Internet of Things on HealthCare and Chinese Wearable Medical Devices

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The Internet of Things (IoT) brings promising opportunities and challenges. It attracts great attentions, however, we have not seen a booming development status of IoT industry in the past years.

2014 China Internet of Things Conference:
It looks, IoT on Healthcare sector, which is closed to daily life of consumers, and we can expect a huge market potential in the coming 10 years

A revolution in healthcare is quietly brewing. The “Internet of Things”—a global system that could eventually comprise billions of devices and applications—including sensors, actuators, microcontrollers, mobile-communication devices, nano-pumps and more—will make health monitoring, diagnostics and treatment more personalized, timely and convenient, while also lowering costs.

IoT on Healthcare

- collect vital signs at front end
- Internet-based
- An overall analysis of big data through cloud-based computing and backend algorithm
MARKET OPPORTUNITY

Aging of Population in China
Aging people over 200 million, 14.8% of the total in 2013
It is estimated over 250 million and 16% of the total in 2020

Chronic disease
- Over 17 million of premature deaths, 85% of which is chronic diseases, huge cost of treatment for coronary heart disease and diabetes
- Over 300 million overweight and obese, 160 million patients with Dyslipidemia and 280 million people suffer from chronically ill.
- Chronic disease becomes younger and younger in average age (most patients are between 40 and 50)

Sub-Health Group
- Over 300 million people
- Popular among high income, high position, heavy pressure, and retired
POLICY

Key Words: healthcare service, rest home, information-based, network infrastructure, medical insurance, health management, portable health data collection, LOT, mobile internet and smart

“Notice on Implementation of Mobile Internet and Industrialization of 4G Project”, by NDRC, September 22, 2013
Key Words: mobile, wearable device, low power consumption, computer interaction, sensor, smart terminal

Key words: internet access, community, as e-government, health care, rest home

The central government of China, 2013
Keywords: 2.22 billion financial support, healthcare and rest home service

“Opinions on Beijing Modern Service Industry” by Beijing Municipal Science and Technology Commission
Key words: mobile Internet, Internet of things, medical healthcare

“Regulations on Beijing Benefiting People Plan Based on Science and Technology “, by Beijing Municipal Science and Technology Commission
Key words: rehabilitation equipments, medical devices, tele-medicine technologies
INTERNET OF THINGS ON HEALTHCARE & WEARABLE MEDICAL DEVICE

China wearable computing industry promotion alliance was founded on April 2, at 2014 China Internet of Things. “Wearable” has become a Buzzword – everyone is talking about it.

Wearable Medical Devices: measure and monitor critical human vital signs, Heart-rate, Blood-oxygen (SpO2), Blood Pressure, Body Temperature, ECG, Respiratory rate, Respiration Carbon Dioxide (CO2), glucose.

The size of Wearable Medical Devices Market in China– huge, enormous, growing. iMediaResearch said, 420 million in 2012. It is estimated to reach 1.2 billion in 2015 and 4.7 billion in 2017. A large data wearable medical devices will be a blue ocean in the coming decades.
Patients are getting older and sicker

Patients often go long periods without nursing supervision

Vital signs show changes hours before an adverse event. Lives can be saved by continuous monitoring with alarm to intervene, spot checks are often too late.
CHINESE WEARABLE MEDICAL DEVICE PLAYER—HOME CARE COMPANY

• 益体康
• 麦邦（达乐堂）

Home care: smart rest home, based on cloud computing and IoT
Home Diagnosis: the aim is to help people get meaning out of their personal data

Home care business model
CHINESE WEARABLE MEDICAL DEVICE PLAYER—HOME CARE COMPANY

Main products:
Medical wireless sensor network access gateway, system software packages and new digital healthcare terminal equipments like Easy PC ECG Monitor, Portable PC ECG Monitor, Body Fat Analyzer, Bluetooth Blood Pressure Monitor/Oximeter etc

Solutions:

- **Healthcare sensors**
  - Periodic or real-time acquisition of human body physiology data.
  - Short-range wireless data transmission.

- **Gateways & modules**
  - Receive data collected by various body sensors.
  - Remote transmit of health data.
  - Provide human computer interaction for health services.

- **Back-end Software & SDK**
  - Receive & filter the remote transmission data.
  - Store and Manage User Health Information.
  - Present historical data & plot trend graph.
  - Help service providers to interact with users.
CHINESE WEARABLE MEDICAL DEVICE PLAYER—MOBILE HEALTH COMPANY

• 春雨天下，http://www.chunyuyisheng.com/
• 杏树林，http://www.xingshulin.com/
• 康智乐思，http://www.dayima.com/
• 山海树科技，http://www.shinehealth.cn/
• 华为(HUAWEI) TalkBand B1
CHINESE WEARABLE MEDICAL DEVICE PLAYER—MOBILE HEALTH COMPANY

Founded in 2005, by a few venture investors from the U.S.
24 hours long-distance monitoring service, with 300K customers

LK86智能远程健康监测管理终端 (LK86 mobile terminal)
CHINESE WEARABLE MEDICAL DEVICE PLAYER—WEARABLE DEVICE COMPANY

• 百度 (BAIDU)  [http://dulife.]

• 滕海视阳  [http://www.sport315.com/]

• 复旦IC，Flexible, and Wireless ECG Patch using Fudan IC (Custom Analog IC Designed by Fudan University)
CHINESE WEARABLE MEDICAL DEVICE PLAYER—WEARABLE DEVICE COMPANY

Mattress Sleep Monitoring: without any paste electrode, mattress bed sensor, for screening primary snoring at rest home or cadre’s sanitarium

Waistband monitoring: vita signs collection, cable-free, leads-free, for pilot, solider and athlete.
CHINESE WEARABLE MEDICAL DEVICE PLAYER—SOFTWARE COMPANY

• 用友医疗 http://health.ufida.com.cn/

• 方正国际 http://www.founderinternational.com/index.htm

• 东华软件 http://www.dhcc.com.cn/

• 嘉和美康 http://www.goodwillcis.com/

• 海纳医信 http://www.hinacom.com/EN/

• 东软 http://www.neusoft.com/
A WEARABLE CLOUD-BASED WIRELESS ECG PROJECT WE ARE MANAGING
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- Web-based, secure login for authorised physician
- Enables viewing of recorded ECG waveform, summary reports and final analysed reports
- Allows for waveform analysis and physician’s comment/annotation

Web-based portal

Peaks of fast heart rate represent episodes of paroxysmal atrial fibrillation detected on continuous monitoring
A WEARABLE CLOUD-BASED WIRELESS ECG PROJECT WE ARE MANAGING
FUTURE AND CHALLENGES

Challenges: Standard, Business model and Chip

Standard:
A joint ITU-WHO workshop on “e-Health standards and Interoperability” in Geneva, 26-27 April, produce roadmap to guide the development of global e-health standards. Many domains—specialized realms of technology—must be bridged by standards yet to be written. In late 2013, FDA recognized multiple standards that collectively help support medical-device interoperability and cyber security. Among the 25 standards listed, 12 originate from within the IEEE 11073™ family of standards for medical-device communication.

Business model:
A complete set of solution based on resources integration, including healthcare expertise, vital signs collection, remote video monitoring and a real-time overall analysis using big data.