

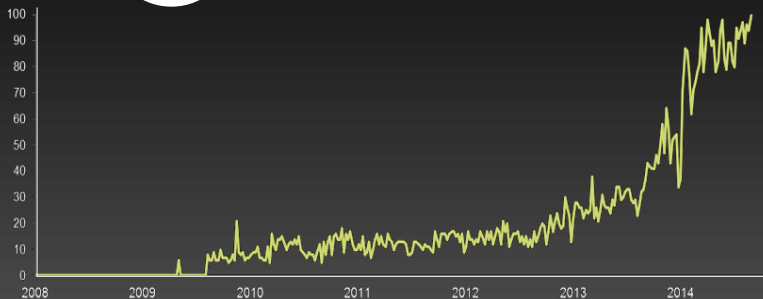
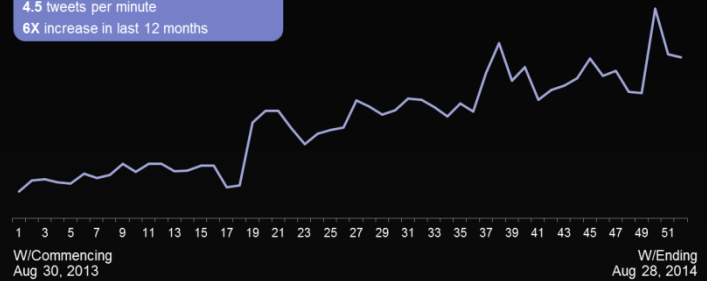


**PRG Symposium**

# Internet of Things – From Idea to Scale

September 12, 2014

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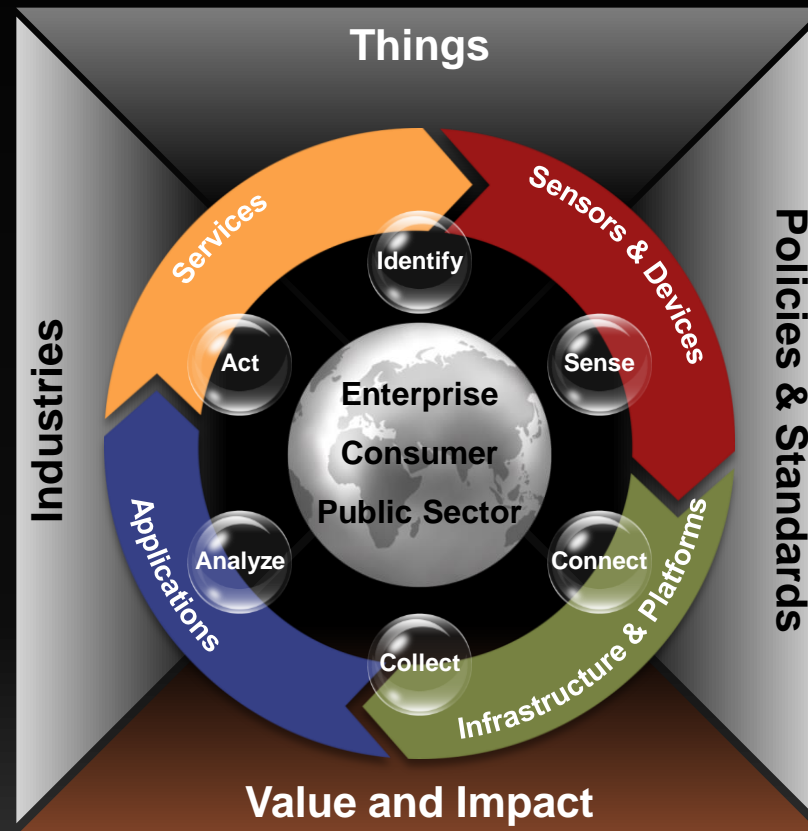


On track for nearly 26,000 publications

Year	Publications
2007	68
2008	132
2009	300
2010	987
2011	1835
2012	2761
2013	7821
2014	17788



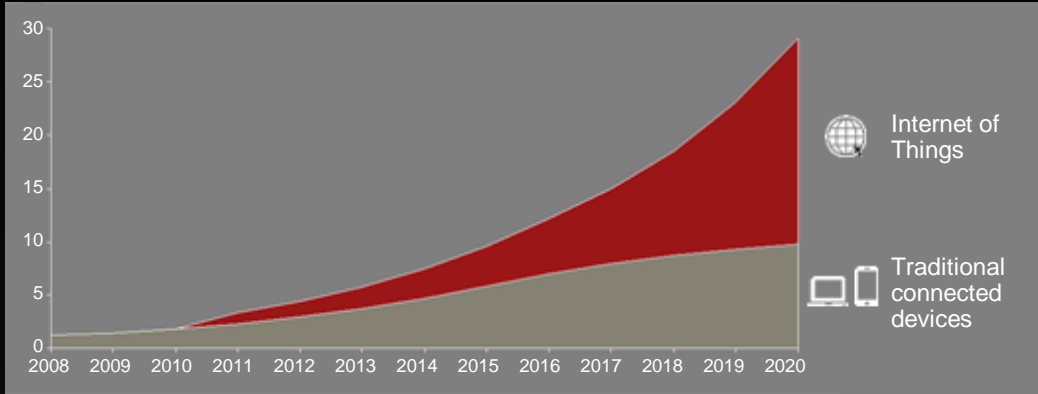
Let's make this a bit more tangible



Are you clear where **your company** and efforts fit into the picture?



# IoT will be pervasive... are you ready?



2013 to 2020: From **half as many** to **twice as many** – growth of IoT devices relative to traditional connected devices

## By 2020 in the World...



Nearly 30 billion devices



Over 7.7 billion people



20X+ as many connected devices per person



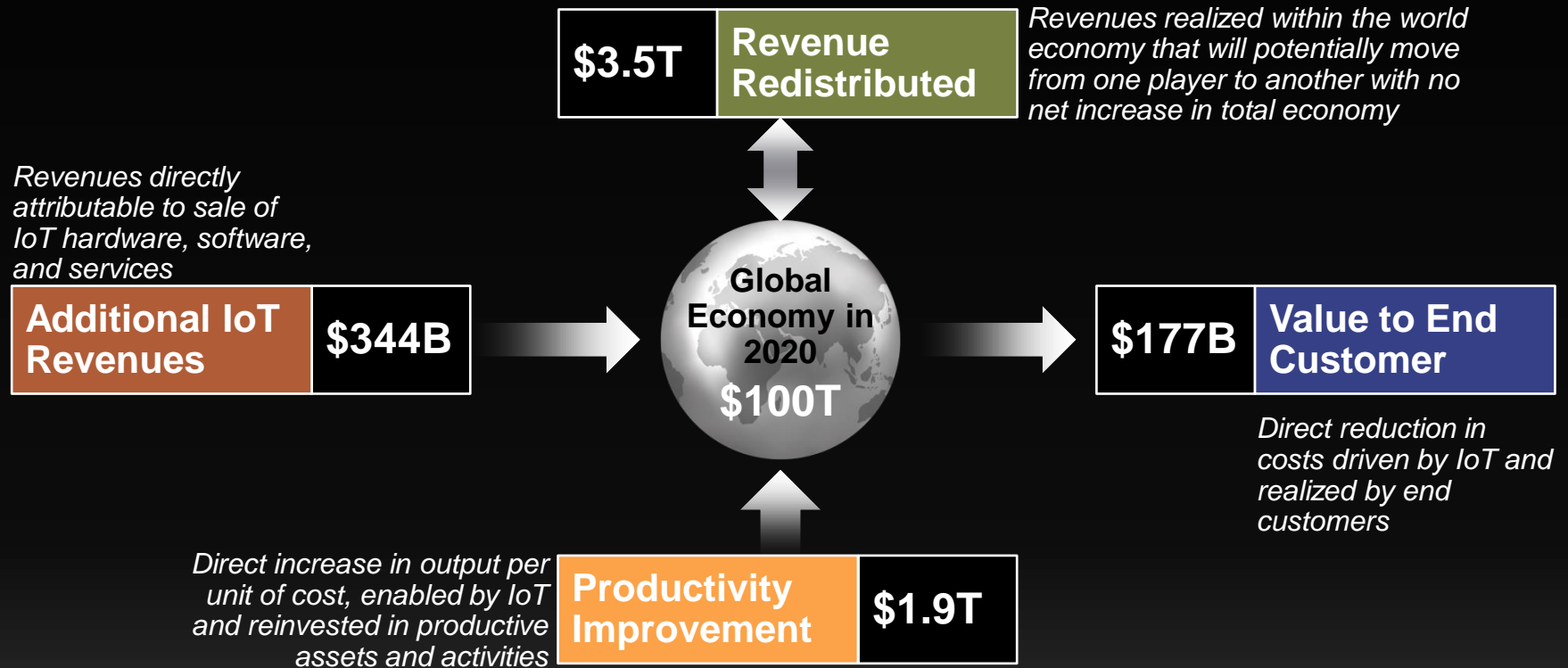
Over 3.2M people

Connected devices

Over 3.5  
per every human on the planet

For a family of four: 250+  
For us in this room: 15,000+  
For all in Silicon Valley: 200M+

# By 2020 IoT will impact close to 6% of the global economy




IoT will be materially **disruptive** – there will be **winners** and **losers**

# Additional IoT revenues will be split in a multitude of ways

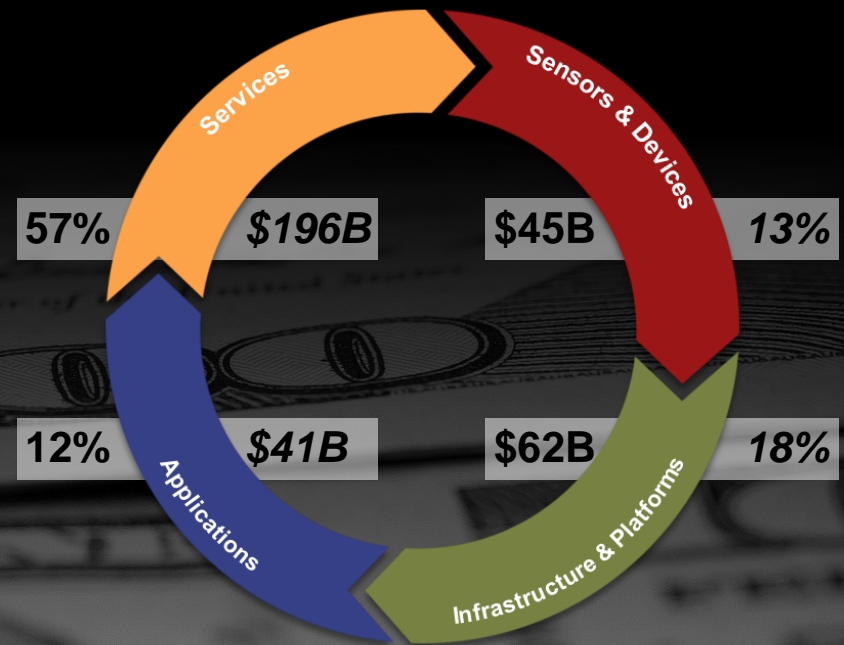
Additional IoT Revenues

**\$344B**

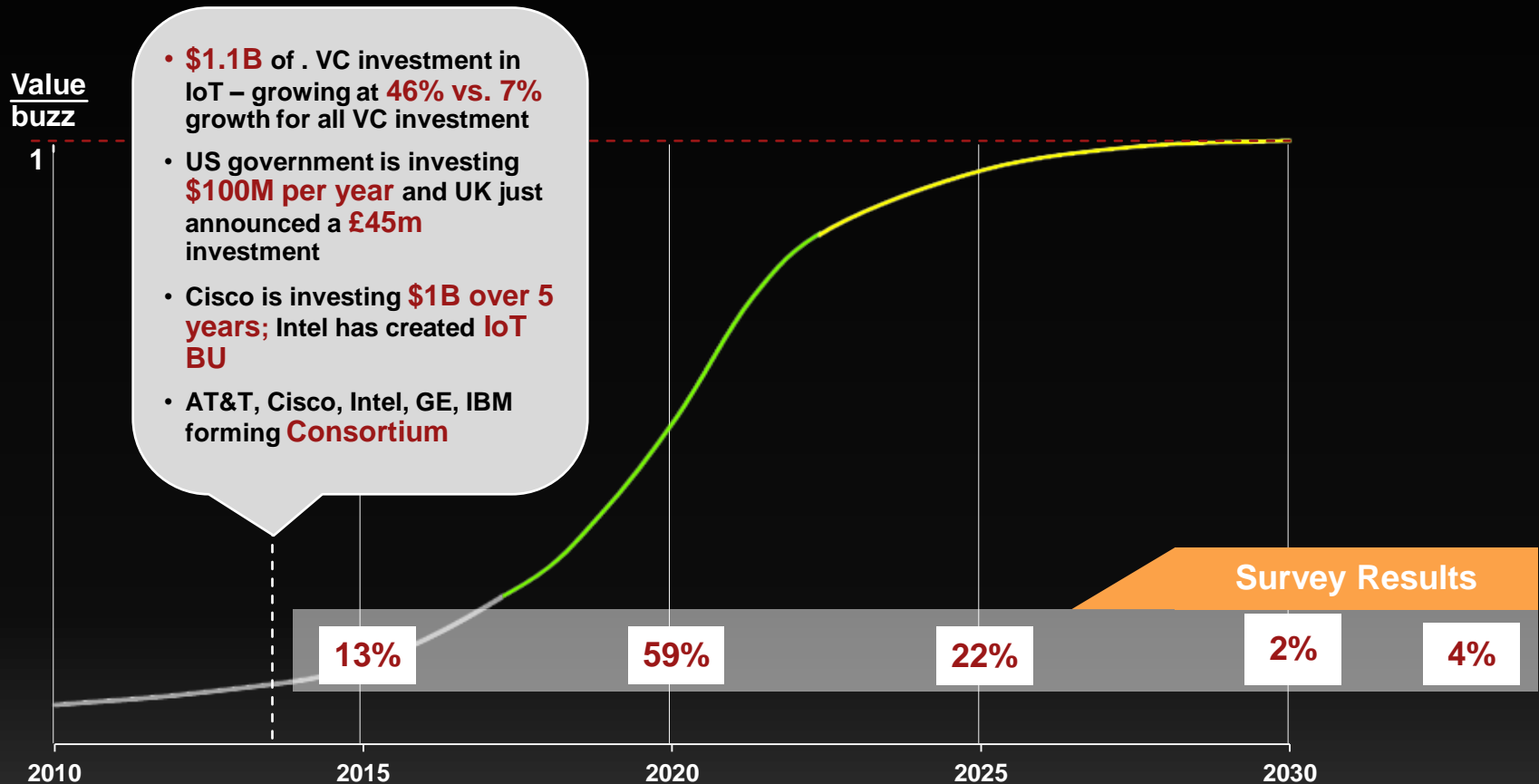
## Survey Results: Time to Value Rank



Enterprise	63%	\$217B	1
Consumer	28%	\$97B	2
Public Sector	9%	\$30B	3



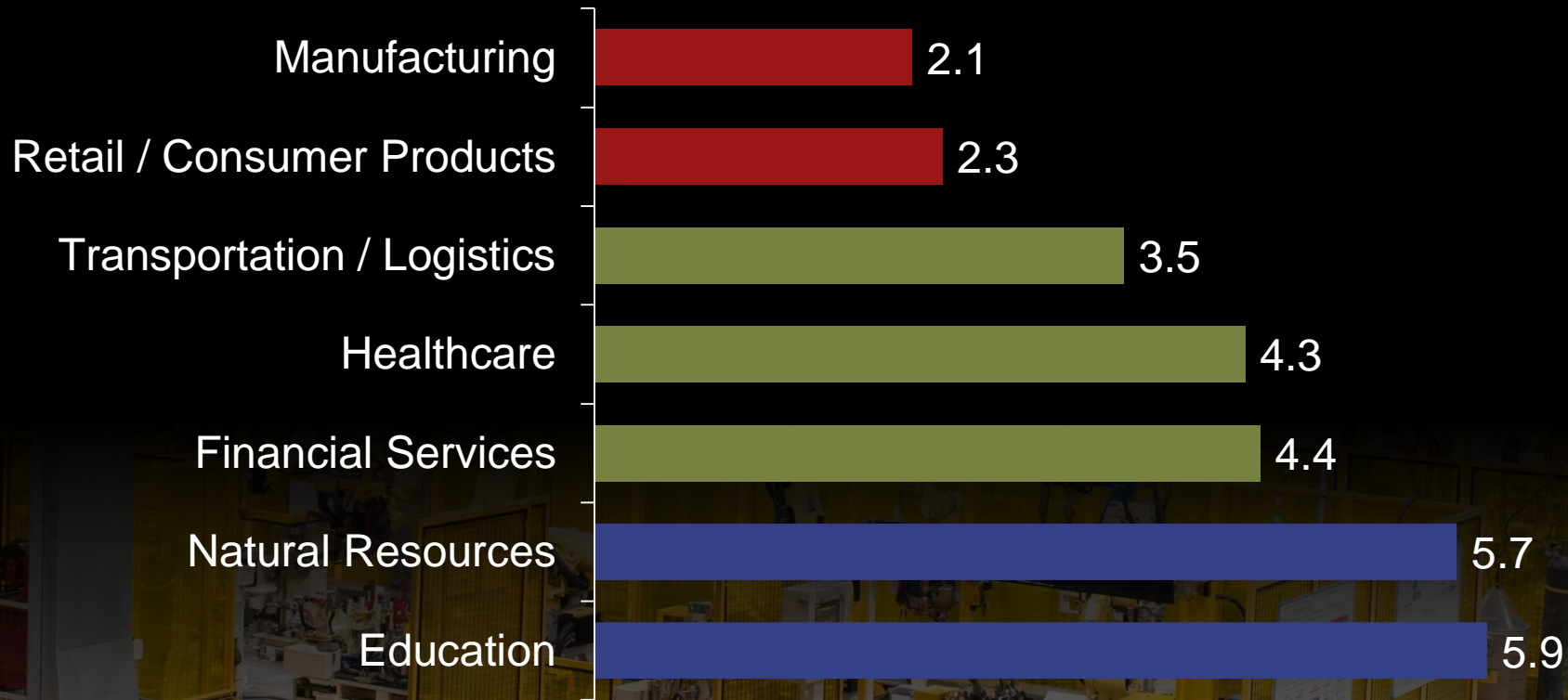
# It will take years for IoT potential to be realized



Do you have the **right timeframe** in mind?

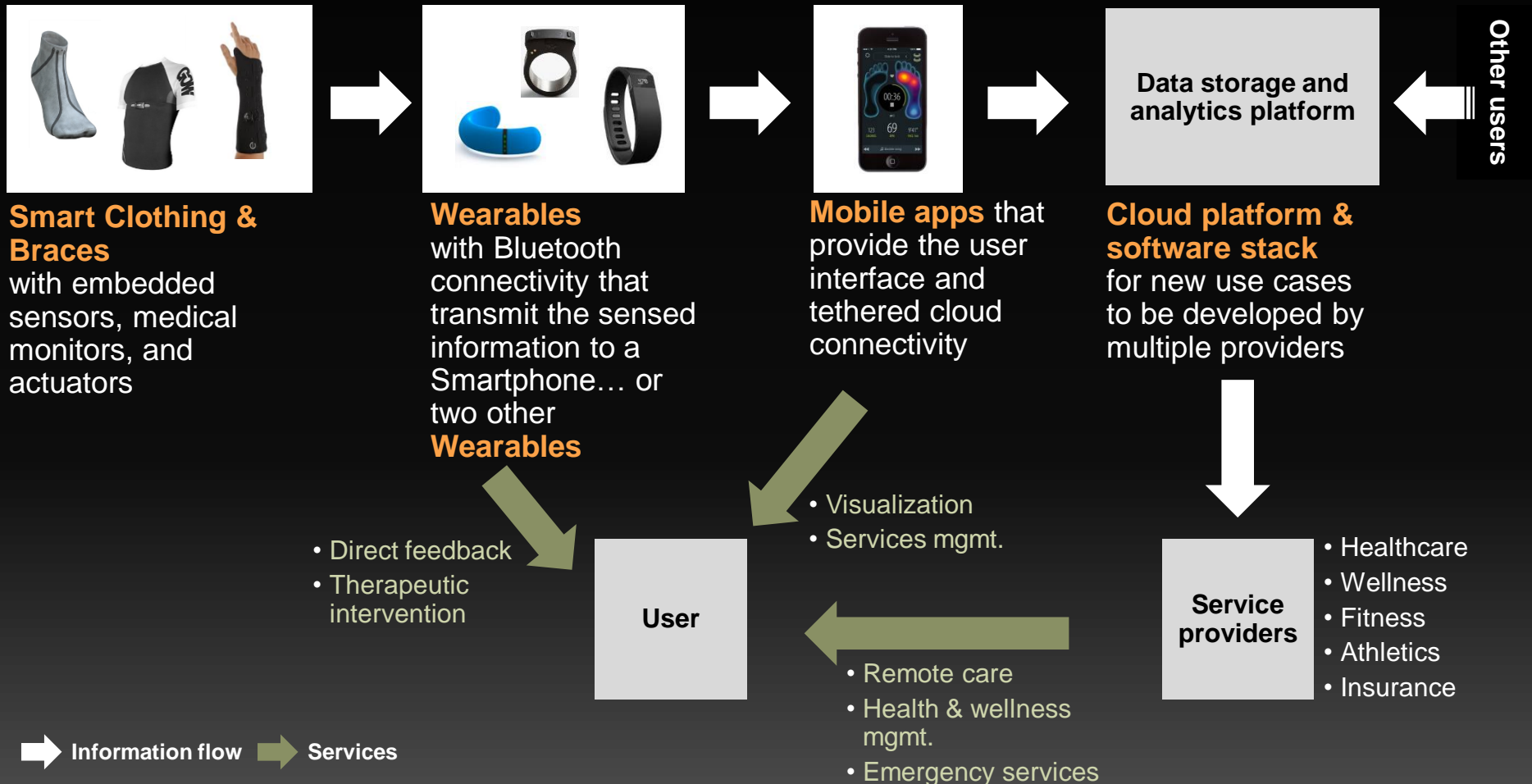


# Not all industries will adopt IoT at the same time



**Focusing your bets will be essential**

# Some value propositions are really compelling – Smart Clothing example



# Some value propositions are really compelling – Smart Parking example

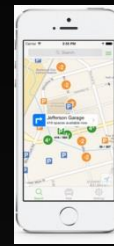


**Wireless sensors** in parking spots and **connected cameras** around the **Smart City** combined with **driver locations** to sense supply & demand for parking spaces

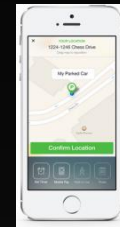


**Cloud Platform**

Data from **sensors** and **users** relayed to the **cloud** via a city wide area network and mobile connectivity



Real-time data is published via **mobile apps** offering data and analytics



**Parkmobile**  
PARKING MADE SIMPLE  
**paybyphone**

Integration with **mobile parking payment** vendors



**Smart City**

- Parking
- Enforcement
- Congestion incentives
- Payments processing



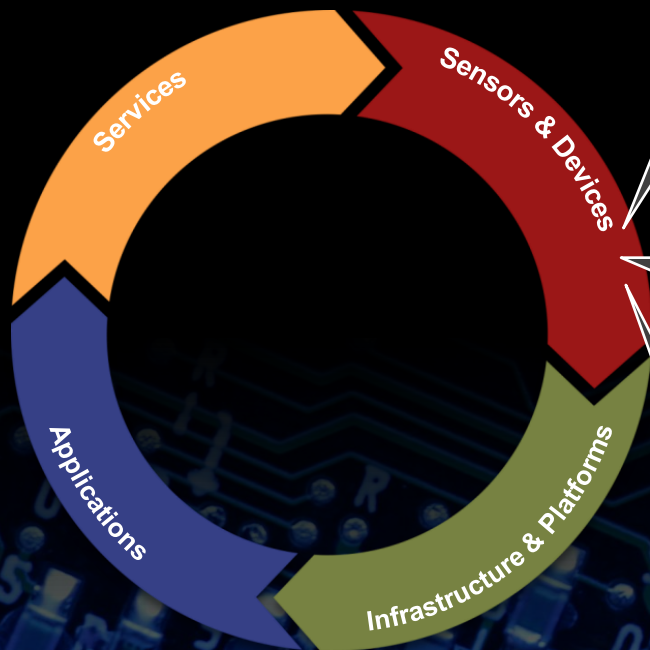
➡ Information flow ➡ Services

# Delivering IoT solutions will require multiple capabilities





# IoT Tech Key Trends – Sensors & Devices



## Costs will continue to fall – but will continue to matter

- Cost of adding **basic IoT functionality** is expected to decrease **five-fold** from \$5 today to \$1 in 2020
- Some costs will remain **fairly flat** – cost of actuators, embedded computing capability, smart user interfaces
- **Additional costs** in higher **integration complexity** as the edge device or module is made smarter

## Functionality will continue to migrate to mobile and wearable

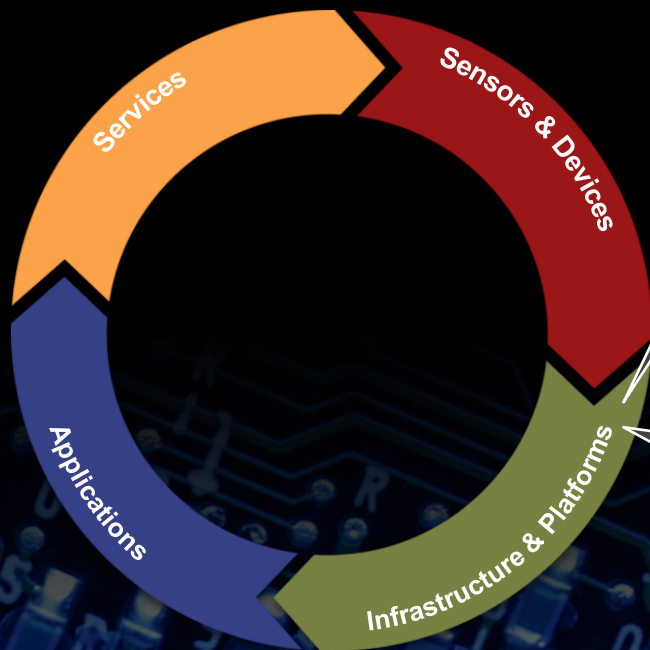
- Will provide **more granular and timely** location, motion, impact and other data that's **good for most** relevant applications
- **Wearables** (growing by >30% per year) are **proliferating** in a **wide variety** of form factors and targeting multiple end uses

## Market will continue to be fragmented, creating opportunities for new entrants

- Market for sensors & devices is fragmented **along verticals** and **use cases** – expected to be the case through 2020
- High levels of startup creation and M&A activity are expected as evidenced by **~50% growth in venture funding** in the IoT space



# IoT Tech Key Trends – Infrastructure & Platforms



## Connectivity will become pervasive

- **Mobile broadband** internet penetration expected to grow from 74% in 2013 to **83% by 2018**
- **Home broadband** will reach saturation by 2017 with **~75%** penetration
- Nearly all will have cellular coverage and nearly **half of households** will be **cellphone only** by 2020

## Focus of innovation and investment will shift to cloud platforms

- **Data aggregation & storage** costs have fallen by >50% from 2009 to 2013 while **computing power** for a given size and cost has doubled every 18 months for the past 30 years; these trends are **expected to continue**
- The market will be **fragmented along verticals** as vertical-specific platform players bring application & service enablers to address specific pain points of the customer
- **Investment** by infrastructure and platform providers will continue to **outpace enterprise** IT investment as well as **public sector IT** infrastructure investment

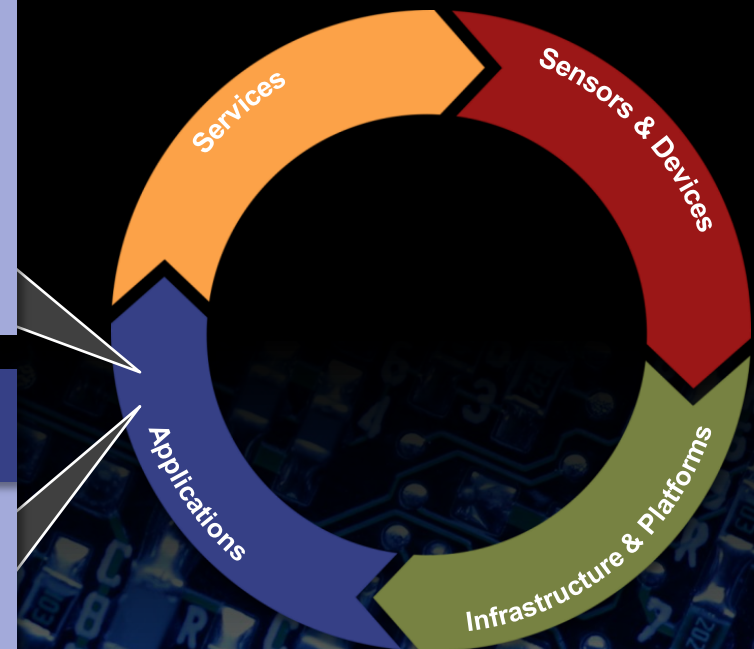
# IoT Tech Key Trends – Applications

## Applications will continue to be targeted – value will migrate to analytics & decisioning

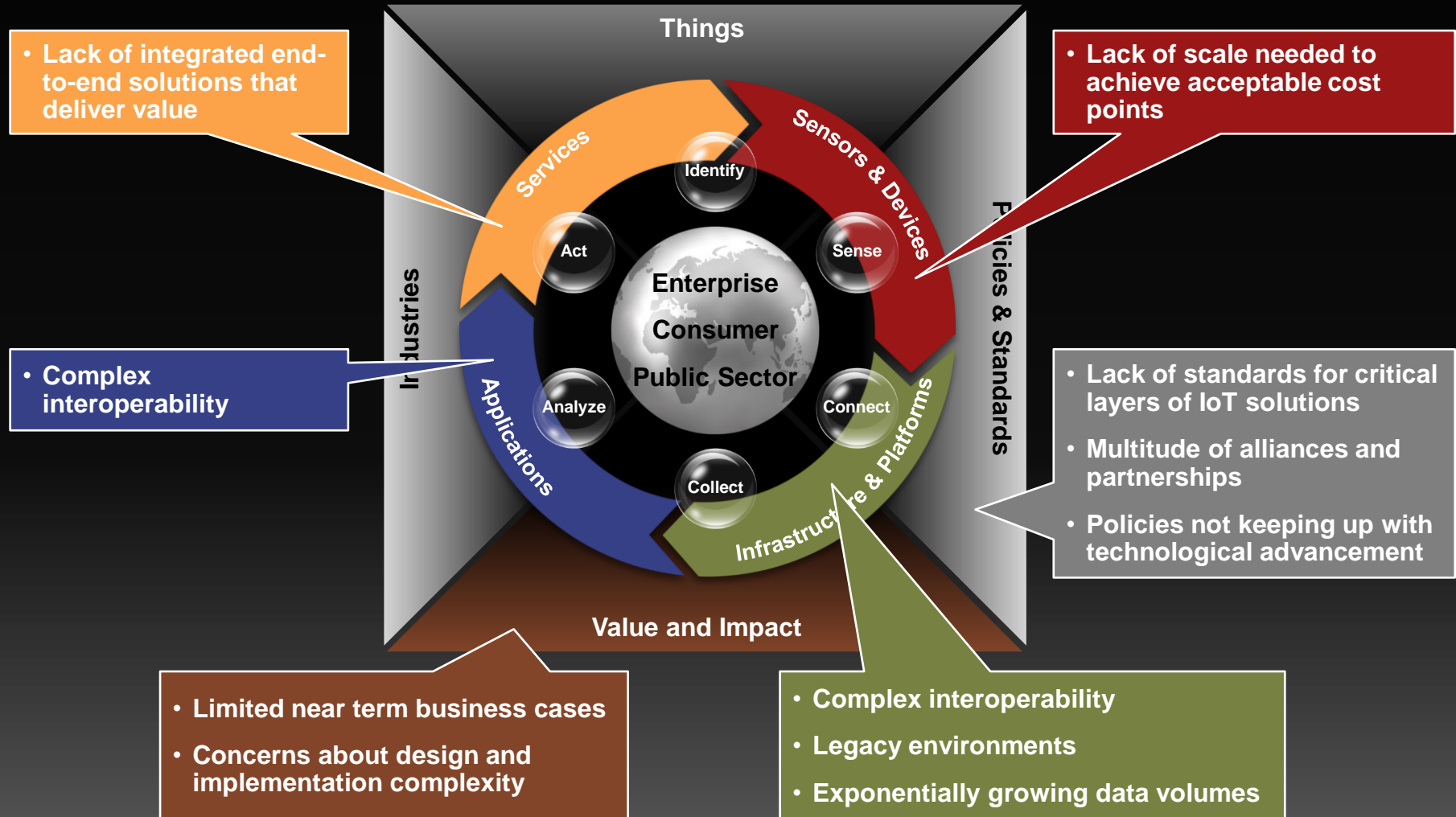
- The majority of applications are specific to a **single use case** or a **collection** of use cases (vs. an integrated suite)
- Basic **communication and storage & retrieval** apps are ahead of **control & automation and data analysis** – the former will likely get **commoditized** while the latter remain **proprietary**
- Initial focus on **data transparency** will evolve to a focus on **insights** from aggregate information pools

## The battle to control the customer interface will continue

- Many players are attempting to create a walled garden ecosystem of sensors & devices and applications – this trend will continue and players will continue to aggressively compete for the right to be the channel to the consumer
- More than one ecosystem will exist and each will be open to outside 3rd parties to deliver value added services



# Challenges to IoT deployment and value span 6 areas



# Succeeding in IoT – going from Idea to Scale – will require a different way of doing business

## Overall Ecosystem



1. Standardized platforms and interfaces
2. Updated policies and regulations
3. Defined cross-industry collaboration models and alliances
4. Strategically eliminated systemic bottlenecks
5. Relentlessly lowered costs

## Individual Company



1. Clarity of business value
2. Strategic and operational flexibility
3. Focus on superior innovation
4. Collaborative and co-creative culture
5. Teams capable of ecosystem collaboration