北京邮电大学

BEIJING UNIVERSITY OF
POSTS AND TELECOMMUNICATIONS

STATE KEY LABORATORY OF
NETWORKING AND SWITCHING TECHNOLOGY

Mobile Internet

(Present and Trend of Mobile Internet
/**Internet of Things**)

Xu Peng

BUPT
State Key Lab. Of
Networking and Switching Technology

Contents

- Arise of IOT (Internet of Things)
- Three Essential Factors of IOT
  - Business Model
  - Leading Applications
  - Technologies

Arise of IOT

- In 1999, Auto-ID Center of MIT brought forward the concept of IOT at first
  the items an identity using
  Internet and manage them intelligently

Identification

- In 2005, ITU published "ITU Internet Report 2005: IOT". In this report, it is described that every thing could exchange informati
  era of IOT is coming.

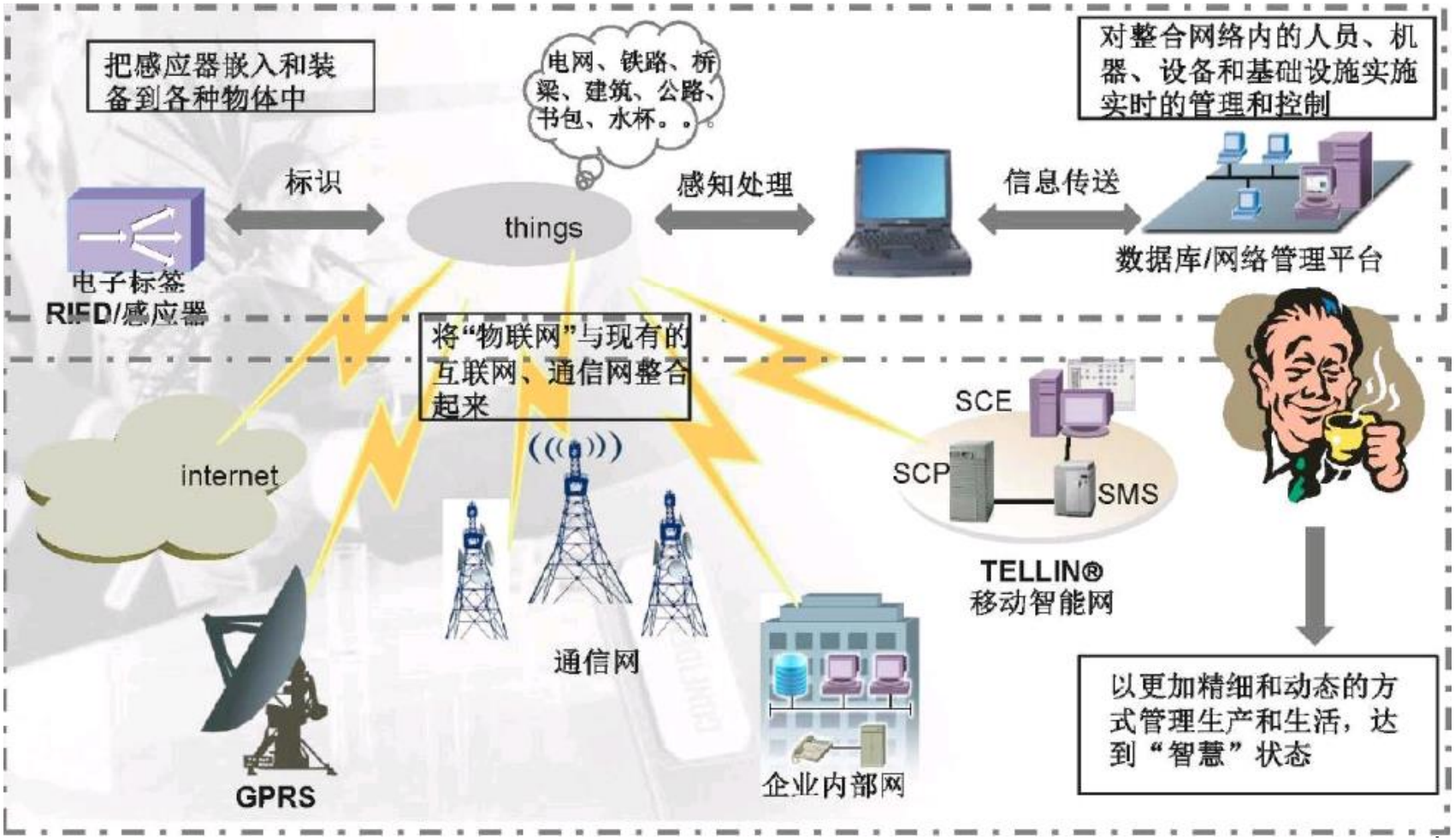
Communication

- In 2008, IBM proposed the concept of "Smarter Planet"

Smart Services

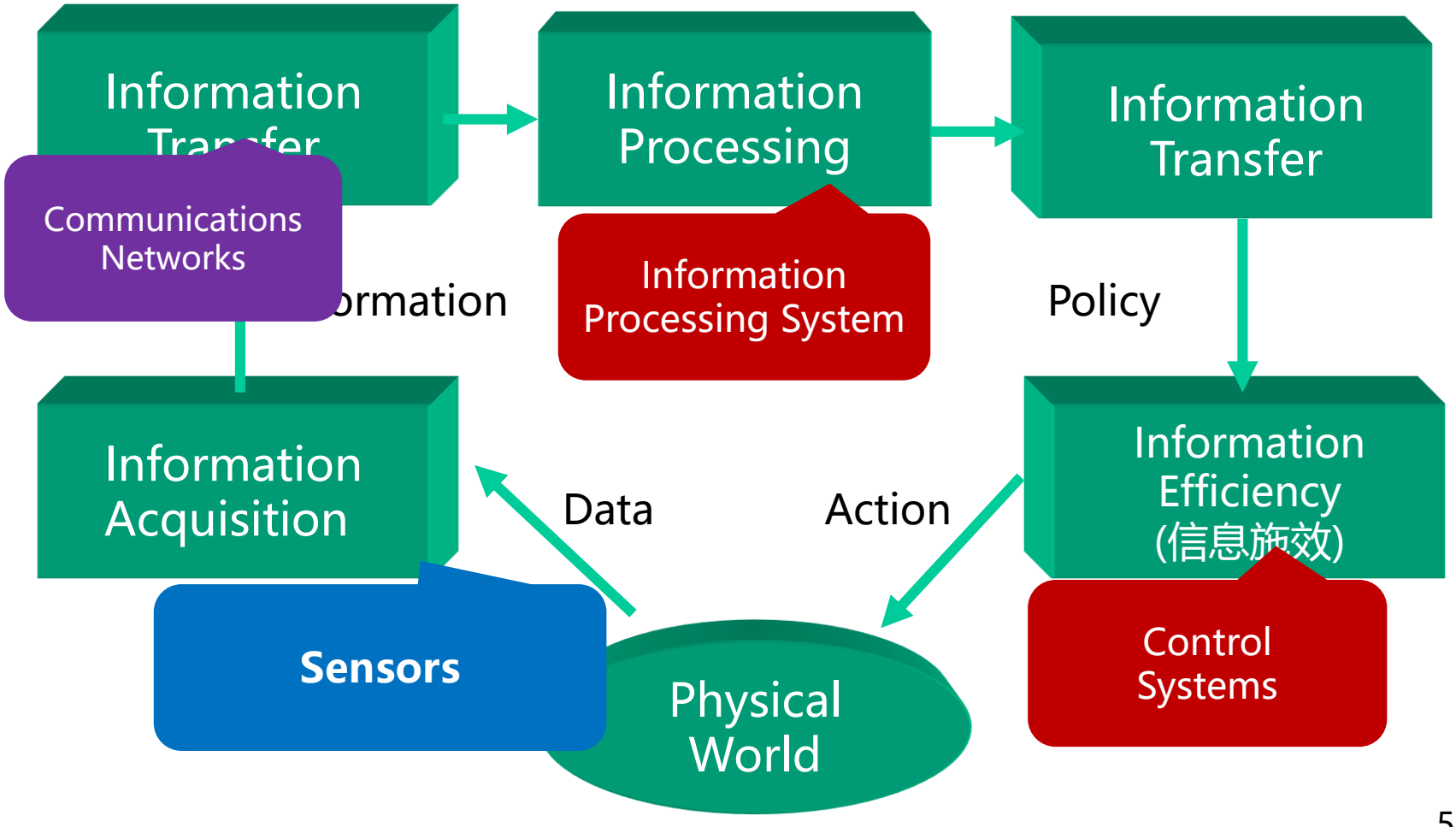
Arise of IOT

- "ITU Internet Report 2005: IOT"



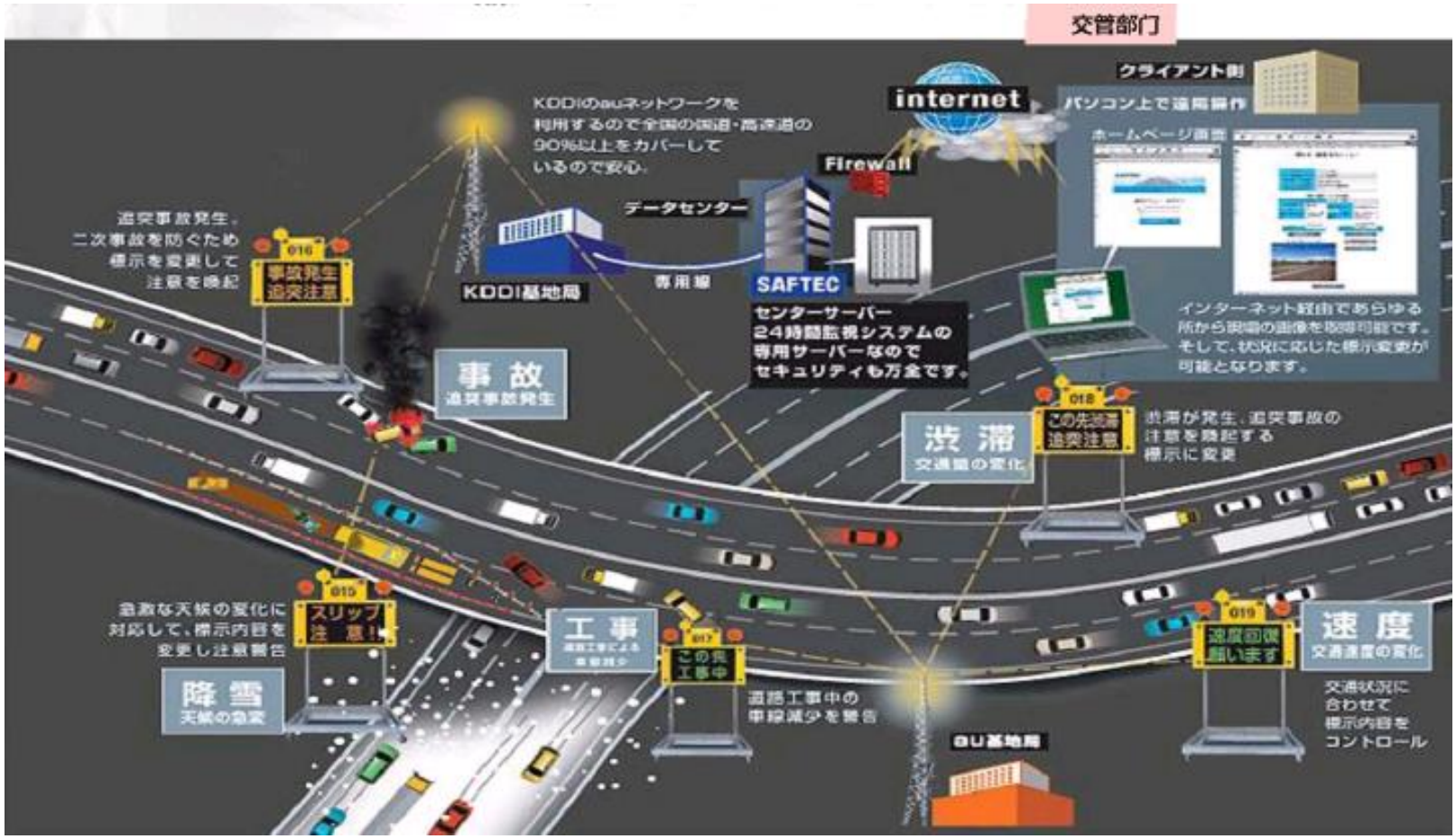
Arise of IOT

- 4 Components and 4 Actions



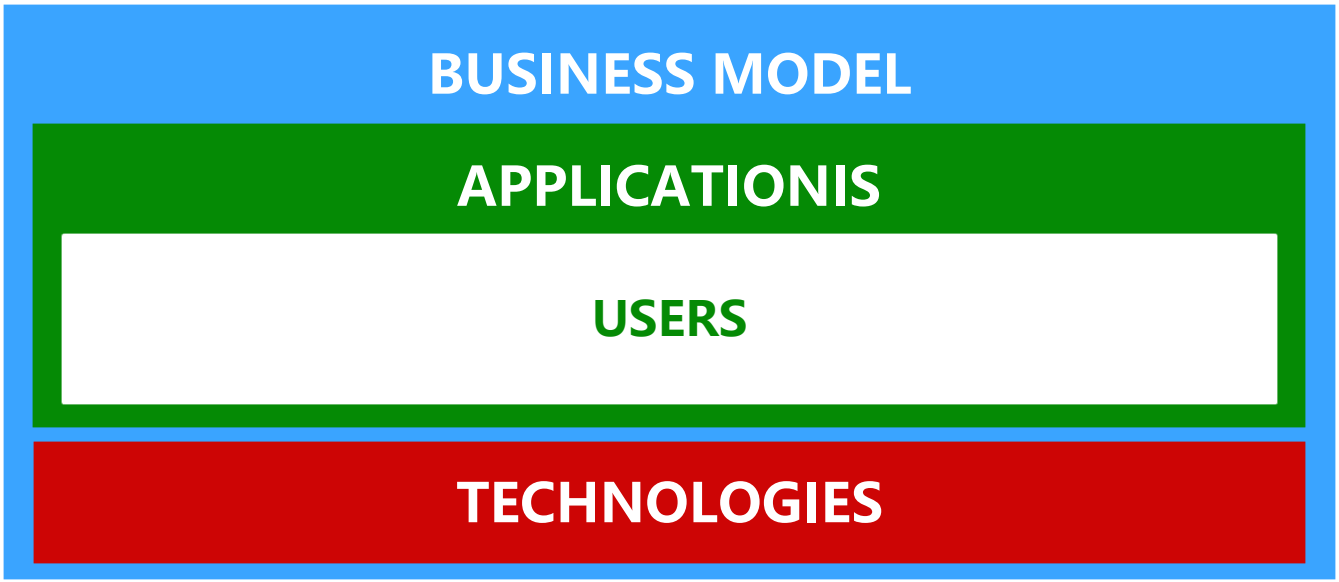
Internet of Things

- What is the core of IOT?



Arise of IOT

- Three Essential Factors of IOT
  - Business Model
  - Leading Applications
  - Technologies



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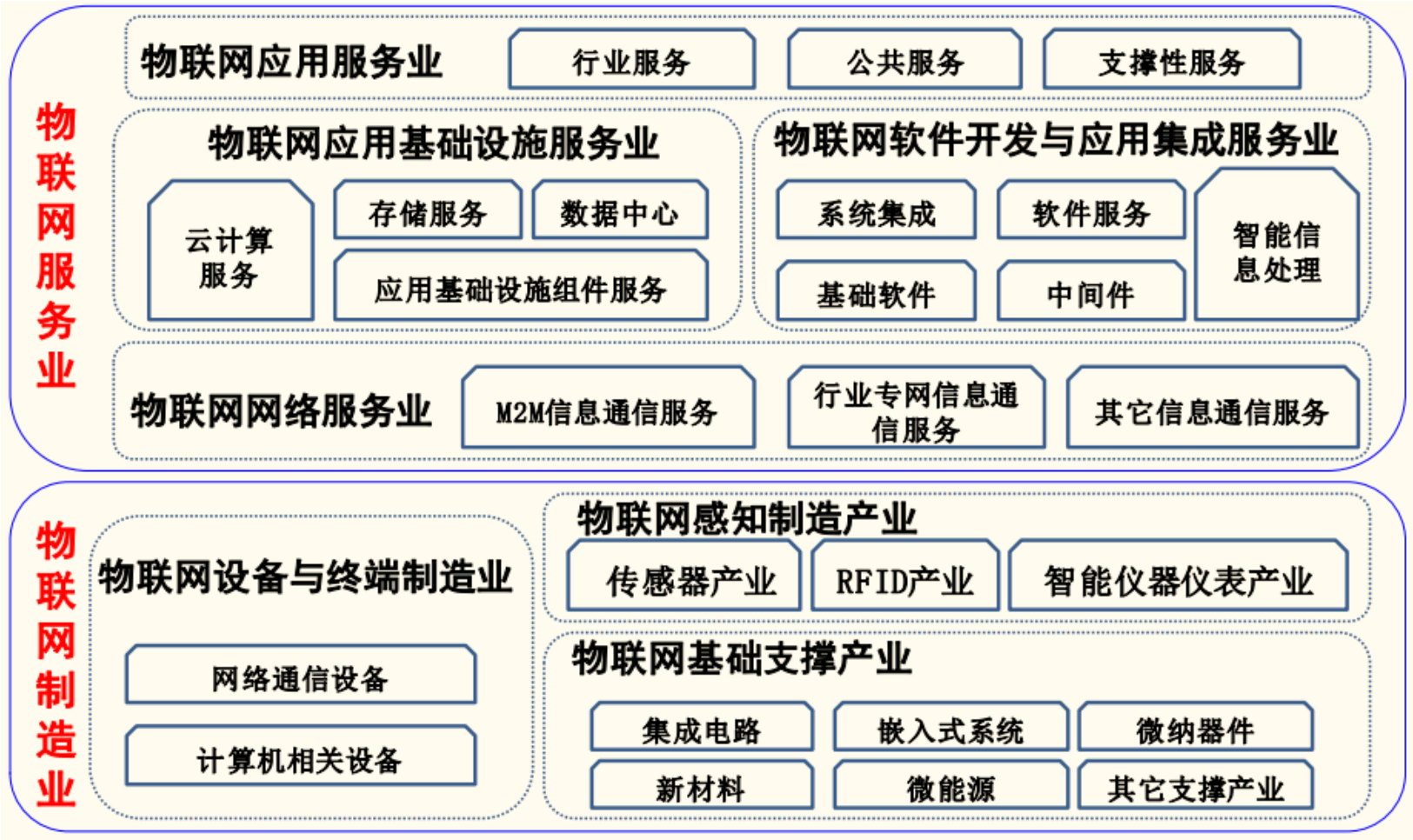
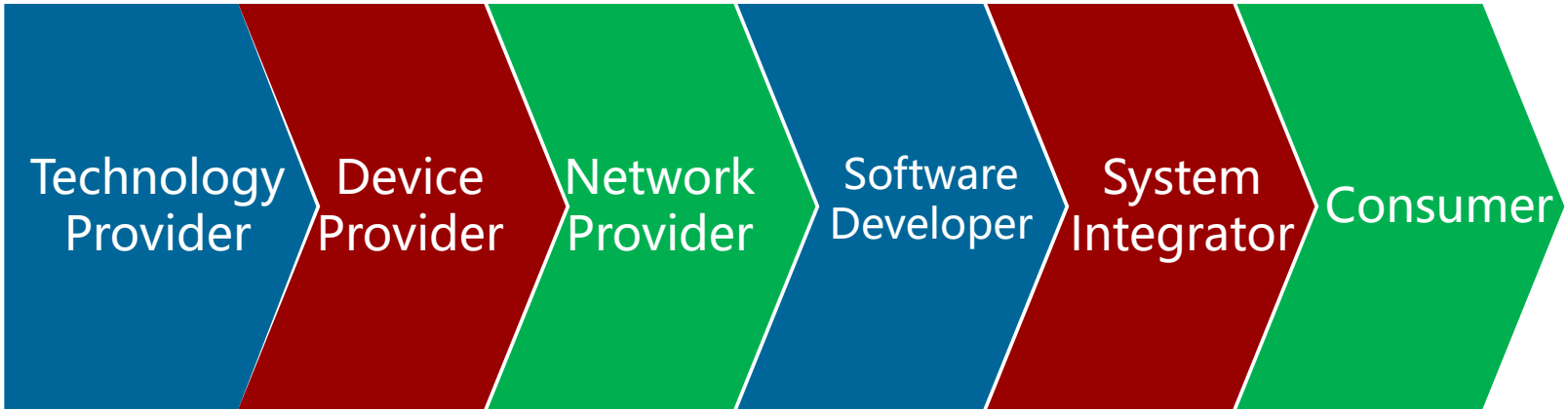
Business Model



Business Model



- Industry Eco-System
  - ✓ Technology Provider
  - ✓ Device Provider
  - ✓ Network Provider
  - ✓ Software Developer
  - ✓ System Integrator
  - ✓ Consumer

Business Model

MONOPOLIZATION

To provides everything, including network construction, network maintenance, service development and service operations

PLATFORM

- To provide network construction, network maintenance and some common capabilities (namely platform).
- To enable others provide applications

APPLICATION

- To directly provide applications to the end users
- To construct the system all by himself or to utilize the 3rd party network

Business Model

- The falling of MONOPOLIZATION
  - Wireless City 1.0
    - Government tried to do everything
      - To provide free network connection of all the citizens
      - To foster applications for all the citizens
  - Wireless City 2.0
    - Government support network providers to construct networks
      - As the enterprise user
      - To invest the network providers
    - Network providers provide "high-quality" networks
    - Application providers provide "high-quality" applications

Business Model

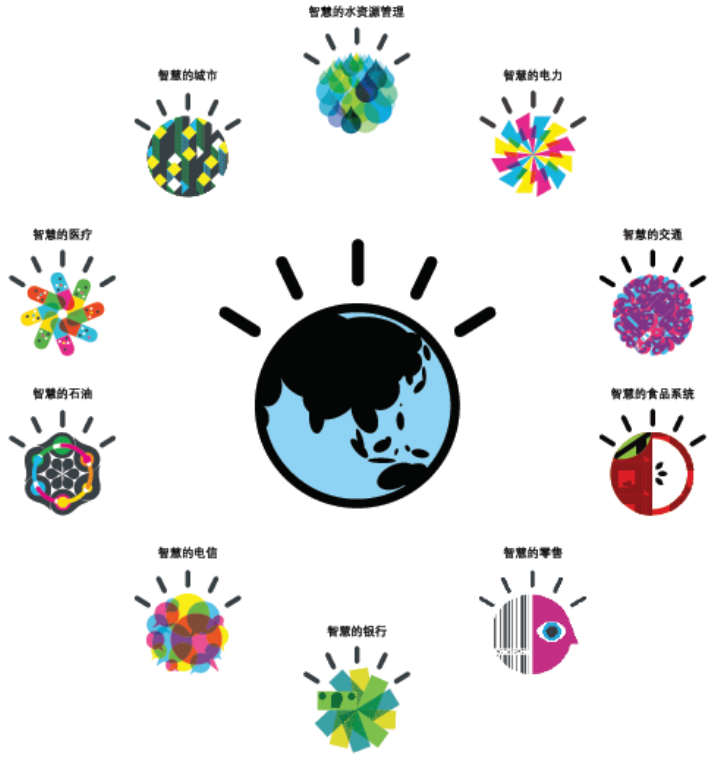
为了避免管道化，要大力发展应用，提高应用收入占比，而“物联网”是最最重要的应用发展方向！

运营商的强项是平台的建设能力和运行/运营能力，在智慧城市的建设中尤其要发挥运营商在平台构建方面的优势！

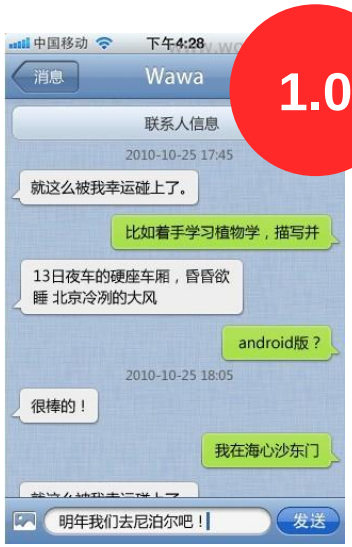
Right ?

Business Model

- Smart Planet
  - IBM, 2009
  - Smart Planet = Internet + IoT
    - To form the new world with advanced technologies
  - Industries
    - Infrastructure
    - Energy
    - Traffic
    - Telecommunication
    - City
    - Water
    - Public Security
    - Bank



Business Model



Business Model

- A Enterprise App Platform
  - From big enterprises to small and medium enterprises
  - From app leader to standard composer
  - From app provider to platform provider

- A Marketing Platform

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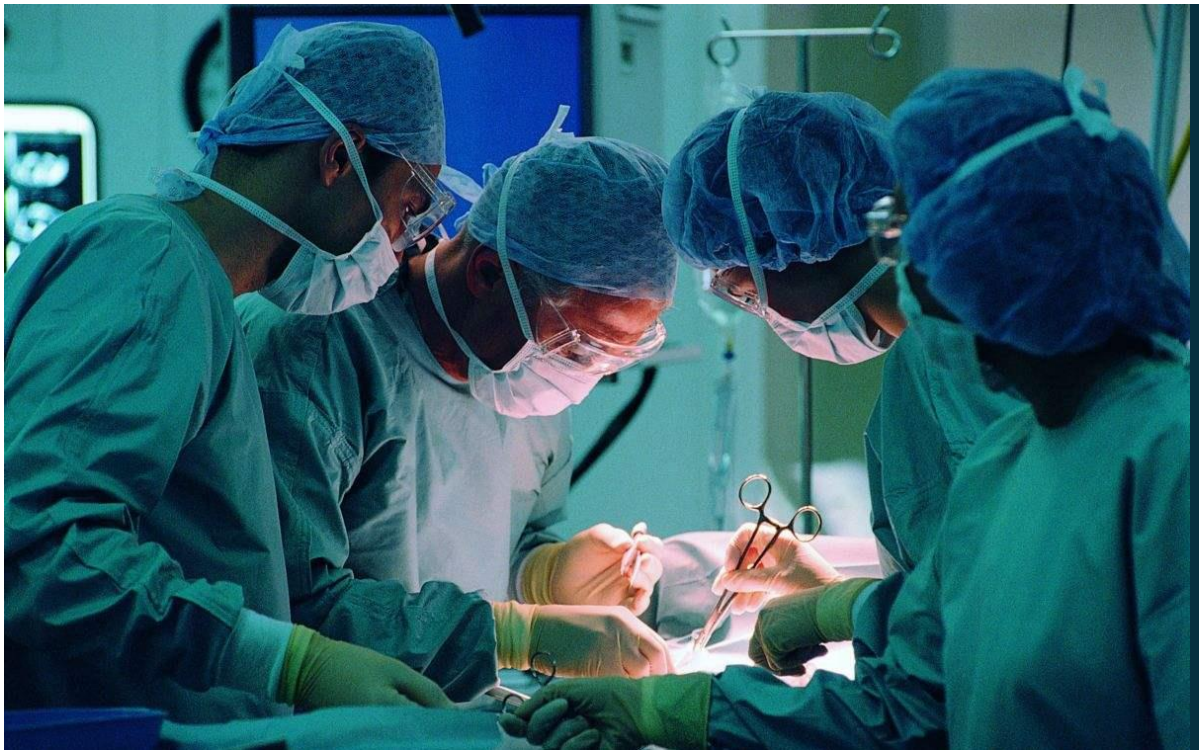
Leading Applications

- Manufacturing

Is it right to
replace human beings with robots ?

Leading Applications

- Health Care/Medical Care



The most difficult task is to break down the industry barrier!

Leading Applications

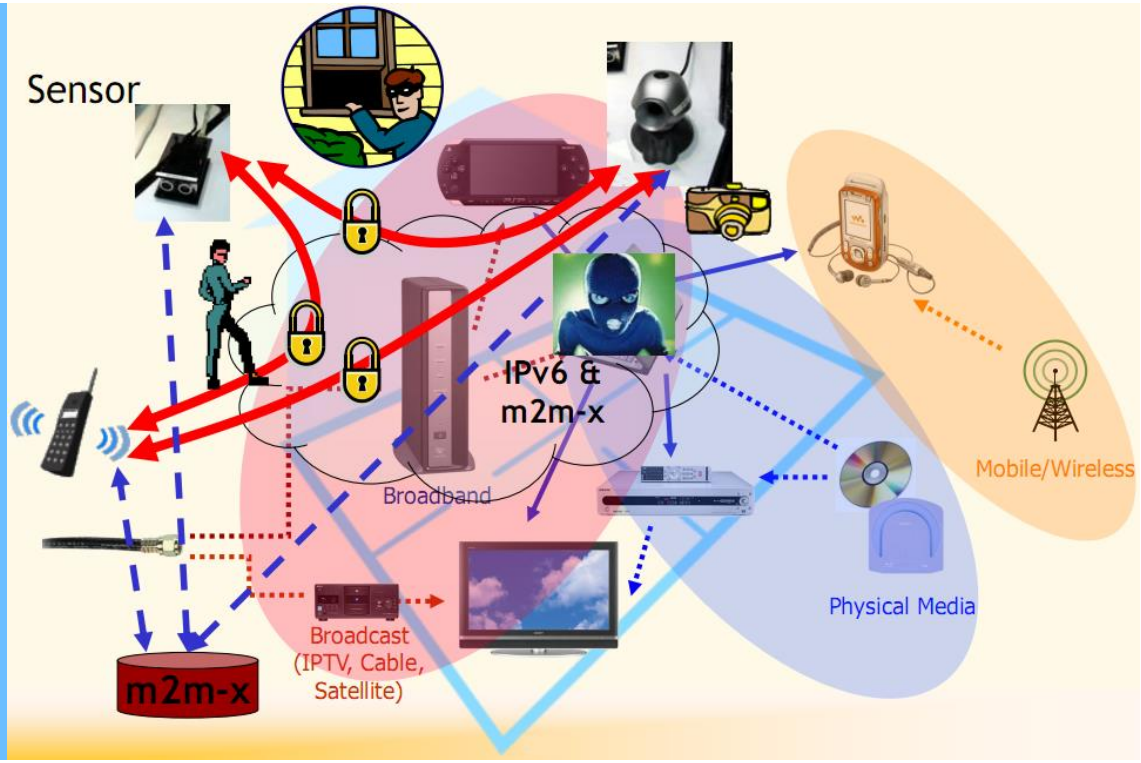
- Food Traceability System

Willingness to Pay

Leading Applications

- Security Monitoring and Control
  - GPS + GPRS
  - GPRS

Precision vs. Coverage



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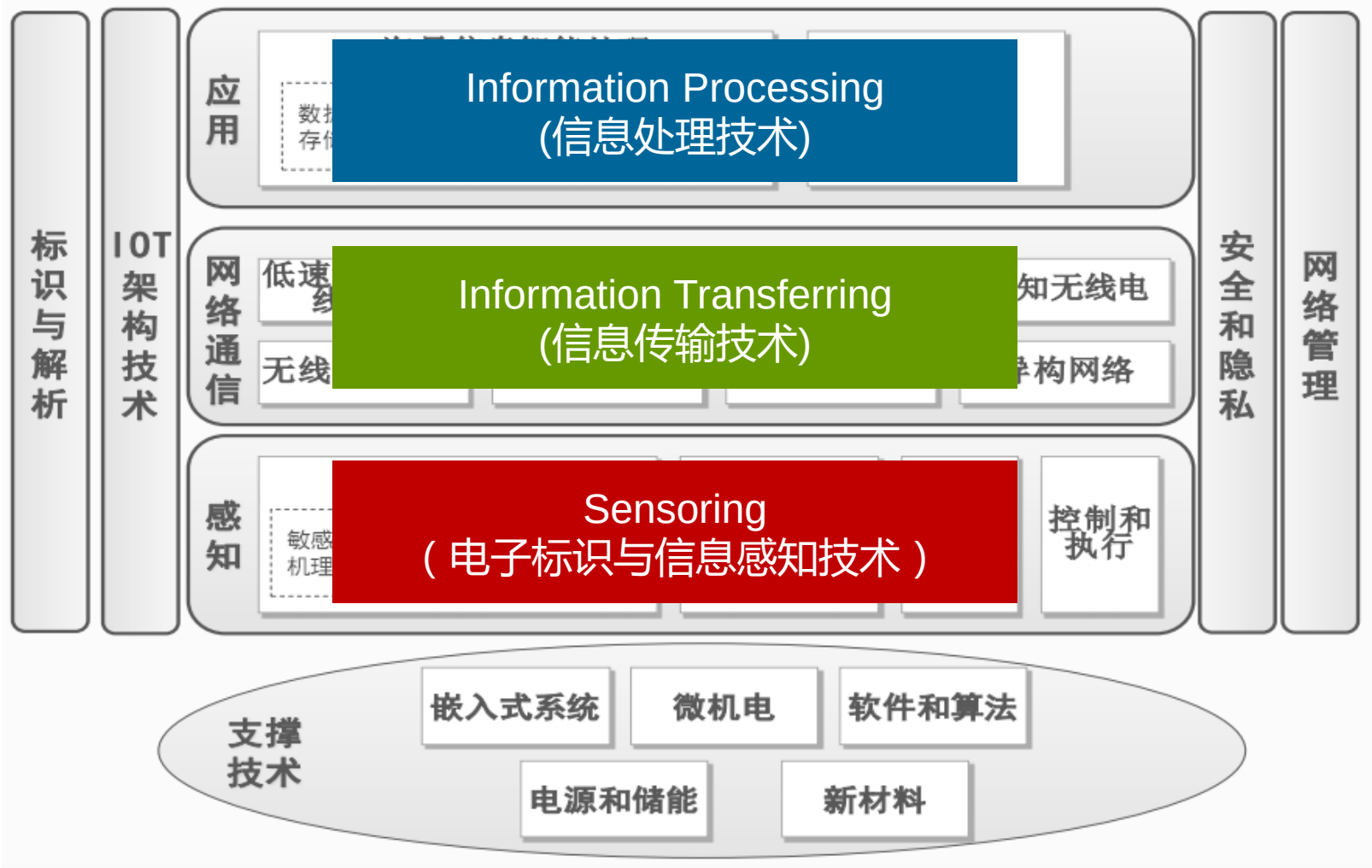
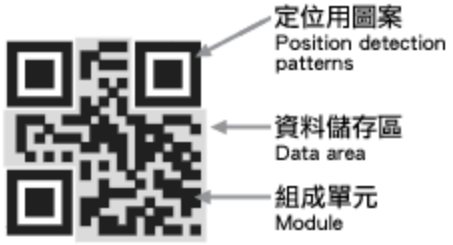
Internet of Things

- Supporting Technologies of IOT

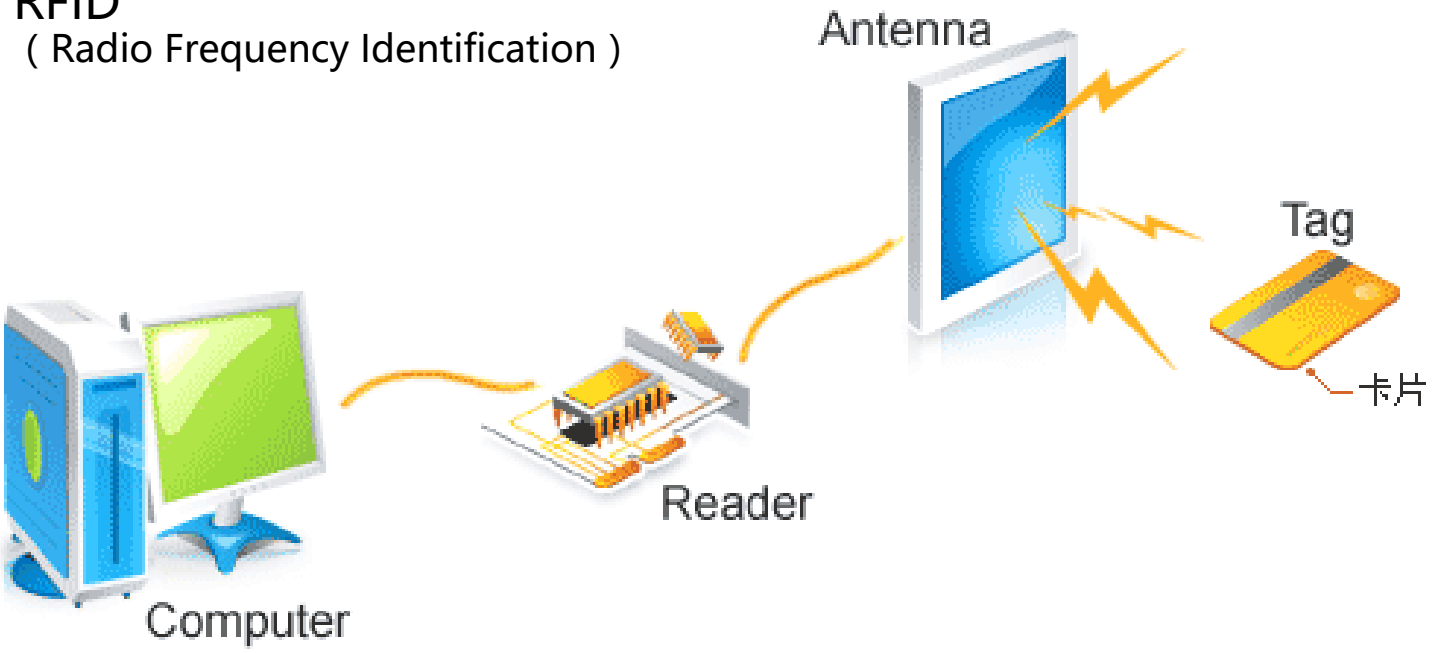


Internet of Things
(Sensoring)

- Sensoring（电子标识与信息感知技术）
  - Bar Code
  - Two-Dimension Code / QR Code

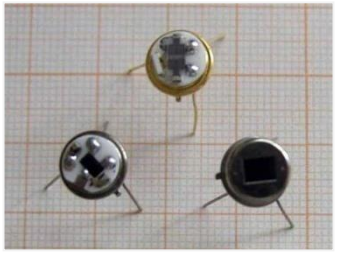


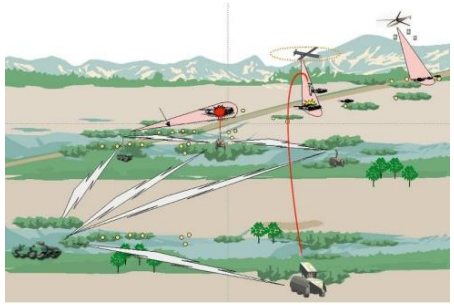
  - RFID
    （Radio Frequency Identification）

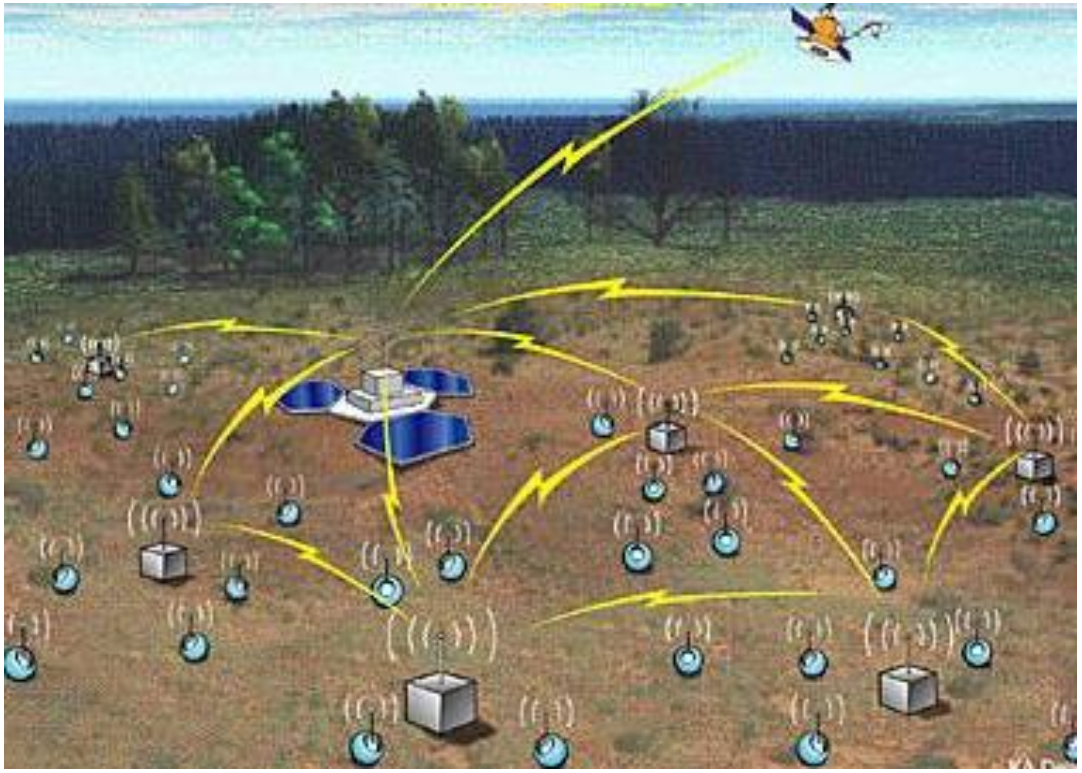


Internet of Things
(Sensoring)

- Sensor and Sensor Network

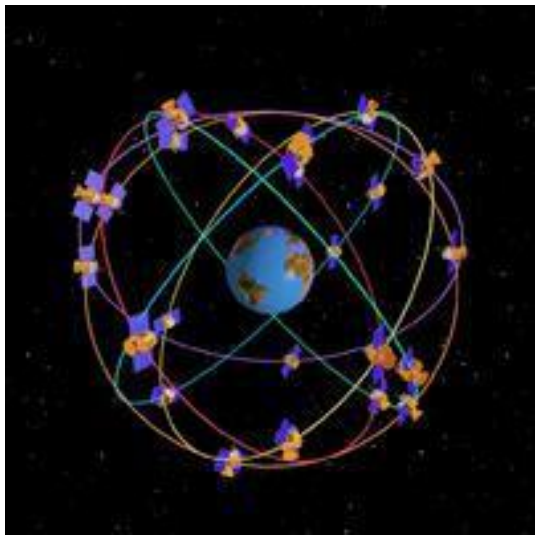



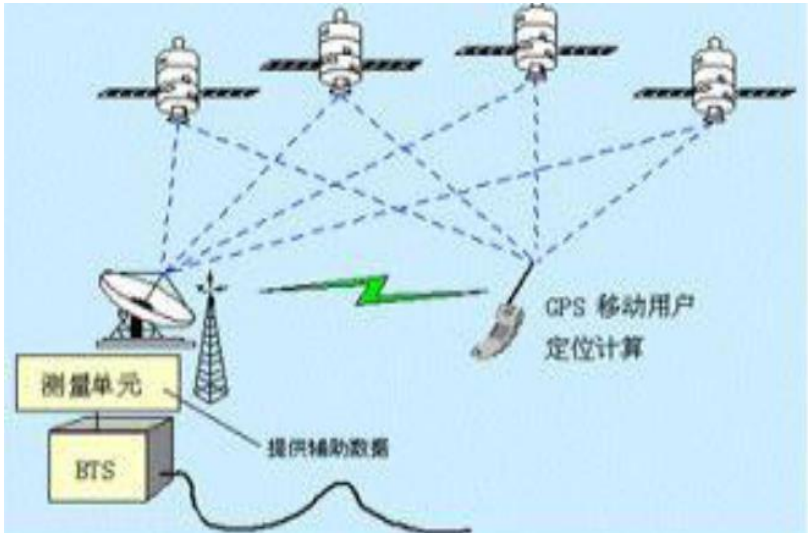





Internet of Things
(Sensoring)

- Positioning Technologies
  - GPS (Global Positioning System)
    - 24 satellites
    - At least 4 satellites to complete the positioning





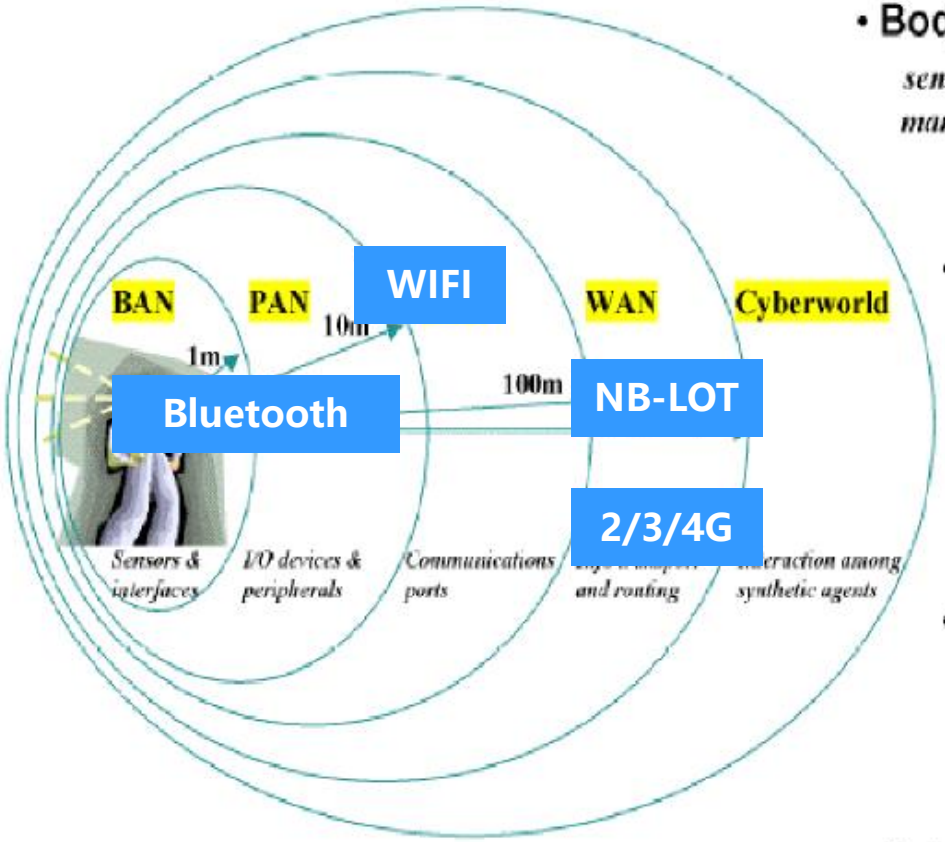
  - 北斗
  - CALILEO（伽利略）
  - GLONASS（格洛纳斯）

Internet of Things
(Sensoring)

- Positioning Technologies
  - Video Monitoring

Internet of Things
(Information Transferring)

- Information Transferring



- **Body area network (BAN):**
  sensors & interfaces friendly management around the body
- **Personal area network (PAN):**
  download information on peripherals
- **Local area network (LAN):**
  nomadic access to fixed, mobile networks and to the Internet
- **Wide area network (WAN):**
  access and routing to fixed and mobile networks with full mobility and QoS guarantees
- **Cyberworld**
  seamless interaction with cymans

Source: WWRF 2001

Internet of Things
(Information Processing)

- Information Processing