



emPOWER

IoT WEST

**J.D. POWER**

# WELCOME

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**Ian Greenblatt**

Managing Director

Technology/Media/Telecom Intelligence

# **J.D. Power** is a leading global data & analytics and consumer insights company

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We've been trusted by consumers for more than 50 years to bring their voice to businesses around the world, leading to better products, services, and experiences.

Our cross-industry and multidisciplinary approach combines leading-edge tools and market expertise to uncover insights that increase understanding and drive business results.

# J.D. POWER AT A GLANCE

We work around the clock to offer businesses around the world an innovative and diverse way to delve into the language of customer experience.

Studies Fielded in



19

Countries

Founded in

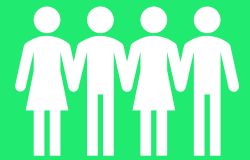
1968

Global Client Base



1000

Clients Served



800+

Staffers, including statisticians, data scientists, PhDs and consumer insight analysts

31

Languages Supported

More Than

5,000,000

Consumers Surveyed Annually

175

Annual Benchmark Studies



# OUR PURPOSE

## VISION

Optimize the customer experience

## VALUES

- Independence
- Integrity
- Impact

## MISSION

To be the premier source of actionable consumer insights that help businesses drive performance and people to make better decisions.

# INDUSTRIES SERVED



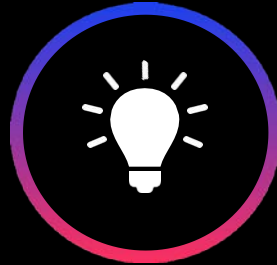
Automotive



Financial Services



Insurance



Utilities



Travel & Hospitality



Technology, Media  
& Telecom



Healthcare



Home Improvement

# HOW WE WORK

J.D. Power's data and analytics offerings include independent industry benchmark studies, customer experience solutions, and customized advisory services, all designed to provide insights and help companies improve quality, engagement, and business performance.



## BENCHMARKING

Key indicators, drivers, and competitive comparisons



## CUSTOMER MEASUREMENT & MANAGEMENT

Combine an innovative platform with data and analytics expertise



## ADVISORY SERVICES

Leading industry specialists for counsel, strategy, and solutions

# AGENDA

TIME	TITLE	SPEAKER
1:15 – 1:30pm	IoT Overview	<b>Mark Thirman</b> , Sr. IoT Consultant <i>J.D. Power</i>
1:30 – 2:00pm	The Bottomless Cloud	<b>Tom Koulopoulos</b> , Author & Futurist <i>Wasabi</i>
2:00 – 2:30pm	VC Investments in IoT & Consumer IoT	<b>Nate Williams</b> , Entrepreneur in Residence <i>Kleiner Perkins</i>
2:30 – 3:00pm	Protecting the Connected Home	<b>Jeff Gardner</b> , CEO <i>Brinks Home Security</i>
3:00 – 3:15pm	BREAK	
3:15 – 3:45pm	Connecting the Things	<b>Shelby Noakes</b> , Director M2M & IoT <i>T-Mobile</i>
<b>3:45 – 4:15pm</b>	Connecting Remote Things & Connectivity Panel	<b>Parthesh Shastri</b> , VP, Strategy & Partner Development <i>FreeWave</i>
<b>4:15 – 4:45pm</b>	Fireside Chat: Experience is the Product in Consumer IoT	<b>Amit Aggarwal</b> , Sr. Director, Digital Solutions <i>J.D. Power</i>
<b>4:45 – 5:00pm</b>	Wrap Up and Q&A	<b>Mark Thirman</b> , Sr. IoT Consultant <i>J.D. Power</i>
<b>5:00 – 6:00pm</b>	Reception & Networking	





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# IoT OVERVIEW

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**Mark Thirman**

@mthirman

Technology/Media/Telecom Intelligence

# Using IoT to delight customers

**Mark Thirman**

@mthirman

J.D. Power

# Twenty Years ago, at the MIT Media Lab, The Term “IoT” was Born



“I coined the term ‘The Internet of Things’ when I had to make a PowerPoint presentation in the 1990s to convince the senior management of the company I was working for, which was Procter & Gamble, that we should put an RFID tag, a tiny microchip, in everything that Procter & Gamble made. They had no idea what I was going to tell them, but they knew the internet was a big deal. ***So if I could get the word internet into the title of my presentation, I could get their attention. So I very hastily called the presentation The Internet of Things*** because we had things that we wanted to track around the Procter & Gamble supply chain. And the presentation was successful. They gave me some money. I cited some research at MIT. The presentation went with me. I never changed the title. That is how the term The Internet of Things kind of became popular.”

- Kevin Ashton

<https://www.techrepublic.com/article/how-the-term-internet-of-things-was-invented/>



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# Twenty Years Later...

- "90% of senior execs in technology, media, and telecommunications industries say IoT is critical to some or all lines of their business in 2018" Forbes - December 2018
- Ericsson is predicting that cellular-connected IoT devices will reach 3.5 billion by 2023, with China being the main driver
- In global terms, Cisco states there will be 1.8 IoT/M2M connections for each member of the global population by 2022. \*
- Worldwide spending on IoT will reach more than \$745 billion and surpass the \$1 trillion mark in 2022. per IDC – January 2019

# A Quiet Revolution Occurred

IoT breaks into two broad categories:

1. Consumer
2. Enterprise/Industrial

**Consumer** starting to take off

**Enterprise/Industrial** segment has connected and monitored machines for over a decade

- First via fixed/hardwired connections within the four walls of a factors
- As cellular connectivity became cheaper and faster, the platforms to manage devices became available: large, distributed engagements became pervasive
- WiFi *not* preferred (security, manageability, etc)

“Nothing happens until somebody puts a sensor on something and connects it to a network”  
- David Geltner – original CTO and architect of Verizon’s M2M/IoT platform (nPhase)



# IoT: Solving Problems Across Verticals

Automotive



Agriculture



Security & Surveillance



Fleet Management



Industrial Equipment



mHealth



Digital Signage



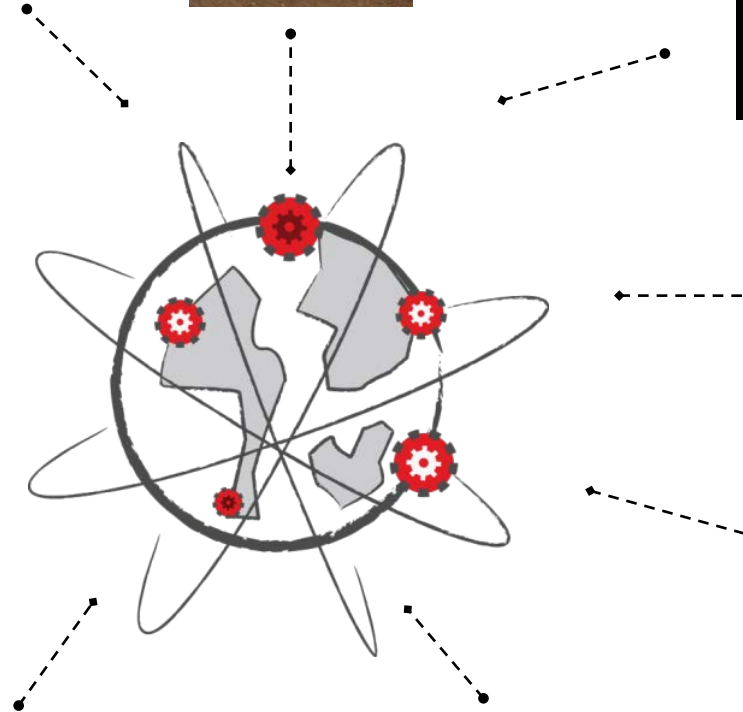
Energy & Automation



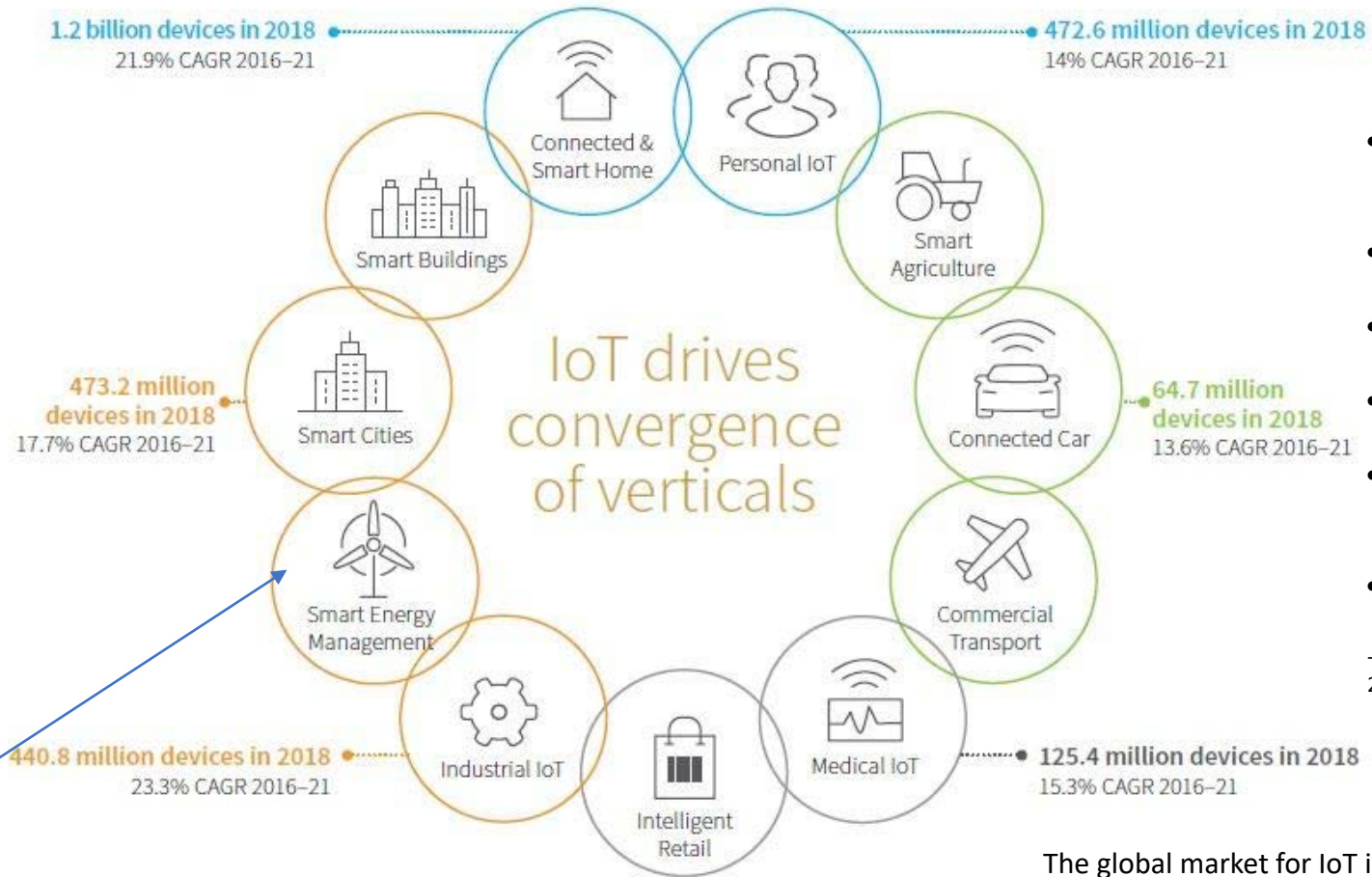
Mobile Payment



Natural Resources



# It's Still All About The Verticals



- ~62M vehicles will be capable of V2V (Vehicle-to-Vehicle) communication by 2023, (increase from ~1M in 2019).
  - Average annual growth rate of V2V communication to 2023 estimated at 173%
  - 5G expected to be key accelerator of V2V expansion
  - ~60% of new vehicle sales in U.S. estimated to be V2V capable by 2023
  - 775M consumer vehicles estimated to be connected via telematics or in-vehicle apps by 2023, increasing from 330M in 2018
  - CAGR of connected cars to 2023 estimated at ~19%
- Telematics, In-Vehicle Apps, and Connected Car Commerce 2018-2023” study by Juniper Research

The global market for IoT in healthcare is expected to reach \$534.3 billion by 2025, according to Grand View Research

The number of devices featuring cellular or satellite connectivity deployed in oil and gas applications amounted to 1.3 million at the end of 2018. Growing at a compound annual growth rate (CAGR) of 6.8 percent, this number is expected to reach 1.9 million units by 2023. – Berg Insight 4/1/2019

Source: IHS Markit

# What are the Bits and Pieces?

IoT enables key information to be exchanged *without* human intervention, making it possible to reduce costs and improve both efficiency and service to customers.

“Firms use IoT technologies to extend digital business into their daily operations and business processes by capturing detailed visibility into the physical world” - Forrester

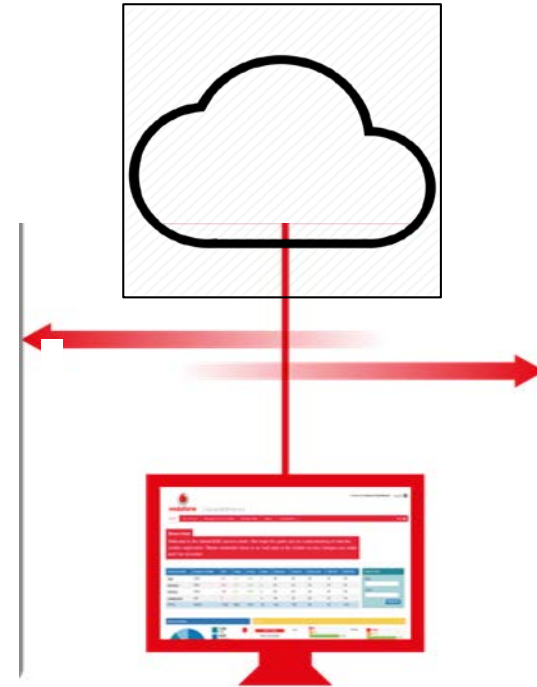
- Terminals
- Connectivity
- Modules (3G/4G, other networks)
- Platforms
  - Connectivity Management
  - Application Enablement
  - Analytics
  - Real-time control
- Item being monitored/managed

## Hardware / Device / Sensor



**Capture**  
device data

## Managed connectivity service



**Transmit**  
the data

## Applications



**Use**  
the data

# Consumer Awareness – IoT, IoE, M2M, Smart Connected Devices, Connected Products

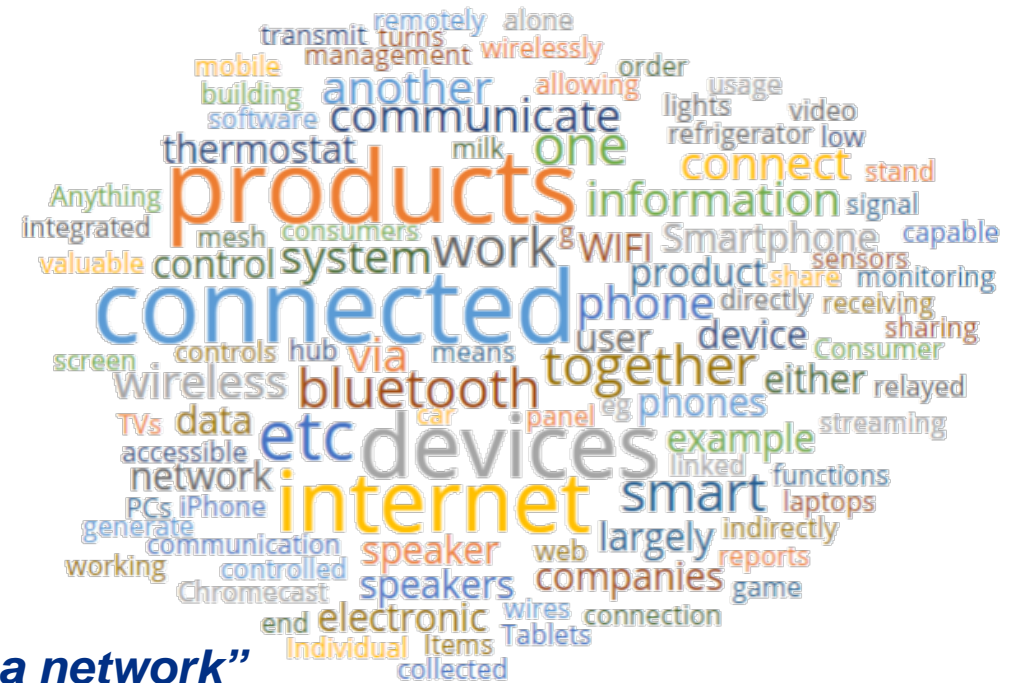
*“Anything connected to the internet”*

*“Stand alone electronic devices which communicate over the Internet”*

*“Products that are connected to one another and can signal information (e.g., a refrigerator that can signal to your smart phone that you are low on milk)”*

*“Connecting people, data, processes, and things within a network”*

*“Network of physical devices, vehicles, building and other items embedded with electronics software, sensors and network connectivity that enables the collection and exchange of data.”*



Source: Survey Results



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# IoT: What it is and what it is not

Is	Not	Comments
“Dumb” connected Things	Laptops, iPads, iPhones	PC/phones/iPads are self contained.
Vertical solutions	Horizontal	Solves a problem
Cardiac or sleep apnea monitors	Fitbit, Tag on Jeans at store	Can’t address it, passive, not connected
Mostly enterprise	Kid’s toy with Internet Access	Not a managed solution
Fleets of things	One of something	Managed by platform(s)

I prefer “Connected Things” to IoT as I do not want my “things” on the internet  
IoT is not just “technology” with a three letter acronym

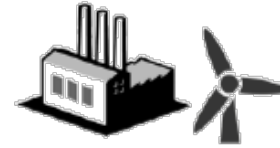


# Consumer ≠ Industrial



## Consumer

- Superficial asset impact
- Data volume in terabytes per day
- User managed security
- Regionalized data storage
- Compute in the cloud: reactive



## Industrial

- Mission critical asset value
- Data volume in PB per day
- Multi-layer security
- Customer-focused storage
- Compute at the edge: proactive

# How Does M2M/IoT work?



1

A sensor detects that the vending machine is out of product

2

Message is sent to the warehouse

3

Inventory is checked on the server

4

Driver is informed & given best route to all vending machines

5

Driver refills the machine

6

Vending machine notifies warehouse when full

# How Does M2M/IoT work?

World Leader of  
Smart Water &  
Recycling  
Management

Proudly Made in the  
**USA** with customers  
In all 50 states

Named **Top Smart  
City Application** in  
the 2014/2015 IoT  
Awards

Currently Available  
in **47 Countries**  
around the world

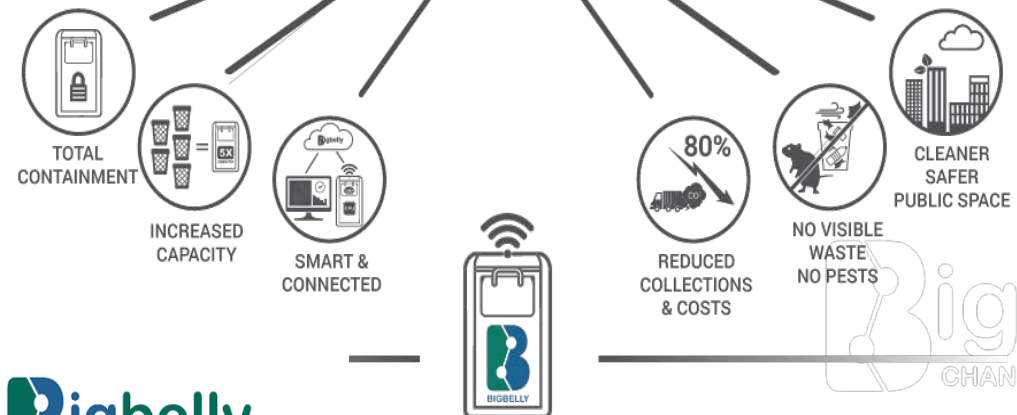
**53 Distributors**  
contributing to a  
global footprint

**5th Generation Solar-  
Powered Smart Station**  
transforming public  
waste management



## Why?

- Connected Trash bin
- Green
- Saves money
- Eliminates unnecessary truck rolls
- Like the vending machine example...



**Bigbelly**  
SMART CITY SOLUTIONS

**Bigbelly**  
POWER  
CHANGE YOUR SPACE  
WEST

**J.D. POWER**

# Broad Enterprise IoT Adoption Continues

## Benefits and challenges

Share of respondents citing each factor

Source: GSMA Intelligence Enterprise IoT survey Q4 2018

The top three benefits of IoT for enterprises:



The top three challenges in IoT deployment:



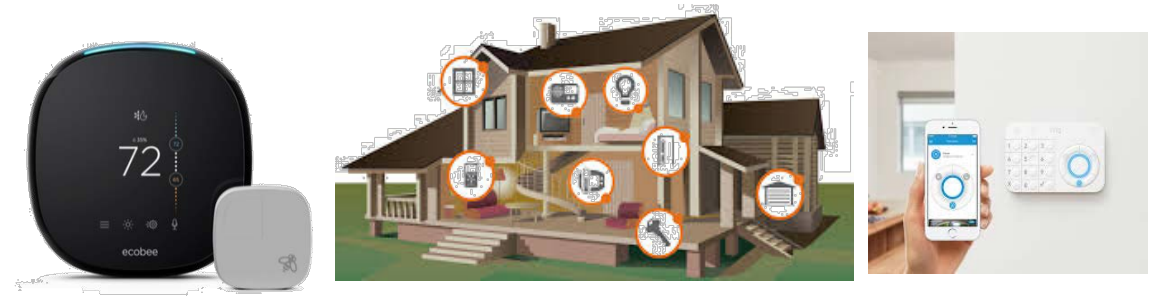
Source: GSMA Intelligence Enterprise IoT survey Q4 2018

Almost two thirds of surveyed companies had deployed an IoT solution by 2018 .  
Three quarters of these companies plan further deployments



# Smart Home Will Disrupt Consumer IoT Segment

- Smart home devices now account for two in every five consumer IoT connections
- Smart home IoT connections will grow at a CAGR of **14%** between 2018 and 2025
- Smart home will represent by far the **largest** category of consumer IoT (ahead of consumer electronics, smart vehicles and wearables)



## Energy management and security are key smart home drivers

Overall, across developed markets in 2018:

Smart home energy device ownership

⚡ ^17%

Smart home security device ownership

🔒 ^15%

Total number of smart home devices per 1,000 households

🏠 ^19%

**100 Million US Homes Lack Smart Devices, but 40 Million Will Have Smart Thermostats by 2020**

Trojan Horse: Alarms, Thermostats, Roomba, Smart Speaker, TV? Who will become the single source of truth for Consumer IoT

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# Why not the TV?: TVs make great anchors



## TV household link

- TV is fixed household identity
- Households can be linked to 1<sup>st</sup> & 3<sup>rd</sup> party datasets
- Gathering point for data from other intermittent smart household devices - think AWS IoT Greengrass
- IP link to multitude of smart home services
- TV UX is natural extension of many services including Voice Assistants

## Out of all the IoT devices, why not the TV?

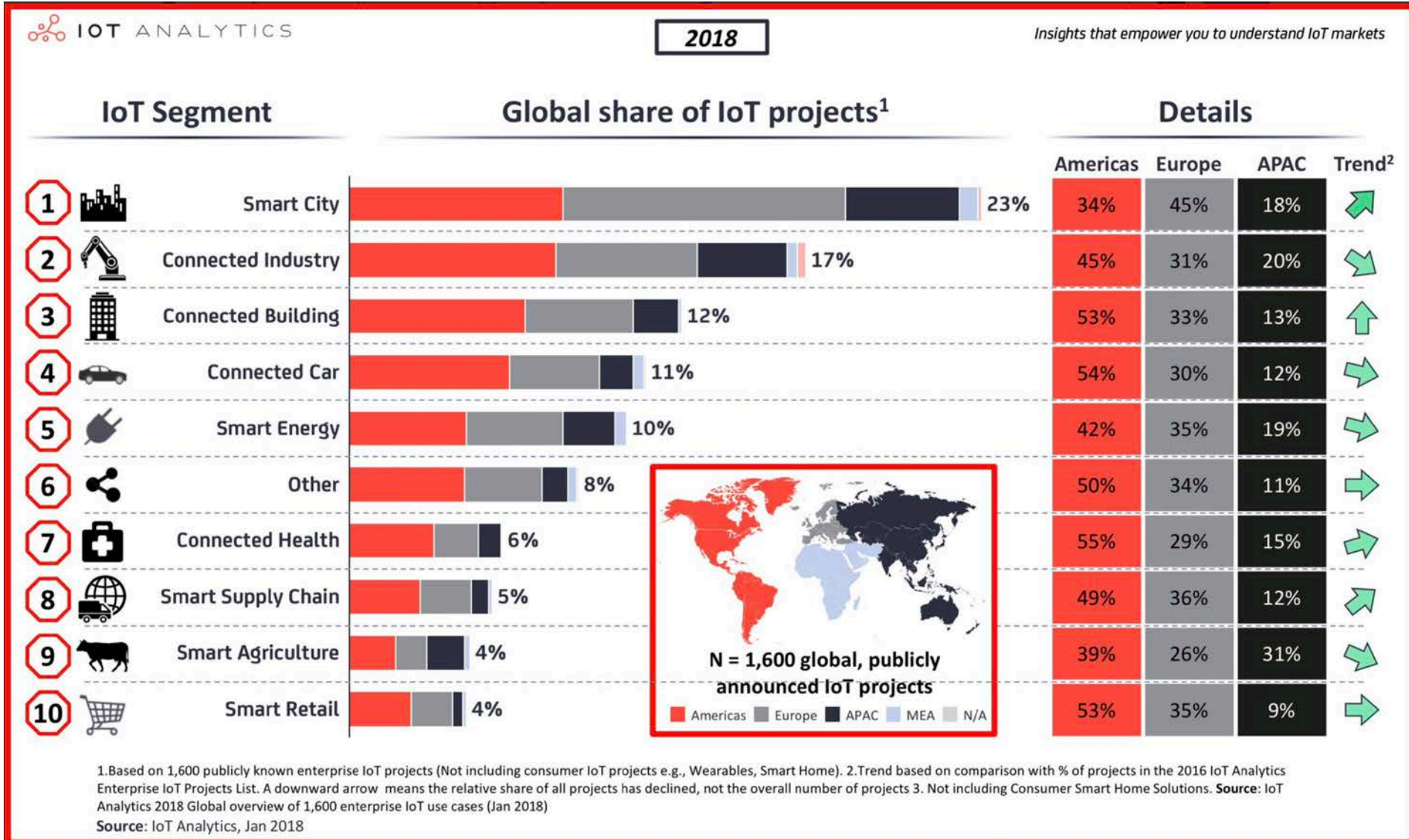
- **TVs are ubiquitous** – almost every house in US has at least one
- **TVs are unique to a household** – unlike mobile phones
- **TVs have high connectivity rates & provide a constant heartbeat** – 82%
- **Very powerful** – 4+ ARM cores, 4+ GPUs, dedicated AI cores, 2+ GB RAM, 8+ GB flash
- **TVs will become anchor devices in connected homes** – their innate characteristics and the role they play in the typical household will drive this
- **TVs are connected things** – as such require many of the same supports
- **TVs likely to become infrastructural** – both acting as bridges and providing local services to other things
- **TVs aren't just anything** – the dynamics of the TV industry, changing ecosystem landscape and evolving privacy requirements make them unique amongst most things



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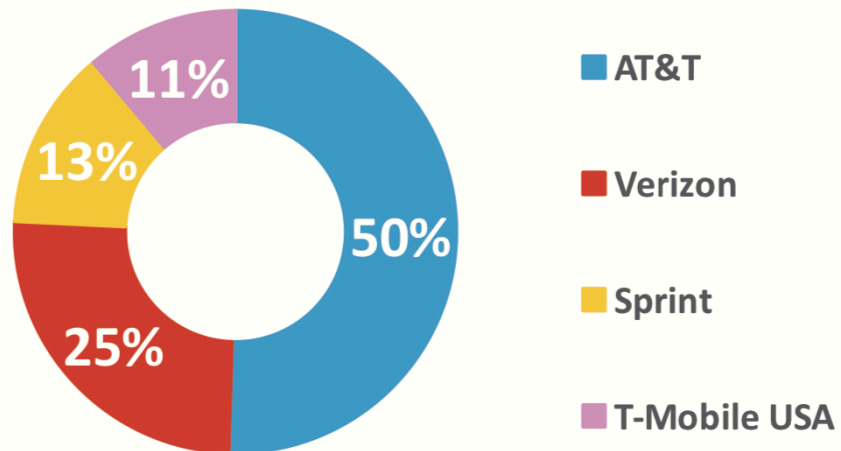
- Bill Baxter – CTO VIZIO. From MIT Connected Things 2019 conference

# Smart City dominates spending



# Mobile Operators continue building large IoT businesses

Market Share of the Top 4 US Carriers



The cellular IoT market in the US is 103.9 million connections. The cellular IoT market is forecast to grow 25%, primarily driven by connected cars, fleets, supply chain, asset tracking and remote monitoring and control.

James Brehm & Associates notes that most operators did very well, with increases in Q4 (TMO & ATT >6%)

# So, the question today is....

How do we use IoT to *delight* customers?

- Challenges
- Connectivity
- Use Cases (Consumer, Enterprise)
- Data Storage in the cloud (“bottomless”)
- The “customer” is often disaggregated in an IoT engagement

# Keynotes, Fireside Chat

- **Tom Koulopoulos**, Author of The Bottomless Cloud,, will talk about a world in which storage costs no longer impede progress. Hosted by Wasabi
- **Nate Williams** – KleinerPerkins. Ex August Home CRO– Nate will talk about VC investment areas in IoT plus his experience with a Consumer IoT company (August)
- **Jeff Gardner** – BRINKS Home Security’s CEO will talk about the Protecting the Connected Home (inclusive of Q&A)
- **Panel** – Opportunities in consumer IoT – Nate Williams and Jeff Gardner
- **Shelby Noakes** - T-Mobile will share his thoughts on Connecting the Things(inclusive of Q&A)
- **Parthesh Shastri** - FreeWave – will discuss Connecting Remote Things
- Panel: T-Mobile and FreeWave – Connectivity Panel
- **Amit Aggarwal**, Sr. Director, Digital Solutions – J.D. Power will joins us for a Fireside Chat
- Panel with all keynotes/Wrap up
- Networking



# Join us at Auto Revolution

# AUTO REVOLUTION

OCT 23-24, 2019 / ARIA / LAS VEGAS

WHERE THE MOST INNOVATIVE MINDS IN

AUTO UNITE TO ADVANCE THE FUTURE

Keynote Presenter: Steve Wozniak!



# Thank you.

Sponsors, Speakers, J.D. Power team, Media Partner,  
attendees





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# THE BOTTOMLESS CLOUD

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Tom Koulopoulos

Wasabi





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# IoT INDUSTRY PERSPECTIVES

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**Nate Williams**

EIR

@naywilliams

# A little about me...

## CXO / OPERATOR



Acq. by Assa Abloy



MOTOROLA

Acq. by Google



Acq. by Motorola



## ANGEL / ADVISOR



PROXY



Acq. by Oracle



Acq. by Whirlpool

## INDUSTRY DEV



Internet of Things Consortium



# KPCB Investments (historical)

Google amazon.com EA Genentech

UBER myfitnesspal nest

Spotify Twitter SoundCloud Snapchat JD.COM

SHAZAM dropcam Square OP@WER

Chegg Waze Duolingo Slack

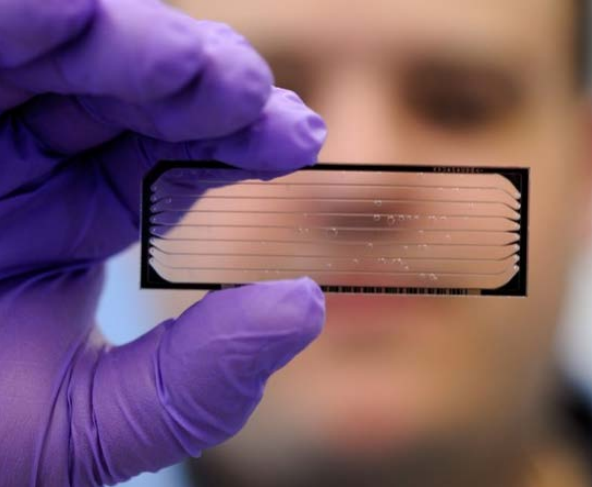
# KPCB Focus Areas



**Digital**  
Cybersecurity  
Cloud and Big Data  
Consumer  
SaaS  
Gaming



**HardTech**  
Today's conversation



**Life Sciences**  
Targeted Therapeutics  
Digital Health

# IoT & Connected Device Leaders (Select)





# Green Portfolio (Select)

## *Power Generation*

**Bloomenergy**

UPWIND SOLUTIONS

spruce

## *Smart Grid*

**enlightened**

Silver Spring  
NETWORKS

**-chargepoint-**

## *Agriculture*

**BEYOND**  
meat

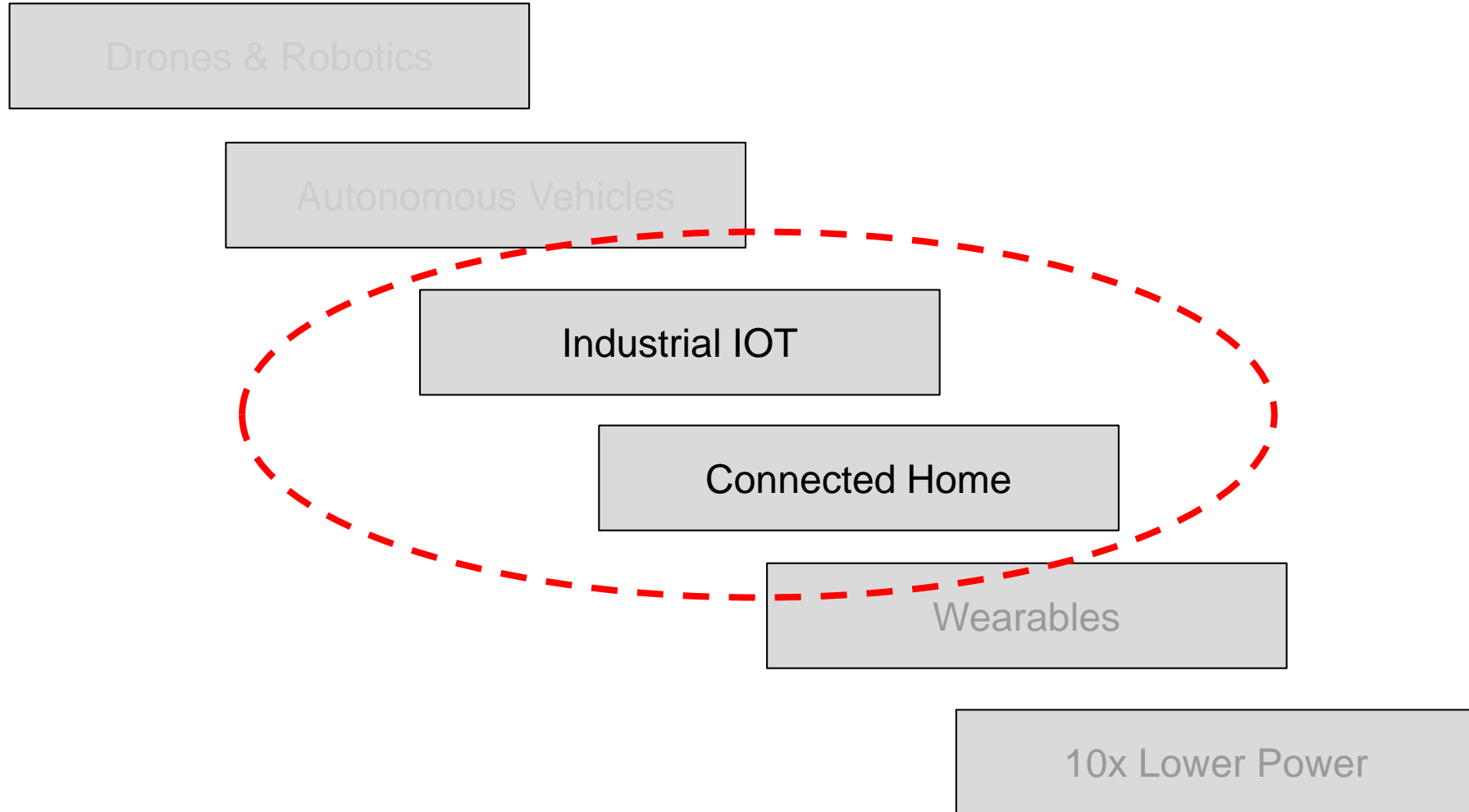
VOLOAGRI

FARMERS  
BUSINESS NETWORK

emPOWER  
WEST

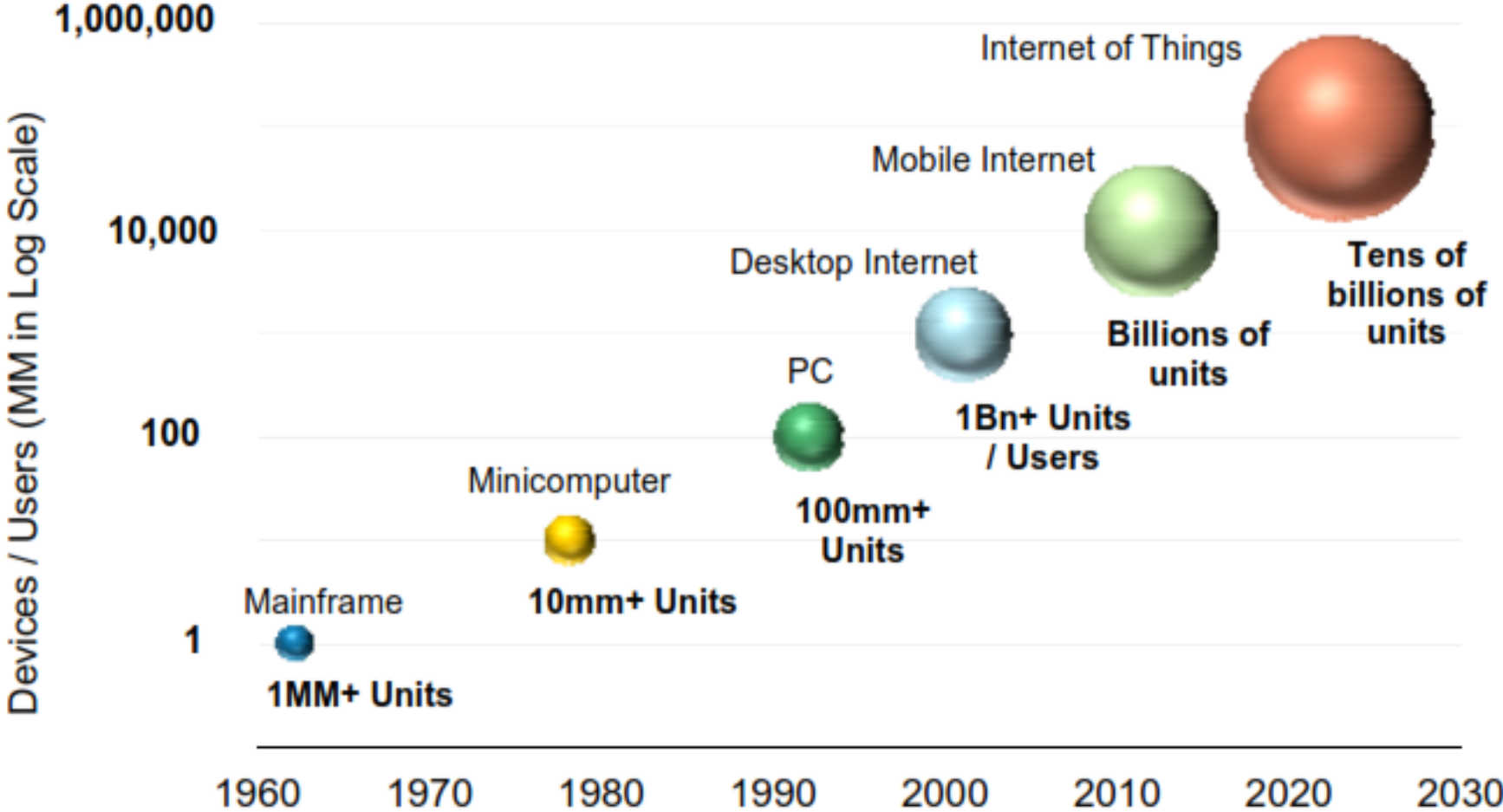
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# KPCB HardTech Focus Areas



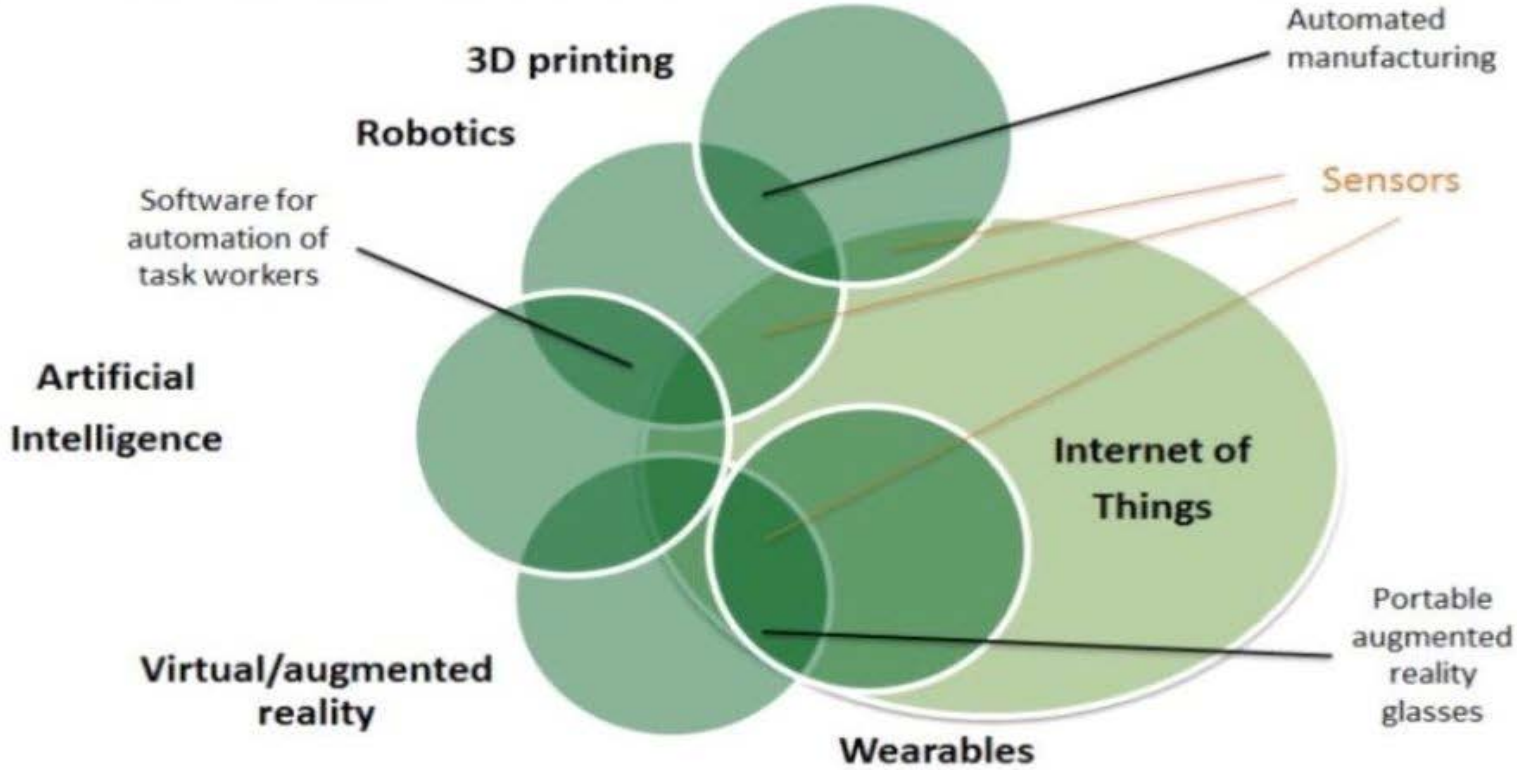
# Inevitability of IoT No Longer Debated

Computing Growth Drivers Over Time, 1960-2030e



# IoT Enables our HardTech Thesis

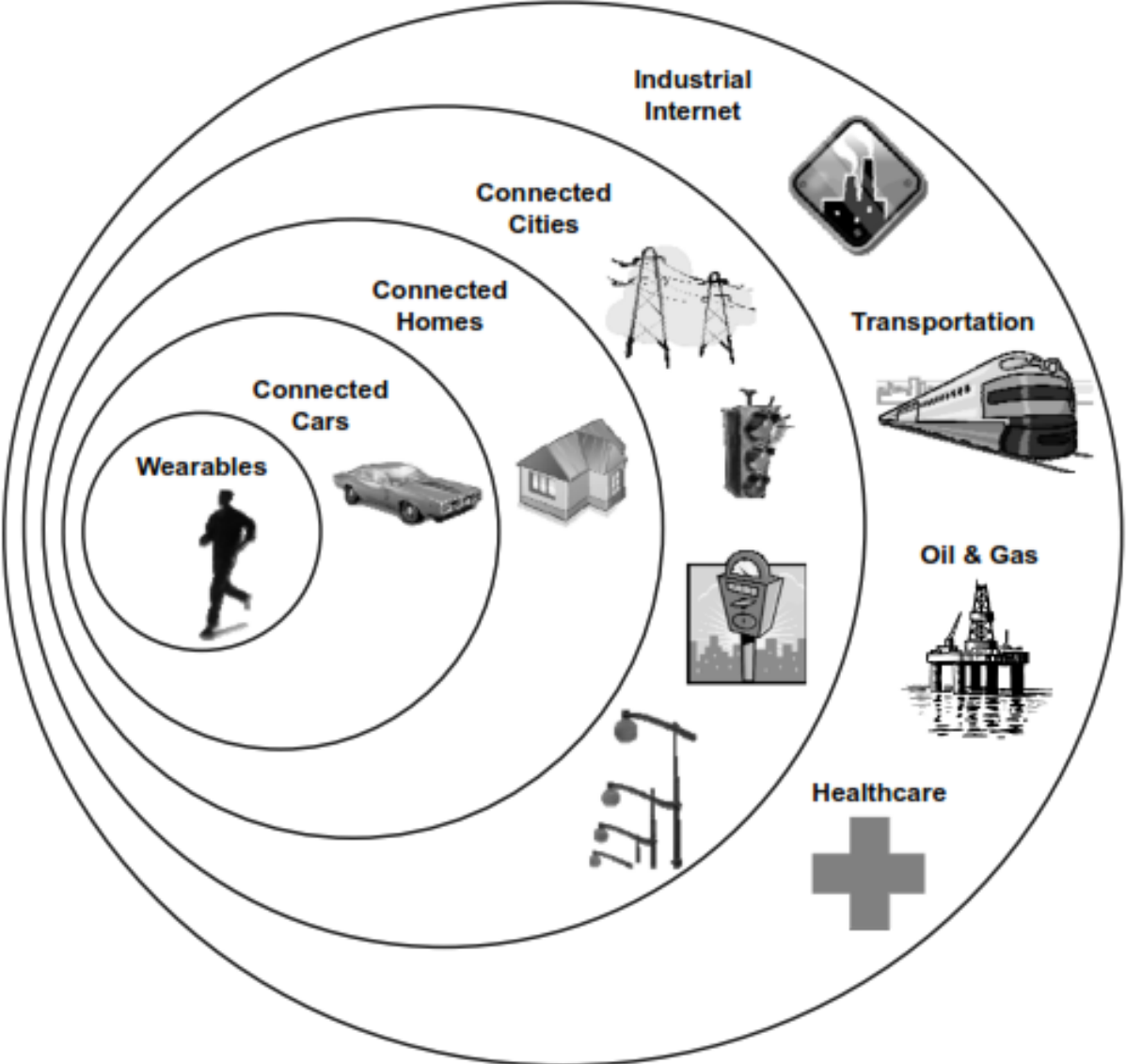
**Exhibit 5: Intersection of innovation accelerators**



Source: IDC, BofA Merrill Lynch Global Research

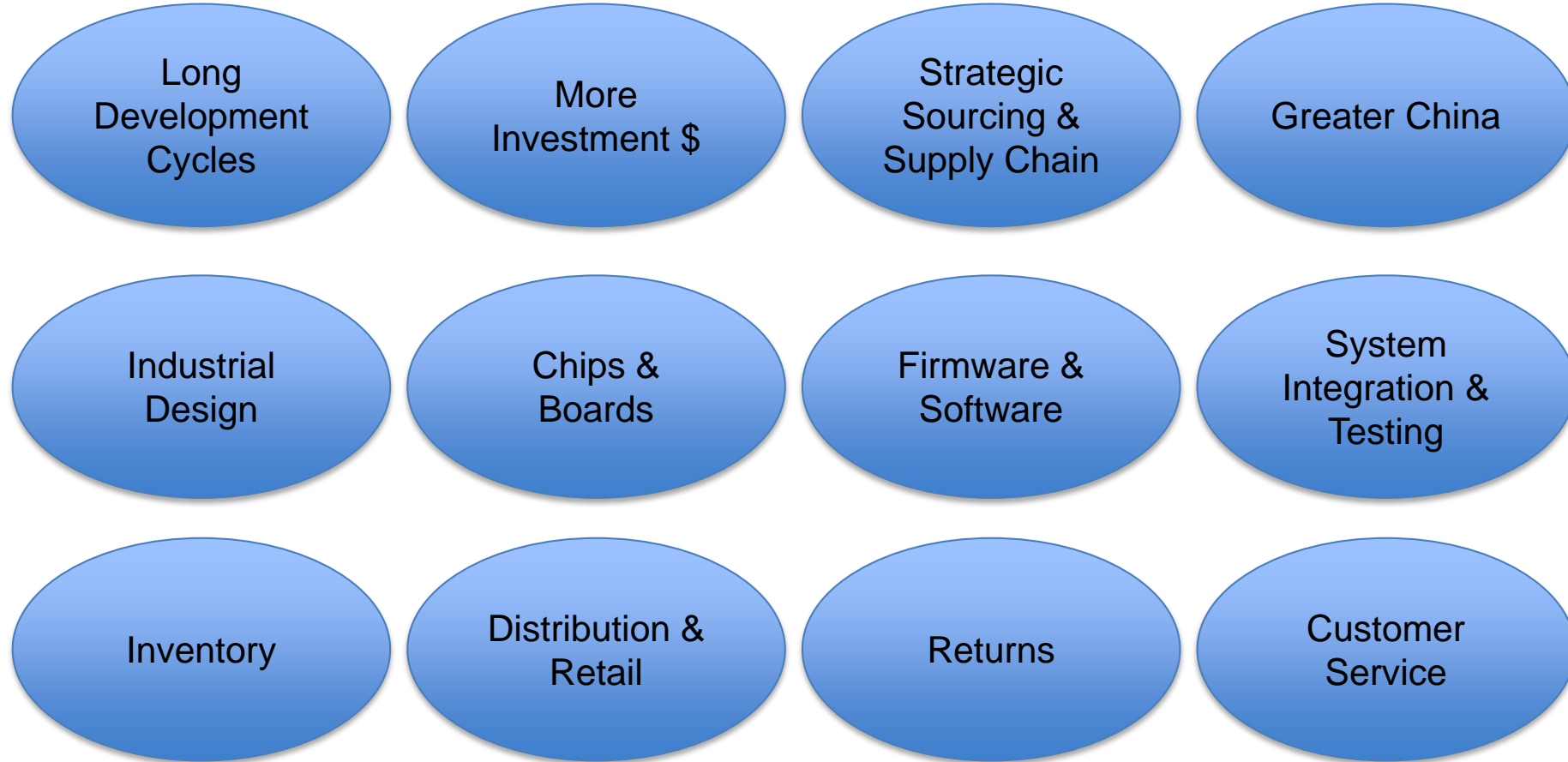
source idc via @mikequindazzi

# Opportunity Materializes Outside-In



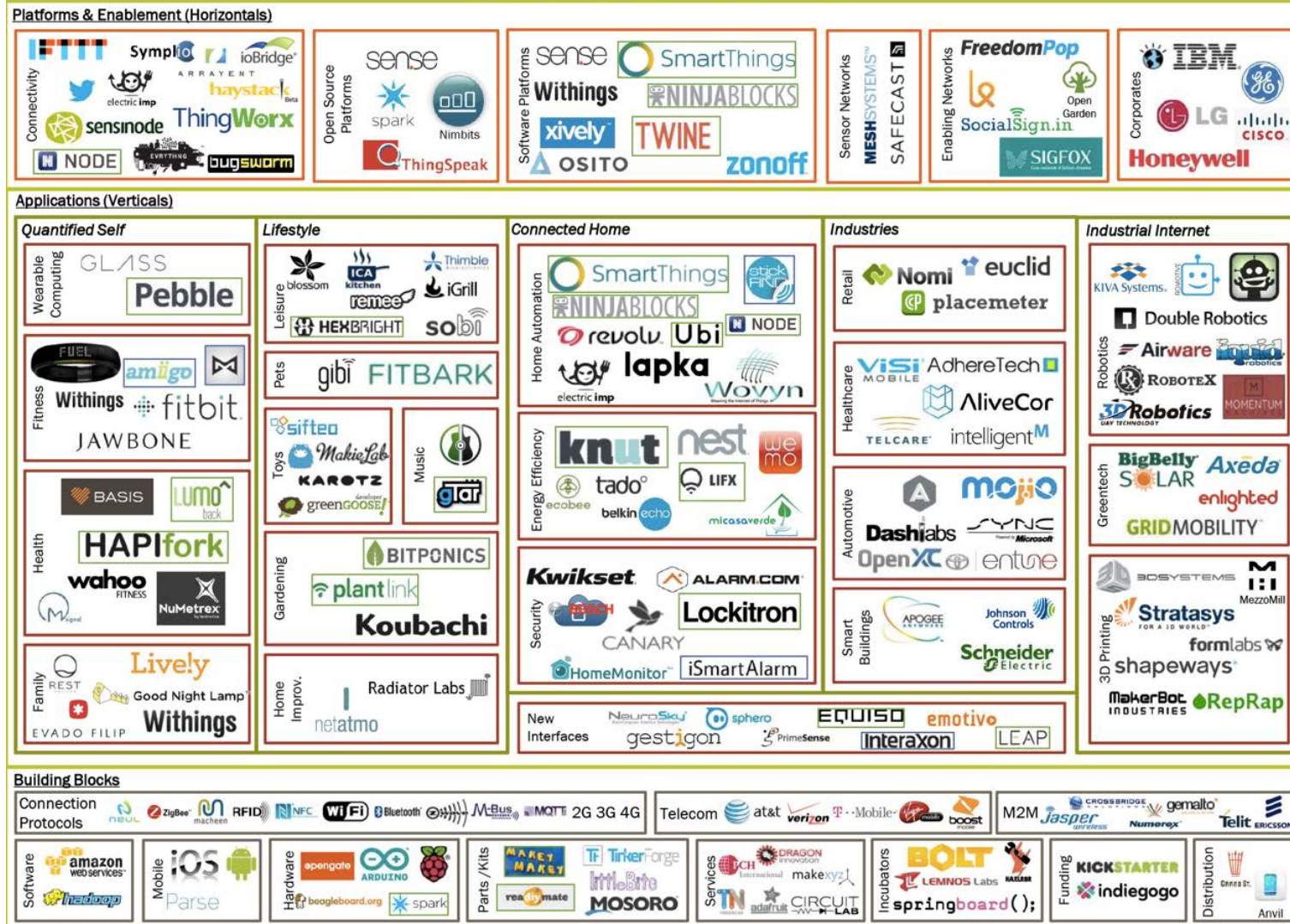


# “Hard”Tech is Sexy Again – But Venture Investing is Not For the Weak, Mal-Resourced or Impatient



# (199 companies as of 6/13)

## INTERNET OF THINGS LANDSCAPE



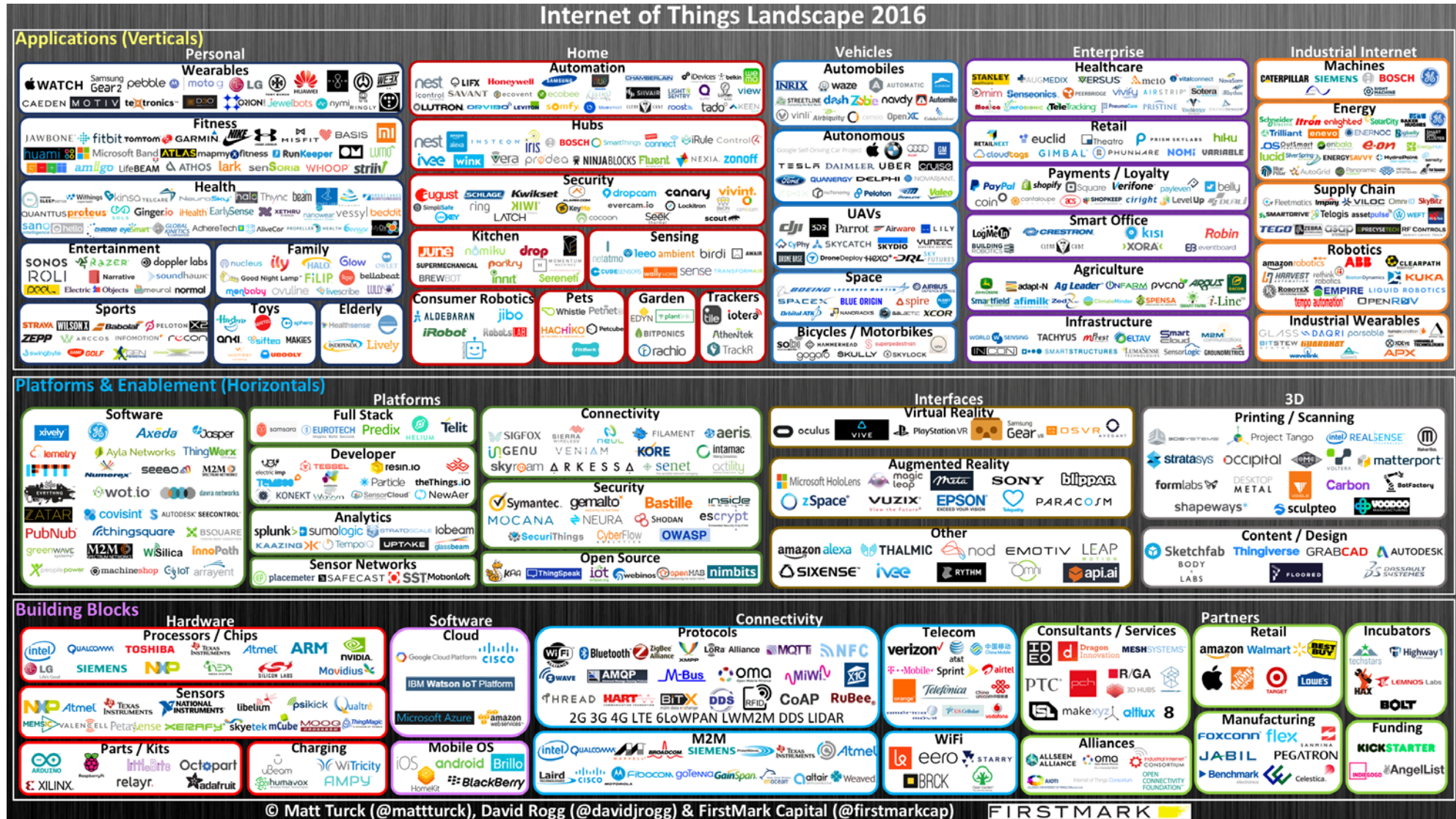
# (612 companies as of 12/14)

**Applications (Verticals)**

<p><b>Personal Devices</b></p> <p>Wearable Computing: pebble, cookoo, recon, im, GLASS, RINGLY, striii, APX, MOTA, Opencore, M, VUEER</p> <p>Fitness: GARMIN, amigo, iFIT, JAWBONE, BASIS, fitbit, tomTom, LifeBEAM, Wahoo</p> <p>Health: LUMO, HAPIfork, SPIRE, Withings, QUANTUS, Lively, iHealth, remoo, alicia, conventis, TESCAR</p> <p>Family: FILIP, greatcall, menbaby, OWLET, Secur, BELLABEA, mimo, pocketfinder</p>	<p><b>Lifestyle</b></p> <p>Sports: Brain Sentry, BIKE SPIKE, so, biometrics, ZEPP, InfoMotion, swingbyte, HAMMERHEAD</p> <p>Cooking: Smart Diet Scale, ANOVA, drop, blossom, iDevices, THE ORANGE CHEF CO., pantry, nimbly</p> <p>Pets: Whistle, PetPace, petiofeed, PetHub, BISTRO, haytag, PetChat</p> <p>Toys: KAROTZ, MAKIES, atoms, UBODLY, seebo</p> <p>Music/Art/Video: ROLI, CACH, GoPro</p> <p>Garden: plantlink, BITPONICS, radiao, EDYN, Greenbox, Koubachi</p>	<p><b>Connected Home</b></p> <p>Automation: Quirky, Radiator Labs, netatmo, LEVITON, SmartThings, Ubi, nest, LIFX, gecko, WeMo, CRESTROM, smarhome, OLUTRON, ecobee, Advanced, vivint, SAVANT, vera</p> <p>Monitoring: lapka, sense, birdi, BlueMaestro, SUPERMECHANICAL, leeo, knet, CUBESENSORS, tado°, ambient</p> <p>Security: HomeMonitor, canary, ring, August, SCHLAGE, Locktron, globesense, genie, Kwikset, Goji, scout, SmartAlarm, Keyfob</p> <p>Tracker: Chipolo, Linquet, Locca!, TrackR</p> <p>Hub: Romey, Control, Lowe's, zonoft, STAPLES, NEXIA, muzzley, wink, revolv, NINJABLOCKS</p>	<p><b>Industries</b></p> <p>Retail: bylight, euclid, PROXIMITY, SIVILL, maAnd, GIMBAL, boni, Royal, PasaKI, PERCH, P, book III, m</p> <p>Payment/Loyalty: Square, shopify, PayPal, VerFone, LevelUp, bailey, payleven, coin</p> <p>Healthcare: VIST, Senseonics, STANLEY, Vitality, MedMinder, CileTracking, AchereTech, VERSUS, CENTRAK, intelgen, Sotera</p> <p>Automotive: Zbie, nifty, INRIX, navidyDELPHI, dash, waze, OpenXC</p> <p>Infrastructure: wavelink, kismet, Trimble, Robin, Schneider</p> <p>Agri-culture: adapt-N, Zed</p>	<p><b>Industrial Internet</b></p> <p>Robotics: Double Robotics, ALBERARAN, ROBOTEX, EMPIRE, KUKA, ABB, LIQUID ROBOTICS, jibo</p> <p>Drones/Aerospace: 3DR, KM, cyphix, Parrot Skybotix, SKYCATCH, spire, DJI</p> <p>Green-tech: BigBelly, enlightened, Smart, Genevo, compology, AMPY</p> <p>3D Scan/Print: MakerBot, Formlabs, FUEL3D, AIO, NEXTENGINE, RepRap, occipital, DAVID, PS3D, Solidoodle</p> <p>Smart Grid: GRIDNET, e-on, Silver Spring, SMART CLUSTER, Itron, Trilliant</p> <p>Asset Tracking: Otago, VILCO, HAN, KALOR, Impiny, CBIC</p>
<p><b>Platforms &amp; Enablement (Horizontals)</b></p> <p>Connectivity/Dev Platforms: spark, kynetx, pinoccio, ioBridge, Ayla Networks, EUROTECH, resin.io, Symply, TESSEL, bluecity</p> <p>Software/Data Platforms: EROBITE, icontrol, thingsquare, carrots, Keen IO, Yaler.net, RaccoWireless, ConnectIO, NewAer, BERO, Axeda, wot.io, IOTG, CANIO, bugswarm, TempoID, evercam.io, covisint, Jasper, Etheric, PubNub, SensorCloud, xively</p> <p>Open Source Platforms: webinos, AllJoyn, openHAB, nimbly.com, OPEN INTERCONNECT, ThingSpeak, GRID2HOME</p> <p>Sensor Networks: SAFECAST, placemeter, Motionloft</p> <p>Personal Interfaces: NeuroSky, wit.ai, LEAP, gestigon, speech, EMOTIV, MakeLight, Reemo, Oculus</p> <p>Security: inside, SafeNet, utimaco, escrypt, gemalto, BASTILLE NETWORKS, MOCANA</p> <p>Corporates: amazon, hp, LG, intel, htc, PHILIPS, IBM, SAMSUNG, Google, WIND RIVER, MOTOROLA, belkin, DELL, BOSCH, ARM, LogMeIn, Microsoft, Honeywell, SONY, Atmel, SIEMENS, QUALCOMM, CISCO, TOSHIBA, SHARP</p>				
<p><b>Building Blocks</b></p> <p>Protocols: Bluetooth, Weaved, MQTT, NFC, RuBee, WiFi, ZigBee, omo, WAVE, emModus, HART, MIWIFI, M-BUS, 2G, 3G, 4G, LTE, CoAP, 6LoWPAN, LWM2M, BITXmI</p> <p>M2M Networks: Helium, SIGFOX, KORE, Stream, aeris, HICHERN, M2M</p> <p>Portable WiFi: Open Garden, GOODSPEED, BACK, hama</p> <p>Telecom: at&amp;t, boostmobile, Verizon, Mobile, Telefonica, VimpelCom, Sprint, US Cellular, Vodafone, airtel</p> <p>M2M: arkesse, Qubarc, Laird, WICED, eonocentur, ecnais, Wavon, Telit</p> <p>Cloud: Google Cloud Platform, amazon, redhat, ORACLE, Microsoft Azure</p> <p>Mobile: iOS, Android, Windows Phone, BlackBerry</p> <p>Processors/Sensors: Raspberry Pi, BeagleBoard, mCube</p> <p>Parts/Kits: re:make, littleBits, WUNDER, TrakerForge</p> <p>Services: dragon, makey, sculpteo, CIRCUIT</p> <p>Incubators: Highway 1, WEARABLE WORLD, RGA Accelerator, Techstars</p> <p>Funding: KICKSTARTER, indiegogo, MedStartr</p> <p>Distribution: angelcam</p>				



# (3,000+ companies as of 6/16)

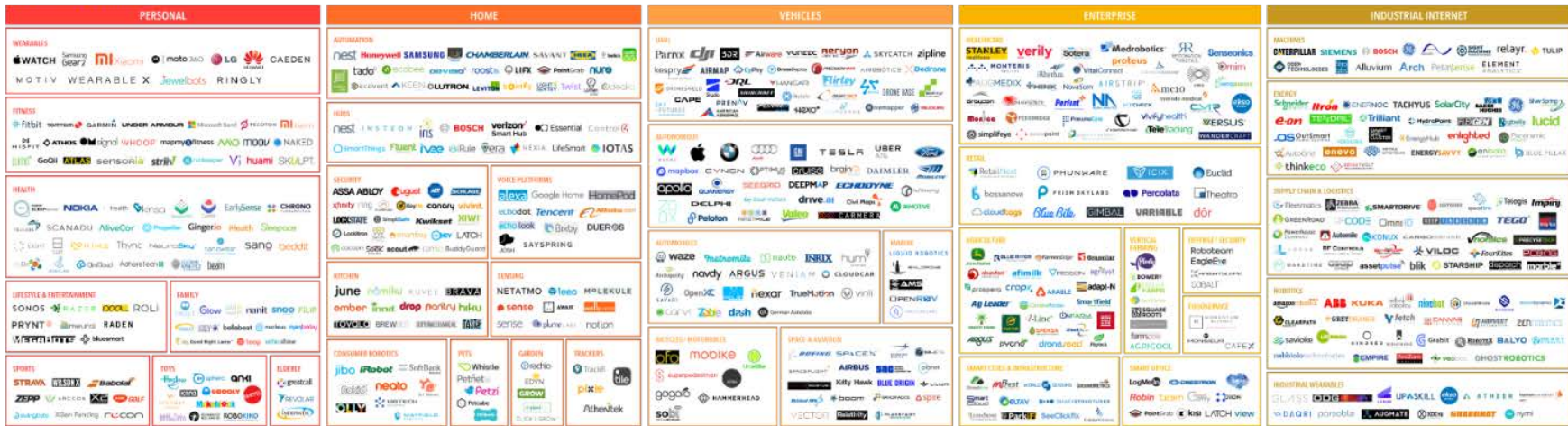


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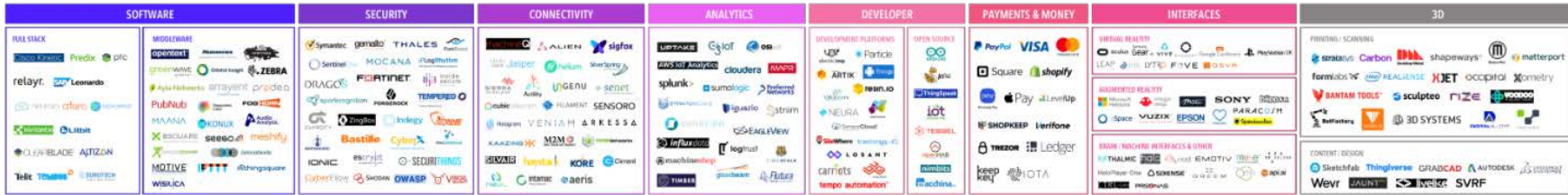


# Where are We Now? (5,000+ companies as of 1/18)

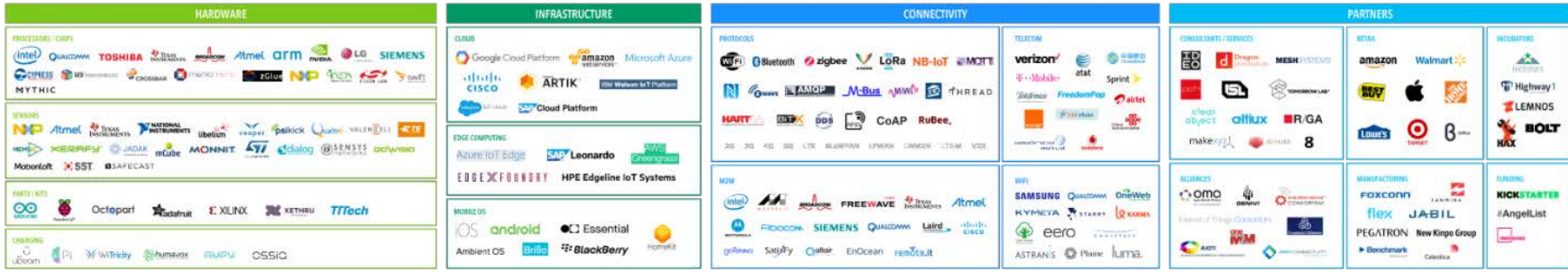
## APPLICATIONS (VERTICALS)



## PLATFORMS (HORIZONTALS)

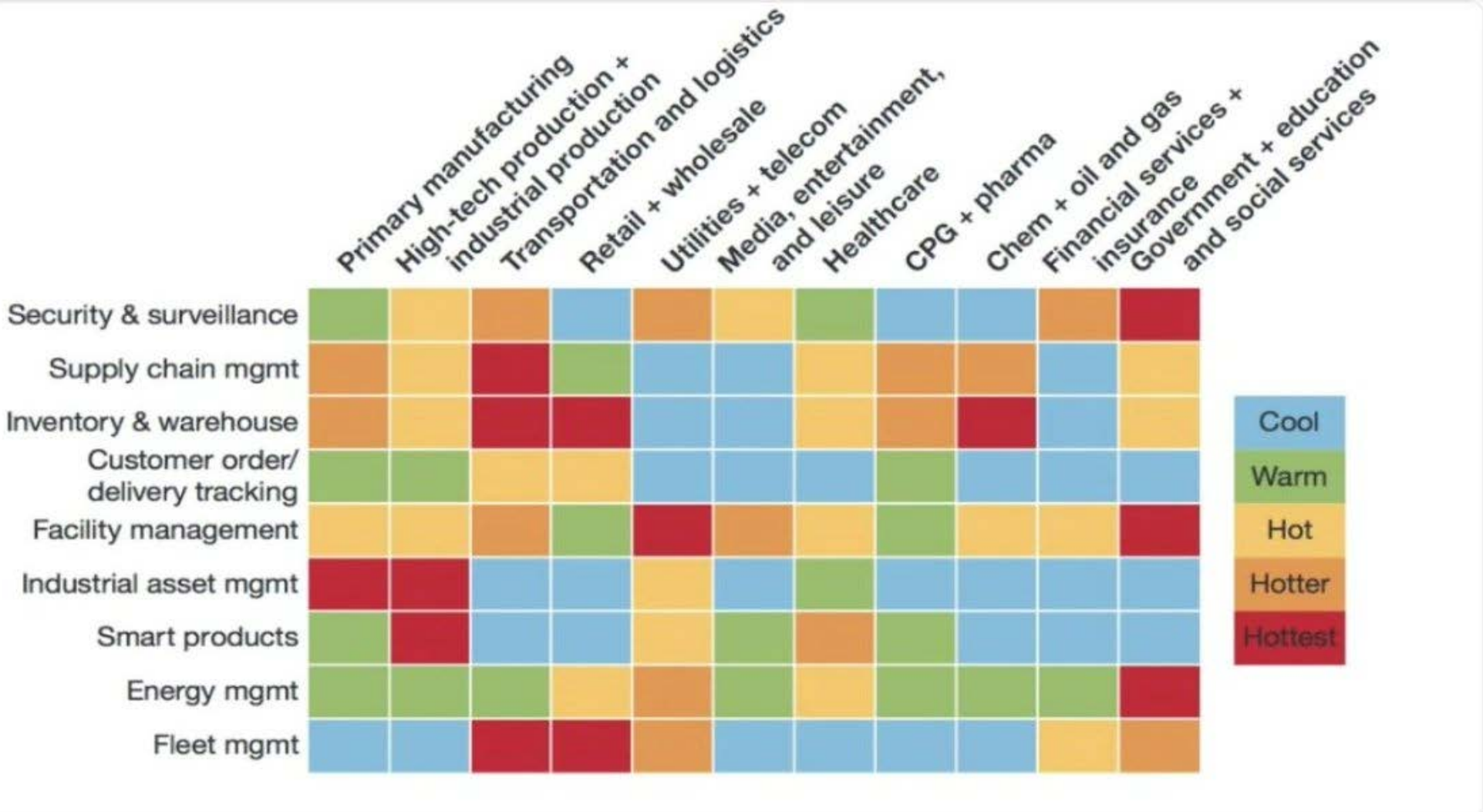


## BUILDING BLOCKS





# KP EIR: Researched IoT by Segment/Vertical



# KP EIR: Researched IoT by Segment/Vertical



## Kleiner EIR Takeaways (and production!)

From Start 9/2017

(WIP, updates as of 9/21/17)

	Utilities and Energy	Manufacturing	Public Infrastructure/ Government	Retail*	Transportation and Logistics*	Agriculture	Healthcare & Life Sciences	Construction	Building Automation/ Workplace IoT*	Multiple Industries/ Industries Not Yet Defined	Consumer
<b>Application/ Action</b>	Tachyus; Wearable Intelligence; C3, Autogrid; Kelvin; Senet	Predikto; LightApp; Melli; Element Analytics	Streetline; OptRTC; Shotspotter; CityScan; Compology; Venios	Retail Next; Prism Skylabs; Euclid; Scanalytics; Placemeter	Drivewayze; Predikto; Telogis; Weft	DroneDeploy; Farmer's Business Network; FarmLogs; PickTrace; Bitponics	Augmedix; Core Informatics; Kit Check	Rhumbix; Viloc	PlotWatt; Envoy; UniKey; Altitude.co; Building Robotics; Humanize; Yanzi; Lucid; chess wise; connexion; MAPIO.		Strava, Nest, Fitbit, Jawbone, Apple, Waze; August
<b>Processing/ Analysis</b>	Tachyus; OSISOft; C3; Autogrid; Kelvin	Sight Machine; Predikto; LightApp; Seeq; Melli; Bit Stew	OptRTC; Shotspotter; Cyberlighting; CityScan; Compology; Venios	Retail Next; Bay Sensors; Prism Skylabs; Euclid; Scanalytics; Placemeter	Predikto; Telogis; Weft	DroneDeploy; Farmer's Business Network; FarmLogs; OnFarm; PickTrace; Bitponics	Tetra Science; Core Informatics; Kit Check	Rhumbix; Viloc	Enlighted; PlotWatt; Robin; UniKey; Lucid; Altitude.co; Building Robotics; Verdigris; Humanize		
<b>Collection/ Connectivity</b>		Ayla Networks; APX Labs; Sight Machine; LightApp; OSISOft; Seeq; Melli; Bit Stew; Arrayent; realyr; Exosite	OptRTC; Shotspotter; Cyberlighting; CityScan; Compology	Retail Next; Bay Sensors; Prism Skylabs; Euclid; Scanalytics; Placemeter	Telogis; Weft; Veniam; Greenroad; vnomics;	OnFarm; PickTrace; Bitponics; blue River; Arable; Farmbot;	Augmedix; Tetra Science; Core Informatics; Kit Check	Viloc	Enlighted; PlotWatt; Lucid; Altitude.co; Building Robotics; Verdigris; Humanize		Waze
<b>Sensors Companies</b>	Kelvin		Streetline	Euclid; Scanalytics; Placemeter	Telogis; Weft	DJI; Precision Hawk; AgEagle; Deere	Kit Check	Viloc; PillarTech	Enlighted; SilverSpring Network; Altitude.co; Verdigris; Humanize;	Samsara; Uptake	Nest, Fitbit, Jawbone, Apple, Google Cars; August
<b>Sensor Types</b>	Well inserts; Google Glass; Equipment embeds	Equipment embeds; Google Glass	Road sensors; Water sensors; Equipment embeds; Microphones	Beacons; cameras; RFID	Equipment embeds	Drones; soil sensors; combines; satellites; planes; barcodes/scanners	Google Glass; Wearables	Wearables; Equipment embeds; Drones	Smart meters; Beacons; Cameras; Wearables; Locks; Videocof, etc.		Smart meters; Beacons; Cameras; Wearables
<b>Things</b>	Petroleum; Rigs; Inspection Drones	Machines; Products	Street lamps; Highways; Parking	People; Inventory; Wearables; Robotics; 3D printing	Vehicles; Products	Soil; Vegetation;	People; Equipment; Drugs	People; Equipment	Lights; HVAC; Building equipment		People; Lights; HVAC
<b>PaaS</b>	Ayla Networks; APX Labs; Jasper Networks; IFTT; Zapier; Arrayent; PubNub; EVRYTHNG; ThingWorx; Relayr; DN2K; Plat.ONE; Waygum; Seebo; Senet; Greenwave; Cirro; Mrumbo; Azeti; Futura										
<b>Fog &amp; Edge Compute</b>	OSISOft; Foghorn; Vimoc; Nebbiolo; Xaptum; Clearblade; machinestop										
<b>Identity and Security</b>	Bastille.io; Cyberflow Analytics; NexDefense; Waygum; Mocana; Argus; Clarity; Bayshore; NexDefense; Forescout; Sentryo; Indegy; patternex;										
<b>AI, ML, Analytics</b>	Maana; Uptake; falkony; Alluvium; Presenso; Sight Machine; Augury										

To End 9/2018



MOTIV



Pattern Brands



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# KP EIR: Researched IoT by Segment/Vertical

TE

Startups  
Apps  
Gadgets  
Events  
Videos  
Podcasts  
—  
Crunchbase  
Advertise  
More

Search 🔍

**CES 2019**  
2018 Year in

**Review**

**Apple**

**China**

## Keep calm and automate to unlock the opportunity in the vertical Internet of Things

Nate Williams @naywilliams / 1 year ago

Comment



Since the term Internet of Things, or IoT, was coined in 1999, the industry has had its share of hype, consternation, successes, and now even twitter parody accounts (@InternetOfShit).

Although large-scale advertising campaigns for the IoT have become mainstream (seen any IBM Watson, Ring, or GE Digital ads lately?), recent [news](#) that GE had throttled growth expectations for its Predix IoT platform begs the following questions.

**Nate Williams**  
Contributor

More posts by this contributor

• [If We Build IoT, They Will Come. Right?](#)

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# Industrial IOT Thesis @ 10,000ft.

Use technology in traditional industrial environments (plants, warehouses, cities) to:

1. Connect physical assets, & make them “smart”
2. Create interesting cognitive models to process data
3. Derive data insights – better efficiency, less downtime, higher output, enhanced profitability

If we can accomplish, then this market will be 100X larger than connected home!

# Industrial IOT: End-End Logistics Visibility

## Shoof Revolutionizes Asset Monitoring and Tracking

ADVANCED WIRELESS  
(WW STD IEEE 802.15.4G)

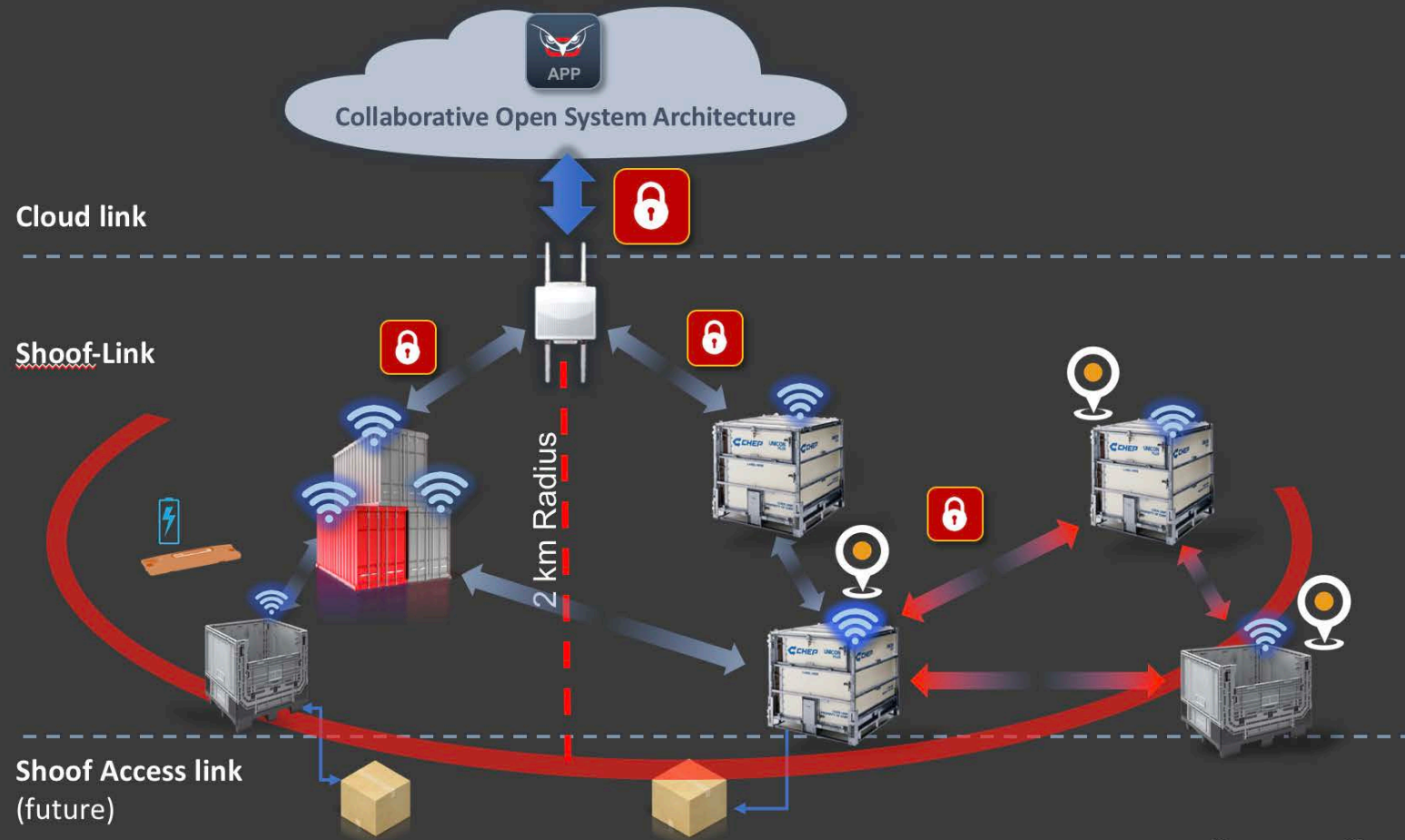
100X range advantage  
(2 kilometers)  
100,000 Tag per B.S.

>10-YEAR BATTERY LIFE  
10x Longer operating life

COLLABORATIVE TAGS  
Contextual and grouped  
data (proprietary)

GPS-Free LOCATION  
1m accuracy  
(indoor/outdoor)

MILITARY-GRADE SECURITY  
End-to-end Tag to cloud  
security  
Blockchain ready

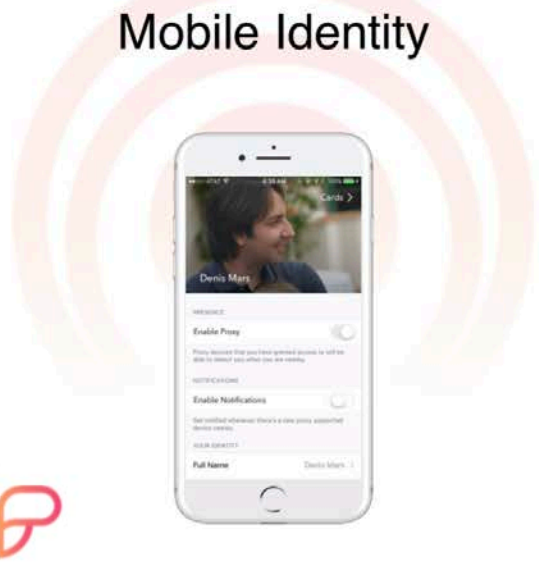




# Proxy: Digital Identity for the Physical World



Mobile Identity



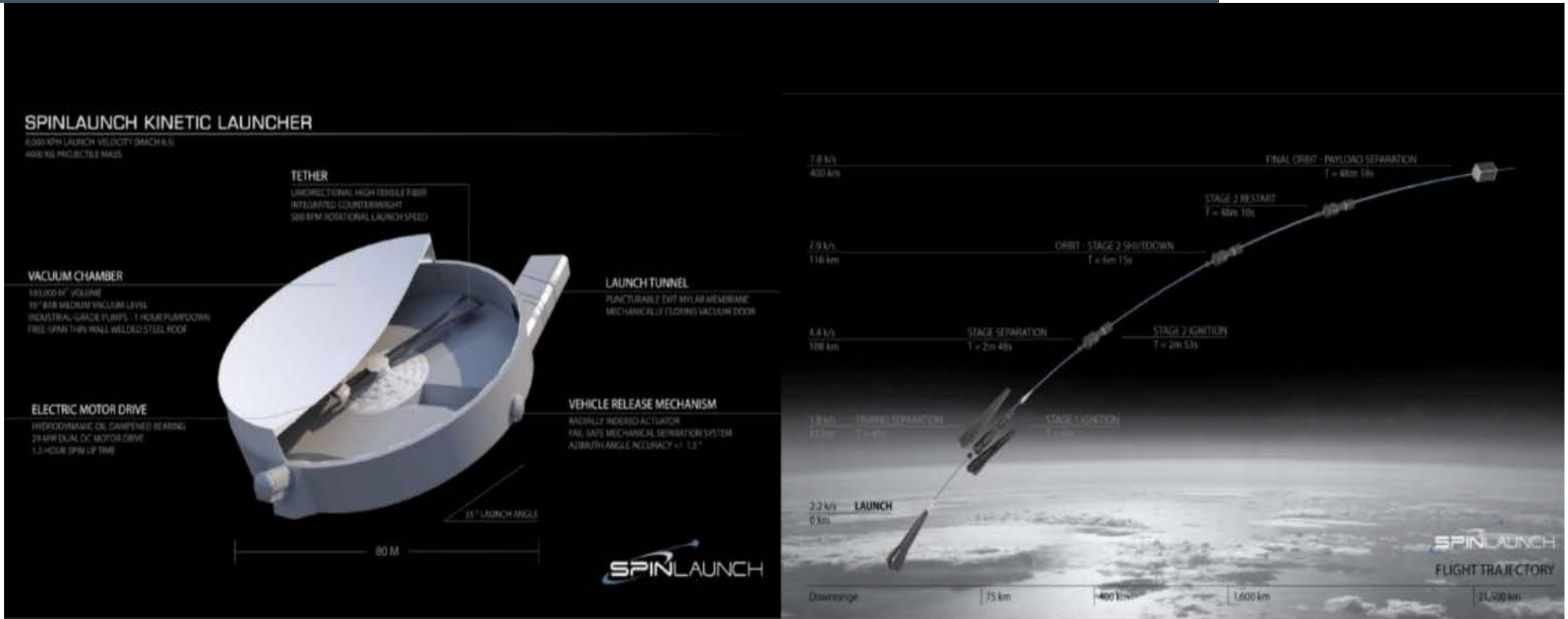
Mobile Access



Presence Aware



# SpinLaunch: Revolutionizing Access to Space



## SpinLaunch - 2020

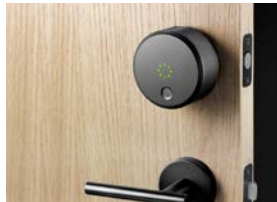
Kinetic launch vehicles require one third less velocity to reach orbit at 10X less mass.

# Connected Home Thesis 1.0, 2.0, 3.0...

**Original 1.0 Thesis:** Reinvent “unloved” products **INSIDE** the home



**But...** Inside the home is very crowded, and complicated



**Revised 2.0 Thesis:** Monitor and Protect **OUTSIDE** of the home

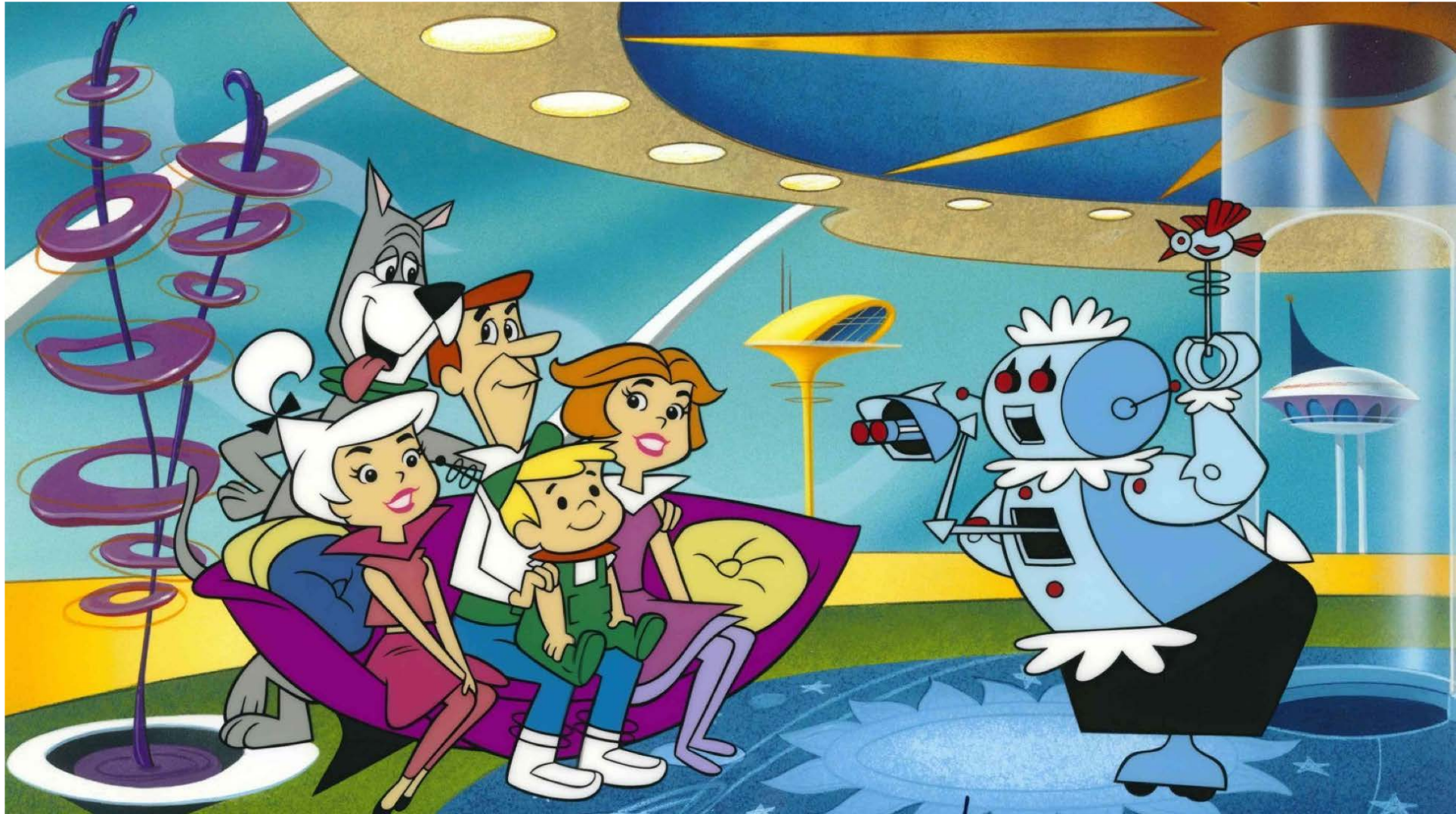


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# The Promise of a Connected Home...





# Vs. Today's Reality !





# Inside Eero's \$97 million fire sale to Amazon

Share on Facebook Share on Twitter +



IMAGE: BOB AL-GREENE / MASHABLE

BY RACHEL  
KRAUS

5 DAYS AGO

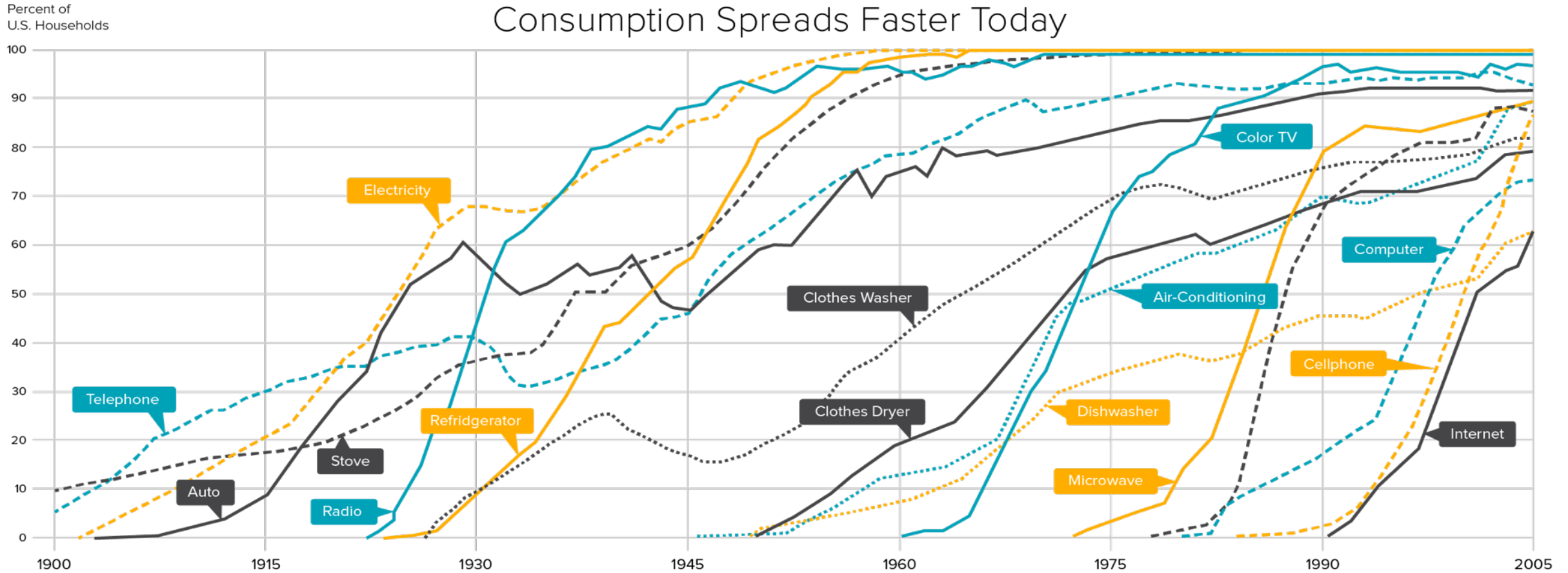
When Amazon announced [a deal to acquire Eero](#), the maker of a [groundbreaking](#) WiFi system, it sounded like a classic Silicon Valley success story: a promising startup is acquired by the biggest bidder in the land, and everyone rolls around in cash. But that is not this story. This story is about investors losing tens of millions of dollars and dozens of employees left with meaningless stock.

According to confidential documents viewed by Mashable, [Amazon](#) acquired Eero for \$97 million. [Eero](#) executives brought home multi-million dollar

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# 3.0 = Hero Products Breaking Faster than Ever



- Time to 50% adoption - phone (50 yrs), dishwasher (45 yrs), car (25 yrs), TV (20 yrs)
- Less than 10 yrs – Mobile phones, Color TVs, VCRs, Broadband
- 100M+ Alexa Devices, 1B compatible Google Assistant products!!!!

# Personal - Reinvent the Wearable

## Ring Technology



# Pattern

Enjoy daily life.

Coming Summer 2019

[hello@patternbrands.com](mailto:hello@patternbrands.com)



**J.D. POWER**

# What's Happening with VC and funding of HardTech / IoT innovation

## Overall

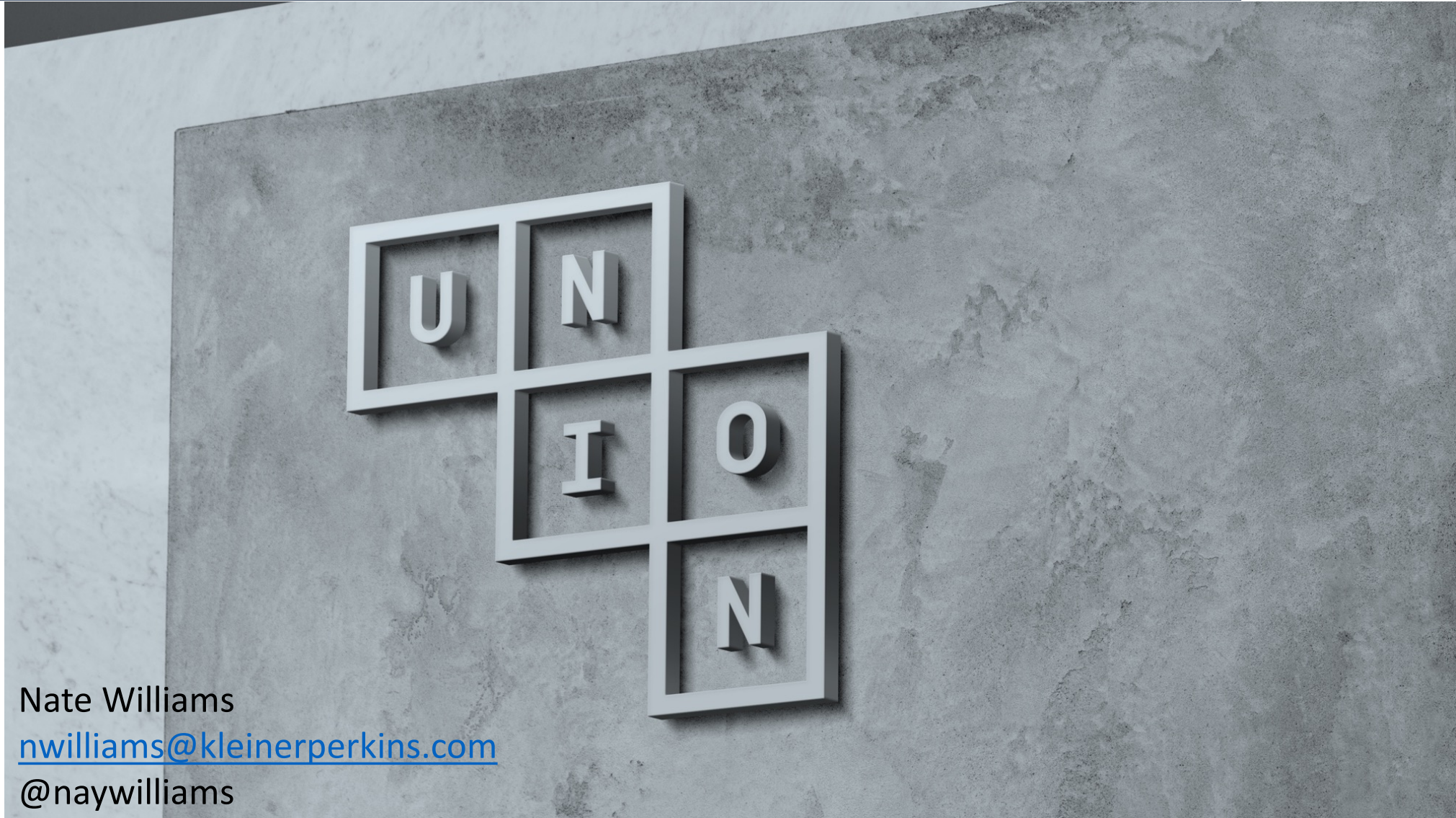
- Dislocation of GP profile (from 2000's to present)
  - Dislocation of Corporates (rise of CVCs)
  - More capital = VPs/Directors now CEOs
- = takes longer and more capital to find product/market fit in IoT

## IoT Specifics

- Industries: Construction, Healthcare, Transportation
- Industrial IoT and edge analytics high interest (revenue)
- IoT Security is always hot, but even hotter now
- Smart Home, digital therapeutics but some concern over high consumer beta; Home Services
- Beware of pilot purgatory – on both sides!



# Thanks! What comes next????



Nate Williams  
[nwilliams@kleinerperkins.com](mailto:nwilliams@kleinerperkins.com)  
[@naywilliams](https://twitter.com/naywilliams)





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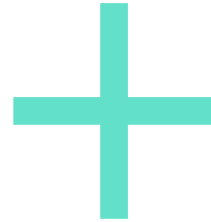
# PROTECTING THE CONNECTED HOME

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**JEFF GARDNER**

PRESIDENT AND CHIEF EXECUTIVE OFFICER

BRINKS HOME SECURITY™



**BRINKS**  
HOME SECURITY™

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# #1 IN CUSTOMER SATISFACTION

WITH HOME SECURITY SYSTEMS, 2018



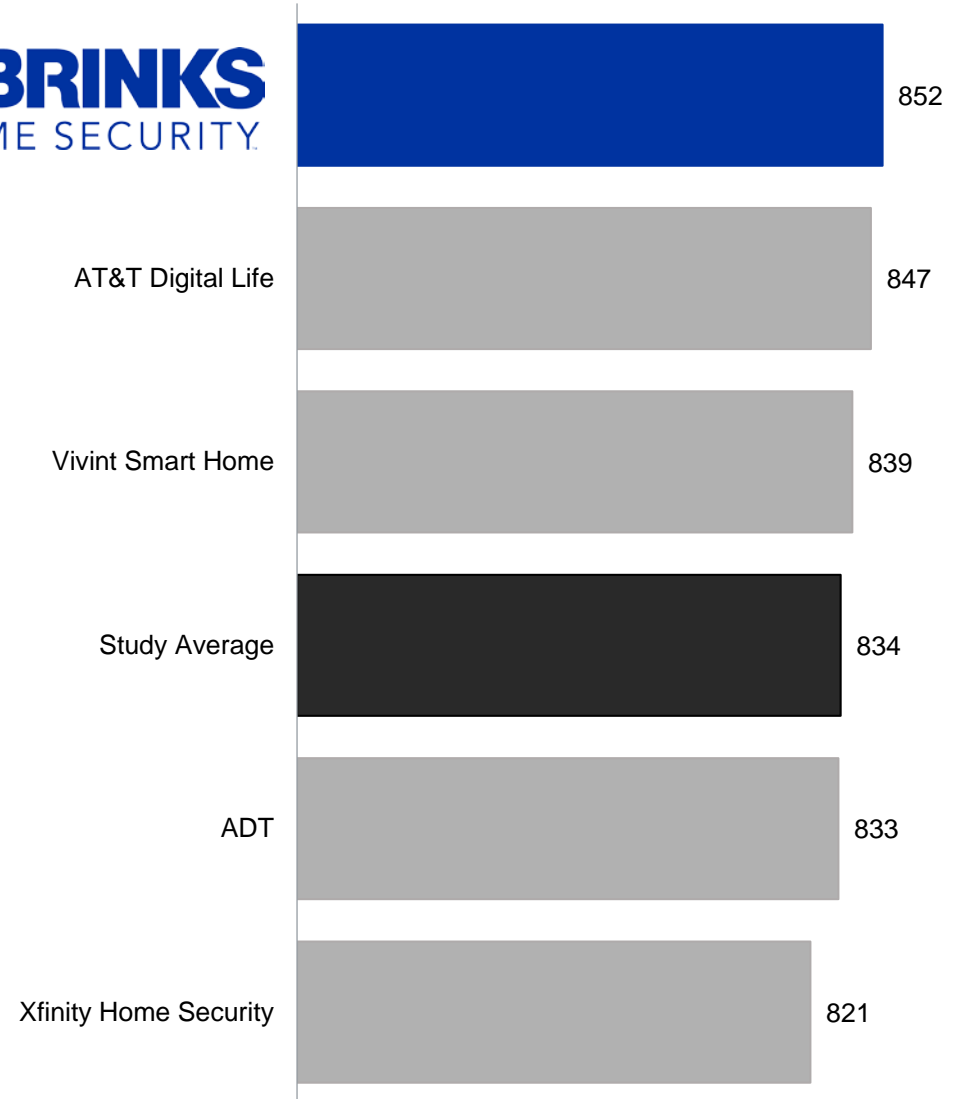
# 2018 Home Security Satisfaction Study

Based on 1,983 users of home security systems between Aug - Sept 2018.

- ✓ Customer Service
- ✓ Usage
- ✓ Enrollment
- ✓ Billing & Payment



## 2018 Overall Satisfaction Ranking



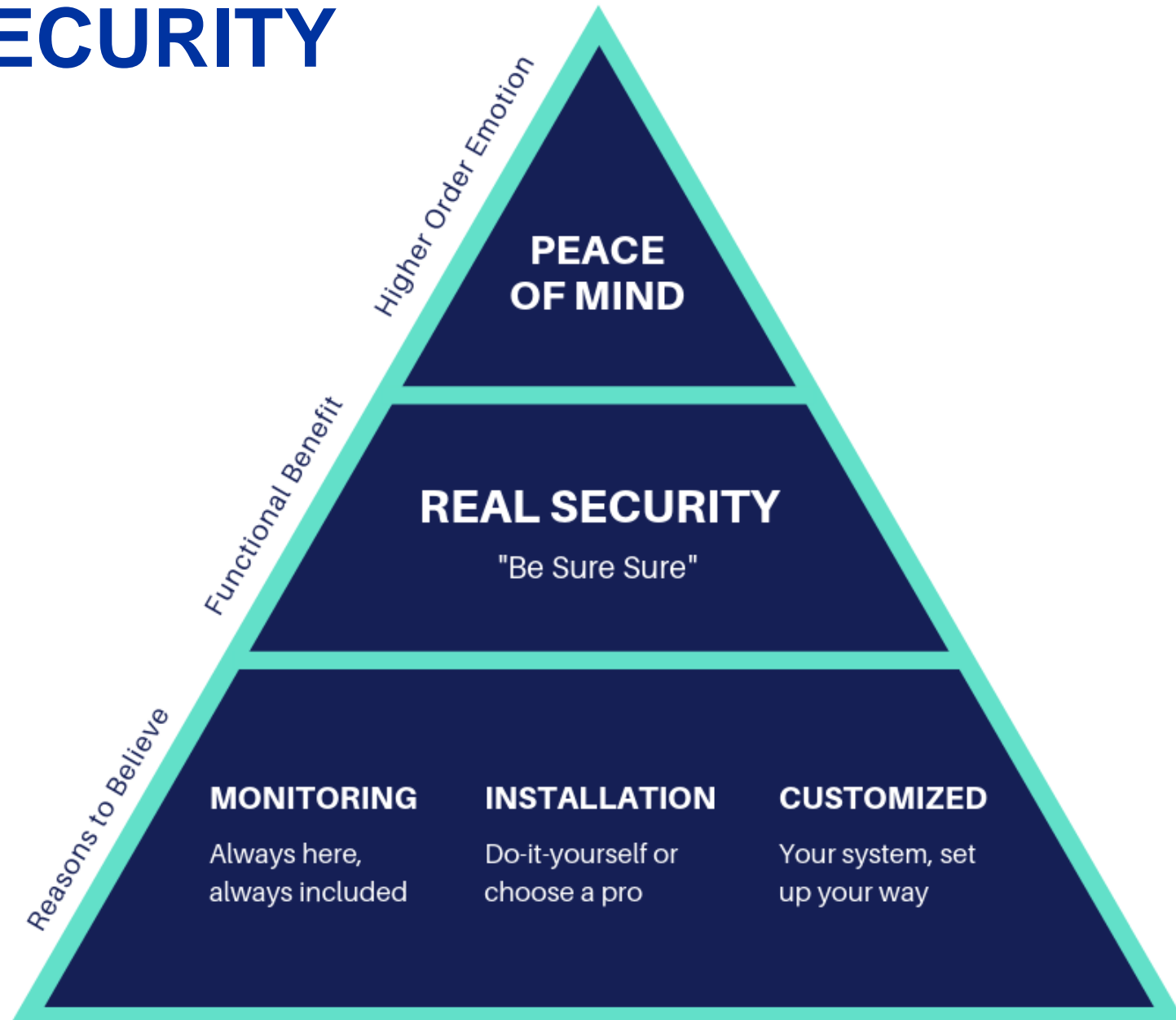


**BE  
SURE  
SURE™**

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# THE REAL SECURITY STRATEGY

- ✓ Always Monitored
- ✓ Installed Your Way
- ✓ Tailored Protection



DO IT YOURSELF OR CHOOSE A PRO.

---

IN A FEW EASY STEPS  
**YOU CAN SET IT UP**



Your equipment will arrive, ready for installation and activation.



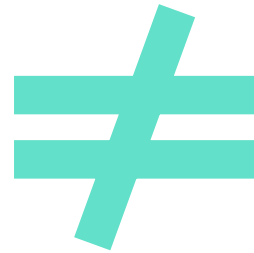
Unbox your system, then place the devices. Just peel and stick.



Once the system is installed, activate your professional monitoring.



CONNECTED HOME



PROTECTED HOME



# A SMART HOME DOESN'T MEAN A **SECURE HOME**

Security alarm triggered.

Today 11:34 AM

Did you land yet?!

Today 2:46PM

There was a break in at your house! Call me!!

Today 2:48PM

# ENHANCING SECURITY WITH THE CONNECTED HOME

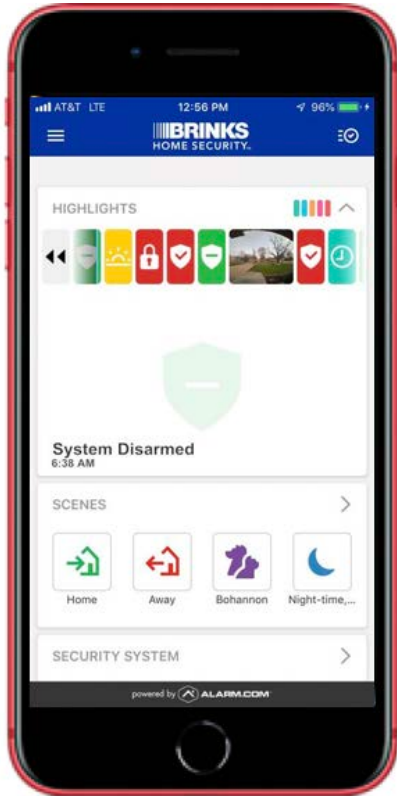
## Video Analytics

- Video alerts of things that matter.
- Differentiate people from animals, cars, and objects.
- Easily establish virtual trip wires to monitor specific areas.
- No more overwhelming notifications.



# ENHANCING SECURITY WITH THE CONNECTED HOME

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## Highlights

- Get a daily snapshot of what happened at your home.
- Easily identify unexpected activities throughout the day.
- Quick recap for daily peace of mind.

# ENHANCING SECURITY WITH THE CONNECTED HOME

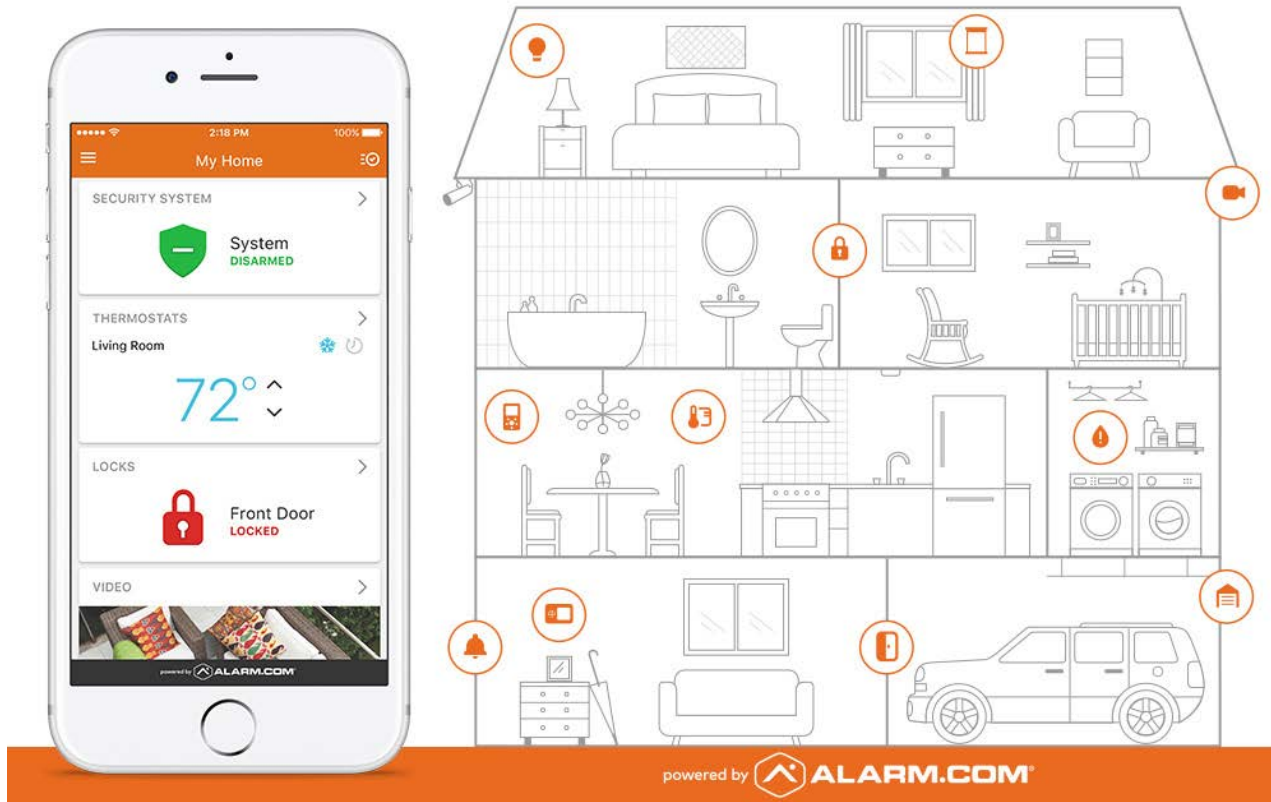
## Facial Recognition

- Ensure that whoever disarmed your system is authorized to do so.
- Notifies you if someone uses a code without a matching face.
- Great for use with non-family members: dog walkers, cleaners, etc.





# ENHANCING SECURITY WITH THE CONNECTED HOME



## Automation

- Take more control of your system
- Example: If outside motion is detected, turn on your porch light and record video.

# ENHANCING SECURITY WITH THE CONNECTED HOME

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## Geofencing

- Your system knows where your phone is, use it to make sure you're protected.
- Arming notifications if you leave your geofence but forget to arm your system.
- Able to let you know if the garage door is open and allow you to close it remotely.



# ENHANCING SECURITY WITH THE CONNECTED HOME

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## Bluetooth Integration

- Seamlessly disarm system with Bluetooth pairing from phone.
- Eliminates the hassle of disarming with the app or on the panel.
- A simpler system leads to a greater use of the system.



# ENHANCING SECURITY WITH THE CONNECTED HOME

## Arming Reminders

- Additional reminders to keep you safe.
- If the system is not armed by a time you choose, receive an alert.
- Can arm system right from the reminder.





## Google Home and Alexa Integration

- Works with automation systems you already use.
- Google, Alexa, or Siri for security and home automation.
- Use the voice control that's right for you to control your system.

Hey Google, what's the status of my security?



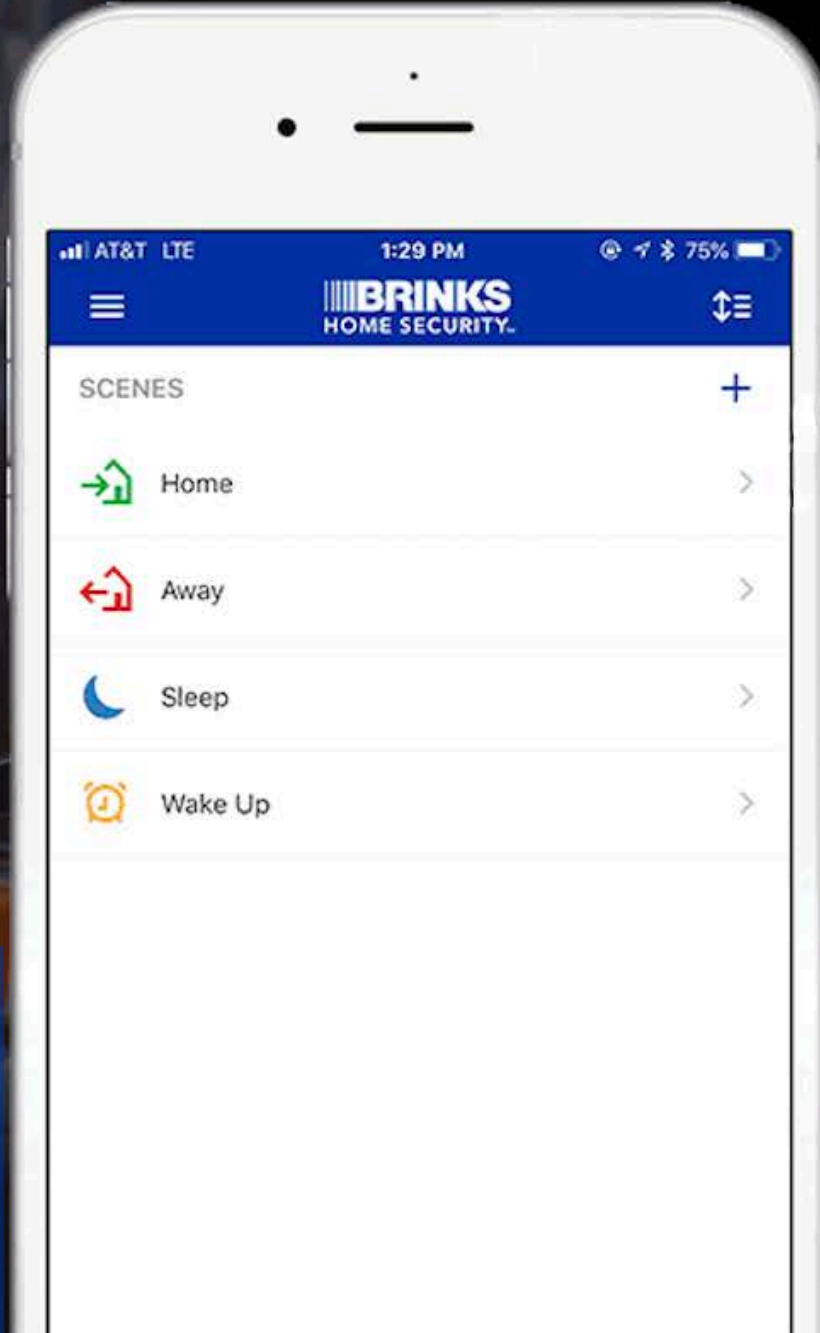
Your security is set to Home and Guarding

Make it cooler



Alright, turning the heat down





## Rules and Scenes

- Create scenes or rules with multiple automation actions.
- Tell Alexa or Google it's "night time" to turn off lights, set thermostat, and arm your system.
- Smarter rules that work for your life.













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# CONNECTING THE THINGS

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**Shelby Noakes**

Director, M2M/IoT, Solutions & Wireless Data

T-Mobile



# T-Mobile Network Overview

T-Mobile

**Shelby Noakes**

Director IOT/M2M

Solutions and Wireless Data

# UNPRECEDENTED GROWTH, STRONG NETWORK, CUSTOMER FIRST

- More than doubled the size of our consumer business since 2012, now at 79.7MM customers
- Consistently ranked #1 in network tests by Ookla and OpenSignal
- Consistently ranked #1 in overall customer satisfaction and likelihood to recommend
- FIRST Nationwide Narrowband network covering 325MM Pops in 2019
- Add in JDP awards! <https://www.t-mobile.com/news/jdp-business-satisfaction-study>





# NETWORKS TO POWER THE FUTURE OF IoT

## 5G

Lower latency

Increased throughput

More simultaneous connections

## 4G-LTE

**FASTEST LTE NETWORK**

CAT-1+

10 Mbps+

Supports VoLTE and Connected Mobility

## NB-IoT

Deliver products fast

Provide better coverage

Vastly improve battery life

Provide cost savings

## 2G

Supported until 2020

# WE KEEP GROWING OUR LTE NETWORK

2.3

M

square miles

323M

POPs covered

5G-ready

equipment deployed on  
1,000+ 600MHz LTE sites



A nighttime cityscape featuring several illuminated skyscrapers. In the foreground, a multi-lane highway is shown with long-exposure light trails from vehicles, creating a sense of motion. The overall scene is dark, with the city lights providing the primary illumination.

# ENABLING INNOVATION WITH NB-IOT

T-Mobile

# WHAT IS NB-IoT?

## STANDARD

Operates in a licensed spectrum and provides assured quality of service with minimal risk of disruption

## SCALABLE

Uses existing networks minimizing the need to deploy additional infrastructure

## SECURE

LTE grade security as standard, keeping your data and network safe

Low Power Wide Area Network (LPWAN) Technology



# NARROW-BAND IoT



## BUILDINGS

Access control, monitoring, and alarm systems



## LIGHTING

Intelligent management of street lighting



## PARKING

Navigates drivers to the next vacant parking spot



## ASSET TRACKING

No lost suitcases anymore



## METERING

Automatic remote reading of utility meters

## NB-IoT TECHNOLOGY

Deep indoor efficient coverage on entire T-Mobile Network today

## BANDS SUPPORTED

Band 2, 4, 12 at launch + Band 71 in 2019

## SIGNAL SUPPORT

IP and Non-IP

## CE MODES (0, 1, 2)

Coverage enhancement modes, repeat the transmission based on configuration

## POWER SAVE MODE

Device notifies network that it's entering a deep sleep mode (up to 14 months)

## EXTENDED DRX SUPPORT

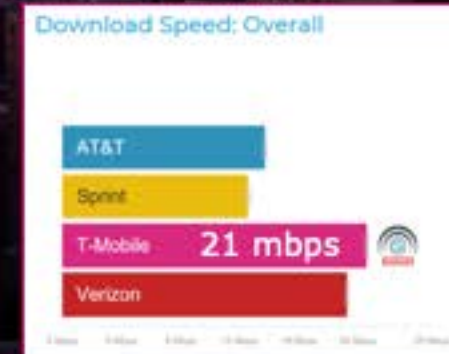
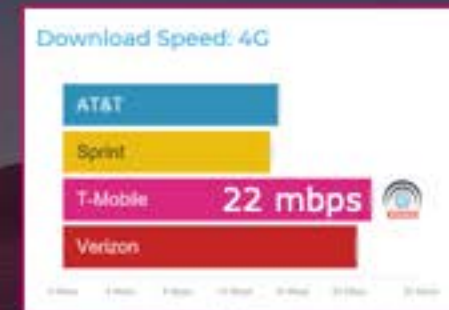
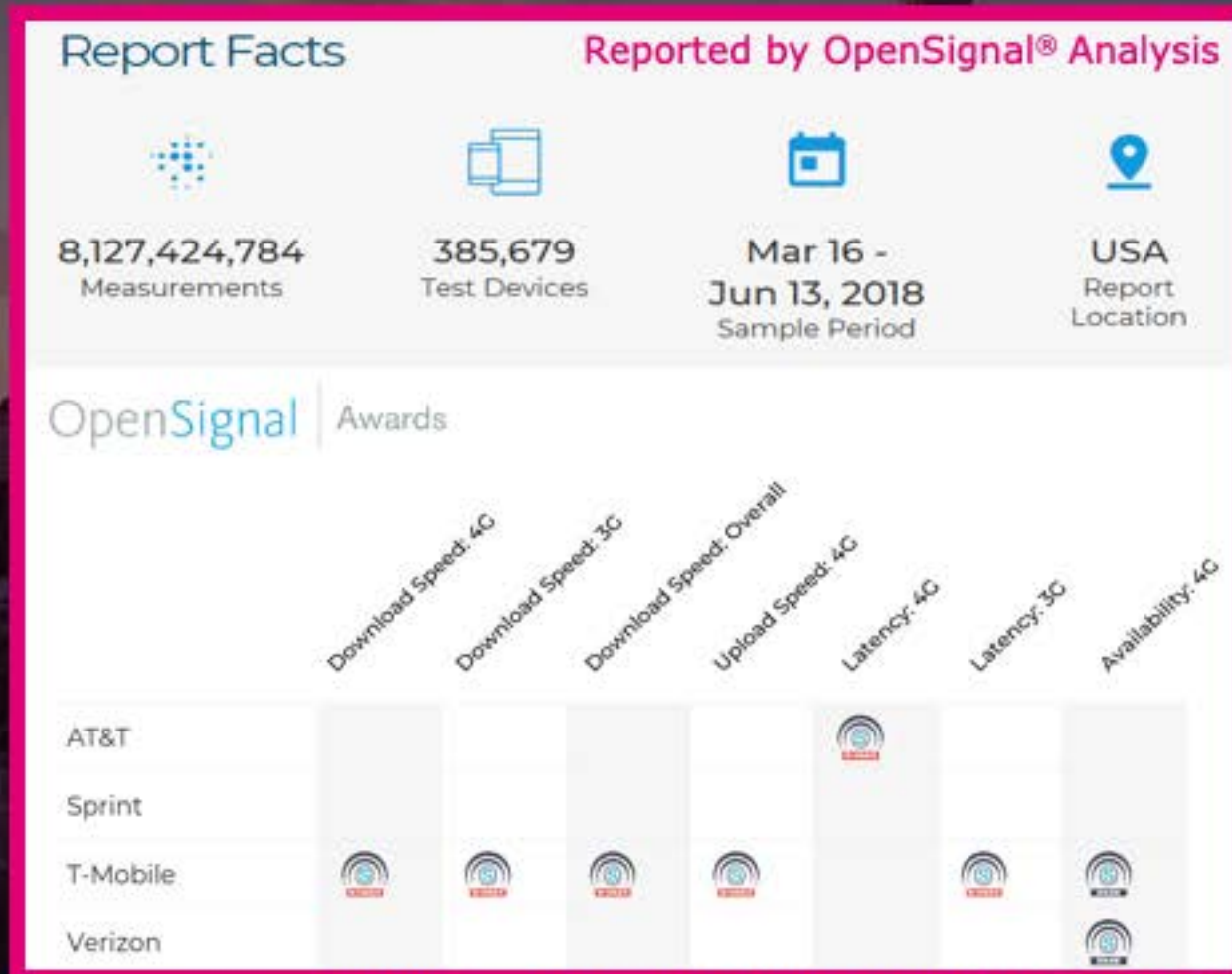
Enhances deep sleep and battery life (up to 3 hours)

## SMS CAPABILITIES

Allows strict device control and network initiation

# T-Mobile Network Indicates Best User Experience

- LTE advanced technology deployed in over 6,000 cities/towns to help improve speed
- Distributed Core architecture in over 50 MSO's nationwide enables great user experience
- Network continues to support low latency, high throughput use-cases as we move towards 5G





A photograph of a city street at dusk, featuring tall buildings and a road with light trails from traffic. A semi-transparent pink horizontal band is overlaid across the middle of the image, containing the text "5G" in white. The background shows a multi-lane road with blurred light trails from cars and buses, indicating long-exposure photography. The sky is a deep blue, and the buildings are lit up with warm lights.

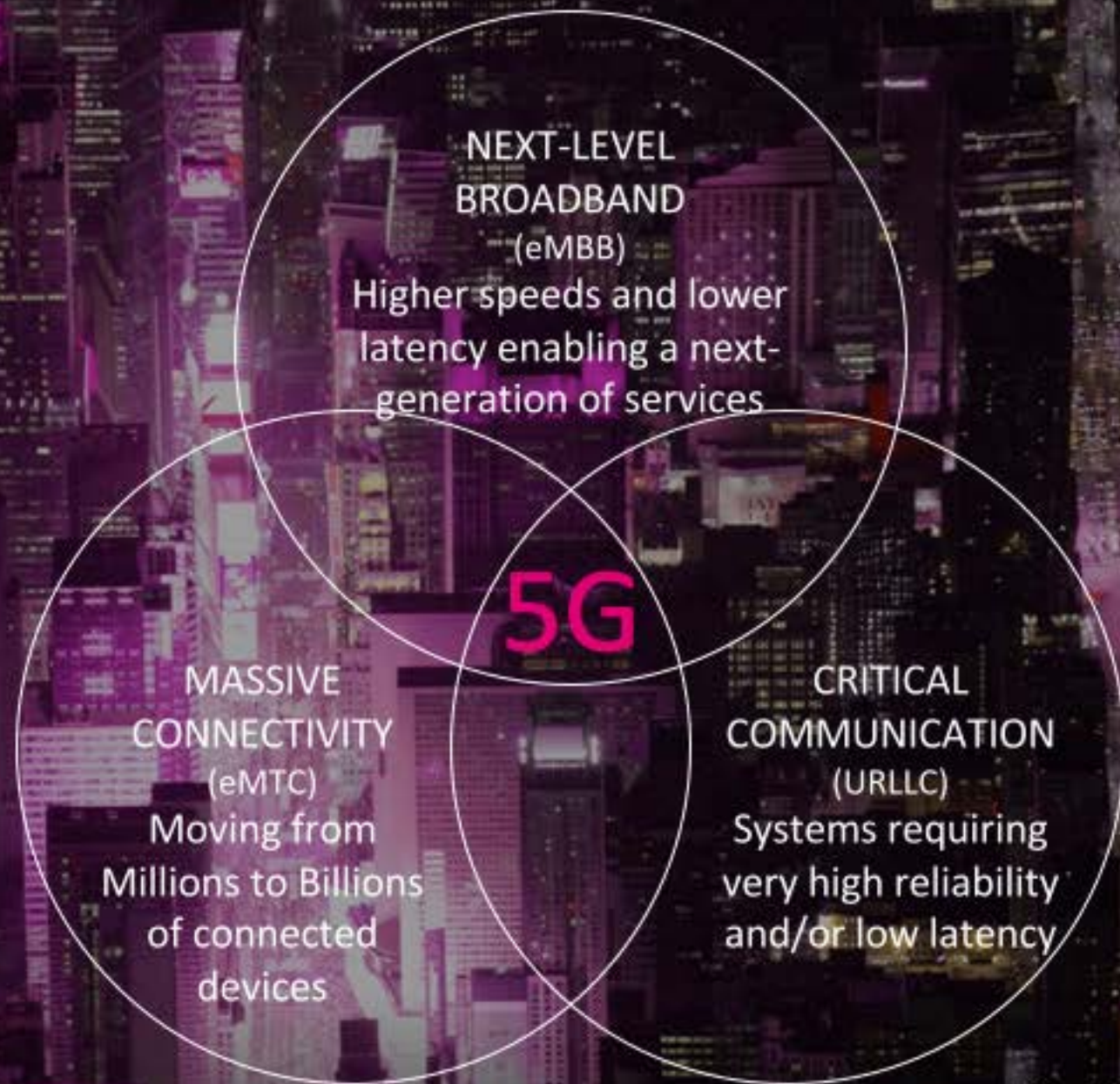
5G



# 5G EVOLUTION

5G will not only be an evolution of mobile broadband networks, it will also enable new unique network and service capabilities

- Gbps speeds
- Virtual reality and augmented reality
- Industrial automation, eHealth, V2X
- Autonomous vehicles





# 5G MUST DELIVER BENEFITS IN A MEANINGFUL WAY

Increase capacity in dense urban environments



# 5G Spectrum explained



## mmWave

Ridiculously fast but can't travel far.  
Good on straightaways but can't cover in-  
building



## Mid Band

Very Fast and good around town.  
Not great out in the countryside



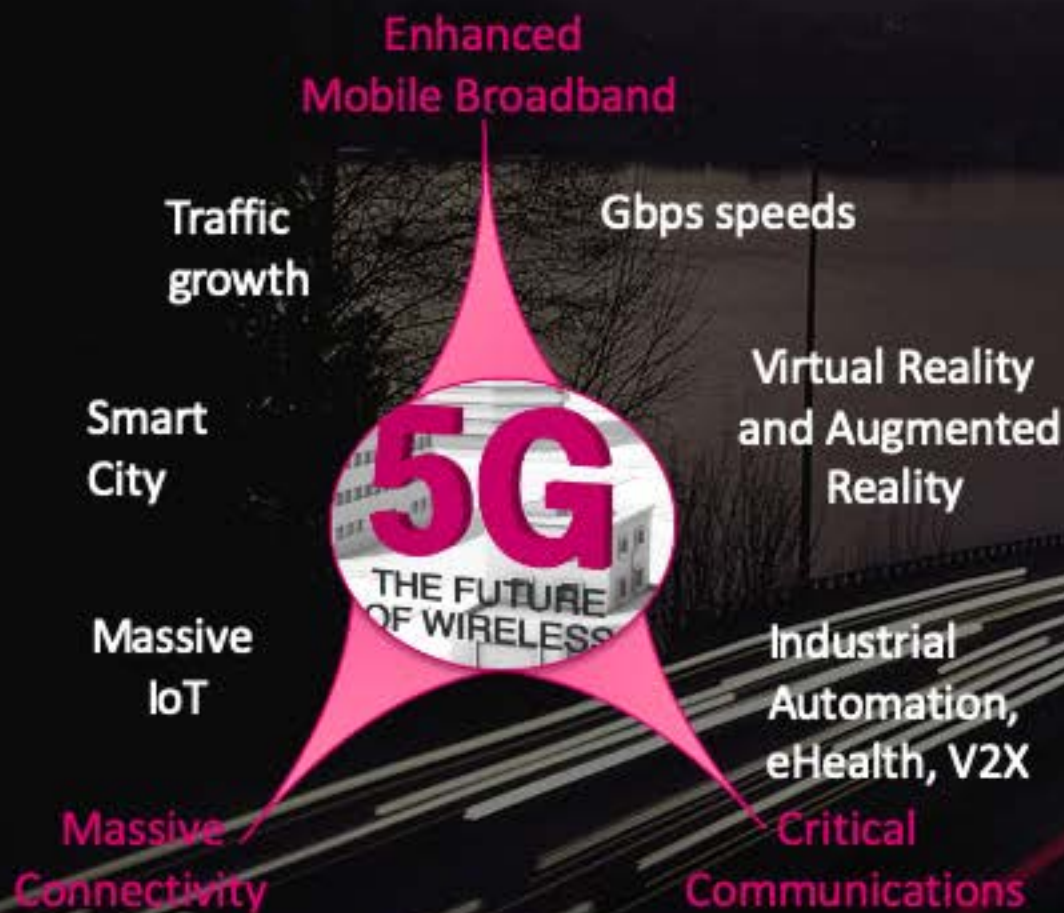
## Low Band

Fast enough.  
Ideal for rural areas

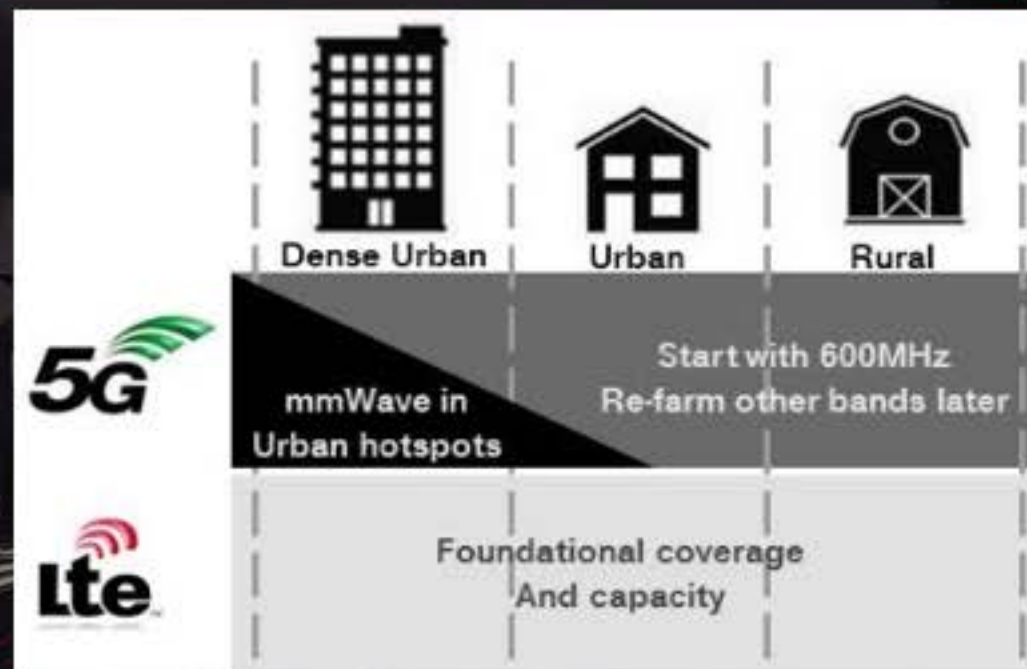


# Industry and T-Mobile Vision for 5G

## Industry Use Cases



## T-Mobile Network Multi-Band Vision



- Introduce 5G on 600MHz low band for coverage and capability; tight integration with LTE Network – Nationwide coverage in 2020
- Complement low band with mmWave assets in traffic hotspots
- Re-farm existing spectrum bands to 5G as feasible



# T-Mobile 5G Feature Timeline

2019

2020

2021

- Non Stand Alone, Option 3x
- Dual Connectivity
  - Dual Simultaneous Uplink and Downlink
- Spectrum Sharing
- Bands - NR: 260(39GHz), 261(28GHz) + LTE - 71, 2, 66

- Stand Alone, Option 2
- Enhanced Spectrum Sharing
- EPS Fall Back for VoLTE
- All IMS Services (e.g. RCS and Video Calling)
- Bands: NR: 71, 260, 261

- NR Bands 2, 66

# Nationwide 5G 600MHz coverage by 2020

## 600MHz 5G trial markets:

- Spokane, WA
- Las Vegas, NV

Ready for partnership testing in 1H 2020



## mmWave 5G trial markets:

- Las Vegas (39GHz)
- Los Angeles (28GHz)
- New York (28GHz)
- Dallas (28GHz)

Ready for partnership testing in 2H 2019



# The Internet of Things connects everything ...

## Smart logistics

Monitoring of supply chains in real-time



## Smart buildings

Intelligent management of buildings and office space



## Smart Retail

Generating customer insights based on behavior data



## Smart City

Intelligent management of street lighting or waste containers

## Equipment monitoring

Localization and optimal maintenance of machines



## Automotive

We connect the automotive industry with the Internet of Things



## Smart Parking

Navigates drivers to the next vacant parking spot

## Smart Healthcare

Remote patient monitoring, tracking of assets or cold chains



... and unlocks \$\$\$ in value



# ... however , challenges exist

## Grappling with complex technology choices



- Several technology choice points
- Highly fragmented ecosystems

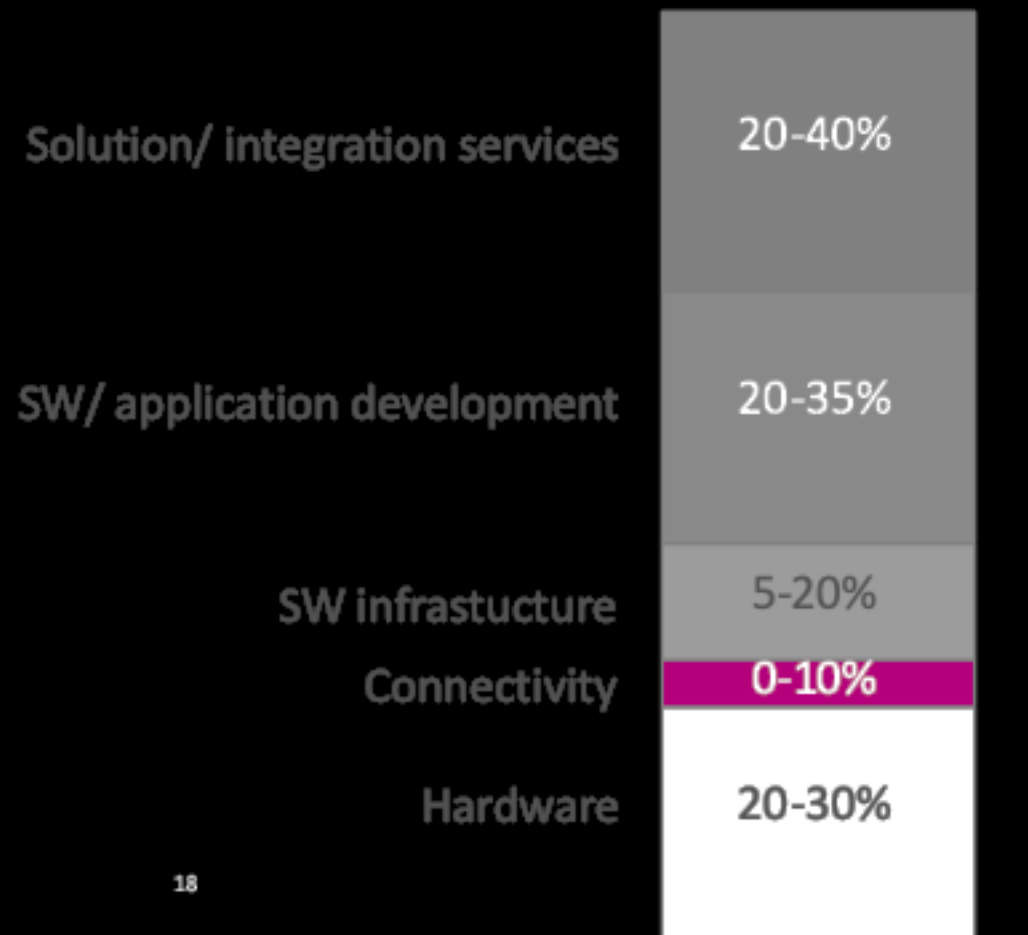
+

## Technology, finance & marketing on different page



- Technology for technology's sake vs. being outcomes or values driven

# Connectivity is the smallest portion of value stack



- Connectivity is required for an IoT solution, but stand-alone is not viewed as a differentiator
- Cellular is not always the connectivity solution of choice, other options often more appropriate (e.g. Wi-Fi, LoRA Zigbee)
- However, business models not yet established, creating opportunity for carriers to develop a differentiated solution and capture value

M2M

IoT

### Traditional M2M:

- Focuses on providing **connectivity only**
- **Isolated** systems of sensors and data
- Business model based **usage**

### IoT:

- **Complete solutions** with rich data analytics
- Combines connectivity with meaningful information for **real-time visualization and decision making**
- Creates **unique and distinctive services** capturing a larger portion of the value chain
- Engages **strategically** with industry




# 5G use cases – range of opportunities





# IoT for Partners





# DEVELOPERS COMMUNITY—TWILIO ENABLING THE LONG TAIL OF INNOVATION

## NB-IOT DEVELOPER KIT

- T-Mobile and Twilio offer developers everything they need—SIM, APIs, modules, and demos— to start exploring the possibilities of NB-IoT

## PROGRAMMABLE WIRELESS

- Delivers IoT connectivity that scales to the enterprise, and serves developers all over the world
- Control, analyze, and monitor cellular connectivity from your TWILIO console or via TWILIO API



# T-MOBILE IOT PARTNER PROGRAM

## CONNECT

T-MOBILE REGISTERED PARTNER

Access to T-Mobile  
roadmap, training and other  
ecosystem members

## CONNECT

T-MOBILE SELECT PARTNER

Exposure to enterprise  
customers and T-Mobile for  
Business sales channel

THANK YOU

T-Mobile





emPOWER

IoT WEST

**J.D. POWER**

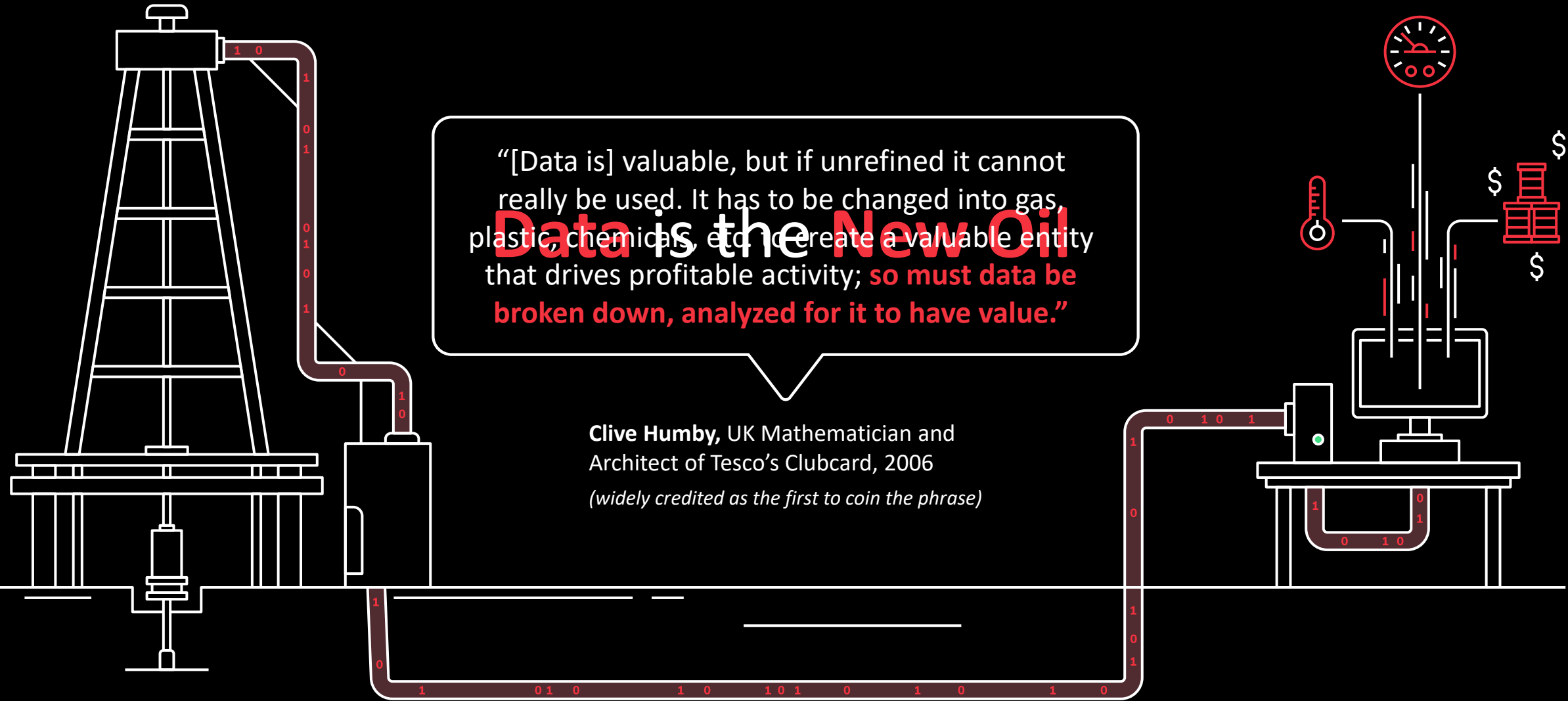




# Making a Case for the **Intelligent Edge** for Remote Assets

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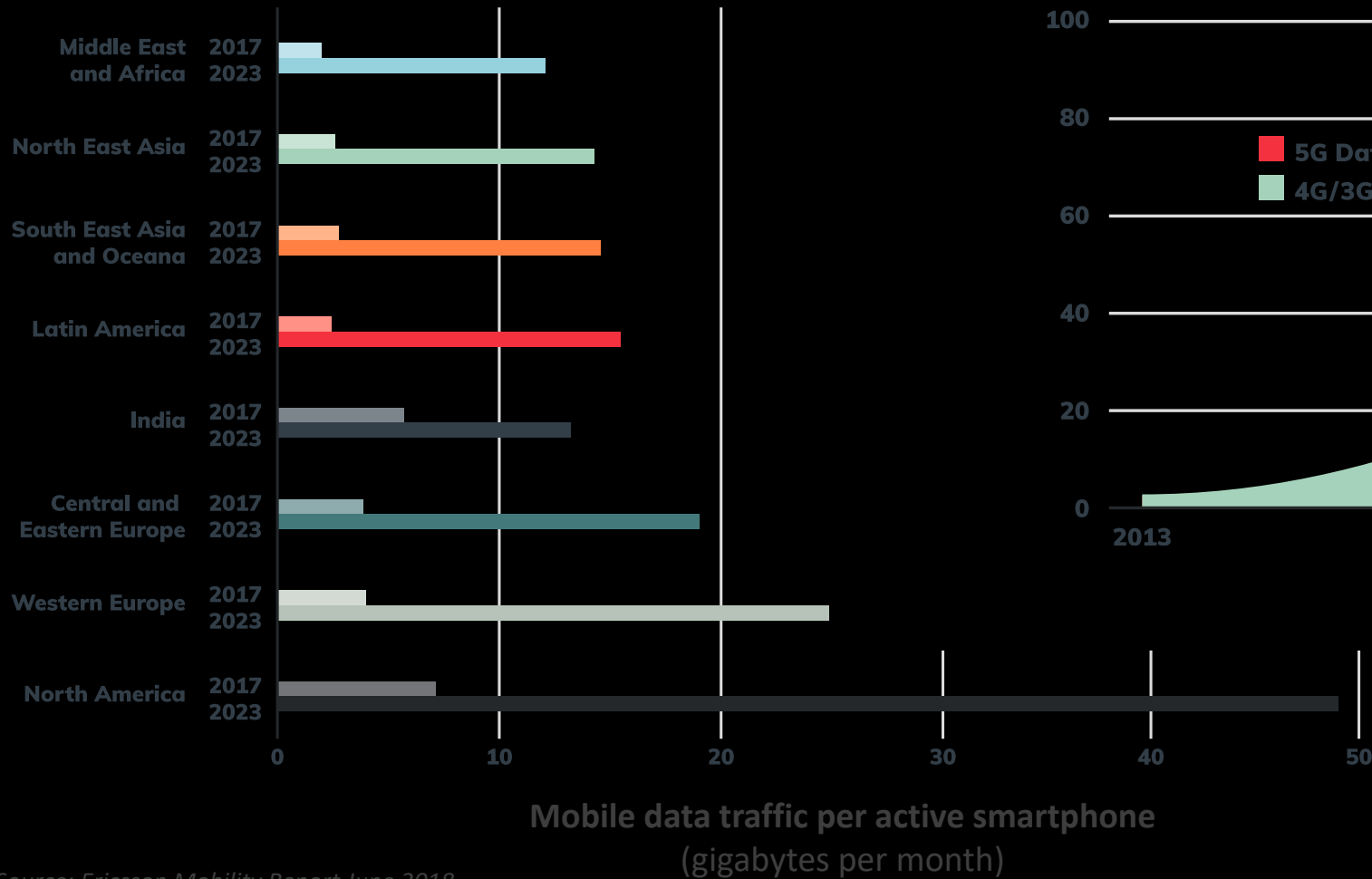
**Parthesh Shastri**  
VP Strategy & Partner Eco-System  
FreeWave Technologies



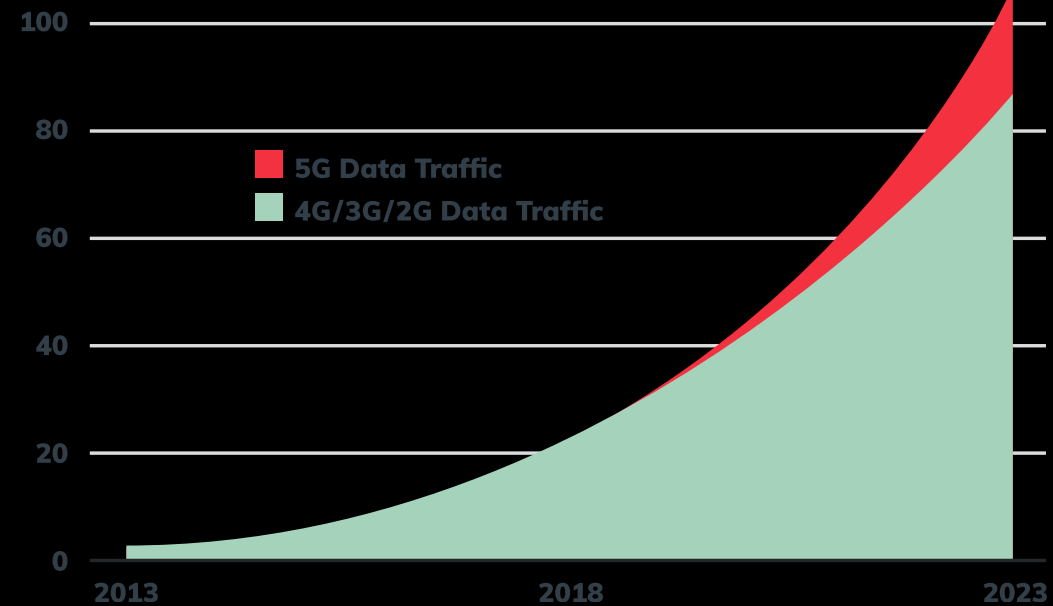
“[Data is] valuable, but if unrefined it cannot really be used. It has to be changed into gas, plastic, chemicals, etc. to create a valuable entity that drives profitable activity; **so must data be broken down, analyzed for it to have value.**”

**Clive Humby**, UK Mathematician and Architect of Tesco’s Clubcard, 2006  
*(widely credited as the first to coin the phrase)*

# The Coming Data Explosion



Global mobile data traffic (exabytes per month)



By 2020, there will be **MORE THAN 4 CONNECTED DEVICES TO EVERY 1 PERSON** on Earth.

Source: Ericsson Mobility Report June 2018





Driven by smartphone adoption...

...which has enabled **new consumer edge applications** — and new business models.

## THE DATA ECONOMY

A data sharing economy marked by collaborative sharing and consumption.

# The Data Economy **Goes Industrial**

The same ingredients that have made consumer edge applications so successful...

**Ubiquitous Internet access**

*Everywhere connectivity*

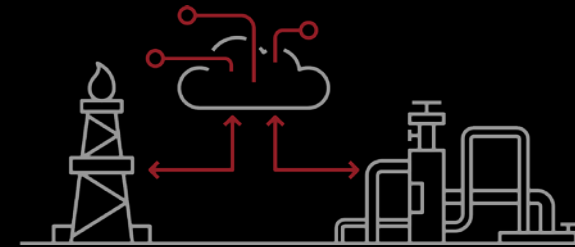
**IoT and M2M**

*Device-to-device communications*

**Big Data and algorithms**

*Advanced analytics*

...are now being **applied to the industrial edge** for Industrial IoT (IIoT) transformation.



*Remote industrial assets communicating peer-to-peer to consume, share, and act on critical operational data.*

Cisco predicts the **number of M2M global connections will more than double** from 2018 to 2021, from **1.5B** to **3.3B**, driven primarily by industrial sectors.

# The Sharing Economy **Goes Industrial**

The same ingredients that have made consumer edge applications so successful...

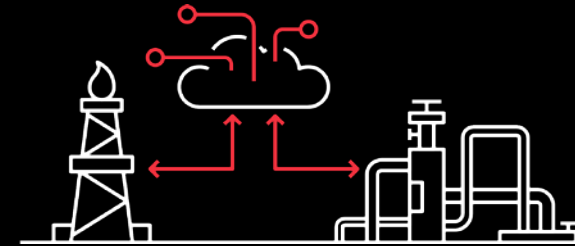
**Ubiquitous Internet access**  
[everywhere connectivity]

**IoT and M2M**  
[device-to-device communications]



**Big Data and algorithms**  
[advanced analytics]

...are now being **applied to the industrial edge** for Industrial IoT (IIoT) transformation.

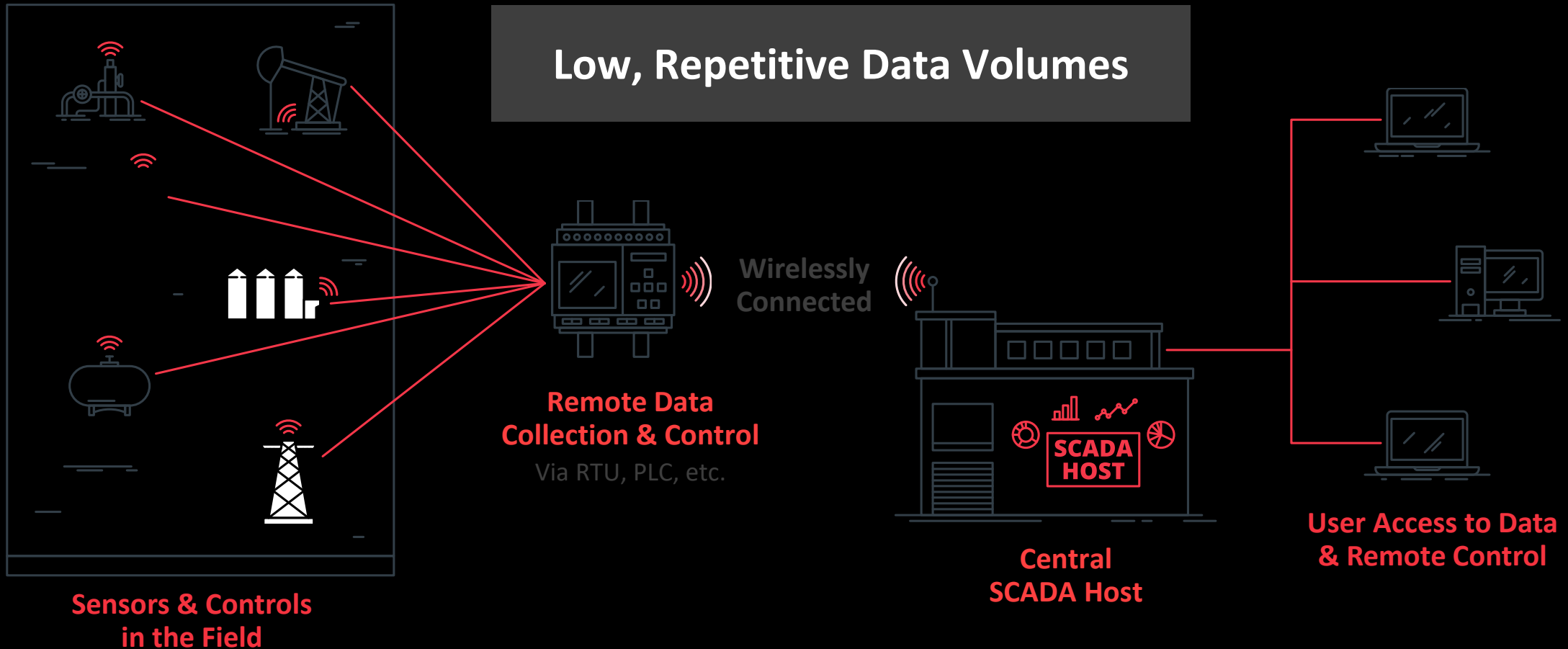


*Remote industrial assets communicating peer-to-peer to consume, share, and act on critical operational data.*

Cisco predicts the **number of M2M global connections will more than double** from 2018 to 2021, from **1.5B** to **3.3B**, driven primarily by industrial sectors.



# Industrial Asset Connectivity **Today**



# What Operations are **Getting Today...**



OT asks...



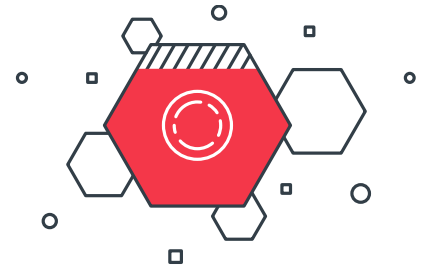
What is the temperature?



What is the pressure?



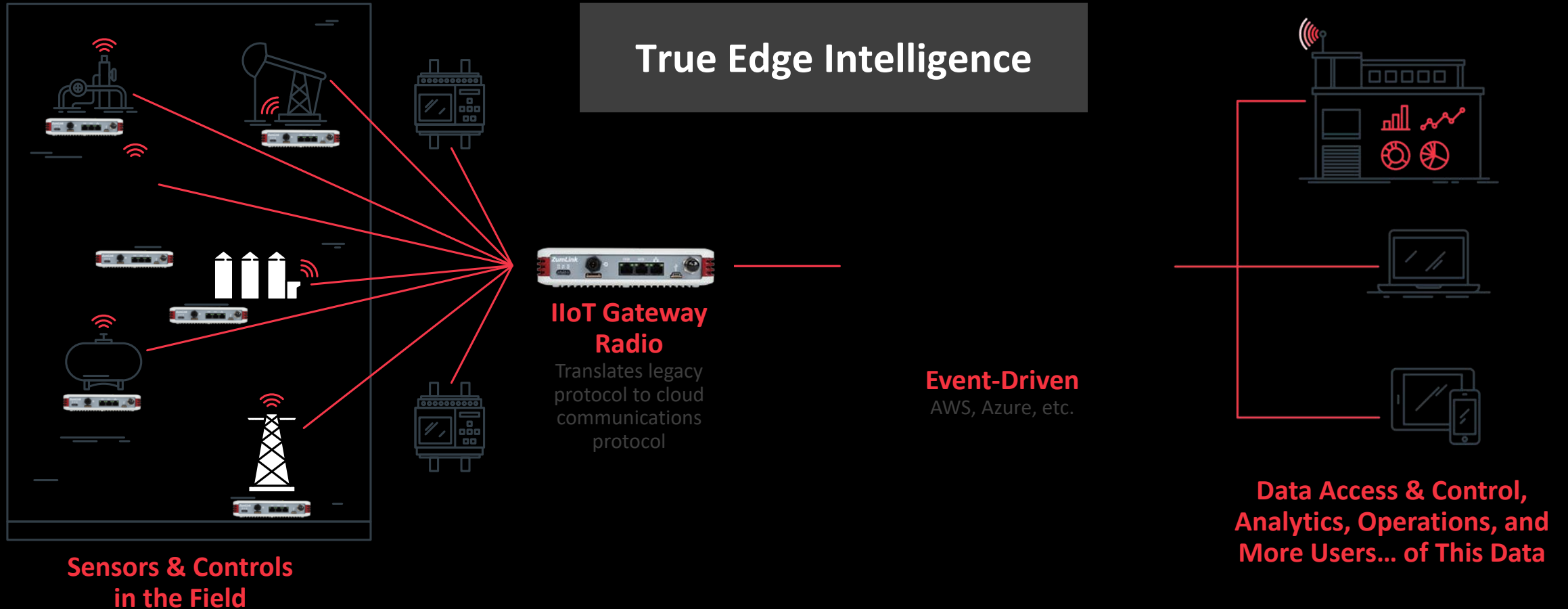
Should I turn off the system?



**80 - 95%**

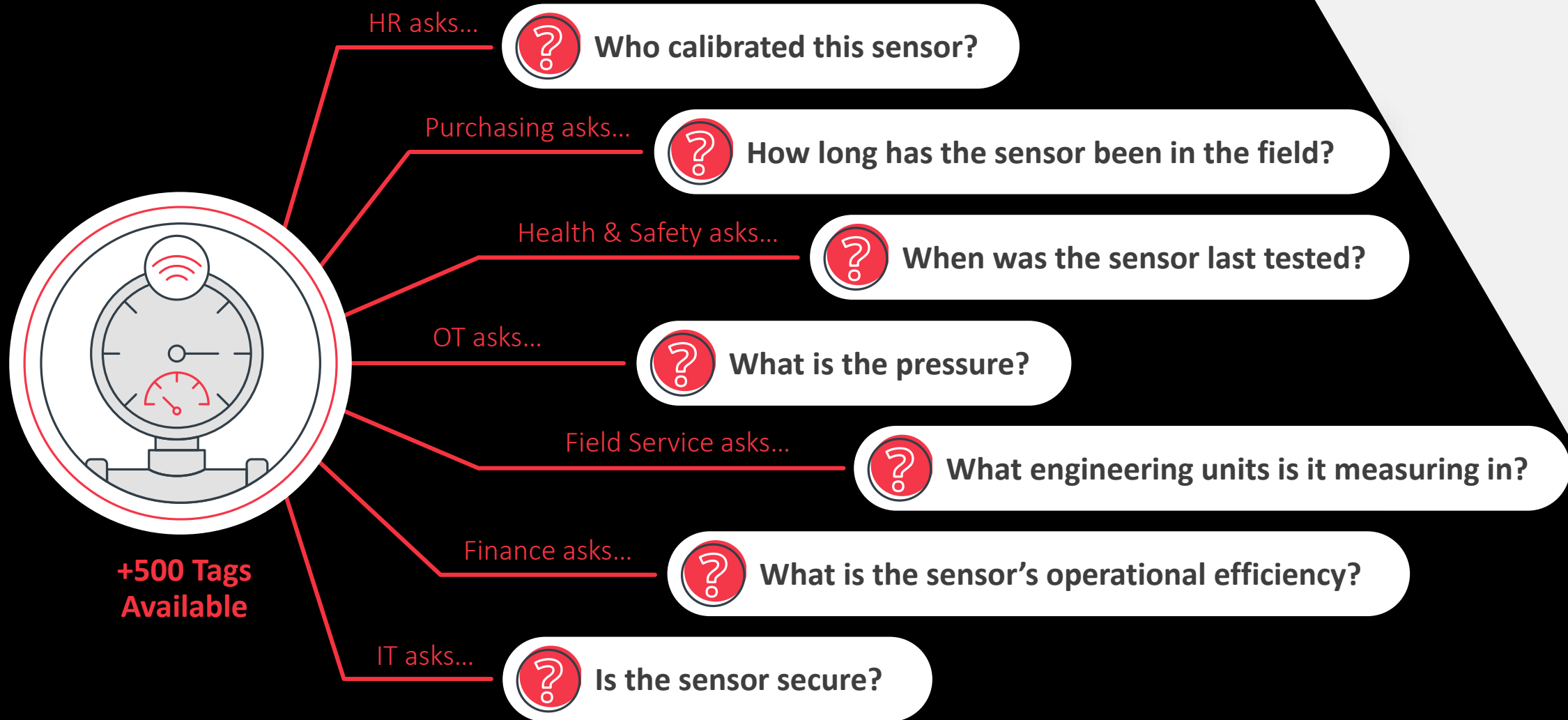
of data generated by machines is still **stranded in the field.**

# Industrial Asset Connectivity of **the Future**





# What **Data Streams Could Enable...**



# Who is FreeWave?

Low-power, long-range IIoT connectivity,  
*now with an intelligent edge.*



**25 Years**

providing M2M  
wireless for **data**  
transfer and  
**command/control**



**3,000+**

customers with  
**deployments**  
across **32+**  
countries



**Long-Range**

leader in reliably  
connecting  
**challenging RF**  
environments



Designed, manufactured and tested **in the USA**

# EDGE —

# EVOLVED.

Full offerings for industrial



**Edge Connectivity**



**Edge Computing**



**Edge Sensing**

to power intelligent remote operations.

# Makes It Easy to Embrace IIoT



MQTT

Ignition EDGE!

AUTOSOL  
Data in motion

Node-RED



Predictive Maintenance



Process Optimization



Remote Monitoring



Command & Control



Robotics



Autonomy



Smart Manufacturing

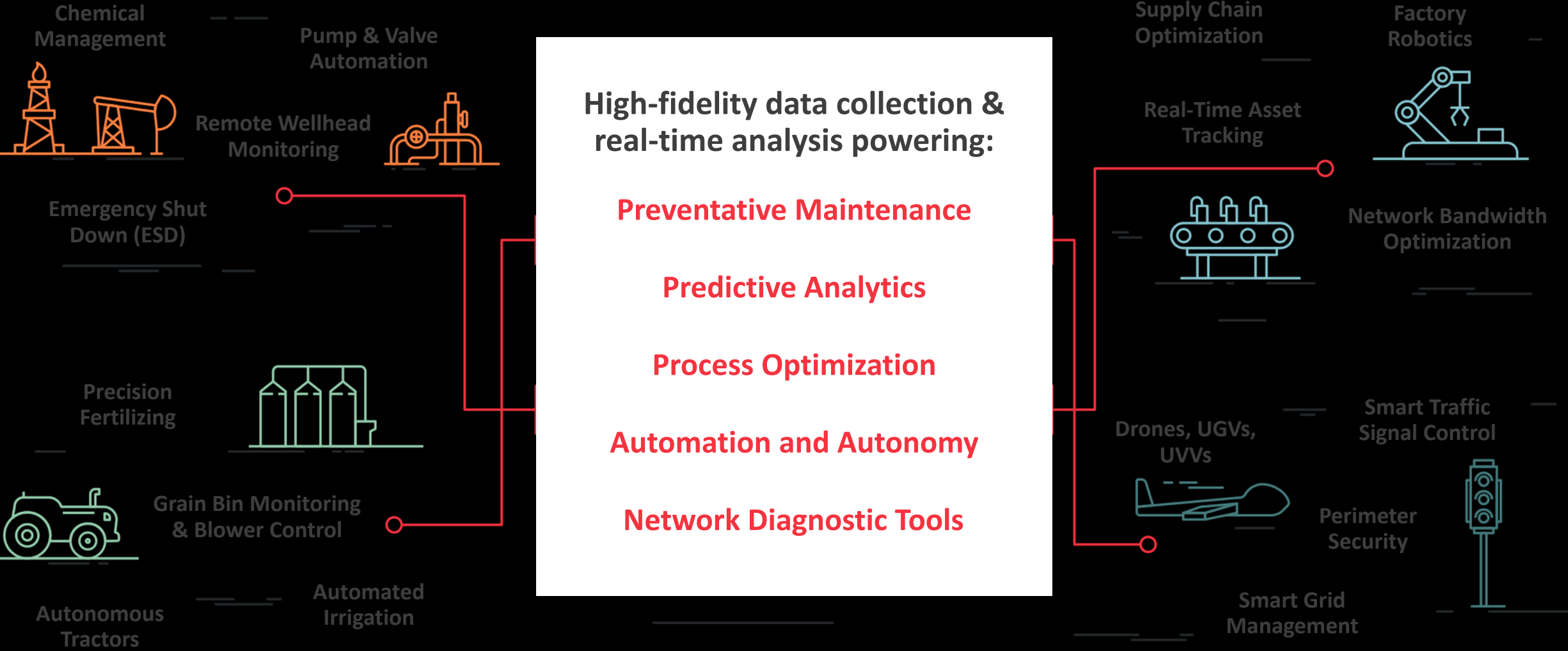
Built for industrial demands...  
**LOW-POWER, RUGGED DESIGN.**

Long-range M2M wireless...  
**PLUS A ROBUST EDGE COMPUTING PLATFORM.**

Evolved for IIoT...  
**READY TO TRANSFORM YOUR OPERATIONS.**



# Industrial Edge Apps Enabled



# Smart Edge Use Case

## THE CUSTOMER

**Sylvan Lake**, Canadian Water & Wastewater Operations

## THE SITUATION

The City's nearly 20-year-old infrastructure was failing and **could no longer reliably communicate with remote stations** for its water/wastewater systems; historical data was inaccessible and lacked capabilities for real-time reporting, immediate alerting or remote asset management.

## THE SOLUTION

FreeWave's **ZumLink™ IQ Industrial Radios** integrated with Inductive Automation's **Ignition Edge MQTT** to upgrade 7 fresh water stations.

## THE OUTCOME

- **Centralized, real-time control** of fresh water operations anywhere.
- Ability to **execute system-wide updates in seconds** using MQTT.
- **Automated compliance reporting** to eliminate costly manual analysis.
- **Near 100% communications reliability** of field radios.

“FreeWave and Ignition gave us the ability to **achieve IoT at the edge via radios**. Adding MQTT makes the **field stations smarter**, while keeping the system's overall footprint and bandwidth requirements small.”

– Crayton White, Systems Integrator for Sylvan Lake

# Smart Edge Use Case

## THE CUSTOMER

A natural gas exploration and production company based in Southern California.

## THE SITUATION

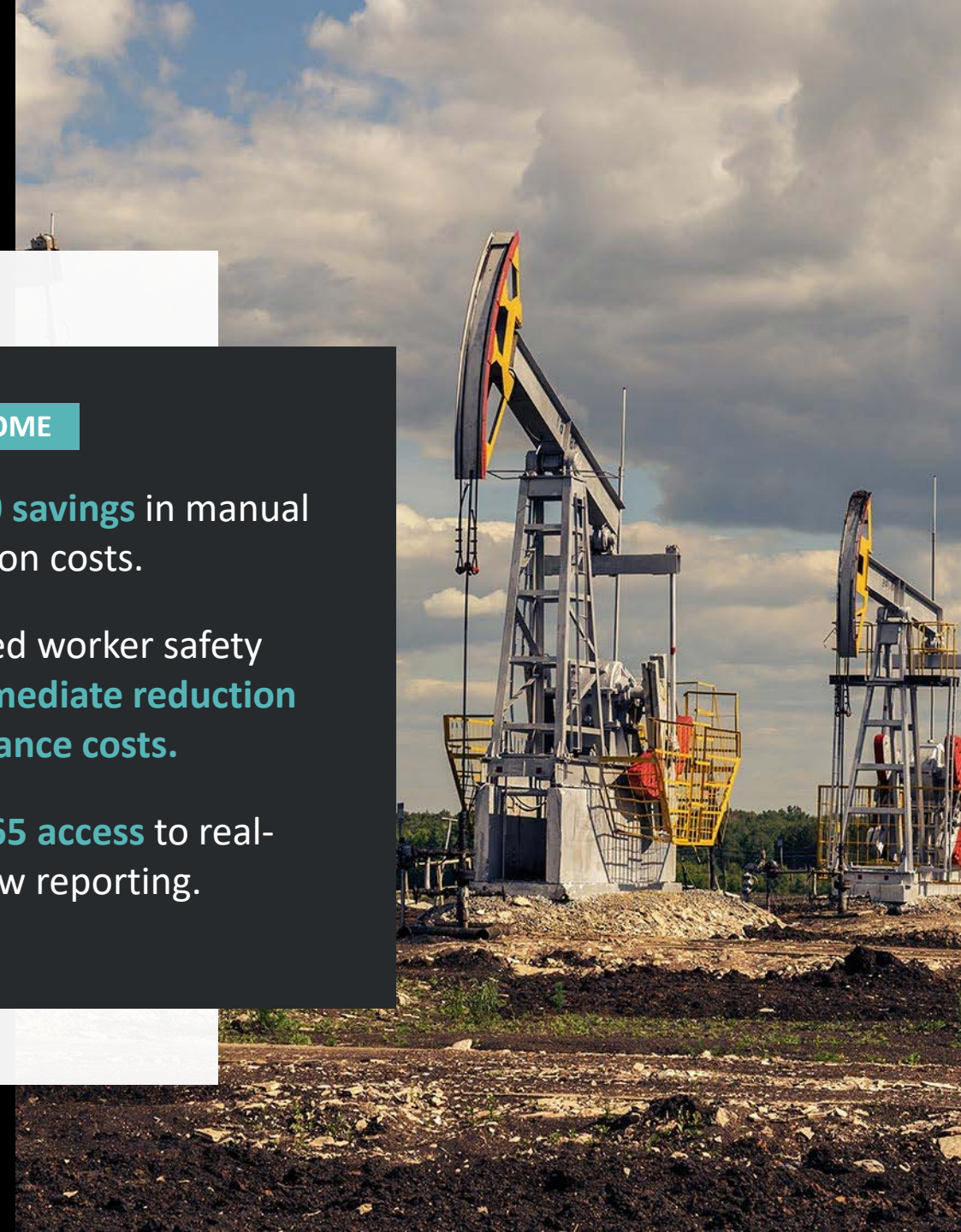
Manually managing 70+ active water injectors with personnel deployed daily to record flow totals.

## THE SOLUTION

78 ZumLink radios loaded with custom application to extract flow totals from existing sensors remotely via Modbus TCP.

## THE OUTCOME

- **\$15,000 savings** in manual inspection costs.
- Improved worker safety and **immediate reduction in insurance costs.**
- **24/7/365 access** to real-time flow reporting.





**Thank You!**

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IoT WEST

J.D. POWER

# VOICE OF THE CUSTOMER IN THE IoT ERA

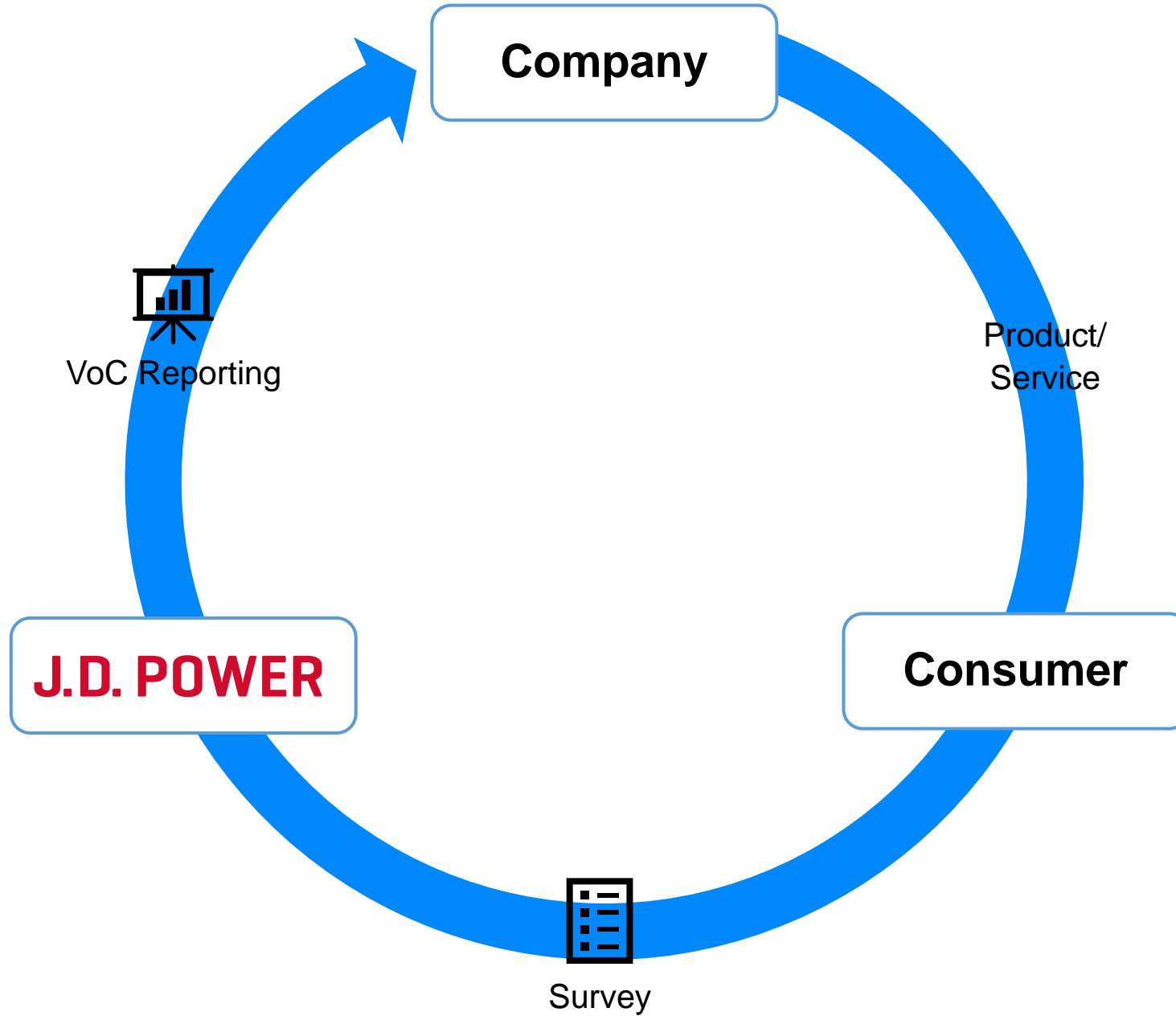
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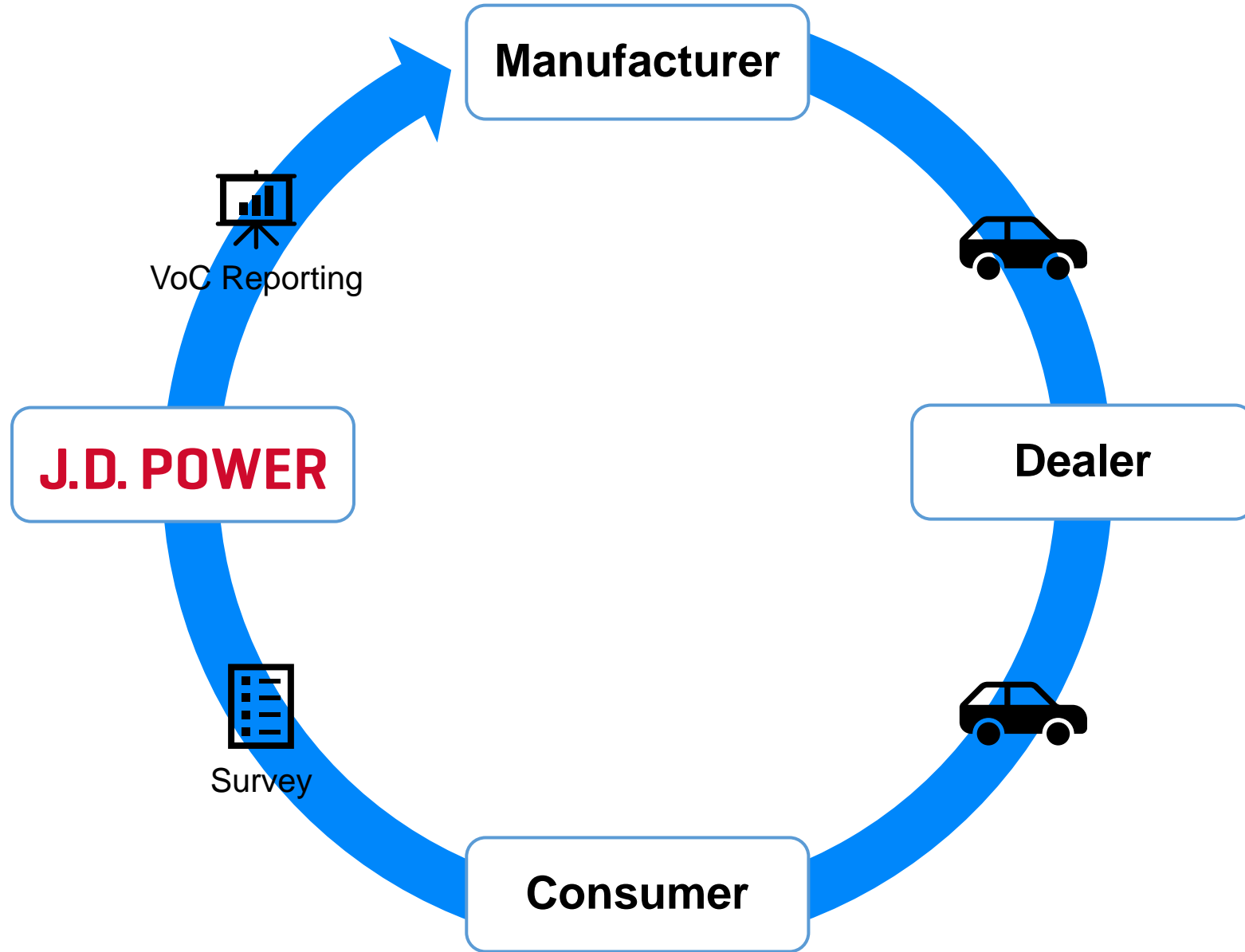
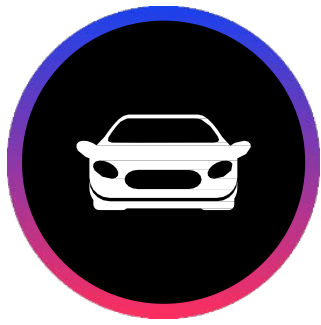
**Amit Aggarwal**

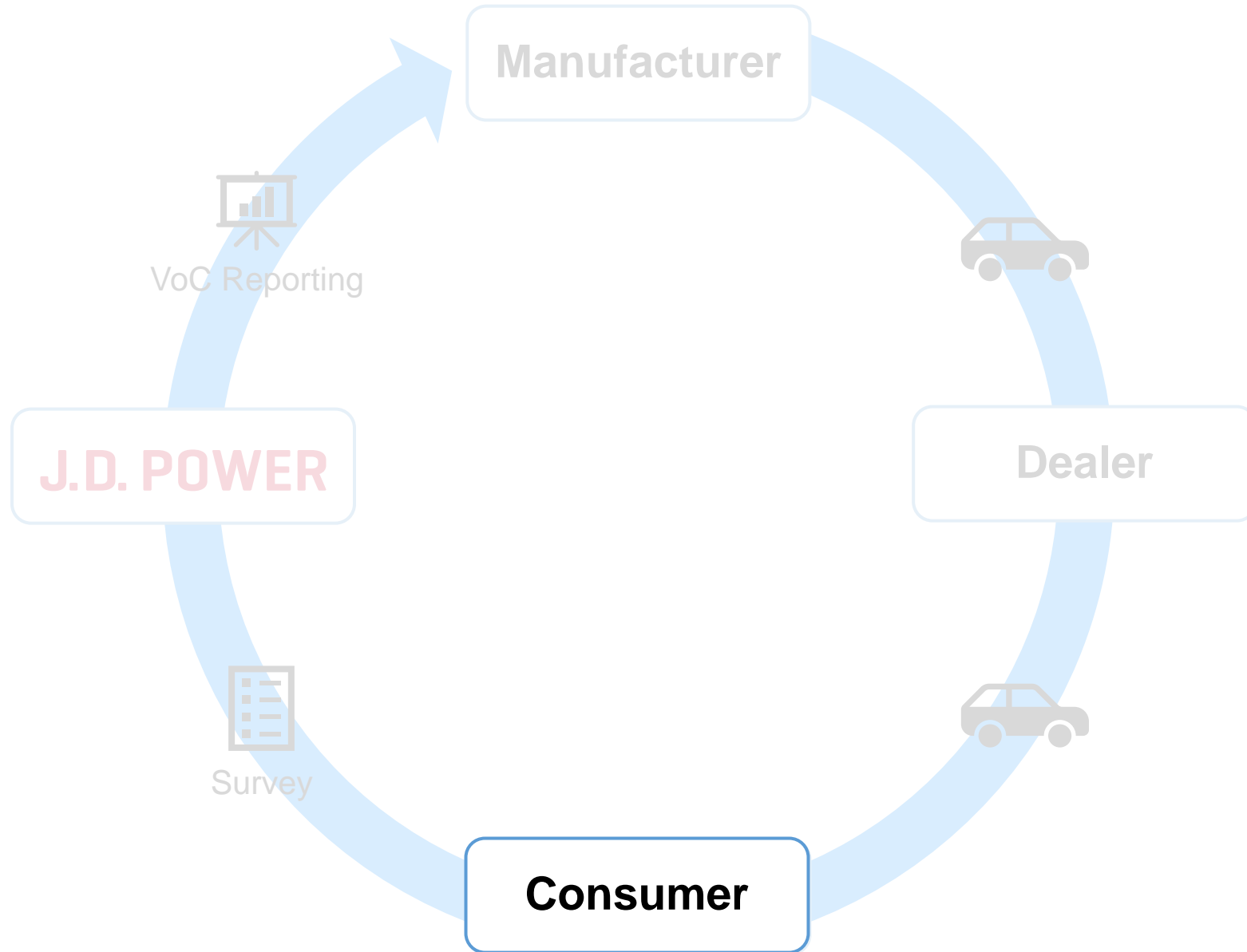
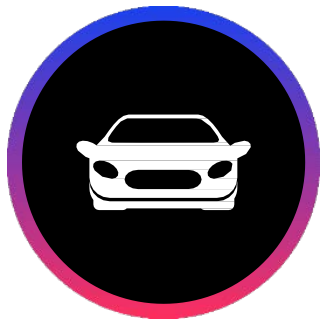
Senior Director, Digital Solutions

J.D. Power

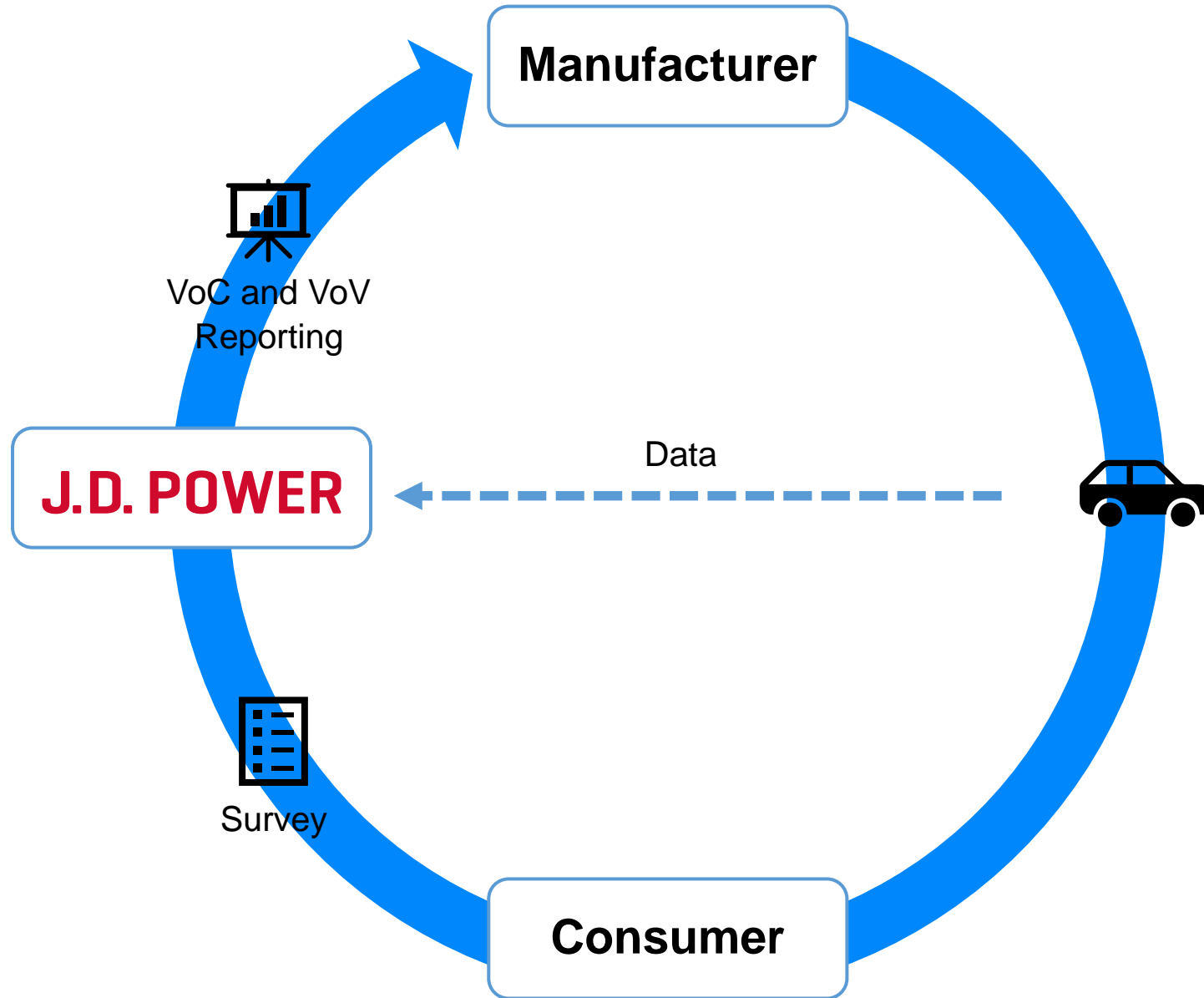
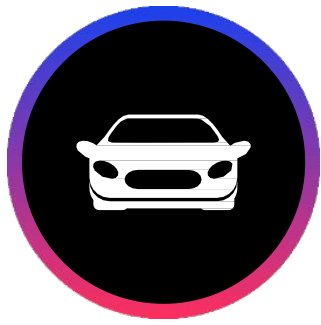






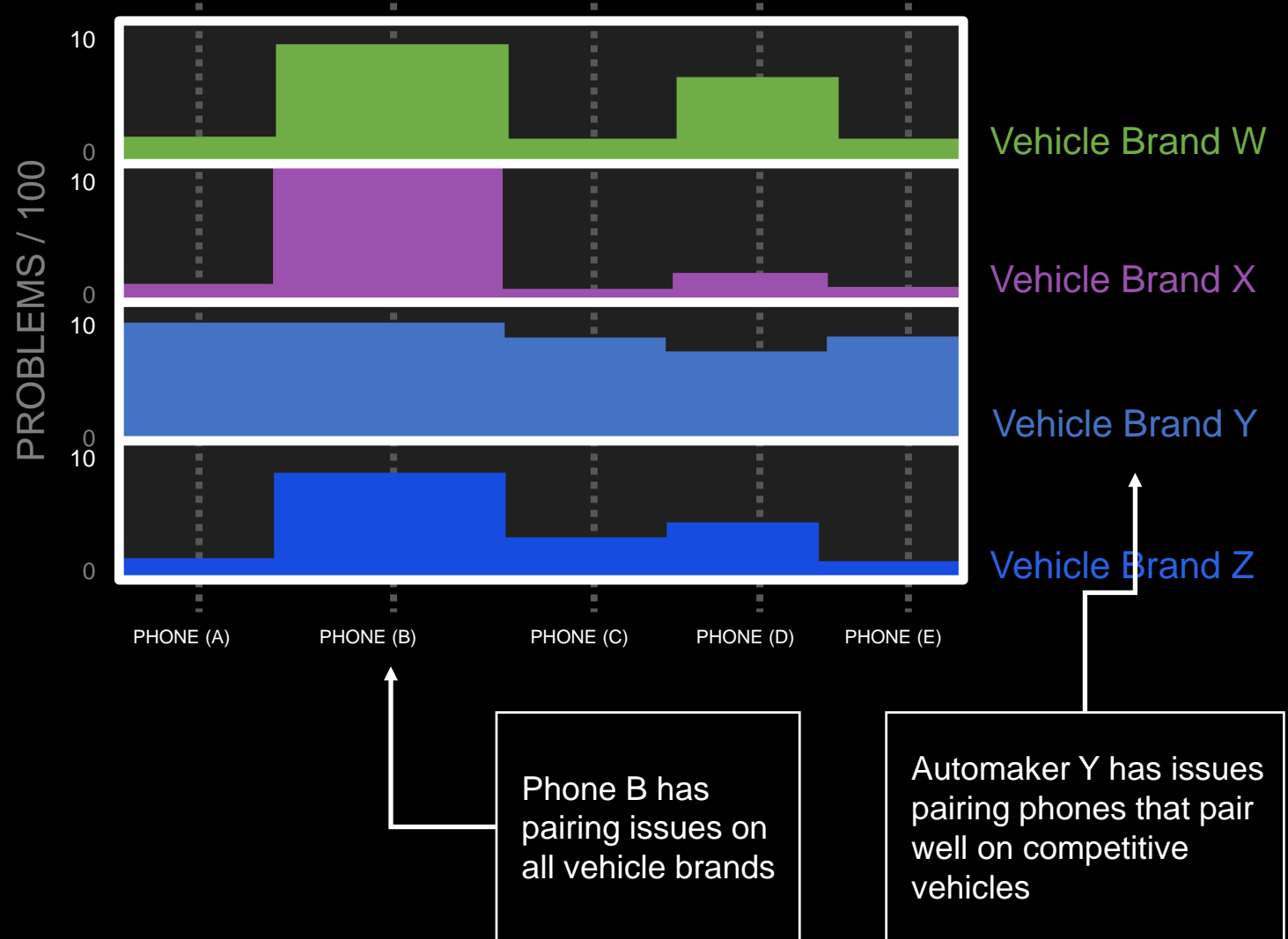






“Most common issue is switching between phones. If I get in the car and it pairs with my wife's phone nearby, then I drive away causing it to lose connectivity with her phone, it will not pair with mine after that until I turn off the car and back on.

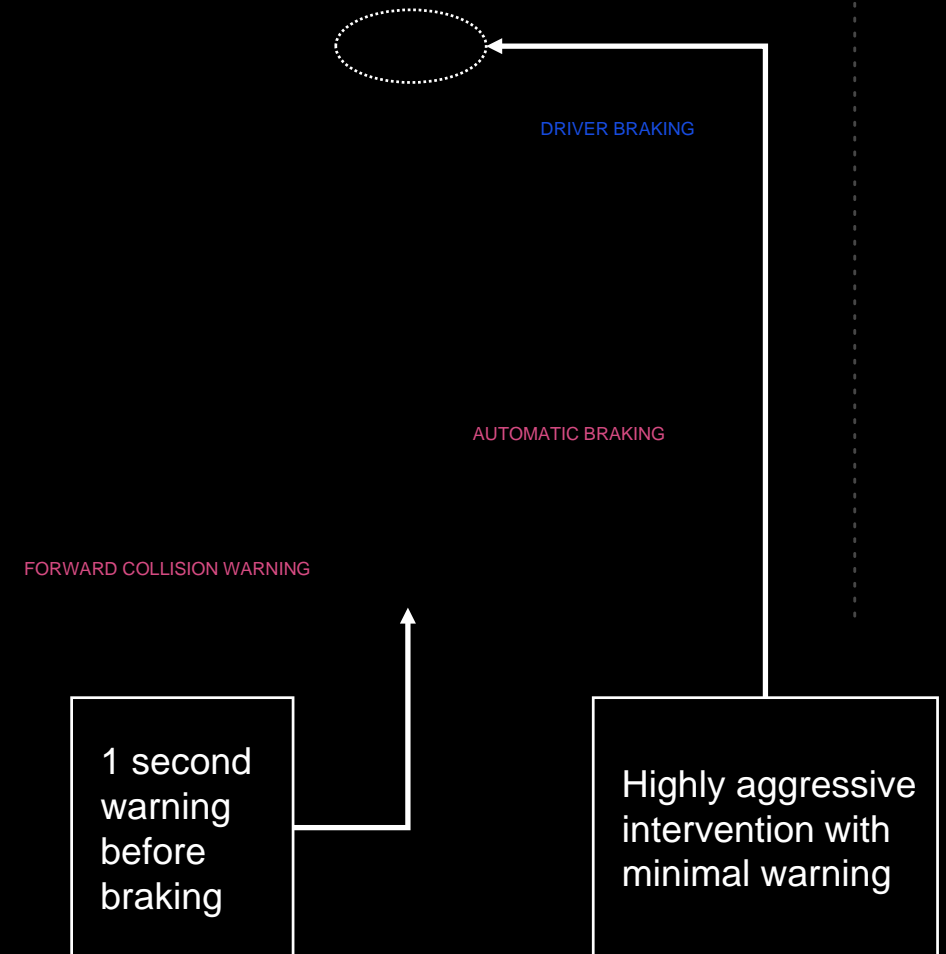
( Real Driver Feedback, TXI Study )



“On multiple occasions, the car automatically braked when this alert sounded, freaking me out and almost causing someone to rear-end me. I do not like this feature.”

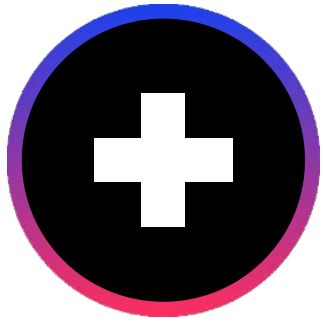
( Real Driver Feedback, TXI Study)

VEHICLE SPEED









**Pharmacy**

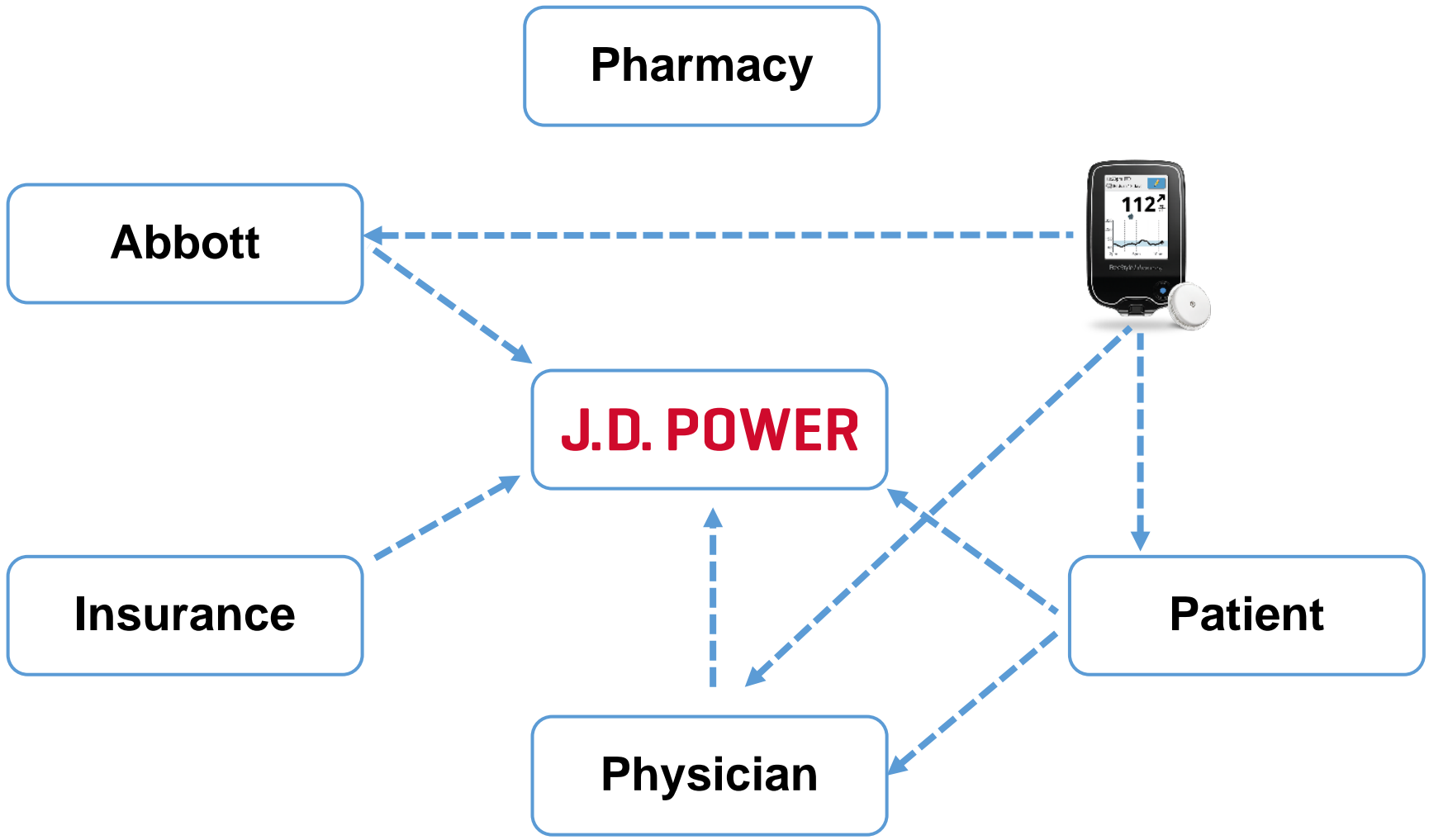
**Abbott**



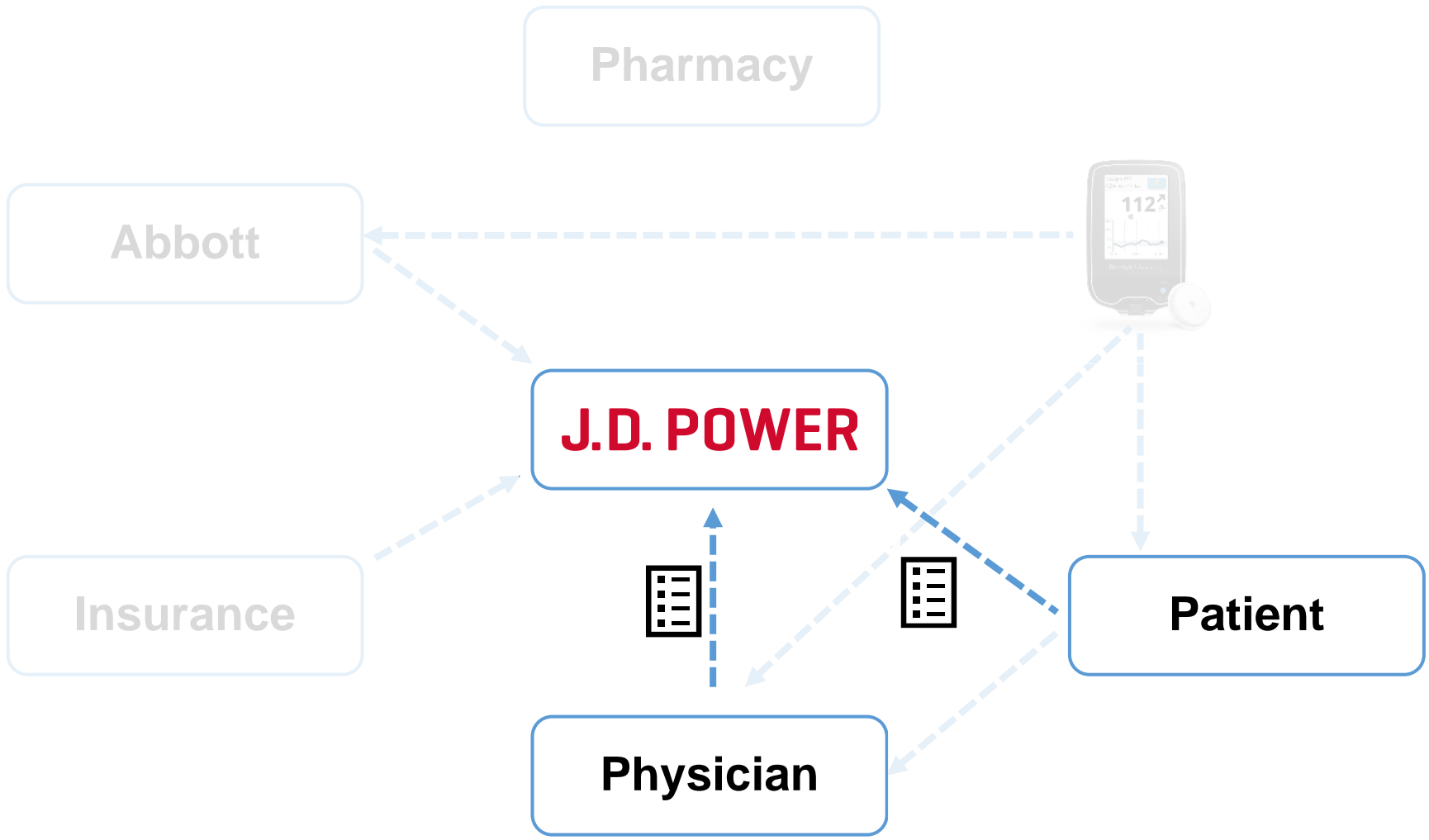
**Insurance**

**Patient**

**Physician**









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# WRAP UP AND Q&A

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# RECEPTION & NETWORKING

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