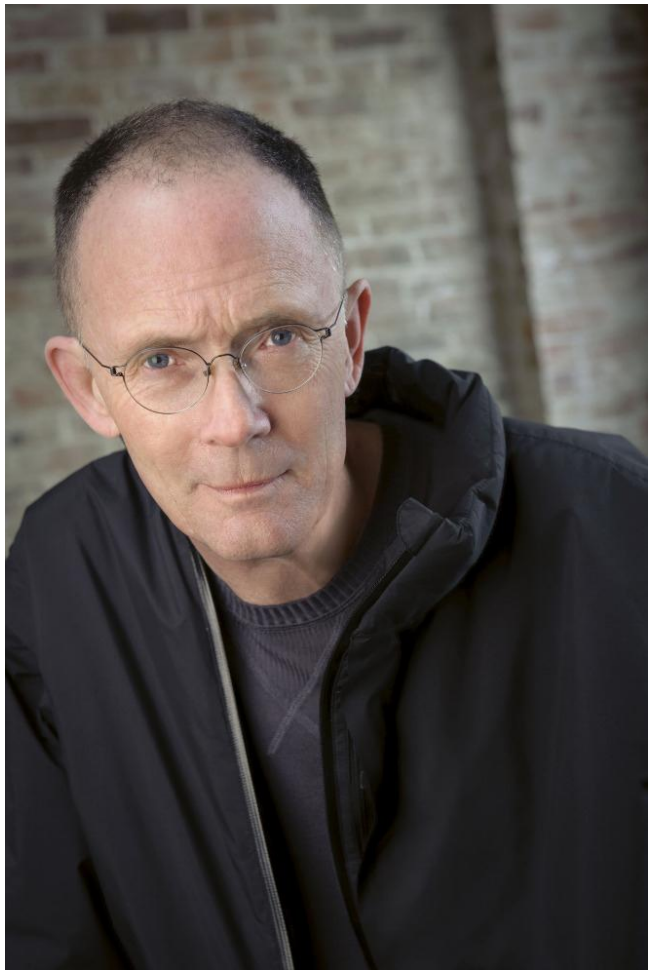
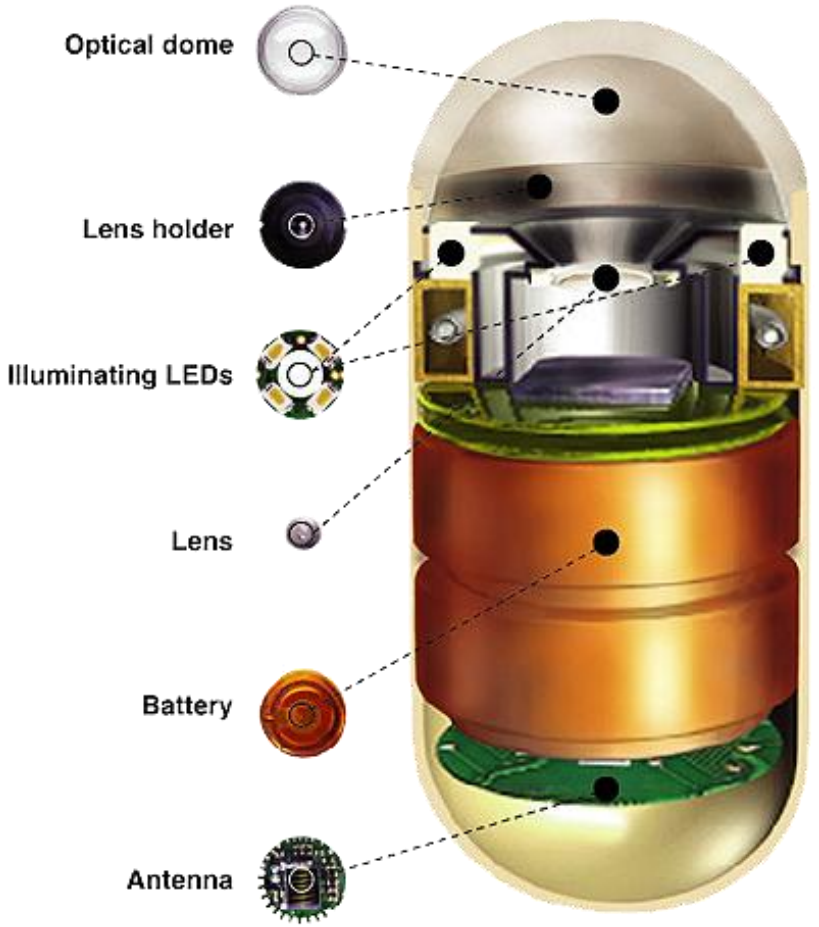
The Internet of Things and Big Data: Opportunities for Value Creation

February 21, 2013

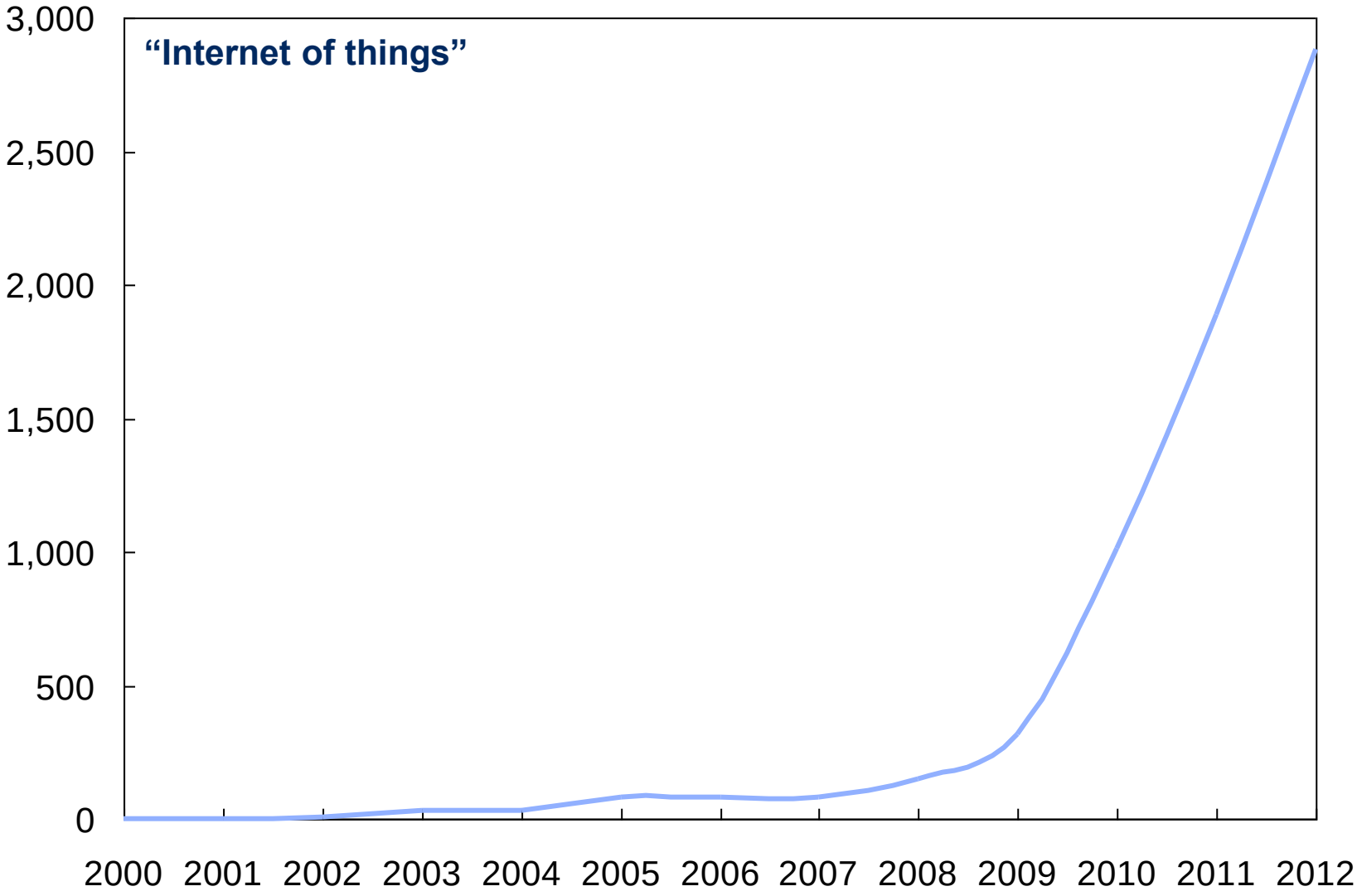
“The future is already here – it’s just not very evenly distributed.”



- William Gibson


Optical dome
Lens holder
Illuminating LEDs
Lens
Battery
Antenna

Press mentions



SOURCE: Literature search

Explore trends

Hot searches

Search terms

"Internet of thi

+ Add term

Other comparisons

Limit to

Web Search

Worldwide

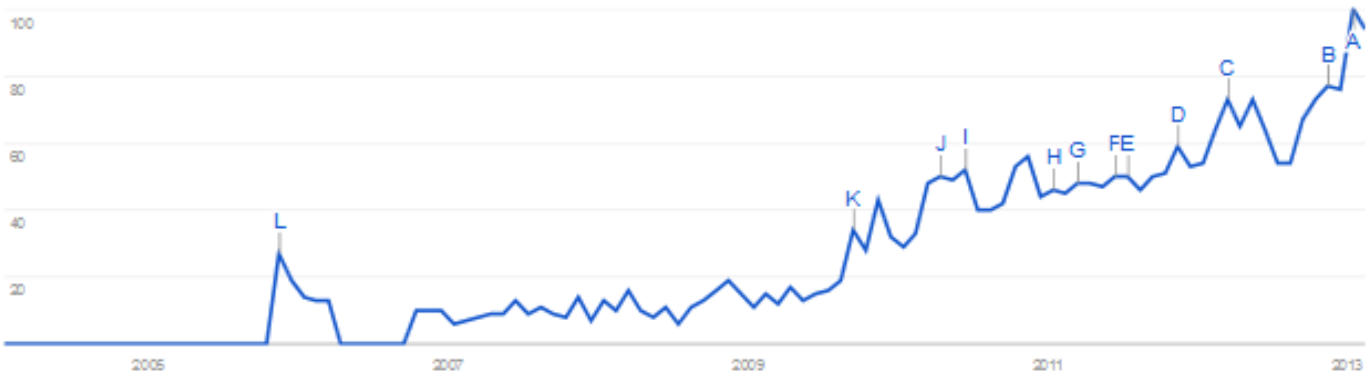
2004 - present

All Categories

Interest over time

The number 100 represents the peak search volume

News headlines Forecast



Embed

Regional interest

Related terms

Top Rising

iot	100
物联网	65
web of things	50
network of things	50

Xinhua 中国新闻

"*This concept [of Internet of Things] first came to my mind when I talked with a group of young researchers who returned to China after their overseas studies*," Wen said, referring to those he met during his inspection tour to east China's Jiangsu Province in November.

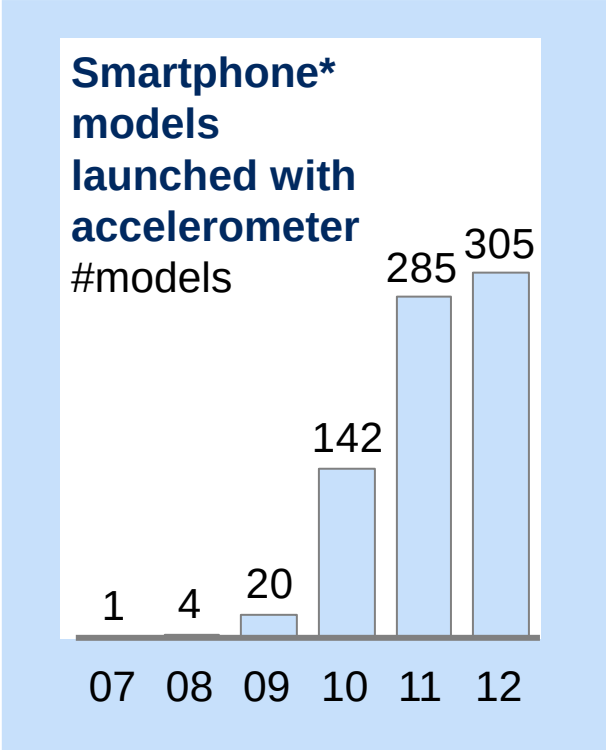
"*I learned Internet of Things is a network that can be applied to infrastructure and services. The program will have a rosy prospect*," Wen said...

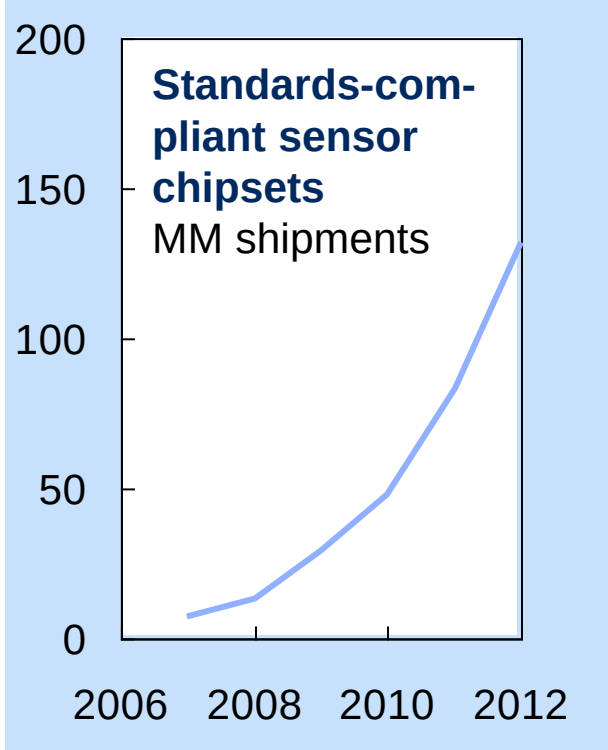
Internet of Things was one example Premier Wen cited while outlining the country's initiatives to foster new growth areas, especially in emerging strategic industries."

- Chinese Premier Wen Jiabao

Sensors are integrated into more physical devices:

- Improved power management
- Miniaturization
- Reduced costs
- Location-based awareness



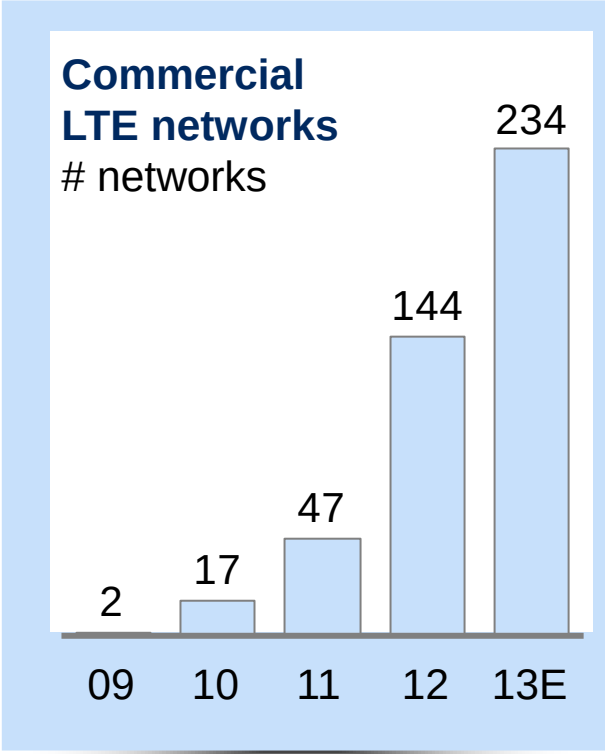


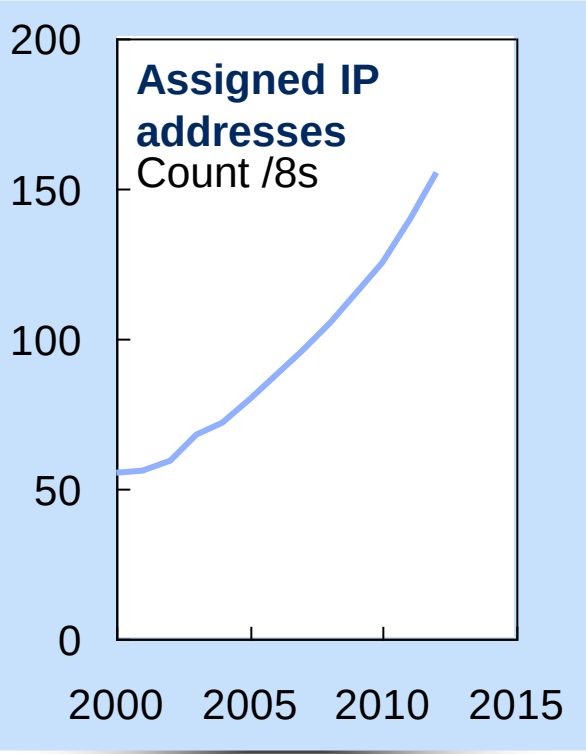
Sensors in everything

SOURCE: Strategy Analytics, 2011, 2013; On World, Yankee Group,

Networks are becoming pervasive, driven in particular by advances in wireless technologies, including:

- Increasing band-width capabilities
- Open standards
- Reduced costs



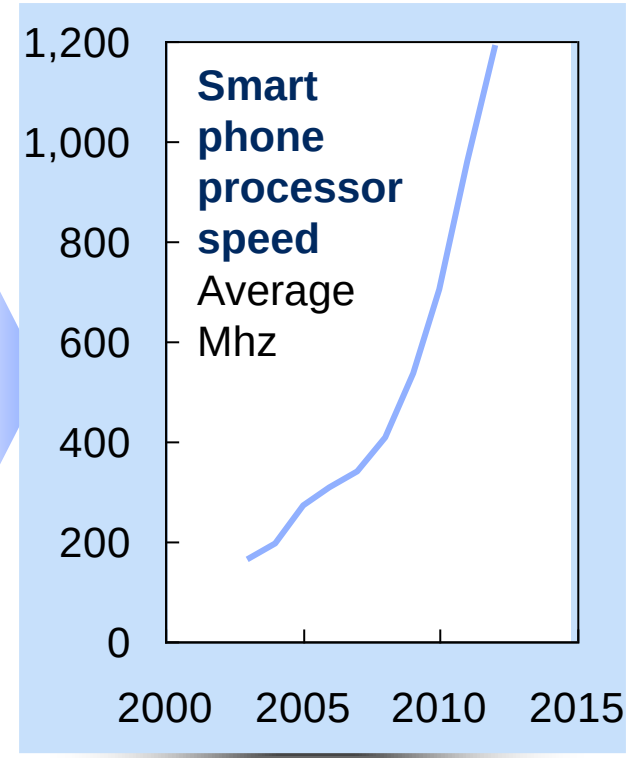


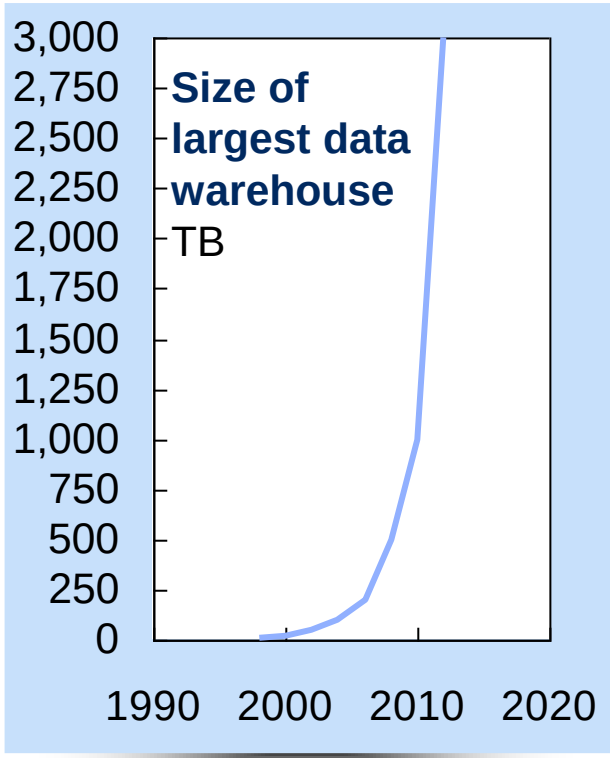
Networks everywhere

SOURCE: APNIC; GSMA

Systems have greater flexibility/intelligence for data processing and increasing autonomy, driven by:

- Increased computational power, memory, and storage
- Remote programmability
- Probabilistic decision making

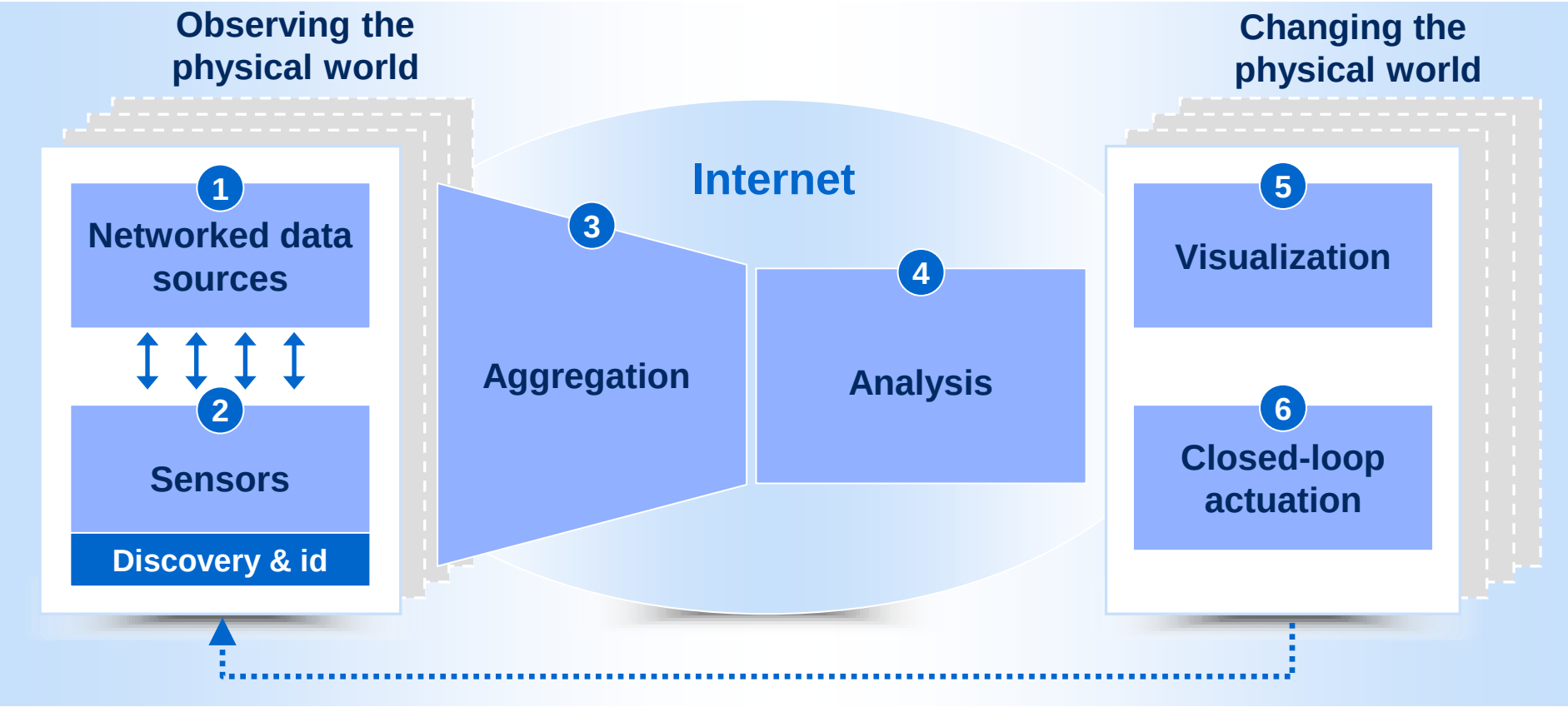




Analyze everything

SOURCE: Press clippings; Guinness World Records; Strategy Analytics, 2013

“Internet of Things” high-level architecture



6 categories illustrate the breadth of potential IoT applications

Information & analysis

Category		Description
A	**Tracking behavior**	Monitoring the behavior of persons, things or data through space and time
B	**Enhanced situational awareness**	Achieving real-time awareness of physical environment
C	**Sensor-driven decision analytics**	Assisting human decision-making through deep analysis and data visualization

Automation & control

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Automation & control	D	Process optimization	Automated control of closed (self-contained) systems
	E	Optimized resource consumption	Control consumption behavior to optimize resource use across a network
	F	Complex autonomous systems	Automated control in open environments with great uncertainty


Google
self-driving car

The Internet of Things can create value through several economic levers

Enable new ways of doing business

Enhance & optimize today's operations

Levers

Allow new customer interactions with opportunities to engage end-users on a dynamic, ongoing basis

Create new dynamic pricing models for inputs and outputs

Create new service models and products to monetize information assets

Improve quality of delivered products and services

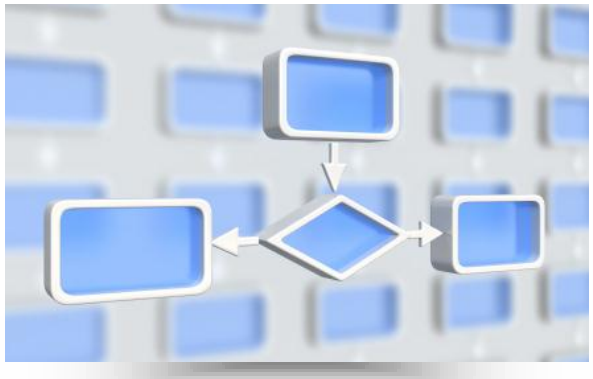
Increase efficiency and reduce costs of energy, materials, capital, and labor

Improve safety for consumers and workers

Continuing challenges for Internet of Things

Technology challenges

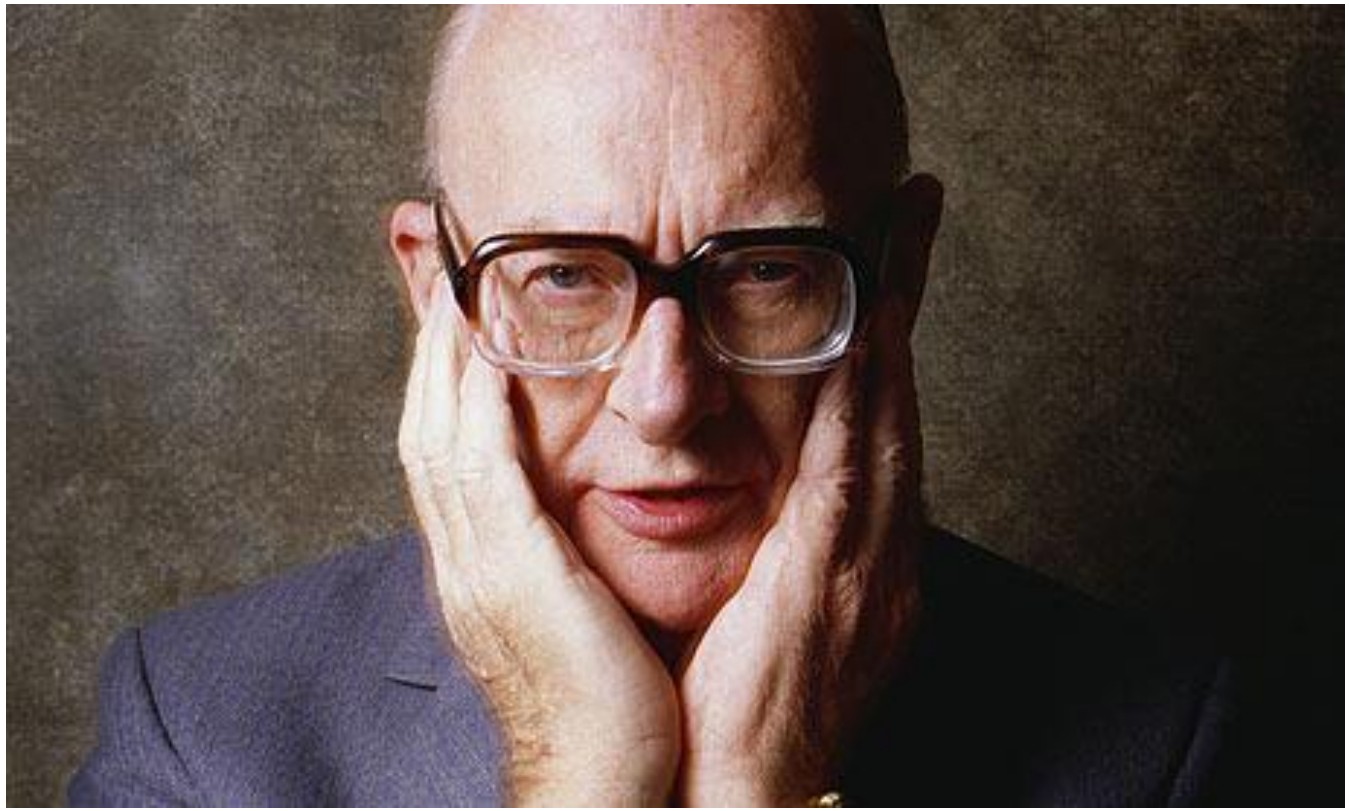
- Cost and capability of sensors and actuators
- Reliability for critical networks
- Technical standards for open networks
- Software for massive data analytics in real-time
- Visualization technology



Policy and organizational challenges

- Data privacy
- Data security
- Legal liability
- Organizational implications (e.g., role of IT function)

“Any sufficiently advanced technology is indistinguishable from magic.”



- Arthur C. Clarke