Mobile Healthcare: From LG Electronics’ Perspective

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Global Megatrend

“Most vital challenges to societies” – Shaping tomorrow’s policies and markets

- Percentage of aged +65 grows globally
- Healthcare costs in industrialized nations rise
- Patients become educated about healthcare

Prevention and early detection are the key

Total expenditure on healthcare, Percentage of GDP, 2006

Source: OECD Health Data 2008

Young Children and Older People as a Percentage of Global Population: 1950 to 2050

Source: United Nation Department of Economic and Social Affairs, 2007b
Healthcare Industry

- Healthcare devices should pass the FDA approval standards
- Many stakeholders can share the benefit through various biz model.

Value Chain

Producers  Providers  Fiscal Intermediaries  User

Major Players

- Devices / Pills
- Physicians / Nurses
- Distributors
- Service Provider
- Insurance
  - Medical / Dental
- Government / Owner / Consumer

Health Plans and Payors

Employers

Physicians and Nurses

Consumers

Chipset Vendors

Government & Regulators

Hardware Partners
Personal Healthcare Market Perspectives

- “Increasing of needs on personal healthcare” - Expanding of healthcare market

In the US,

**Fitness & Wellness**
2008: 54 million who are health conscious, among them about 42 million have a fitness club membership

**Chronic Care**
2008: 123 million people suffer a chronic disease
2013: 128 million

**Geriatric Care**
2008: 9.5 million seniors prefer living independently at home
2013: 13.5 million

*Source: Parks Associates, 2007, 2008*
Personal Healthcare Market Imperatives

Market

• User convenience & accessibility are the keys to Personal HC success
• Size & power are key to mobile
• Multi-function
• Repeatability

Competition

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<th>Professional</th>
<th>Home</th>
<th>Mobile</th>
<th>Trend</th>
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<tr>
<td>Roche</td>
<td>Stronger</td>
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Home

• Roche and GE healthcare dominate global market
• Competitors continue to invest in user friendly devices

Mobile

• No dominant players
• Omron and Hitachi continuing to development new mobile platforms

* Source: Frost & Sullivan (’06), Global Industry Analysts (’07)
Mobile Healthcare Ecosystem

- Device Manufacturers
  - Medical Devices
  - Mobile Devices

- Network Providers
  - Network Service
  - Website Management
  - Wireless communication

- Healthcare Providers
  - Healthcare management
  - Medical Service

- User
  - Customer
  - Government

Value Chain
Mobile Healthcare Devices Examples

Nokia’s Heart Monitor Phone (2009)

Providing a health condition in real time

Samsung and Adidas’s miCoach fitness phone (2008)

Stride sensor (pedometer) & heart rate monitor
Mobile Healthcare Devices Examples

- **Wellness Mobile Phone (CEATEC Japan, 2007)**
  - Sensors: Heart Rate, Electrodes, Motion, Odor
  - Function: Stress Level, Fat, Calorie, Etiquette

Heart Rate Sensor
- Heart Rate Variation
  - “Do you go to bed after midnight?”
  - “Don’t worry”
  - “Keep your chin up!!”

Electrodes → Fatness

Motion Sensor → Calorie

Odor
“Not too Bad!!”
Blood Glucose Monitor with iPhone 3.0 OS

- Apple suggested to J&J m-healthcare service
  → Glucose management service with mobile platform

OneTouch glucose meter (Johnson & Johnson)

iPhone OS 3.0

Bluetooth wired

Healthcare providers

Food recommendation
Insulin dose calculation
Glucose level history
Mobile Healthcare Devices Examples

Intel, GE, BOSCH

**Health Buddy**

Intel Health Guide + GE QuietCare®

Motion sensor

PHS6000

BOSCH Health Buddy

Decision Support Tools

Content Development Tools

Clinical Information Databases

Secure Data Center

Health Buddy® Appliance

Monitoring Tools

Blood Pressure Monitor

Peak Flow Meter

Weight Scale

Blood Glucose Monitor
Mobile Healthcare Devices Examples

**Glucose Phone (2004)**
- Diabetes
- Pedometer

**Wellbeing Phone (2005)**
- Diabetes
- Fat
- Stress

**Drunkometer Phone (2005)**
- Alcohol sensor

**UV Sensor Phone (2006)**
- UV sensor

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World's First ‘Glucose Phone’
[2004.4.29, news.donga.com]
Mobile Healthcare Devices Examples

LG CNS + Intel

Terminal

- for Korean domestic market

Blood Pressure

Glucose meter

Weight Scale

USB, Bluetooth

Stress

Sleep pad

ECG
Trends in Mobile Healthcare Industry Progress

**Convergence 1.0**
- Mobile + Medical Device
  - Sensing
  - Monitoring

**Healthcare phone**
: LG, Samsung, Nokia, Apple

**Convergence 2.0**
- Conv.1.0 + Network
  - Data Center

**Convergence 3.0**
- Conv.2.0 + Medical Service
  - Alliance with hospital

- Implant
- Blood Pressure
- Glucose Meter
- Pulse Oximeter
- Weighing Scale
- Hospital
  - Consultation
  - Diagnosis
  - Prescription
  - Medication
  - First aid

- First aid
  - For First Aid Treatment
LGE Mobile Healthcare Service Roadmap

**Convergence 1.0**

Mobile phone connecting with medical devices

- **u-Health Phone**
  (Home & Mobile Healthcare System)
  - Vital sign measurement & monitoring
  - Phone application & server S/W
  - Connectivity Interface

![Diagram of mobile phone connecting with medical devices](image)
Mobile solution providing advanced healthcare function

- **Emergency Care System**
  - Fall & Emergency detection
- **Mobile Medication Management**
  - Mobile prescription
  - Medication alarm & monitoring
- **Health & Wellness**
  - Fitness management (food, exercise)
Service with medical service provider by system integration

- Remote patient management
- Telemedicine
- Extended Emergency Monitoring
  - Activity monitoring based on home sensor

Activity Daily Monitoring

Mobile Phone

Hospital

Telehealth Service
LGE Healthcare Ecosystem

**Hospital Diagnostic Solutions**

“Deliver innovative diagnostic solutions to hospitals”

**Mobile Applications**

“Anytime, anywhere health management”

**Home Healthcare Solutions**

“Improve family health with convenient and connected solutions”

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**Diagnostic Imaging**
- Endoscopy
- Digital Pathology

**POCT**
- Blood analysis
- Body fluidic analysis

**Home/mobile healthcare applications**

- Personal Health Device
- Mobile Device

*POCT : Point Of Care Testing*
Digitally yours