Industrial Internet of Things Value?

- IIoT is creating a universe of sensors, which enable an accelerated, deep learning of existing operations

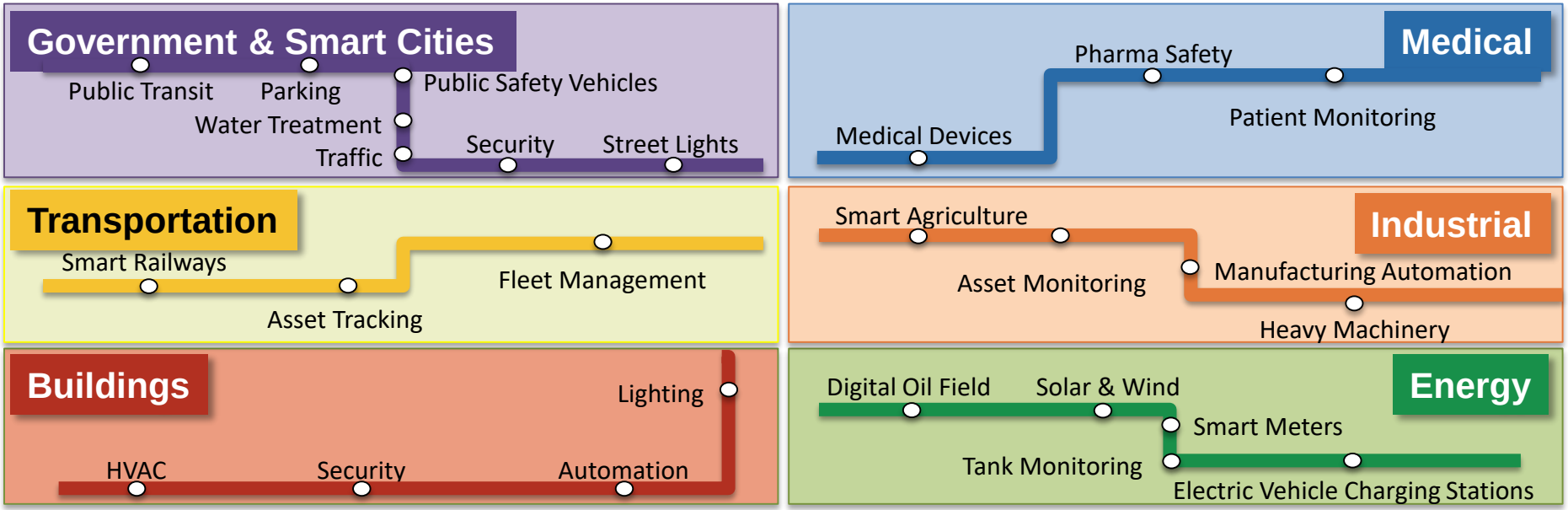
- These data tools allow for rapid contextualization, automatic pattern and trend detection

- Furthering this of manufacturing operations will finally allow for true quantitative capture of formerly “expert” qualitative operations

IIoT Business Drivers

- Compliance with New Regulations
  - FDA's FSMA (food safety), DOT's FCSMA (driver e-logs), EPA, OSHA
- Cost Reduction / Avoidance
  - Field service, predictive maintenance, logistics, supply chain
- Product Differentiation
  - Adjunct offering, avoid commoditization, reliability/uptime, new premium SLAs, better roadmaps
- New Revenue Streams / Models
  - Managed Hardware-as-a-Service offering, recurring revenue

The IIoT is Many Things



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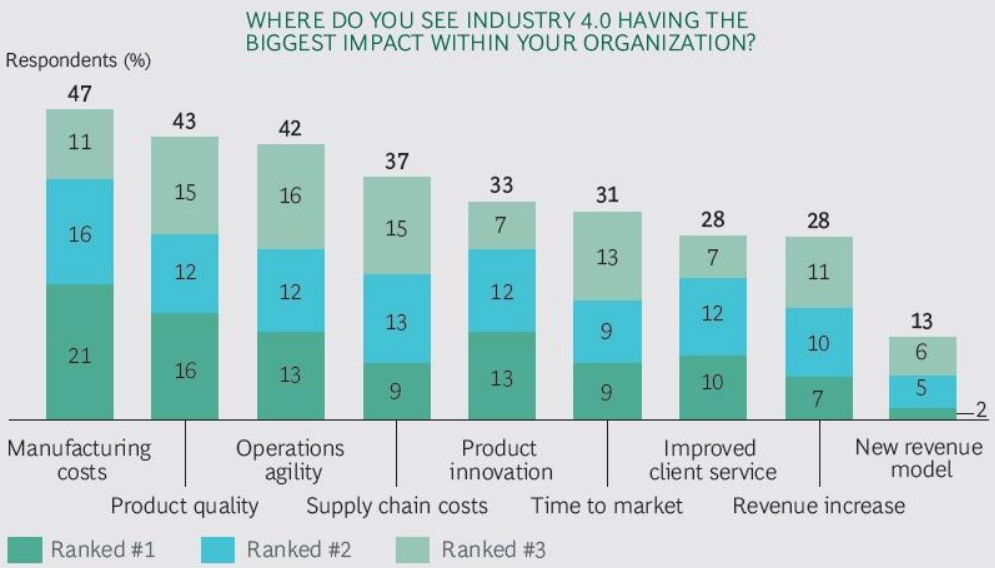
WHAT IS THE VALUE?

Cost Improvements Seen as Most Value

EXHIBIT 1 | Respondents Expect Cost Improvements to Create More Value Than Revenue Growth



Source: BCG's 2016 Value from Industry 4.0 survey.
Note: Because of rounding, not all numbers add up to the totals shown.

Manufacturing is leader in IoT spending

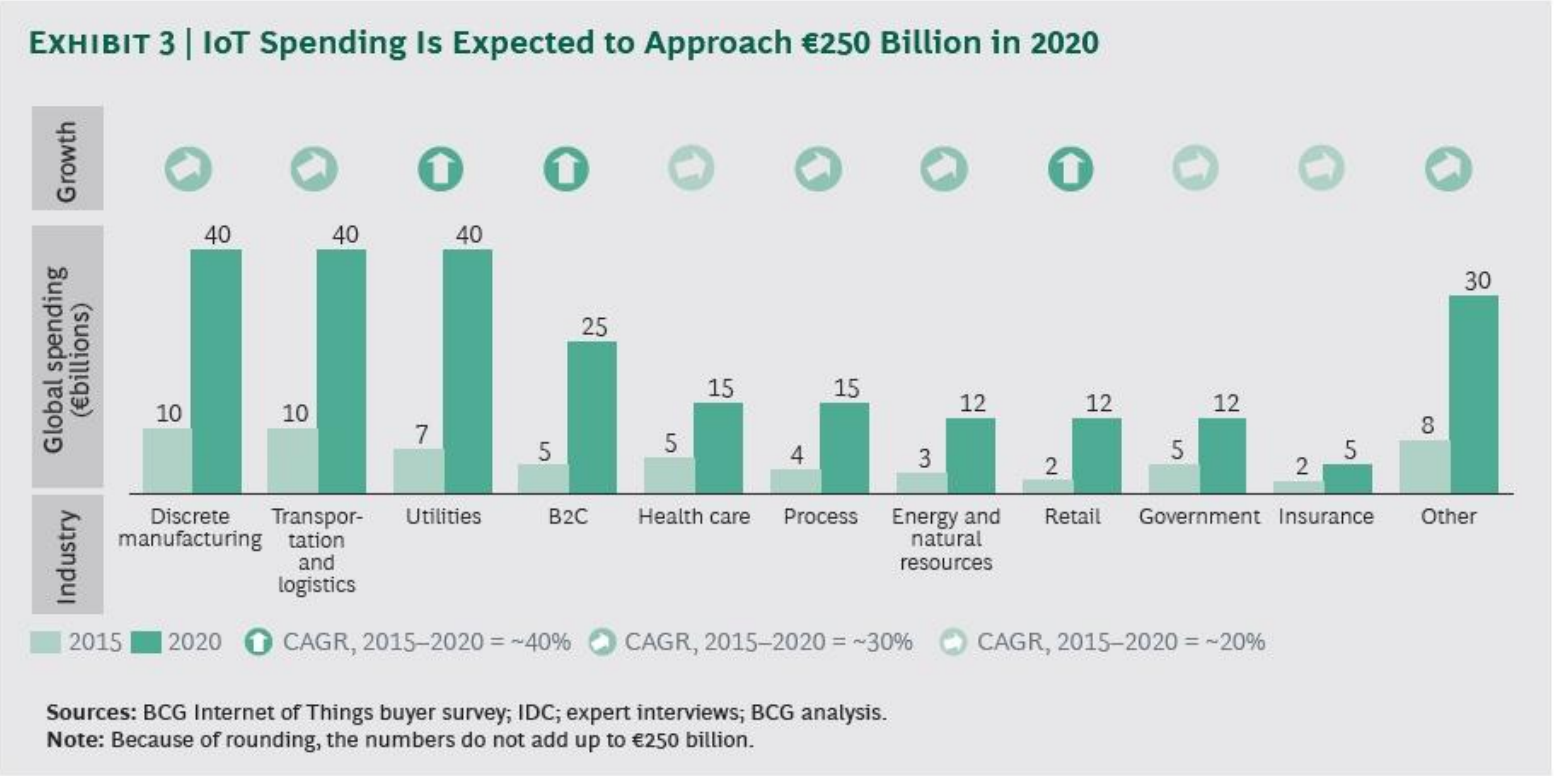


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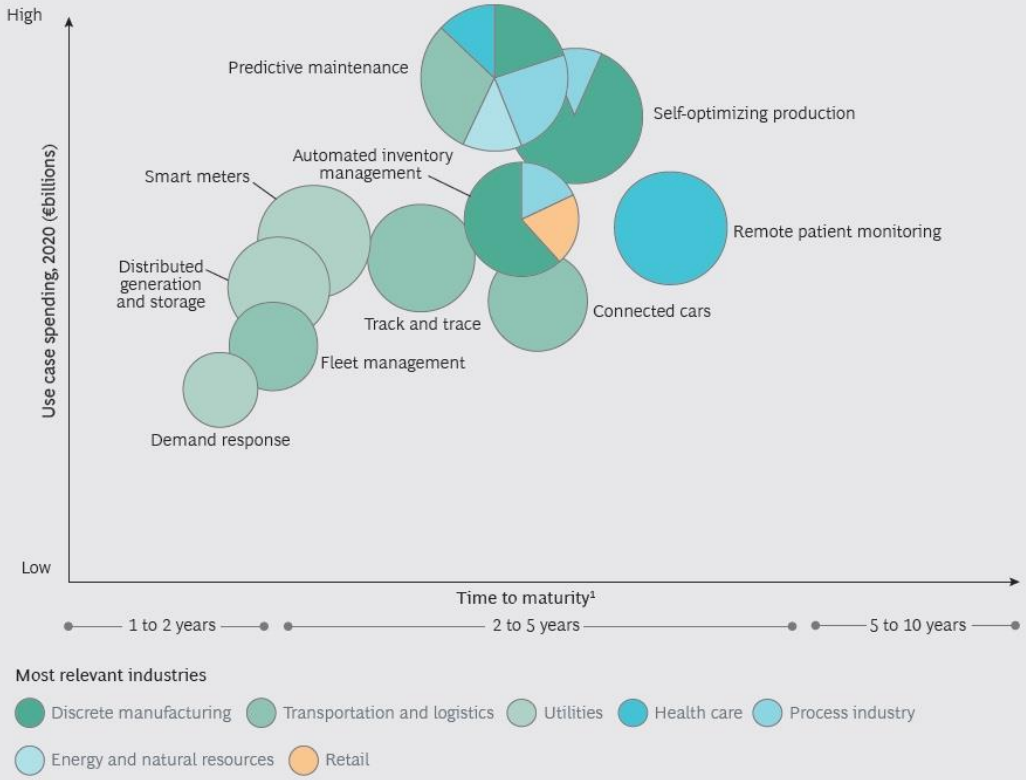
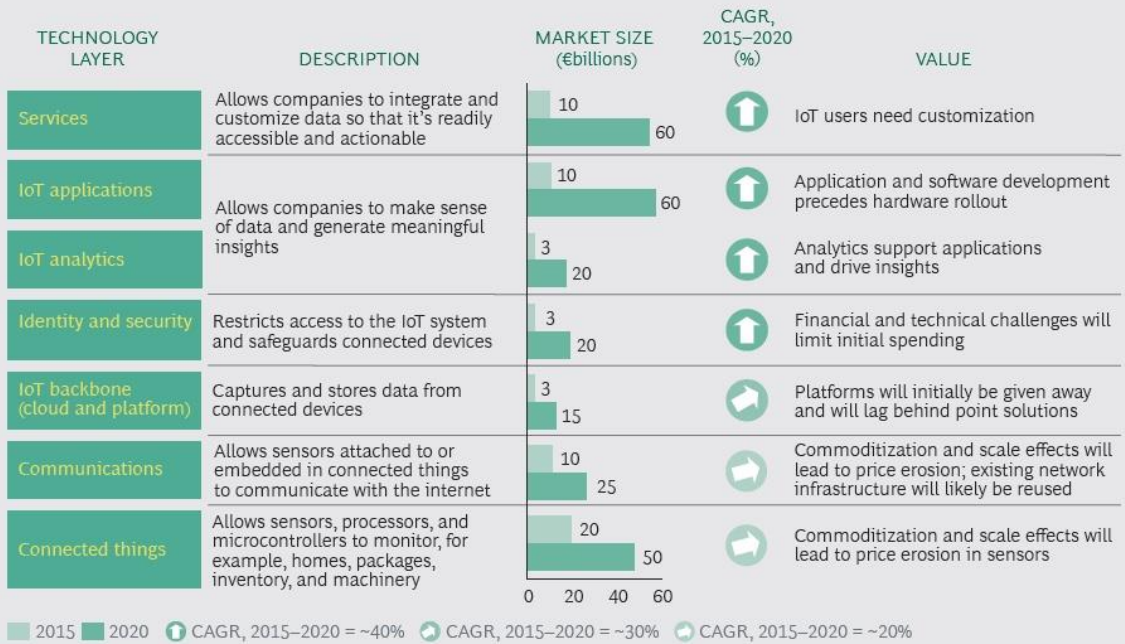
EXHIBIT 2 | Ten Use Cases Will Drive IoT Growth Through 2020



Sources: BCG Internet of Things buyer survey; IDC; expert interviews; BCG analysis.
Note: The bubble sizes indicate relative amounts of spending.
[1]Productive and scaled use within real-life settings (that is, no pilots). To capture opportunities, vendors must quickly ramp up activities. The timing of commercial viability for these use cases was derived from responses to a survey question: "When do you expect to productively use [name of use case]?"

Value in Service, Applications & Analytics

EXHIBIT 1 | Services and IoT Applications and Analytics Will Capture Some 60% of IoT Spending



Sources: IDC; Gartner; ABI Research; BCG Internet of Things buyer survey; expert interviews; BCG analysis.

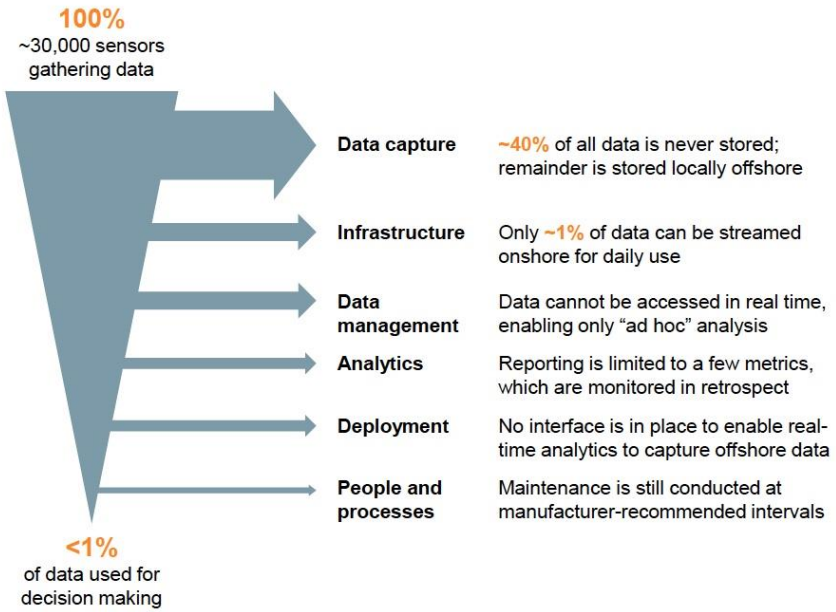
Uneven Progress Capturing Value from Analytics

	Potential Impact	Value Captured	Barriers
Manufacturing[2]	▪ Up to 50% lower product development cost ▪ Up to 25% lower operating cost ▪ Up to 30% gross margin increase		▪ Siloed data in legacy IT systems ▪ Leadership skeptical of impact

Data not being utilized

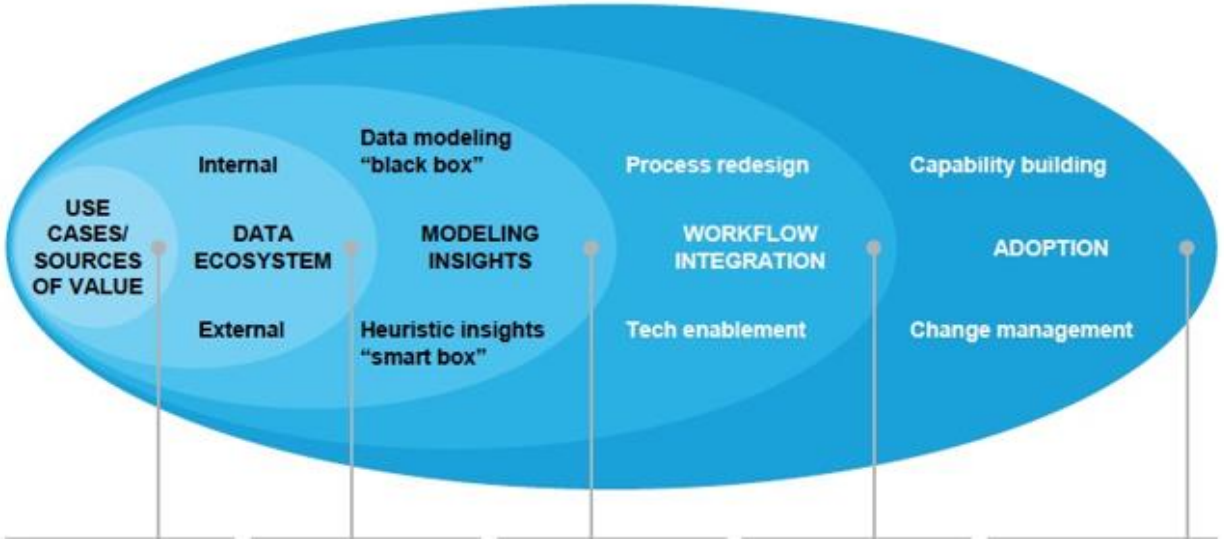
Exhibit 3

99 percent of data collected from 30,000 sensors on an oil rig was lost before reaching operational decision makers

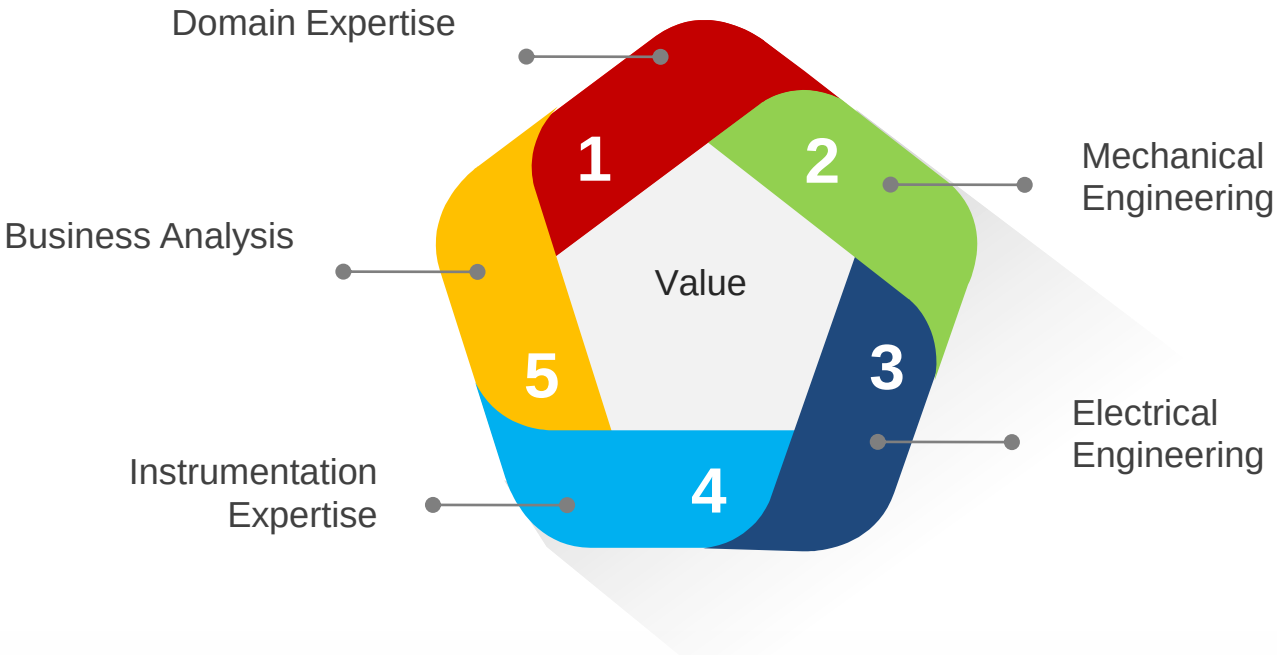


SOURCE: McKinsey Global Institute analysis

Transformation lies in people and workflow



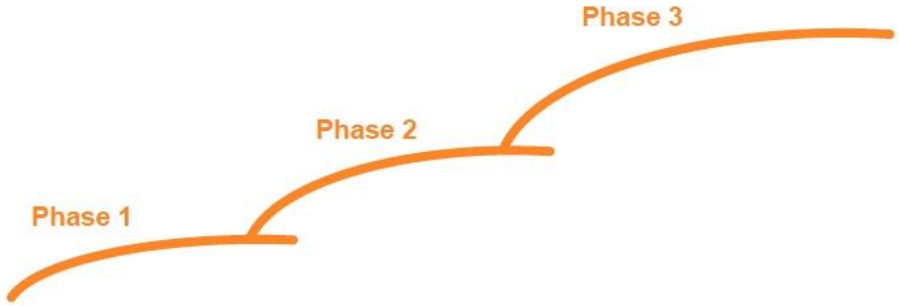
IIoT Success Requirements = Domain + Connectivity + Analytics + Integrate into Action



Suppliers and organizations need to think about processes…

Exhibit 33

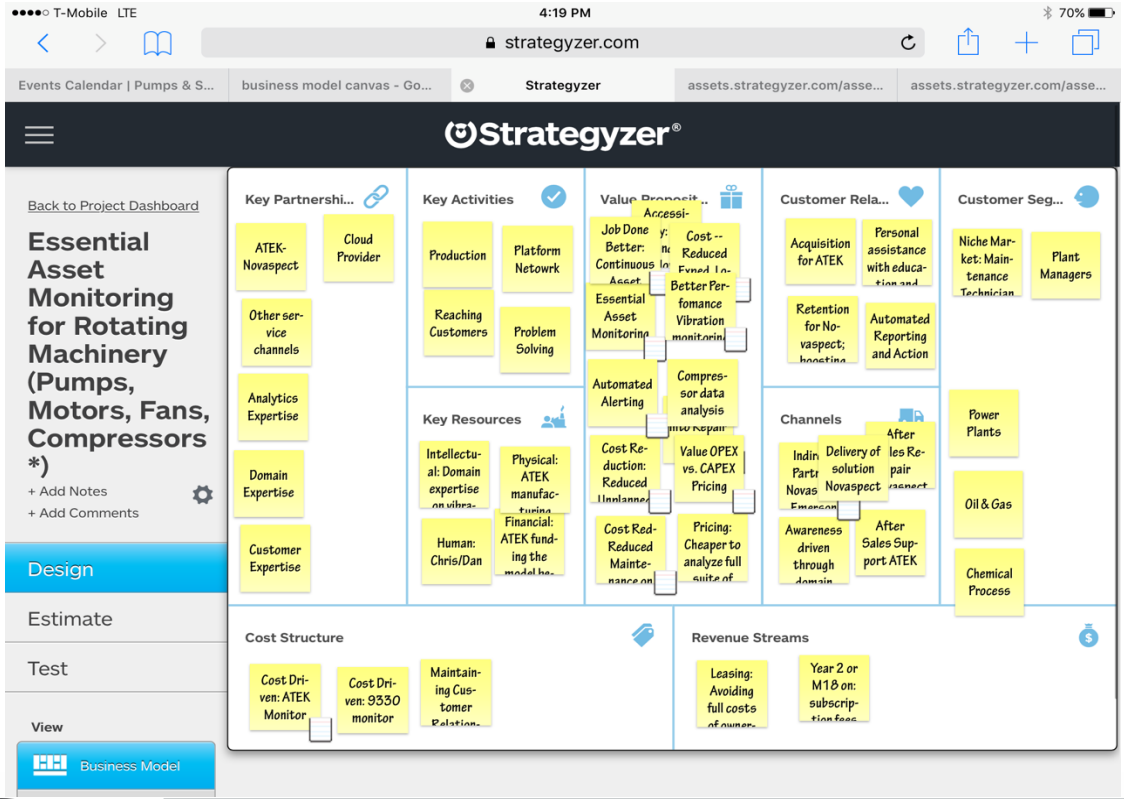
IoT supplier industry could evolve in three phases



	Phase 1	Phase 2	Phase 3
New domains of value capture	▪ Connectivity ▪ Sensors ▪ Physical setup/ infrastructure ▪ Devices/ hardware	▪ Software ▪ Analytics ▪ Platforms ▪ Security	▪ Adjacent business models based on the technology

SOURCE: McKinsey Global Institute analysis

Need to Process Map



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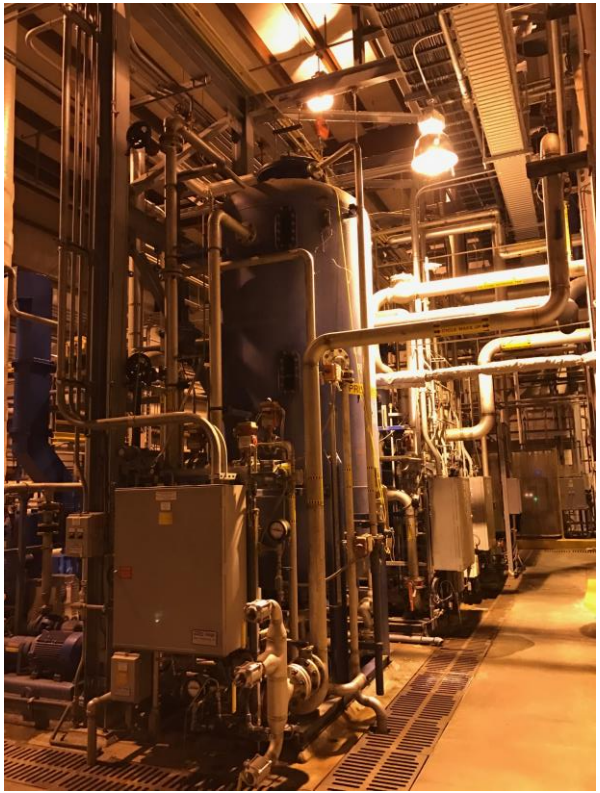
Value Proposition

- Essential Asset Monitoring vs. Critical Asset only
- Continuous Asset Monitoring vs. Monthly Diagnostics
- Automated Alerting to Various User Groups
- Dashboards and Analytics to Visually Explore; Root Cause
- Reduce Unplanned Maintenance – 30, 60 or 90 days in advance
- Reduced Planned Maintenance on Healthy Assets
- Operator Confidence Up and Less Operator Error
- Reduction in Expedited Logistics and Premium Pricing
- Integration into Workflow and Repair
- OPEX Pricing Model

Value Proposition vs. Constraints

- Extremely Lean Staff: Break-fix or periodic maintenance -- putting fires out
- Legacy Systems have Critical (not Essential) Assets integrated with SCADA or PLC systems
- Cannot utilize current reports nonetheless new automated alerting nor reporting – no expertise or no time or do not trust
- Budgetary constraints anything above a maintenance budget

IIoT Predictive Maintenance Today



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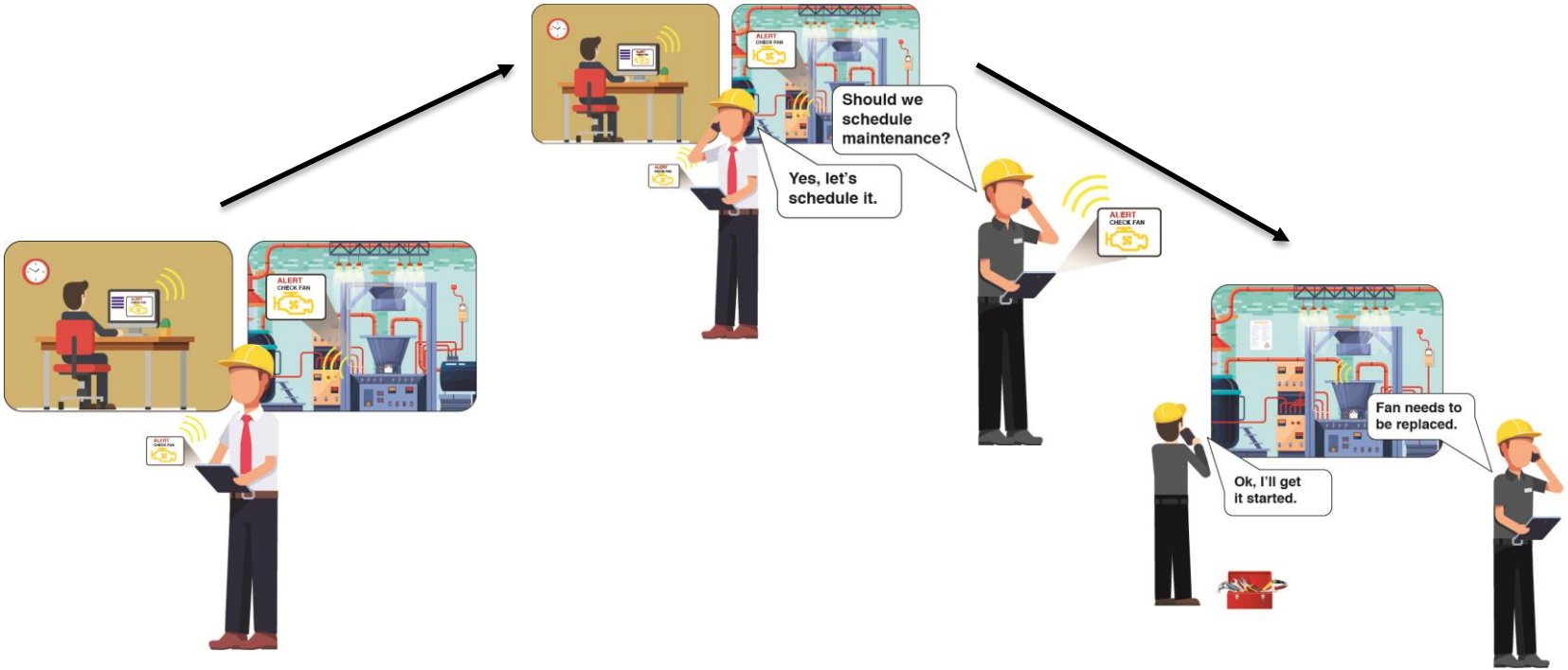
Value Proposition vs. Constraints

- No Time
- No Expertise
- No Budget
- Not Enough People
- Primitive Diagnostics
- Users of machines are different than repair technicians
- Has enough problems
- Does not to need to be informed of another problem but rather having a solution for the issue scheduled to be fixed

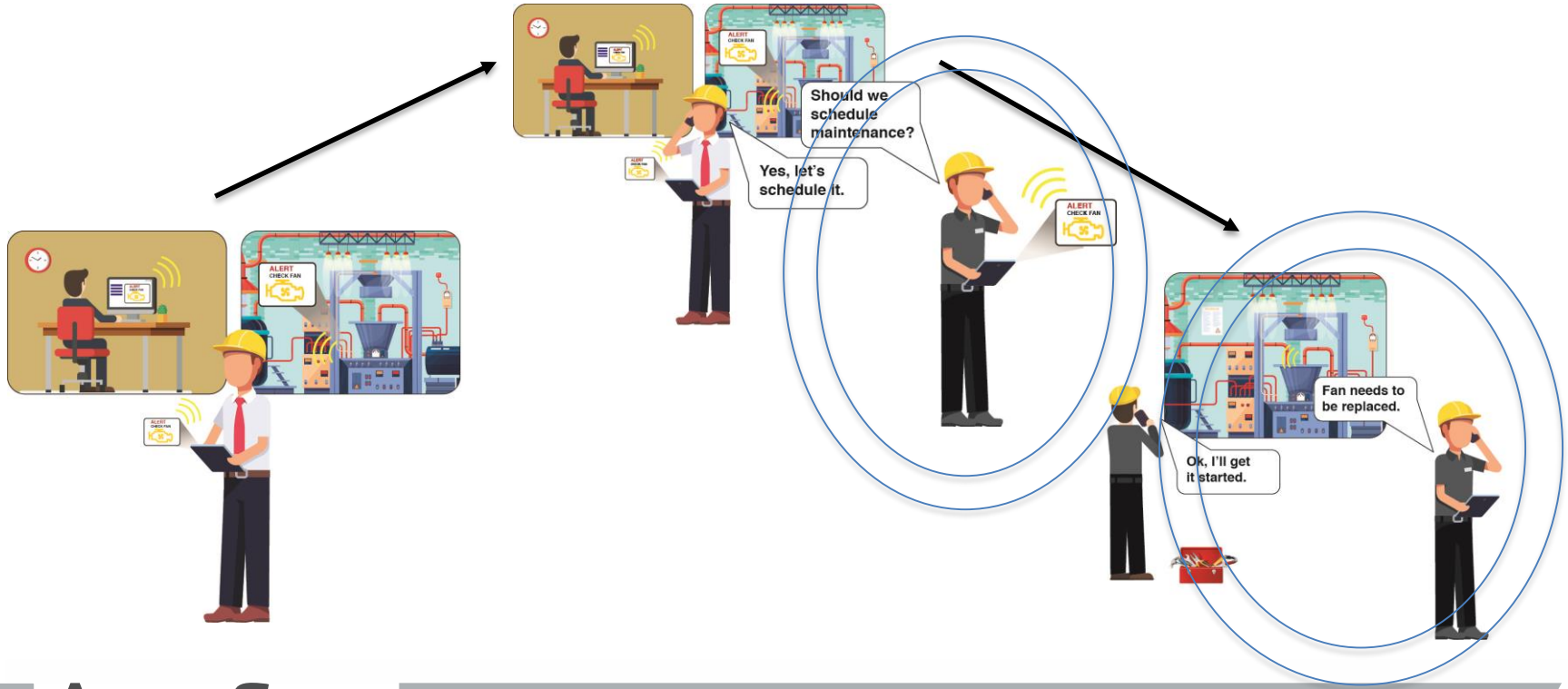
Real Value Proposition

- Periodic blood pressure check
- Continuous blood pressure monitoring
- Radiologist (domain expert) to read results
- ALERT! Signs of a heart attack
- Sound alarm; schedule and perform surgery
- The real prescription is HOW to deliver the value in a business MODEL

Human Interjection to Maximize Automation



Human Interjection to Maximize Automation



IIoT Predictive Maintenance Model Should Include

- Technology Solution that has easy “bolt on” connectivity outside SCADA or IIoT
- Automated Alerting and Dashboard Reporting
- People and Process to Interject with Alerting
- People and Process with Domain Experience to Diagnose and offer Prescriptive Solution
- People and Process to Schedule Maintenance
- People and Process to Repair Equipment

Condition Monitoring Example

- Monitoring solution with accelerometer, thermistor, etc. with gateway, cloud and dashboard
- Combined with Emerson Reliability Team and Technology
- Read high amplitude sound signature to perform predictive maintenance with vibration analysis
- Reliability team that has account access, maintenance contract
- Reliability and Maintenance team that constantly maintains equipment and interjects with alerts over time
- Reliability and Maintenance team to perform equipment diagnostics, root cause and repairs
- Delivered in monthly subscription model

IT/OT Role Convergence

OT Roles Today

- No Time
- No Expertise
- No Budget
- Not Enough People
- Primitive Diagnostics
- Users of machines are different than repair technicians
- Has enough problems
- Does not to need to be informed of another problem but rather having a solution for the issue scheduled to be fixed

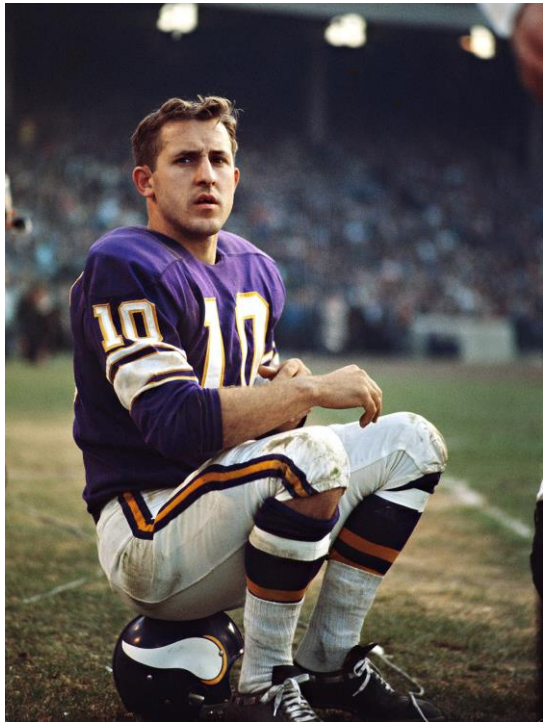
OT Roles Today

- Cannot consume streaming dashboards
- Skeptical of Data Science, Technology solutions without real world testing
- Conservative work culture
- Positions and goals aligned around “break fix mentality” keeping them employed
- Incentives, tools and re-educating is needed to move the needle

OT/IT Convergence – an Evolution

- IT roles will have to facilitate discussions between subject matter experts, operations, and new technologies to prove value to a skeptical audience
- IT roles will require more domain expertise
- OT roles will require more analytical expertise
- Education and lifelong learning and a culture to learn will be required

OT/IT Convergence – an Evolution



OT/IT Convergence – an Evolution

RETHINKING VALUE AND VERTICAL A.I.

Full Stack Products

- Full-stack fully integrated solution to the end customer problem from the interface that solves for the need all the way down the stack to the functionality, models and data
- Ecosystem is more defensible than just proprietary data or models

Subject Matter Expertise

- Full-stack solutions requires deep subject matter expertise
- Selling these products requires trust, respect and relationships within the industry
- Teams combining SME and technical are able to model domain richly and drive innovation from thinking outside the box by understanding what the box is
- Teams with domain only are stuck in the box, and Silicon Valley are stuck out in left field

Proprietary Data

- Defensible AI are built on proprietary data by aggregating public data and enriching it in some challenging way, running simulations and training datasets
- Adding more to the “data flywheel” to capture unique data to serve needs of unique models and needs of customer
- Data Value Chain ensures the customer’s motivation is aligned with your motivation that compounds value of proprietary dataset

AI Delivers Core Value

- Amazon, FB and Netflix are all companies that use AI to drive very high percentage of lift in revenue and engagement but is delivering ecommerce, social media and video entertainment
- Vertical AI is not the core value, but an attachment that optimizes the core value

What is Value

“People don’t need a drill, they need a three inch hole”

What is Value – Another Iteration