Consumer Electronics Meets Disease Management

May 2003

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www.bhtinfo.com (208) 395-1197
Ancient Writings Provide Insights About Past Civilizations
BMJ, Circa 1999

What’s wrong with this picture?
Summary

• Where Are We Now?
  - Technology
  - Business Models
• Where Do We Want to Go?
• How Do We Get There?

Fragmented
Integrated
High value, niche apps
Where Are We Now?
- Technology
- Business Models
Samsung Global Network
$35B+ Revenues

47 countries

- Production Subsidiaries: 24
- Sales Subsidiaries: 35
- Branch Offices: 20
- R&D Center: 10
- Service Center: 1

(THE THIRD NATIONAL DISEASE MANAGEMENT SUMMIT)
21st Century Vision

Vision

Leading the Digital Convergence Revolution

Mission

Digital - ε Company

A company that leads the Digital Convergence Revolution through Innovative Digital Products (Digital) & ε-Process (ε)
4 Strategic Business Areas

Component Set Network Contents & Service

Core Components
- System LSI (SOC)
- Small & Mid-size LCD (SO)
- Optical Component
- Memory
- TFT-LCD

Home Network
- D-TV
- Web Pad
- Home Gateway
- Home Server

Mobile Network
- 2G / 3G HHP
- Notebook PC
- Wireless PDA
- IMT - 2000

Office Network
- Display
- Printer
- IP Terminal
- InfoMobile

Strategic Alliances
Home Networking: How will health care connect?

Additional information:
http://www.samsungelectronics.com/homenetwork/index.html
The World Thru the Eyes of Consumer Technology Companies

- Stagnation in technology markets
- Saturation points for some consumer technologies
- Commoditization of core components

- “Where else can we look for market opportunities?”
- Obvious first opportunities: MP3s, digital cameras

Next tier -- Healthcare!
Promising e-health killer applications (PEHKAs)

1) Electronic Medical Records (EMRs)
2) Personal Health Records (PHRs) and Self Care
3) Remote patient monitoring (RPM)
4)
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Medical Monitoring
Medical Devices

Medtronic is the World’s Leading Medical Technology Company, Providing Lifelong Solutions for People with Chronic Disease
Telemedicine
Disease Management

LIFEMASTERS

PHYSICIAN

PATIENT EDUCATION

VITAL SIGN MONITORING

DECISION SUPPORT

PATIENT

Bridging the gap between physician & patient
Fitness/Wellness

THE NEW S-SERIES
WWW.POLARWATCH.COM

THE THIRD NATIONAL DISEASE MANAGEMENT SUMMIT
Sensors

LifeShirt Recorder saves data to compact flash memory card
ECG leads
Posture sensor
Ribcage band for respiratory rate and sigh count
Abdominal band measures respiration
Smart Houses
3 Definitions of U.S. Chronic Disease Market Size
(Drawn to scale)

$500 M
DMSCs

$20 – $100 B
Opportunity*

$1 Trillion -- Patients with Chronic Conditions

* Projections by BCG and First Union
"Inside the Box"

DMSCs (Business Model)
- Prevent unnecessary hospitalizations and ER visits
- Save $$ short term for payor
- Quality w/o ROI only “sells” for a few diseases
- 4 to 6 top diseases
- Done “to” the patient
- Care coordinator = 3rd party
- Local/regional focus
- Outsource vs. build

"Outside the Box"

DM (Care Delivery Model)
- Optimize patient health status & clinical outcomes
- Save $$ long term for payor or patient
- Health care consumerism/ patient empowerment
- 100+ conditions/diseases
- Done “by” the patient
- Care coordinator = patient or doctor
- Not geographically bound
- Assembly from components viable
4 Different Chronic Disease Customer Segments Emerging

MCOs
Employers
Patients/Caregivers
Providers
## Varying Value Propositions for Chronic Care

*Who cares most about ________?*

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<thead>
<tr>
<th></th>
<th>MCOs</th>
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Where Do We Want to Go?
Home Networking:
How will health care connect?

Additional information:
http://www.samsungelectronics.com/homenetwork/index.html
Promising e-health killer applications (PEHKAs)

1) Electronic Medical Records (EMRs)
2) Personal Health Records (PHRs) and Self Care
3) Remote patient monitoring (RPM)

(continues on next slide)
Are consumers interested?

Survey respondents are very receptive to electronic home healthcare

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Very important</th>
<th>Important</th>
<th>Total</th>
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<tr>
<td>Saving money</td>
<td>51</td>
<td>31</td>
<td>82%</td>
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<tr>
<td>Improving the quality of my overall health</td>
<td>47</td>
<td>35</td>
<td>82%</td>
</tr>
<tr>
<td>Avoiding trips to the emergency room or stays in the hospital</td>
<td>49</td>
<td>32</td>
<td>81%</td>
</tr>
<tr>
<td>Being sure a family member or friend is well</td>
<td>47</td>
<td>34</td>
<td>81%</td>
</tr>
<tr>
<td>Having a sense of control over my health</td>
<td>43</td>
<td>37</td>
<td>80%</td>
</tr>
<tr>
<td>Preventing side effects or drug interactions</td>
<td>43</td>
<td>34</td>
<td>77%</td>
</tr>
<tr>
<td>Knowing when to change medication or dosage</td>
<td>38</td>
<td>35</td>
<td>73%</td>
</tr>
<tr>
<td>Knowing when to go back to the doctor</td>
<td>35</td>
<td>38</td>
<td>73%</td>
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<tr>
<td>Avoiding visits to the doctor's office</td>
<td>35</td>
<td>36</td>
<td>71%</td>
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<tr>
<td>Taking medication as directed</td>
<td>38</td>
<td>31</td>
<td>69%</td>
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How Do We Get There?
The Opportunity

- Develop high value, expandable, niche applications
- Migrate to an integrated platform
First Generation -- 1998

Personal Information Carrier (PIC)

- Same size as dog tag
- 2 MB/sec Data Transfer Rate
- Flash Memory
- Capacities: 8-64 MB
- Removable hard drive
- OS Interoperable
Portable PHR …

**CapMed HealthKey**

HealthKey combines CapMed’s award-winning Personal Health Record software, with award-winning DiskonKey technology. HealthKey is the first portable health record tool utilizing USB technology.
Multiple value propositions for second generation health care PSD

Health Management Tool Benefits

- Managing Chronic Conditions
- Tracking & Trending Information
- Adherence to Treatment Schedules
- Health & Wellness Education in Context
- Patient/Doctor Compliance
- Communicating Information
- Centralize Fragmented Records
- Comprehensive Medical History
- Transporting Medical Images
Third Generation -- Samsung MyKey Health

- Value proposition of 2\textsuperscript{nd} generation HealthKey (see previous slide)
- + Customization for health care applications, e.g.,
  - Security/authentication
  - Privacy
  - etc.
- + Integration with:
  - EMR/PHR and health care providers
  - Home network applications, e.g., personal finances
  - Mobile network applications
Convergence

Electronic Medical Record/Personal Health Record
Challenges

• Reimbursement
• HIPAA: Privacy/confidentiality issues
• Physician resistance
• Technology maturity
  – Infrastructure
  – Bandwidth
  – Standards
  – Friendly user interfaces
'Digital Angel' lands in China
Will implantable tracking chips be used by totalitarian government?

Posted: March 28, 2002
1:00 a.m. Eastern

Editor's note: The April issue of WND's monthly print magazine, Whistleblower, takes an in-depth look at implanted chips, futuristic surveillance technologies and the virtual end to privacy. One of the companies profiled in that issue is the subject of this report – Digital Angel Corporation, manufacturer of the "Digital Angel" tracking device.
What Do Consumer Technology Companies Bring to the Table?

- Technology
- Intellectual property
- Marketing expertise
  - Consumer marketing
  - Scalability -- “Mass market” mindset
  - Global presence
- Unbiased by delivery system politics and culture
- Capital
Summary

• Where Are We Now?
  - Technology
  - Business Models
• Where Do We Want to Go?
• How Do We Get There?

Fragmented

Integrated

High value, niche apps
END
Better Health Technologies

- Creating value for patients and shareholders
- Strategy, business models, partnerships
- Disease/care management and e-health
- Consulting/Business Development

- E-Care Management News
  - Complimentary e-newsletter
  - 3,000+ subscribers in 27 countries worldwide
  - Subscribe at www.bhtinfo.com/pastissues.htm
BHT Clients

Pre-IPO Companies
Cardiobeat (medical device/DM)
EZWeb
Sensitron
Life Navigator (remote monitoring connectivity)
Medical Peace (physician driven care management)
Stress Less (stress condition management)
DiabetesManager.com (Internet diabetes DM)
CogniMed (highest cost/risk patient management software)
Caresoft (consumer focused DM)
Benchmark Oncology (oncology DM)
SOS Wireless (cellular phone technology)
Click4Care (Internet DM)
eCare Technologies (Internet DM)

Established organizations
Medtronic
-- Neurological DM (medical devices/chronic disease solutions)
-- Cardiac Rhythm Patient Management
Samsung Electronics, South Korea
Siemens Medical Solutions
Joslin Diabetes Center
National Rural Electric Cooperative Association (employer coop)
Disease Management Association of America
Blue Cross Blue Shield of Massachusetts (MCO)
PCS Health Systems (PBM)
Varian Medical Systems (oncology equipment & systems)
VRI (behavioral health care management services)
Washoe Health System (delivery system)
S2 Systems (transaction processing software)
CorpHealth (MBHO)
Physician IPA
Centocor (biopharma)