IoT: Here or Hype?

Steve Eglash

Executive Director, Secure Internet of Things Project

Technology Adoption and Market Growth

ooze or avalanche

Some IoT Applications

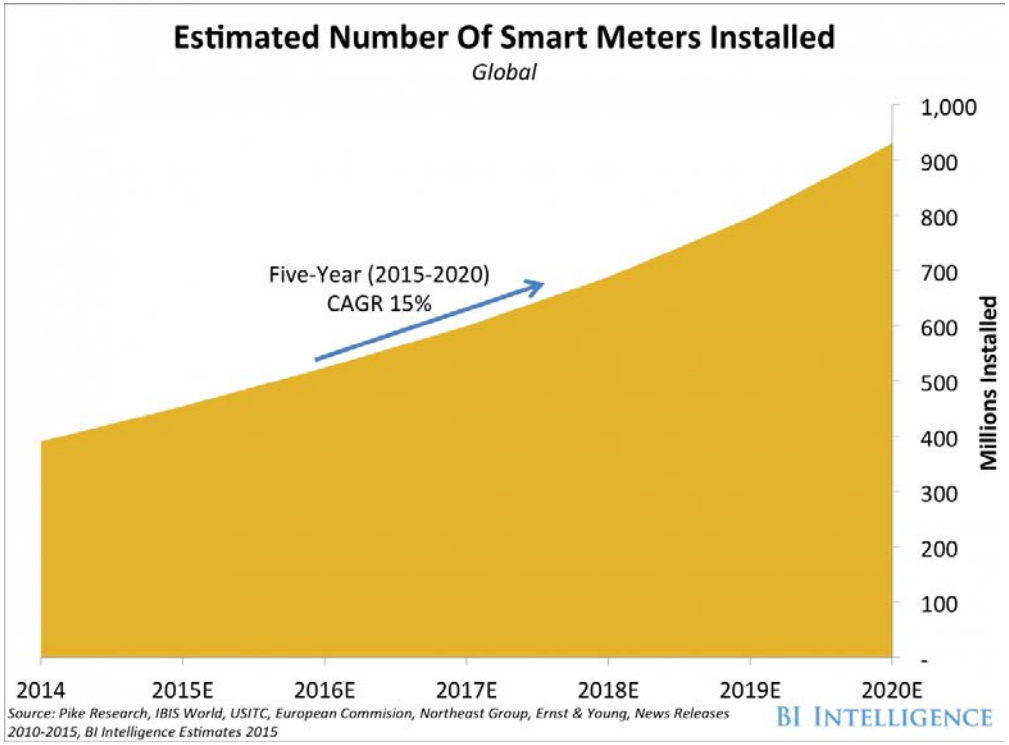
Asset tracking	Automotive & transportation
Environmental monitoring	Facilities management
Healthcare	Home appliance & smart home
Insurance	Inventory
Oil and gas exploration & production	Smart grid

Some IoT Tools

Analytics	Connectivity
Security	User interfaces (h/w and s/w)

Utilities Example: Smart Meters

- Global installed base of 450 million in 2015 increasing to 930 million in 2020
- Manage energy flow into buildings
- Data for smart water management



Smart City San Diego

- Public-private collaboration including City of San Diego, San Diego Gas & Electric, General Electric, the University of California San Diego, and CleanTech San Diego
  - Network of 3200 smart sensors to direct drivers to open parking spaces, help first responders during emergencies, track carbon emissions, and identify intersections that can be improved for pedestrians and cyclists
  - LED street lights with adaptive controls
  - Solar-to-EV to charge plug-in EVs, store solar power, and provide renewable energy

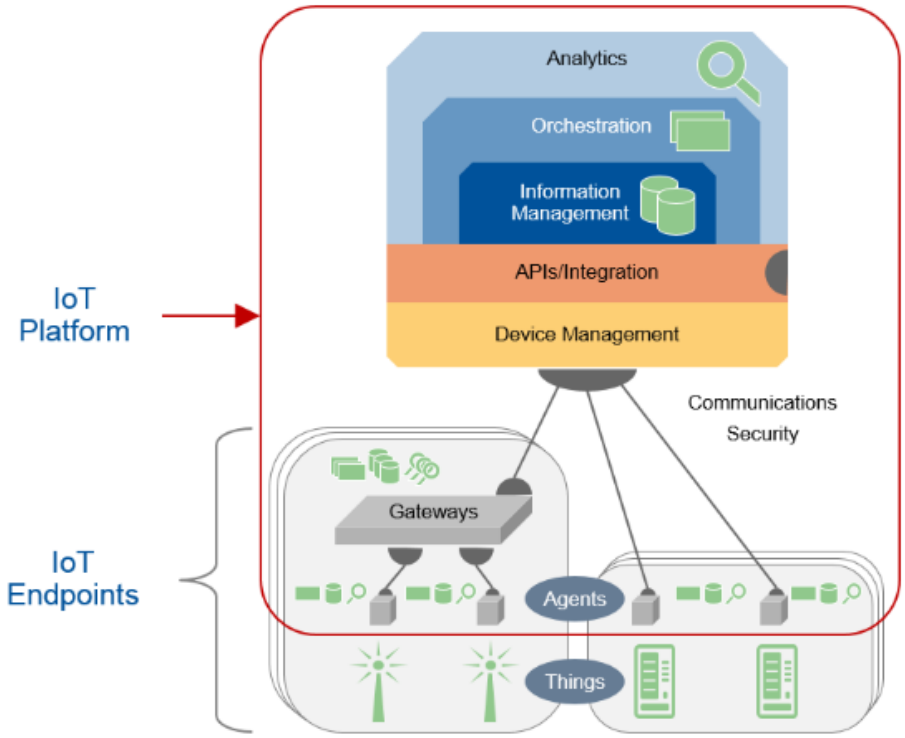
Insurance Example: 1concern

- Artificial intelligence for emergency response
  - Crises and disasters like earthquakes and floods
  - Hazard mitigation and preparedness
  - Real-time response and recovery
- Models enable smarter infrastructure investments
- IoT plus models enable smarter disaster response
- Customers include cities of San Francisco and Los Angeles
- Startup company, CEO & Co-Founder is Stanford Engineering grad Ahmad Wani

Healthcare Example: VALIDIC

- Cloud health data platform for data access, integration, standardization, and storage
- Activity, biometrics, dashboards, adherence, lab tests
- Data partners

The Rise of IoT Platform Companies



IoT Endpoints = Things +

= Optional IoT Localized Device/Data Management, Apps/Analytics, Communications, Security, UX

= APIs

SOURCE: GARTNER (JULY 2016)

Some IoT Companies – End User

Apple	iPhone
Ford	Connected cars
Johnson Controls / Tyco	Smart equipment
Nest	Thermostat, camera, smoke + CO alarm
Samsung	Smart phone, smart home, Artik cloud

Some IoT Companies – Platform and Enabling Technology (1 of 2)

ARM	mbed Cloud IoT device platform
Cisco	Connectivity, data analytics, security
GE	Industrial internet: predictive maintenance, smart manufacturing, cyber security, control
Google	Google Cloud IoT Core: collect, process, analyze, and visualize IoT data
IBM	Watson
Intel	Connected things and the cloud: autonomous vehicles, industrial, retail
MediaTek	Chipsets

Some IoT Companies – Platform and Enabling Technology (2 of 2)

Microsoft	Connected factory, remote monitoring, predictive maintenance, connected field service, connected vehicle, smart buildings
Rockwell Automation	Industrial power, control, and information systems
SecureRF	IoT security
Symantec	Embedded security
Verizon	IoT, M2M, and mobile
VMware	IoT infrastructure management
Vodafone	Platform and applications

IoT and Analytics

- IoT applications require data analytics
  - Real-time analysis, trends, anomalies
  - Machine learning algorithms with domain knowledge
  - Combine time-series data with unstructured or semi-structured data (proprietary or public)

New Products, Services, and Business Models

- Evolutionary versus revolutionary
- Example: Smart infrastructure and smart vehicles
  - V2V and V2I communications
  - Road hazards, traffic flow
  - What is enabled?

Discussion

- Has IoT arrived or is it still primarily in the future?
- Is the distinction between companies serving end-users directly and companies offering platforms or enabling technologies meaningful?
- What are other IoT applications?
- What are other IoT tools?