eHeath and mHealth—
China Unicom's experience and view

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25 June 2013, Shanghai

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China Unicom: the largest WCDMA operator

China United Network Communications Group Co., Ltd("China Unicom") was officially established on 15th October 2008.

- ***China Unicom* had the largest 3G (WCDMA) network in the world.**
- **By May 2013, the number of *China Unicom* mobile subscribers had reached 258 million, among which the 3G (WCDMA) subscribers 96 million.**

Prospective & Commitments:

China Unicom is committed to forging itself into a world-leading information service provider by offering innovative and superior services.

Information service	Innovation	Superior Services	Leadship
•Its the core sector of the company operation. Providing information-life services can reflect our custom-centralized service conceptual framework.	•Its the original driving force and the requirement of differential competition to achieve solid development in a long-term.	•Its the basis of the company to become information service provider in the future. By offering the best information service to establish a leading service system in the industry.	•Its the ultimate goal for the company, to obtain world-wide leadship in fields including: scale of the company, operating performance, operating efficiency, innovation ability and quality of service .

IoT creates new opportunities for telecom operators

Mobile phone services will gradually saturate. M2M is the new growth point

China population: 1.3 billion

China's mobile subscribers: 1.165 billion (by May 2013)

IoT: strategic emerging industry in China. By the end of 2012, the total revenue of IoT industry in China reached RMB 365 billion, up 38.6%.

In Feb 2012, China MIIT *(Ministry of Industry and Information Technology)* released 《The national 12th five year plan for IoT industry》
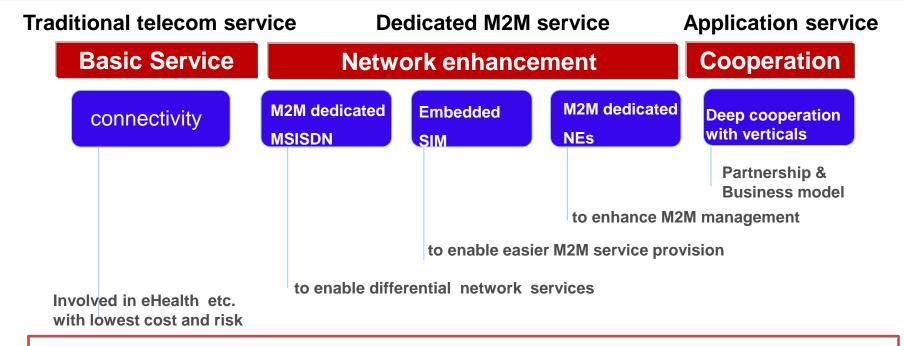
In Feb 2013, the State Council of China released 《The guideline for promoting the healthy development of IoT industry》

Smart healthcare
- **One of the 9 key application areas of IoT industry in China**
- **Major focuses in the coming years: in-Hospital informatization, drug management and logistics, remote health monitoring at home and community**

M2M service strategy

Traditional telecom service   **Dedicated M2M service**   **Application service**

Basic Service	Network enhancement		Cooperation

connectivity

M2M dedicated MSISDN

Embedded SIM

M2M dedicated NEs

Deep cooperation with verticals

Partnership & Business model

to enhance M2M management

to enable easier M2M service provision

to enable differential network services

Involved in eHealth etc. with lowest cost and risk

China Unicom has severed about 10 million M2M terminals in various industries including video surveillance, intelligent transportation, eAutomobile, smart grid, eHealth, etc. The market is vertical and diversified.
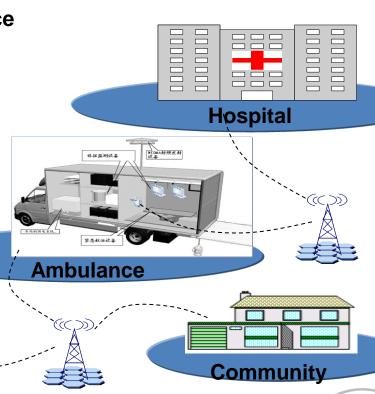
(1) Connectivity service

- **Connectivity: *China Unicom's* main M2M service provided to verticals**

Other value-added services include:
- **Dedicated tariff packages**
- **System integration and solutions**

- **Challenges**
- **M2M ARPU is lower (*1/10* of H2H ARPU)**
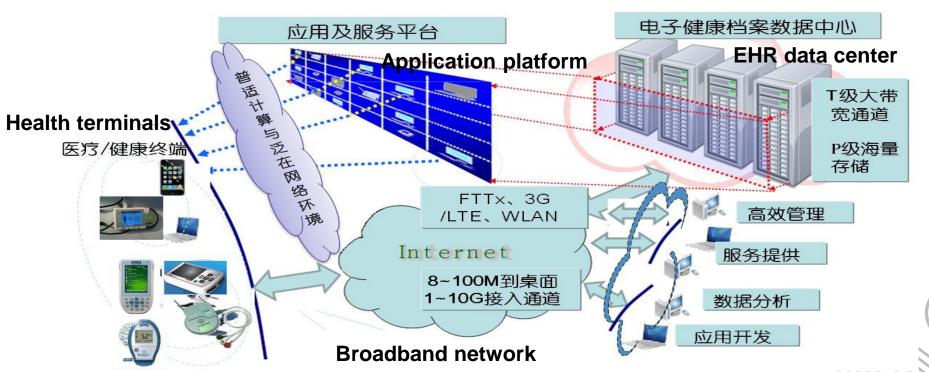- **Market requirements are fragmental.**
- **Business model is premature.**
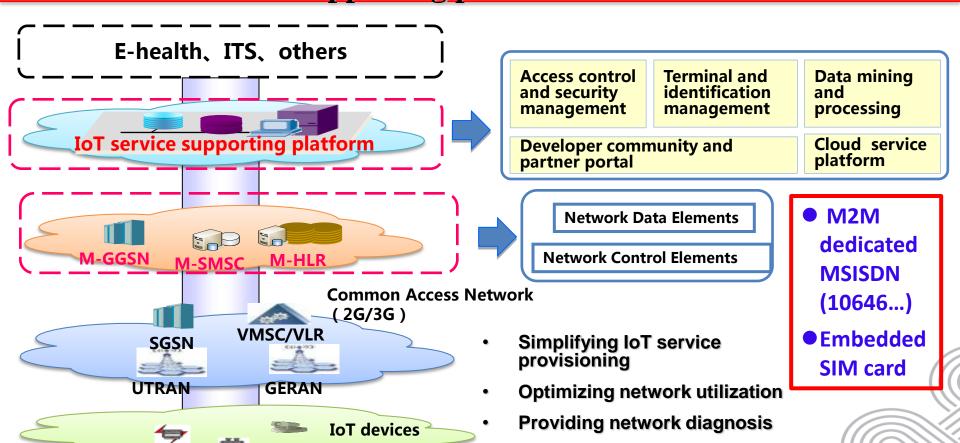
(2) Data center and cloud services

Provide secure storage and transfer for EHR, Clinic data

应用及服务平台
Application platform

电子健康档案数据中心
EHR data center

普适计算与泛在网络环境

Health terminals
医疗/健康终端

T级大带宽通道

P级海量存储

FTTx、3G/LTE、WLAN

Internet

8~100M到桌面
1~10G接入通道

高效管理

服务提供

数据分析

应用开发

Broadband network

(3) M2M dedicated network and service supporting platform
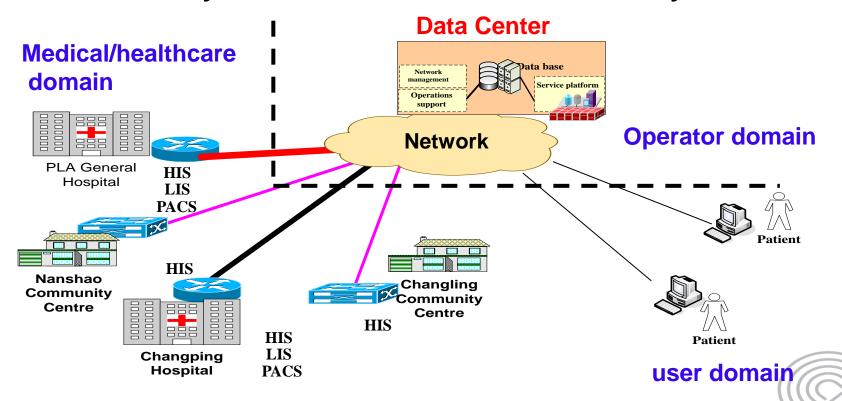
E-health、ITS、others

IoT service supporting platform

| Access control and security management | Terminal and identification management | Data mining and processing |
| Developer community and partner portal | | Cloud service platform |

M-GGSN   M-SMSC   M-HLR

Network Data Elements

Network Control Elements

- **M2M dedicated MSISDN (10646...)**
- **Embedded SIM card**

Common Access Network (2G/3G)

SGSN

VMSC/VLR

UTRAN   GERAN

IoT devices

- Simplifying IoT service provisioning
- Optimizing network utilization
- Providing network diagnosis

China Unicom's practice in eHealth

Commercial services

- **Call center service (114): making on-line doctor appointments for patients in many cities**

- **Connectivity and communication services for hospitals and healthcare administrations**

- **Hospital mobile office**

- **System integration**

Pilot projects

- **Home health tele-monitoring**

- **Health monitoring for elders in agedness apartments**

- **Mobile health and sports monitoring**

- **Smart ambulance based on 3G mobile**

Standardization

- **China Unicom is actively involved in some standardization activities for eHealth**

- **CCSA**
- **ITU-T IoT GSI**
- **OneM2M**
- **GSMA**

On-line appointment and health information services are the dominant eHealth business of today. Health monitoring service is new focus with great market potential.

(1) On-line appointment service
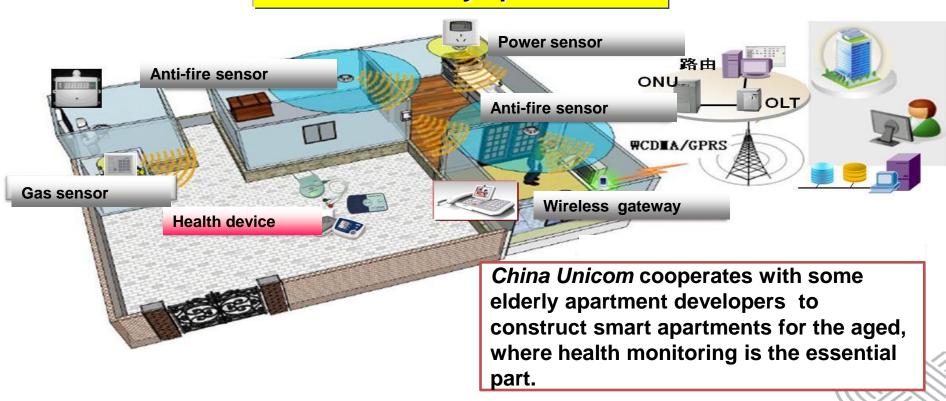
Beijing hospital on-line appointment platform

- *China Unicom* constructed the platform in partnership with Beijing Municipal Health Bureau
- Multiple access available : fixed phone, Internet, mobile phone
- Available for 141 hospitals in Beijing
- Register number over 100,000 per day

(2) Health monitoring for elderly

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Smart elderly apartment

Power sensor

Anti-fire sensor

Anti-fire sensor

ONU

路由

OLT

WCDMA/GPRS

Gas sensor

Health device

Wireless gateway

China Unicom cooperates with some elderly apartment developers to construct smart apartments for the aged, where health monitoring is the essential part.

Mobile health monitoring

China Unicom cooperates with some health device vendors to develop mobile health and sports monitoring terminals

- Integrated mobile module with SIM card
- embedded SIM card
- Terminal management protocol
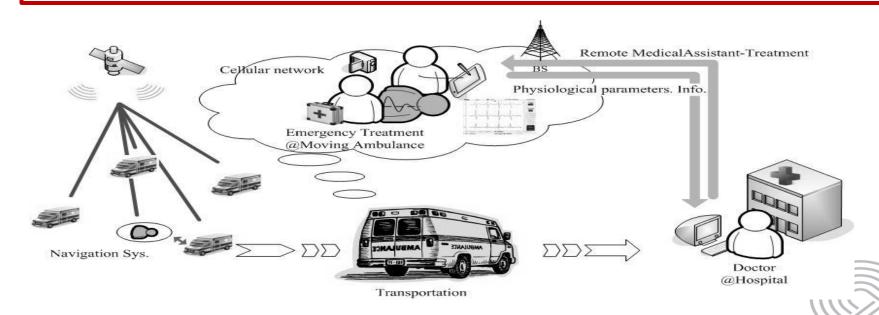- Interoperability of different types of terminals with service platform

(4) Smart ambulance based on 3G

China Unicom cooperates with some 112 emergency medical centers and hospitals to develop smart ambulances based on ECG monitor embedded with 3G and video surveillance with 3G.

Data collected from ECG monitor can be sent to hospital through 3G network in real time. This will greatly benefit the pre-hospital emergency care.

(5) eHealth standardization activities

- **CCSA** *(China's communication standard body)*
  - **Ubiquitous ehealth application scenarios and technical requirements (Technical Specification)**

    Editor: China Unicom

- **ITU-T IoT GSI**
  - **Requirements and network capabilities for EHM-health monitoring services (ITU-T Recommendation)**

    Editor: China Unicom

- **OneM2M & GSMA**
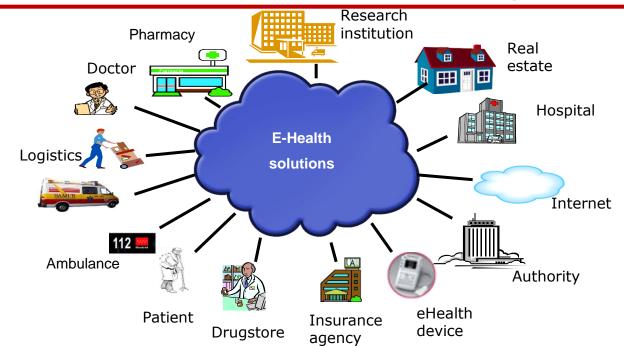 - **Involved in multiple activities and work items related to eHealth.**

Challenges

- ☐ **Lack of expertise**
  - ● **Due to the lack of expertise, it's hard for operator to directly design and provide popular eHealth services for patients.**
  - ● **After-sale service is a big burden.**
- ☐ **Premature business model**
  - ● **For fragmentary market, it's hard to copy the existing mature business model.**
  - ● **How to build a multi-win ecosystem?**
  - ● **How to develop cost-effective devices and services?**
- ☐ **Consumption habits**
  - ● **Patients only trust medical/health authority or experts, not telecom operator, when selecting medicine/health services.**
- ☐ **Industry barriers**
  - ● **Traditionally, medicine and telecom are two independent industries.**
  - ● **Lack of standard for cross of medicine/health and telecom industries**
- ☐ **Potential risk**
  - ● **The rule/law is absent for privacy protection and responsibilities division in case an accident occurs.**

Opportunities

- **A healthy ecosystem is the key to growth of eHealth or mHealth industry**
- ***China Unicom*'s involvement in eHealth is still in the early stage. *China Unicom* will strength the effort in eHealth by providing reliable connectivity, flexible tariff packages and better service support for partners as well as deepening collaboration.**

Thank You !

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