Amazon's IoT Strategy:
A Force to be Reckoned With

@Things Expo	Chris Kocher
Santa Clara, CA	Managing Director
November 1, 2016	Grey Heron

GREY HERON

There is Nothing New in IoT
- but everything has changed

Clouds

Chips

Networks

Solenoids

Sensors

Smart Phones

Communication protocols

Big Data

Compute engines

Analytics

Storage

Platforms

Appliances

Security

Devices

Things

Each Wave of Computing Innovation Disrupted Incumbents and Created New Business Models

Size, Price

Network Speed, Bandwidth

Mainframes
1960s-1970s

Minicomputers
1970s-1980s

PCs and Laptops
1980s – 1990s

Internet

Smartphones, Tablets 2000s-2010s

IoT Sensors, Devices and Wearables 2010s – 2020s

# of Devices and Time
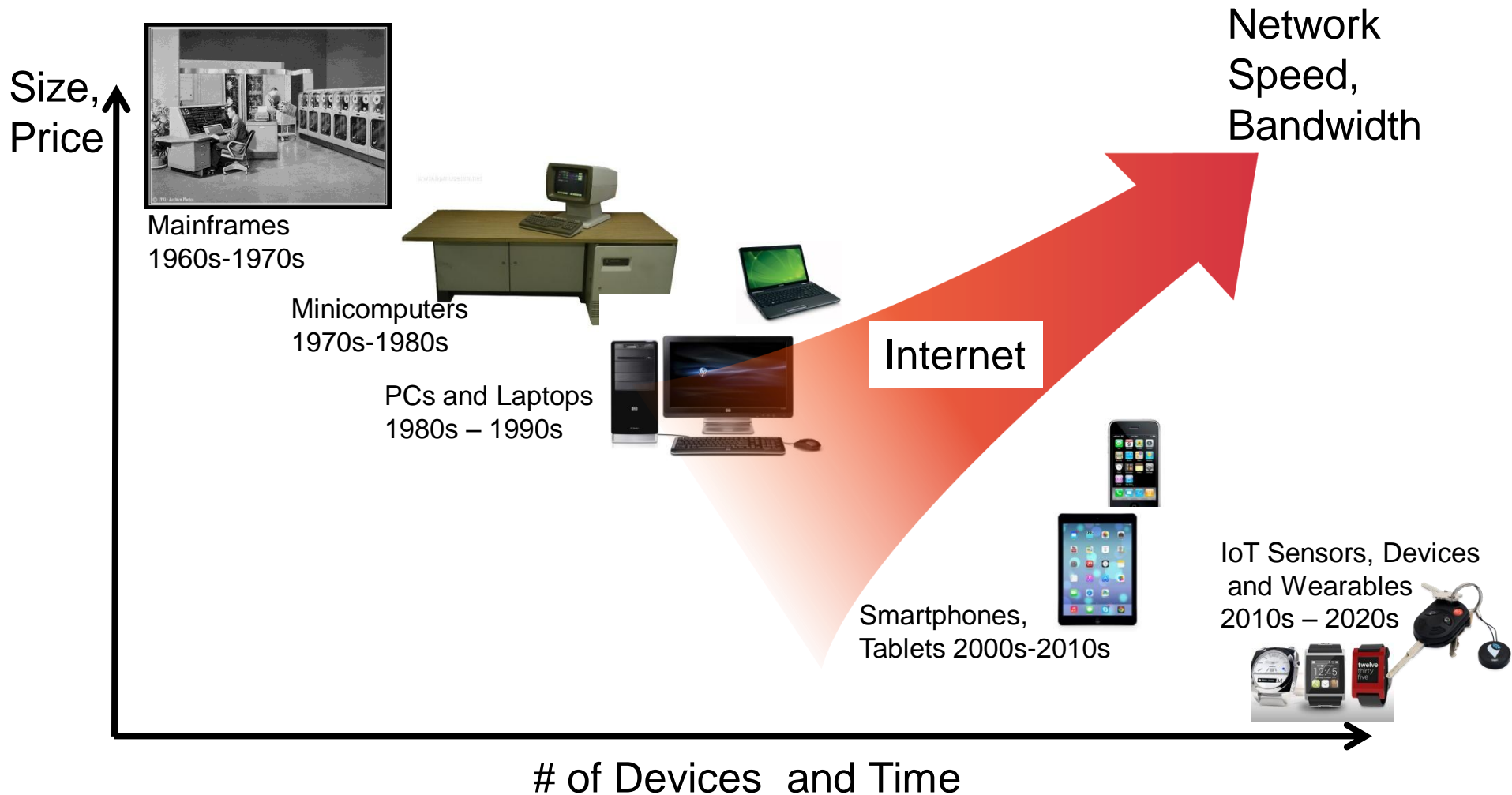
10 Key Areas Driving IoT Ecosystems
- Amazon plays in at least 5 of them

Smart Cars

Intelligent Transportation

Smart Buildings:
Energy, Light, Security

Connected Homes

Quantified Self - eHealthcare

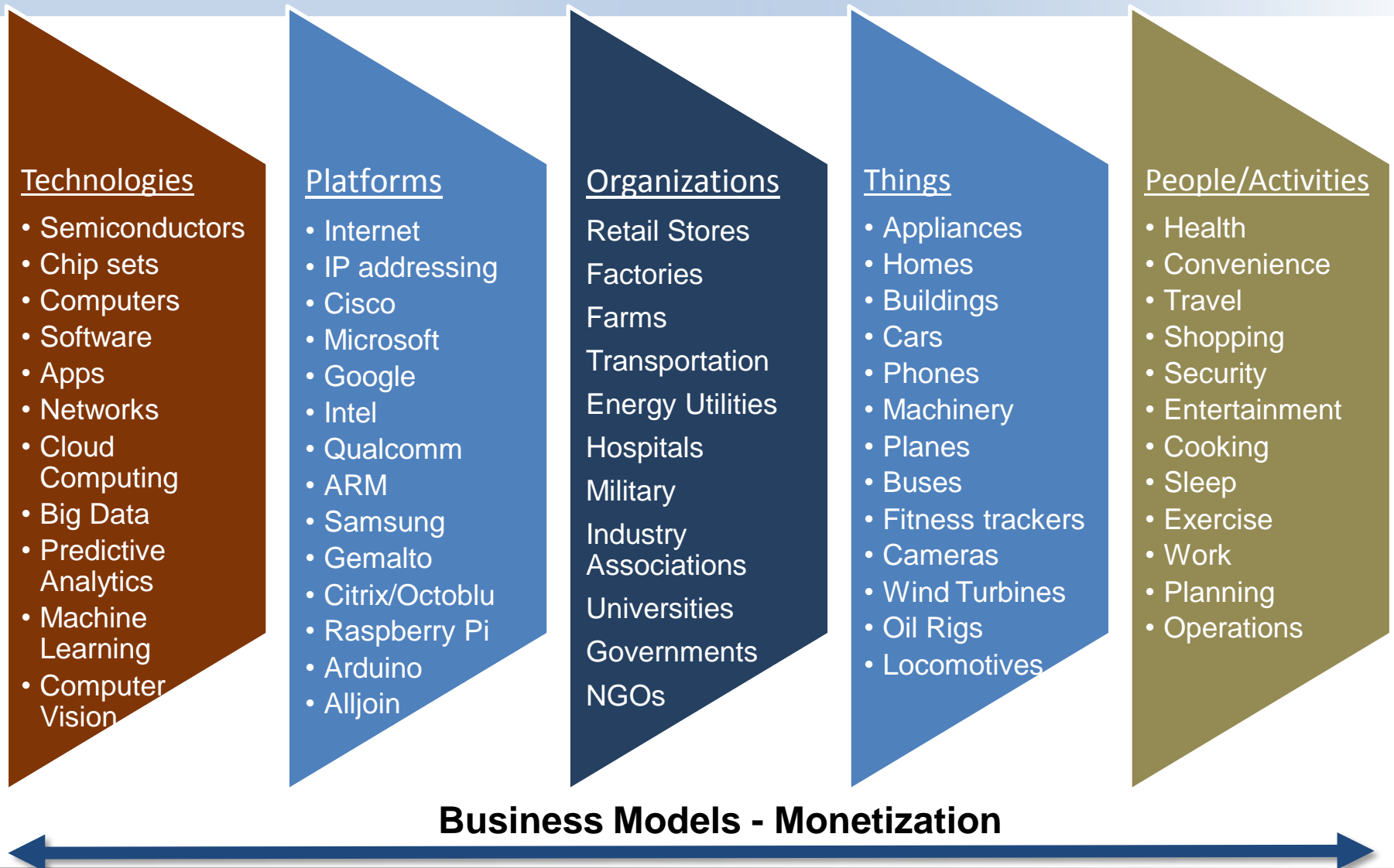Smart Cities and eGovernment ($148B in '20)

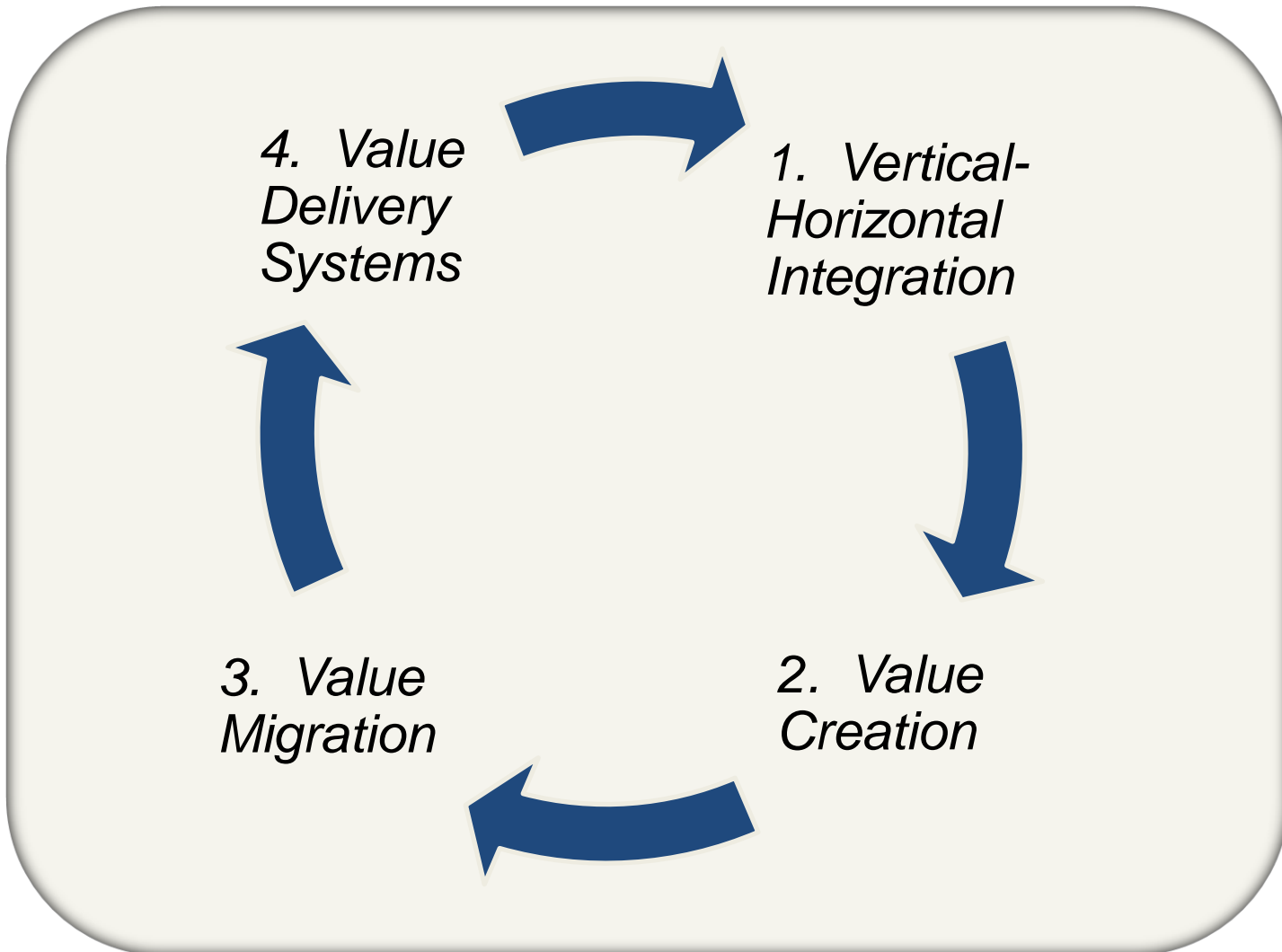Retail Stores

Industrial Internet

Utilities and Energy Grids

Agriculture 2.0

GREY HERON

Ecosystems and Partnerships Are Critical

- Amazon is very good at building partner programs

Technologies

- Semiconductors
- Chip sets
- Computers
- Software
- Apps
- Networks
- Cloud Computing
- Big Data
- Predictive Analytics
- Machine Learning
- Computer Vision

Platforms

- Internet
- IP addressing
- Cisco
- Microsoft
- Google
- Intel
- Qualcomm
- ARM
- Samsung
- Gemalto
- Citrix/Octoblu
- Raspberry Pi
- Arduino
- Alljoin

Organizations

Retail Stores

Factories

Farms

Transportation

Energy Utilities

Hospitals

Military

Industry Associations

Universities

Governments

NGOs

Things

- Appliances
- Homes
- Buildings
- Cars
- Phones
- Machinery
- Planes
- Buses
- Fitness trackers
- Cameras
- Wind Turbines
- Oil Rigs
- Locomotives

People/Activities

- Health
- Convenience
- Travel
- Shopping
- Security
- Entertainment
- Cooking
- Sleep
- Exercise
- Work
- Planning
- Operations

Business Models - Monetization

The 4 Values (4V) Framework for Monetization

4. Value Delivery Systems

1. Vertical-Horizontal Integration

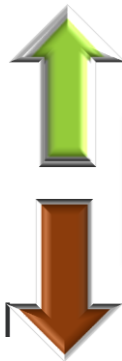2. Value Creation

3. Value Migration

GREY HERON

Vertical and Horizontal Integration

amazon

- Echo, IoT Alexa voice platform
- Dash buttons
- Firestick, FireTV, Fire Phone
- Prime entertainment (videos/TV/music)
- Amazon Prime, Fresh, Pantry, Now…
- Kindle Readers
- eBooks

Online book seller

Amazon is integrating
Up and Down the Stack

- eCommerce and retail
- Amazon Marketplace Platform
- Amazon Web Services (AWS- Cloud - Chips)
- Distribution logistics, shipping, drones…
- Airplane fleets, shipping companies…

Online bookseller…

…Or, Economic
Powerhouse

Amazon's Backend for IoT

- AWS IoT Framework
- SDKs for developers to work with IoT devices
- Kinesis Analytics tuned for analyzing high-volume streaming data*
- AWS Lambda – Alexa integration
- Special data ingestion devices
- AWS IoT Gateway
- AWS IoT Rules Engine
- AWS API
- AWS Registry to track IoT devices
- Pricing 250K free 512K messages/mo. Or $5 per million

*2lemetry acquisition March 2015, includes beacons and facial recognition

Amazon's Front End for IoT – Dash Buttons

- frictionless commerce for home and office

Dash Buttons (2015) for the home:
– one click e-commerce ordering

Dash Buttons (2016) programmable
– ordering all kinds of things

Dash Buttons → Futures?
- low cost IoT sensors and endpoints?

Amazon's Other Front End for IoT
- Alexa, Echo, Dot and Tap - *a new platform for a new world*

• Voice recognition system

• Gateway to the internet

• AI-enabled speaker

• Front end to ecommerce engine

• Voice controlled 'browser'

• Voice interface to entertainment - Pandora, Spotify, Tune In

• Controller for your Connected Smart Home

• Virtual assistant – reminders, timers, calendar, weather

• 1000+ 'skills' – news, radio, jeopardy, horoscopes, weather, time, traffic, uber, fantasy football…

• 3-4 Million sold in 6 months- impacting Bose and Sonos sales

GREY HERON

Echo is Leading the Pack in this New Category of Voice Controlled Speakers/Devices

- *Google* 'Home' will be controlled by
  – Google Voice, Google Now, OK Google

- *Apple*'s new device using Siri?
  - expect to hear more from Apple in 2017
  - similar to Echo, expected to control devices via Apple's Home Kit as well as play music, read news, set timers…

- *Microsoft* - Using Cortana speech recognition and AI

- *IBM- Watson with "Cognitive Computing"*

- *Samsung?   Sony? Xiaomi? Bose? Sonos?*

Amazon is Building out a Powerful Ecosystem
- partners reinforce the platform in a virtuous circle

- Lighting
- Heating and Cooling
- Smart switches and outlets
- Connected Cars
- Entertainment systems
- Appliances
- Security Systems
- DIY and professional installers

Alexa Skills Set : News Flash, Jeopardy, Jokes…
Alexa Voice Services API - unbundled from Echo for other HW

Amazon's $100M Alexa Fund
- Helps Build Out the Echo Ecosystem

The Alexa Fund
$100 million in investment to fuel voice technology innovation

Rachio – an intelligent water sprinkler control system

Sutro – a smart pool monitor

Petnet- a smart feeding appliance for pets

Musaic – an intelligent sound system for playing music and controlling lights

Scout – a do-it-yourself security system for homes

Garageio – smart garage door monitor and opener

Mojio – a connected-car tracking and monitoring system

Amazon will Participate in Multiple IoT Areas

- Connected Home and office
  - Dash buttons, Alexa, replenishment services and partner programs
- Medical:
  - Gmate Smart Glucose Meter - Dash button to reorder test strips
- Transportation, shipping, logistics:
  - Beijing Century Joyo Courier Services- Chinese shipping company
  - Leasing 20 Boeing 767 jets to deliver packages
  - Utilize USPS for Sunday delivery
- Connected Car:
  - Ford Synch- Alexa integration
  - Garageio- Home –Car integration
- Industrial Internet (IIoT):
  - Kiva robotics for warehouse automation – factory floor?

- Alexa can take Amazon into almost any segment with Voice recognition, AI and ecommerce fulfillment behind it

Amazon is Eating the Entire Supply Chain
- Conquering the Last Mile of Home Delivery

- Connected home/office - Dash buttons or Alexa can recommend and order anything you need
- Orders flow through Amazon commerce servers…
    - Powered by their AWS servers (and chips designed in Lab 126?)
- With many delivery options: Prime, Fresh, Pantry, Now…
- Utilizing Amazon logistics and delivery vehicles…
    - Fleet of 20 Boeing 767s to skim high volume shipments
    - Leverage FedEx, UPS logistics and even USPS for Sunday Delivery
- Distributed from Amazon's highly automated warehouses
    - using Amazon's 30K Kiva robots and inventory optimization
- Replenished by ships coming from China to US…
    - Beijing Century Joyo Courier Services- Chinese shipping subsidiary
- Offering Amazon's private label items

GREY HERON

Amazon in Your 'Hood'

Amazon's Footprint Increasingly Closing in on Population
% of Population within 20 Miles of an Amazon Fulfillment Network Node
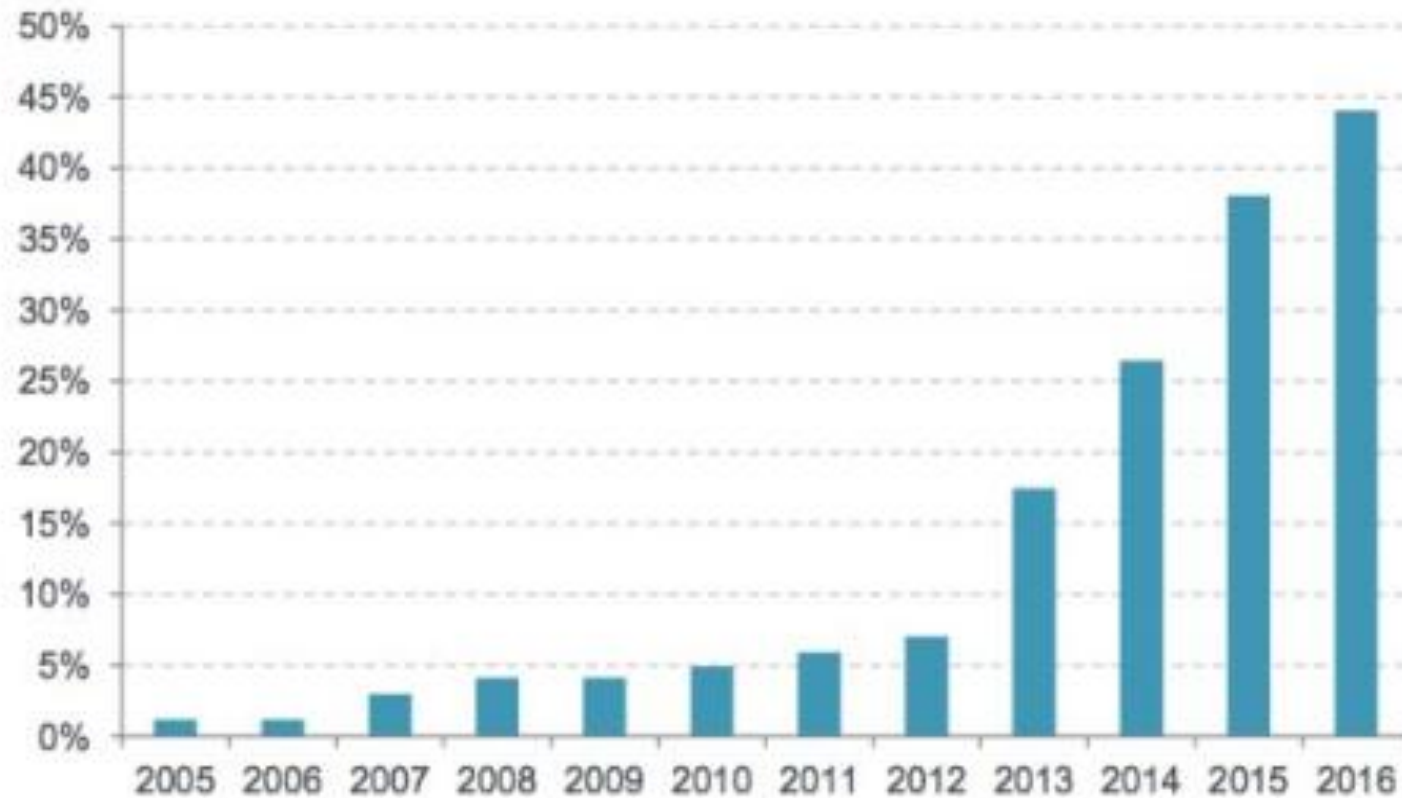
Source: Piper Jaffray, company filings, MWPL, Facebook, Twitter, various news sources, US Census Bureau

Taking Distribution to a Whole New Level?

Source: Lucas Films

GREY HERON

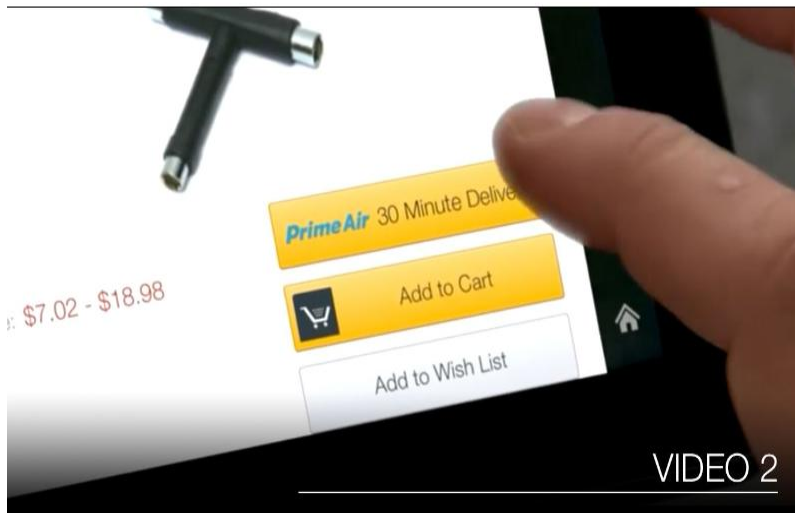# What if You Had a Blimp for a Warehouse?
- floating over major metropolitan areas

… With Drones that Delivered Packages Everywhere…

Photo sourced from Audi TV ad

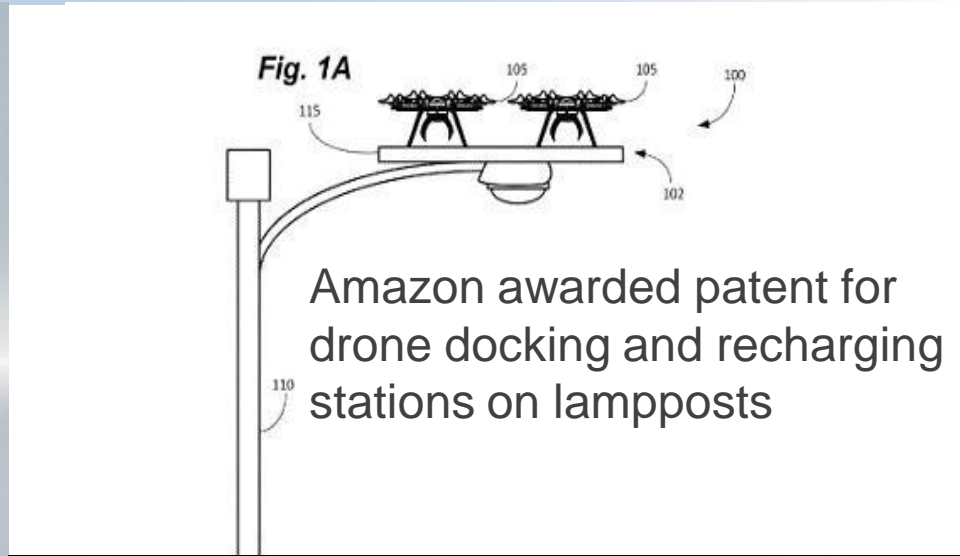# …Delivering Small Items to Your Door in Minutes

VIDEO 2

Abstract

Described is an airborne fulfillment center ("AFC") and the use of unmanned aerial vehicles ("UAV") to deliver items from the AFC to users. For example, the AFC may be an <u>airship that remains at a high altitude (e.g., 45,000 feet) and UAVs with ordered items may be deployed from the AFC to deliver ordered items to user designated delivery locations</u>. As the UAVs descend, they can navigate horizontally toward a user specified delivery location using little to no power, other than to stabilize the UAV and/or guide the direction of descent. Shuttles (smaller airships) may be used to replenish the AFC with inventory, UAVs, supplies, fuel, etc. Likewise, the shuttles may be utilized to transport workers to and from the AFC.

Amazon, Mercedes and Partners Addressing the Last Mile Delivery Challenge

Fig. 1A

Amazon awarded patent for drone docking and recharging stations on lampposts

Mercedes working with Mattermark And Starship Technologies on drone And robot delivery vans

Vans & Robots
powered by Mercedes-Benz Vans STARSHIP

A Few Amazon Numbers to Put Things in Perspective

- 50-60M Prime subscribers paying $99 per year ~$5B
- ~ 40% penetration of 124.6M US households in 2015
- Average spend by prime members is $1100 vs $600 for others
- Amazon Market Places sells $100B + of other companies products
- AWS Cloud revenues > $10 billion annually
    - bigger than Google and Microsoft – AWS is one of the largest IT cos.
- 30K robots in Amazon Warehouses
- Amazon shipping costs are between 5-10% of revenues
- More than $1T is spent annually in international freight market in order to ship $19 trillion dollars of goods WW
- Amazon 'could' earn $400 billion year in the global logistics mkt.
    - Robert W. Baird & Co.

Amazon is in 'Cat Birds Seat' to Monetize Big Data

- Other companies can monetize collected data with improved products, alternate pricing, special coupons, referral fees, targeted ads, etc.

- But, Amazon is in a unique position to monetize data by identifying customer needs and then selling new products and delivering them directly to customers through a highly optimized supply chain they control

- Amazon is weaving itself into the fabric of our everyday lives

7 Things Amazon is Likely to Focus on in the Future
- and ideas you can use to accelerate your monetization

1. Deliver low-cost, good-value, easy-to-use, scalable offerings

2. Build on core expertise - leverage Amazon's stack

3. Create a platform/ecosystem that enables partnerships that can be further monetized

4. Keep things simple, technically and business model wise

5. Pursue self-service platforms (Mkt.Place, AWS, Alexa) and markets where Amazon can lever economies of scale

6. Take market share in short term, even at expense of profits

7. Seek out inefficiencies - optimize the 'heck' out of everything

GREY HERON

A Few Parting Words of Advice
- It's all about partnering, ecosystems and monetization

- Align with customer value

- Play in the right ecosystems: - partner, partner, partner

- Focus on business model innovation - not just product

- Define your monetization strategy -not just technology vision

If you are a:

- Big Company – Partner and look for opps. in adjacent markets

- Small Company – Decide how and with whom to partner

- Device company – Can you sell a service or pay-per-use?

- Software company – Partner with companies where you can add value – stay focused

Thank you!

Chris Kocher
To discuss your Monetization or IoT strategy contact:
kocher@greyheron.com
www.greyheron.com

Related articles on IoT, Monetization and Amazon
Why Nest is down and Amazon up in the IoT ConnectedHome
Monetizing IoT: Show me the Money

GREY HERON

Back Up Slides

GREY HERON

Key IoT Monetization Issues

Security and Privacy – an increasing threat

- More devices, more distributed, more valuable data - offers new routes for malware to penetrate systems, expose valuable IP…

Big Data, streaming off IoT - a huge monetization opportunity

- Real time data collection and management to enable new subscription, recurring revenue, per-use and other monetization models

Flexible, scalable products and biz models – a must

- Advanced capabilities to easily scale, provision, update and manage software and devices through remote feature enablement

Integration with existing ecosystems for 'whole solutions'

- Back office integration of IoT implementations with ordering, provisioning, billing and support infrastructures

Big Data Just Got a Lot Bigger
- merging operations technology (OT) with IT

Data 'richness' = better insights = more value creation

- <u>Granularity</u>
- <u>Time-based</u>: second, minute, hour…
- <u>Types</u> of data
    - Location, temperature, acceleration, biometric…
- <u>Formats</u> of data<u>:</u>
    - Numeric, text, images, video
- <u>Shared </u>– not locked into proprietary silos
- <u>Accessible </u>via dashboards, BI, apps, etc.
- <u>Enriched </u>with proprietary and 3rd party data:
    - CRM, demographic, credit history, claims processing, accident, government…

GREY HERON
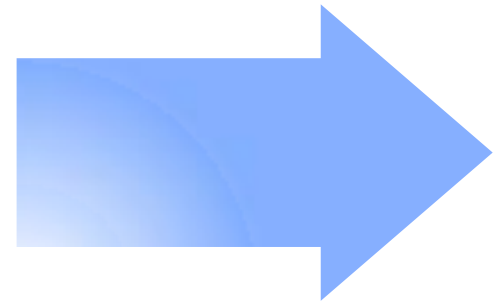
…And Provides New Opportunities

More customer engagement, new biz models and revenues

- Provide <u>greater value</u> for customers
  - increase engagement, loyalty and monetization
- Identify <u>new customer segments</u>
  - e.g. sharing economy millennials, Air BnB renters…
- Create <u>new product /service</u> offerings
  - e.g. new policy types, new combinations
- Move into <u>adjacent markets</u>
  - leverage ecosystem partners to enter new markets
- Price differently to <u>increase margins</u>/capture <u>market share</u>
  - e.g. usage based pricing, pay-per-use, per hour, per API call…

GREY HERON

Link Monetization to Customer Value and Usage

Cost Reduction

- Reduce costs
- Streamline operations
- Improve efficiency
- Shorten cycle times
- Minimize downtime
- Improve safety
- Shorten supply chain
- Reduce inventory costs
- Raise service levels for same cost
- Eliminate wasted time, resources
- Reduce labor costs
- Remove 'friction'
- Reengineer operations
- Reduce customer acquisition costs (CAC)

Revenue Enhancement

- Better satisfy customers needs
- Improve brand image/loyalty
- Sell more of existing products
- Sell new products/services
- Increase 'stickiness'
- Reduce churn – Increase LTV
- Create new business models
- Reach new markets
- Be more competitive
- Incent referrals
- Price differently
- Increase margins
- Find new revenue streams

How Big Is the IoT Monetization Opportunity?

CISCO

30-50
Billion

Devices by 2020

GE

$10-15
Trillion

Global GDP productivity
gains over next 20 years

Gartner

$309
Billion

Additional supplier
revenues by 2020

IDC

$7.1
Trillion

Market for IoT
Solutions in 2020

CISCO

6.6
Sensors

Per Person by 2020

McKinsey

$4-11
Trillion

Global IoT market
by 2025

Gartner

$1.9
Trillion

Cost savings and
improved productivity

GSMA

$2.5
Trillion

IoT Value in 2020

Chris Kocher