

Internet of Things

Shaping Our World

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CET

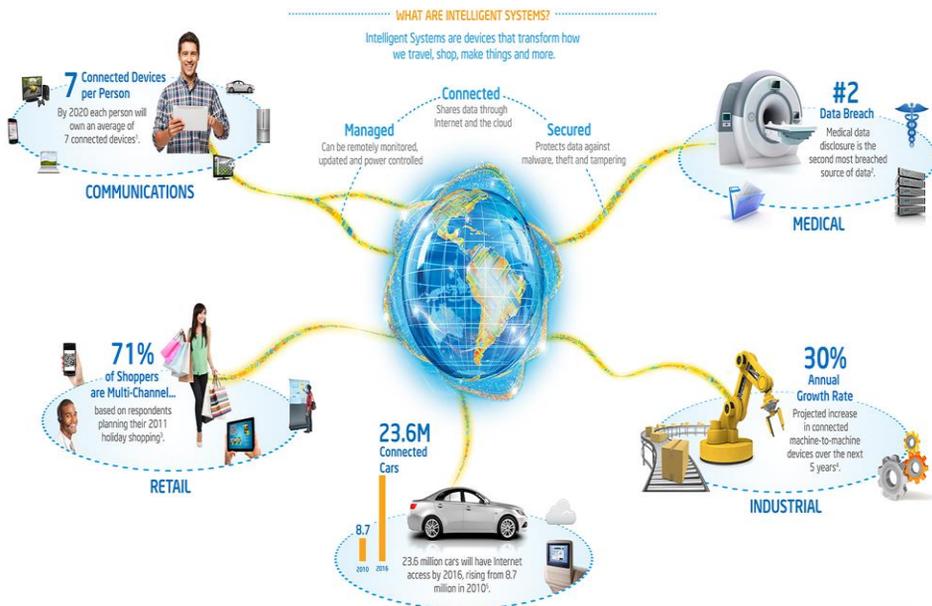
Center for Entrepreneurship & Technology



BROWN

School of Engineering

Intelligent Systems for a More Connected World



Explosion of Connected Objects



50 Billion connected devices by 2020

Enterprise Europe Network 'Internet of Things' matchmaking event

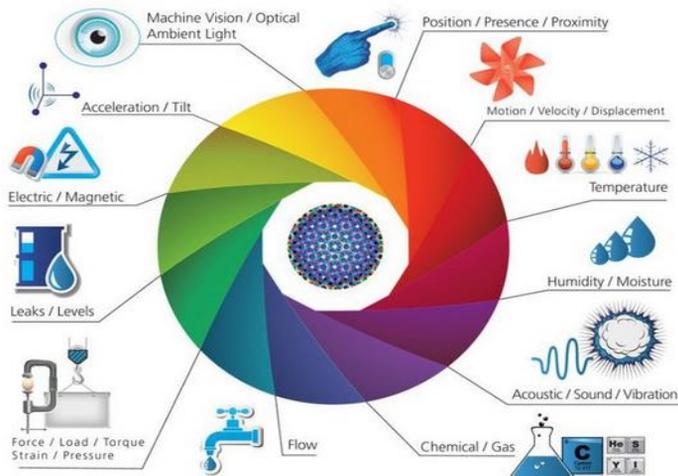
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1 SENSORS & ACTUATORS **2 CONNECTIVITY** **3 PEOPLE & PROCESSES**

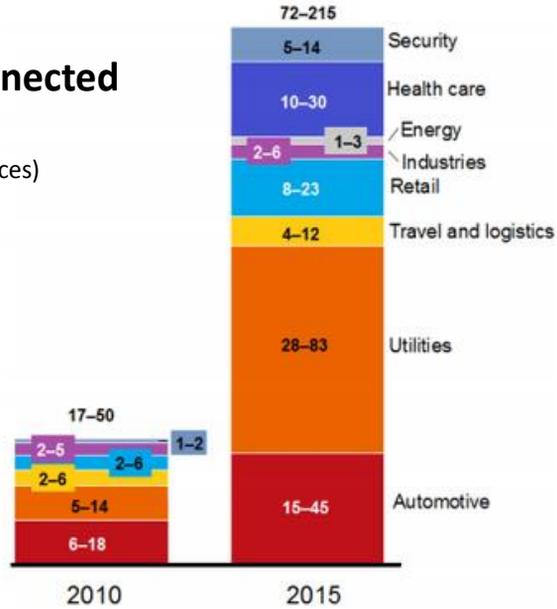
1 SENSORS & ACTUATORS

We are giving our world a digital nervous system. Location data using GPS sensors. Eyes and ears using cameras and microphones, along with sensory organs that can measure everything from temperature to pressure changes.



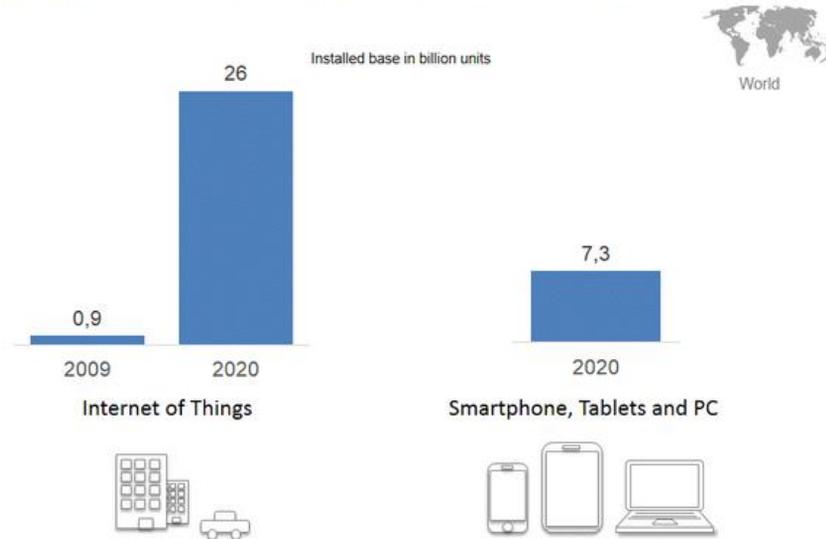
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Growth in Connected Devices (millions of devices)



Source: McKinsey & Co.

Internet of Things installed base will be almost 4 times bigger than combined number of Smartphone, Tablets and PC



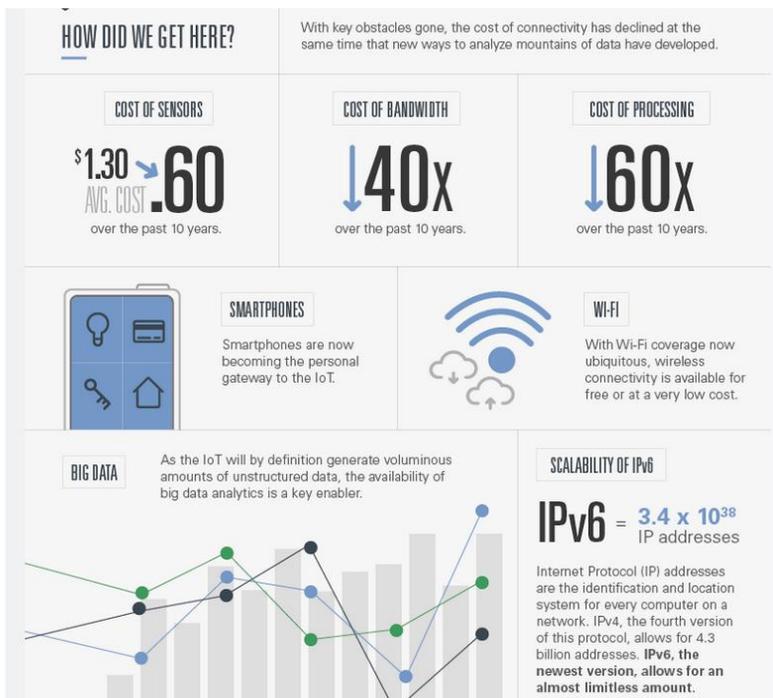
Insightfulcharts.com

Source : Gartner November 2013

But Why?

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Use Cases

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Smart Alarm → Talks to Your Calendar



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Platforms: Horizontal Play

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Wearable Platform



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Industrial Use Cases



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Start Home Platform



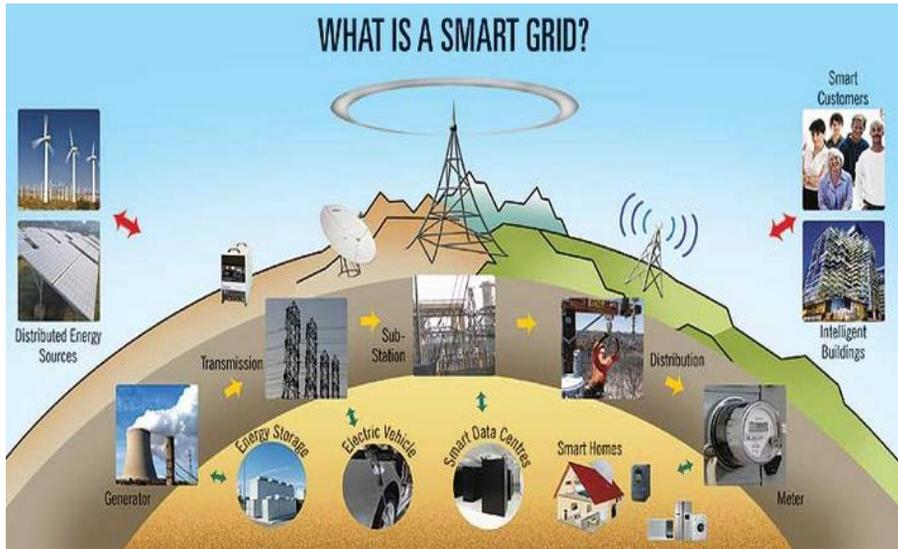
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Vertical Play: End-to-End Solutions

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Smart Cities

- Parking is third highest revenue generator for cities
- Cities losing ~40% of possible parking revenue
- Smart parking, provide an estimated a 20% to 30% increase in parking revenue

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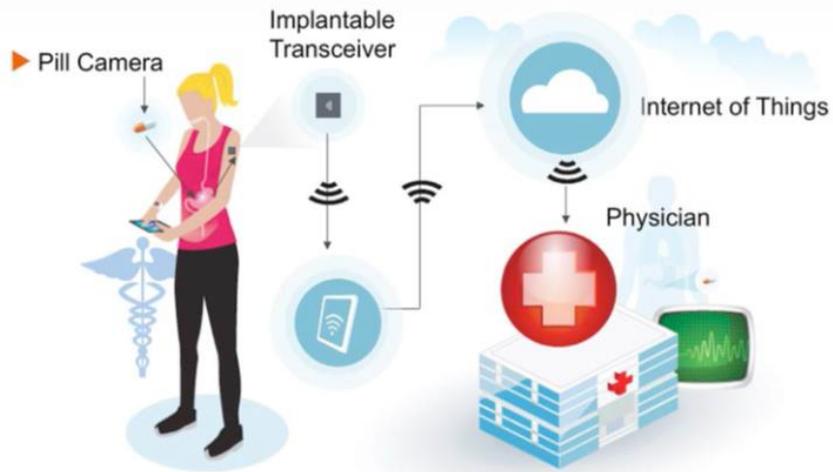
- 300m parking events completed since 2010



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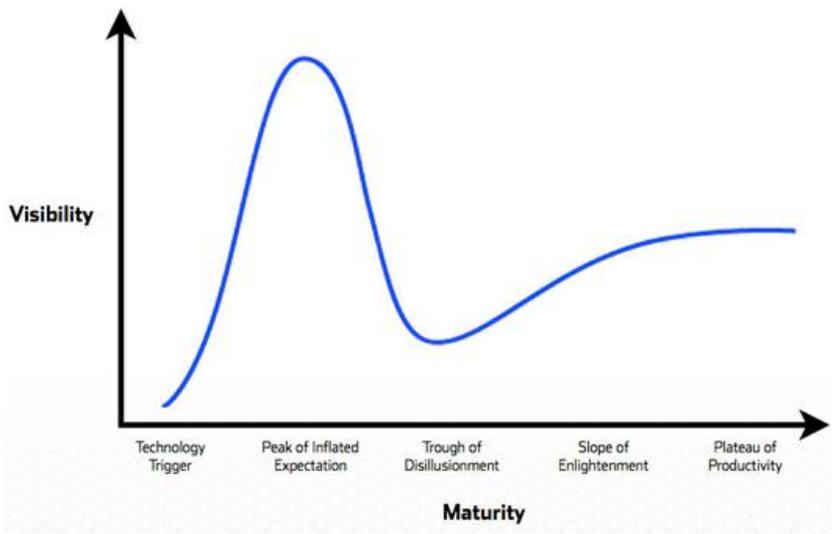
Personal Health



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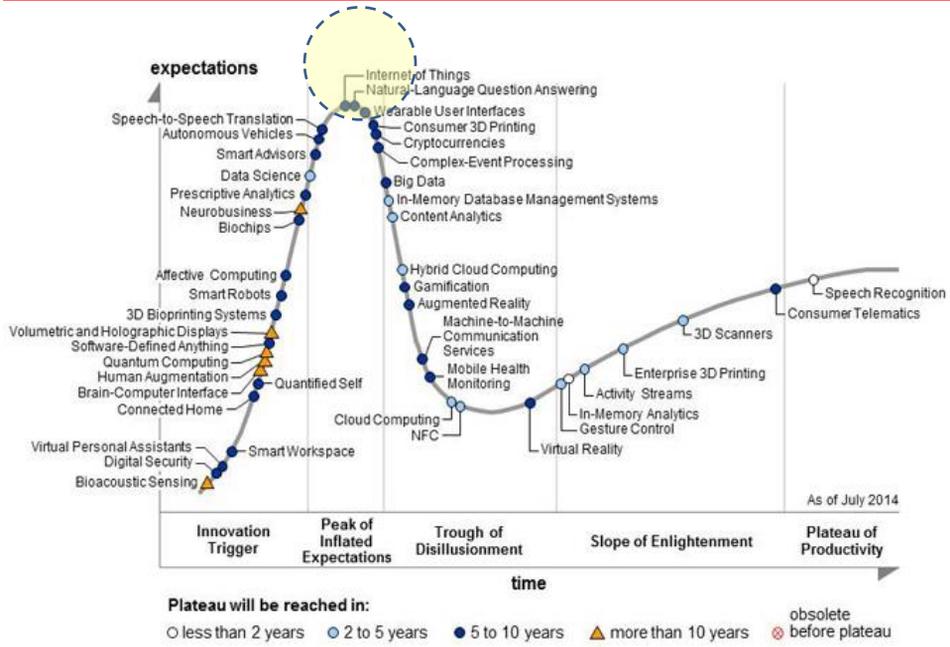
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Gartner hype cycle.



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Two Insights for IoT Market



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User Interfaces Get in the Way



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Best User Interface is **No** User Interface



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**Scheduled Events Can Be Event
Driven → Huge Savings**

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Why Do We Collect Garbage Every Week?



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Smart Farming





Smart Building Management

An IoT Based Solution for Saving Energy, Water & Maintenance of Critical Systems

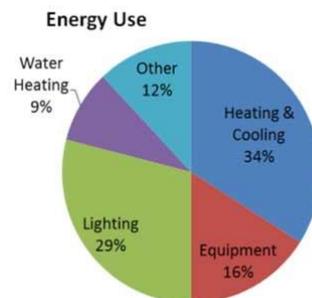


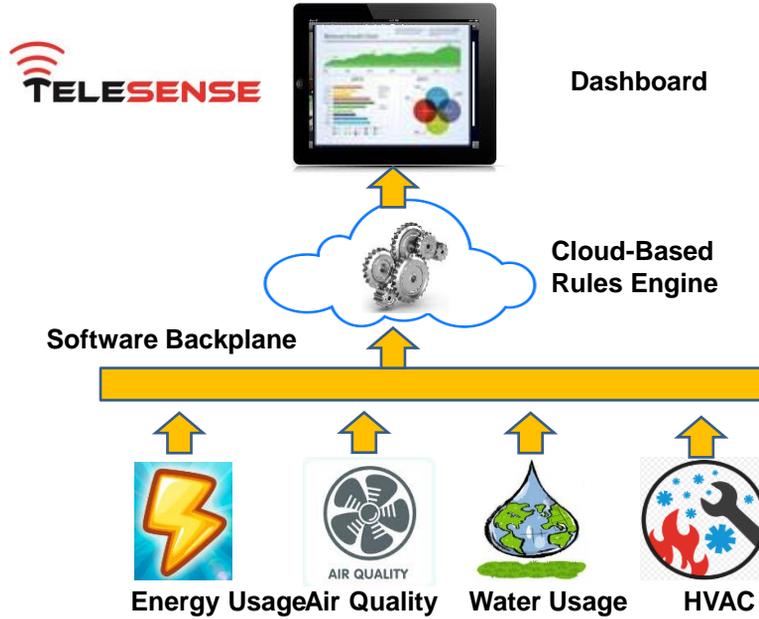
Automation Systems Without Behavioral Sensing Waste Energy

Behavioral Sensing is machine learning of how building is being used

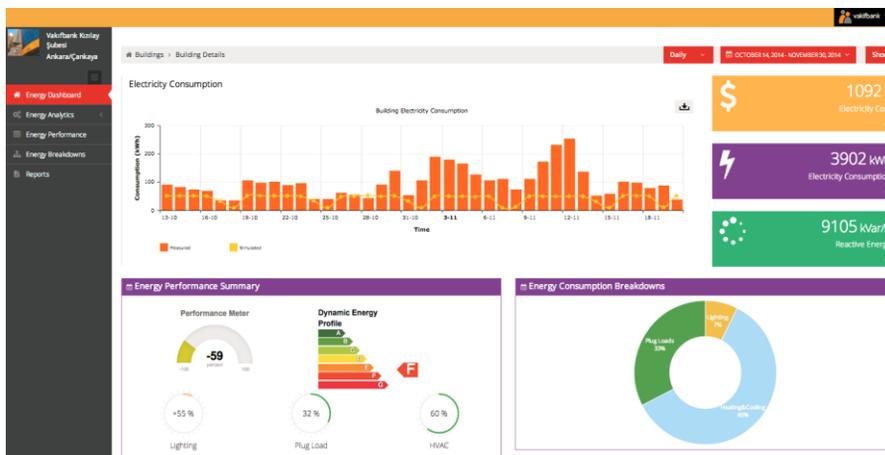
Continuous monitoring of temperature, air quality, occupation level & dynamic energy pricing

Benefit: **Up to 30% savings**

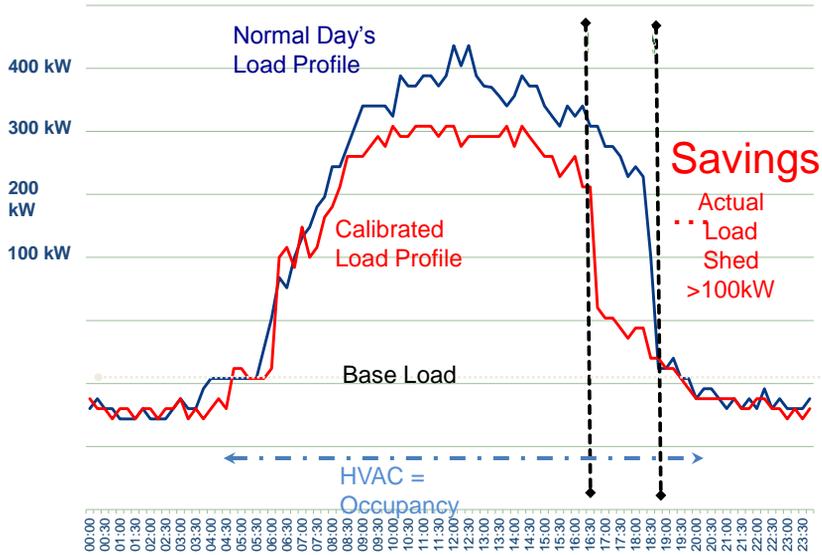




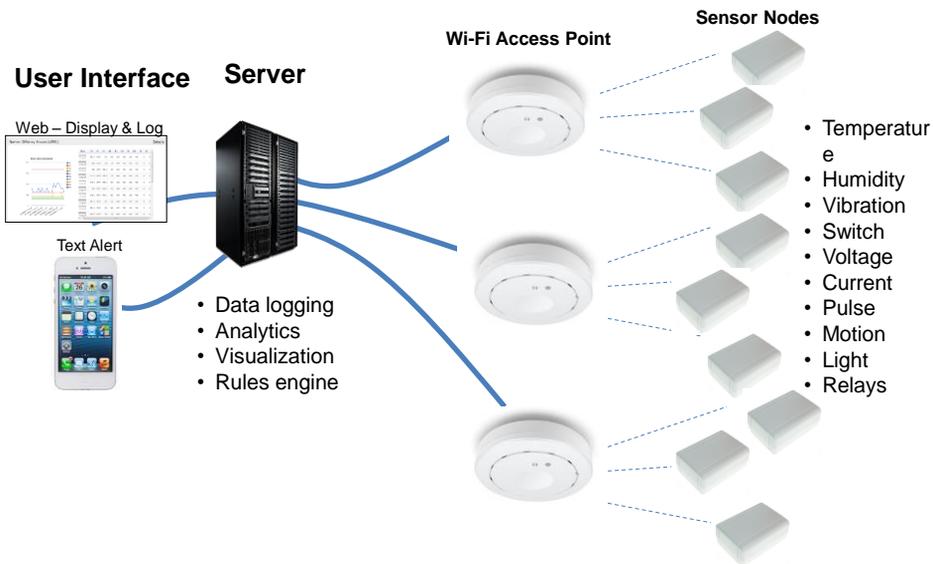
Dashboard for Energy Monitoring



Anticipating Energy Usage with Smart Sensors



System Architecture



Monitoring Machine Failure



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Industrial Safety



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Complexity & Safety & Savings



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