Continua Health Alliance and Associated Standards

Design and Developer Forum on Telemedicine Systems: Issues, Design, Development and Standardization
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Agenda

- Motivation to Standardize Telemedicine
- Considerations when Standardizing
- Continua Health Alliance Introduction
- Standards Overview
  - Personal Area Network Interface
    - IEEE 11073 Personal Health Device Data
    - Bluetooth Health Device Profile
    - USB Personal Healthcare Device Class
  - Health Record Network Interface
    - Personal Healthcare Monitoring Report
- Conclusion
Personal Health Device Market Data

- 861M Chronic Disease patients, 50% co-morbidity (one or more additional diseases):
- 75-85% spent on chronic disease management
- 278M Healthy Independent Living (Worried Well)
- 15% US GDP growing to 25% ($1.5T with 1/3 waste)
- UK invests $4B to date on £12B forecast for National Health System redesign
- 262M elders – planet is aging

Undeniable Market Need
Over Age 60, World Wide Average is 10%

Driving the Need: Population over age 60 now

% of Population over age 60:
- 0-9%
- 10-19%
- 20-24%
- 25-29%
- 30+%
Driving the Need: Population over age 60 future

2050 Over Age 60, World Wide Average is 21%

Motivation to Standardize Telemedicine

- HOME CARE
  - Healthy, Independent Living
  - Chronic Disease Management
  - Community Clinic
  - Doctor's Office

- RESIDENTIAL CARE
  - Assisted Living
  - Skilled Nursing Facility

- ACUTE CARE
  - Specialty Clinic
  - Community Hospital
  - ICU

QUALITY of LIFE

100%

COST of CARE/DAY

$1 $10 $100 $1,000 $10,000

Digital Health Group
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Considerations when Standardizing

- Recruiting companies with similar interests
- Collecting/agreeing on use cases
- Defining an architecture for seamless data flow
- Surveying for existing solutions
- Building consensus around a solution
- Writing the standard
  - Determining whether to phase-in the solution
- Implementing / testing the viability of the standard
- Testing that a solution interoperates
- Certifying a product
Non-technical Considerations

- Encouraging adoption of the standards
- Reimbursement
- Policy and regulatory implications
- Harmonization with other organizations
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“Our Mission is to establish an eco-system of interoperable personal health systems that empower people & organizations to better manage their health and wellness”
Three focus domains

1) Disease Management (DM)
   - Vital sign monitoring / remote patient monitoring (RPM), medication reminders and compliance, trend analysis and alerts, Email, chat, video, appointment scheduling, personal health records

2) Aging Independently (AI)
   - Helping elderly age gracefully in their own home, basic context and activity monitoring. May include DM-like elements

3) Health & Fitness (HF)
   - Weight loss, Fitness, “Worried Well” vital sign monitoring (e.g. Weight, Blood pressure, Glucose, Cholesterol, Activity level), Personal Health Records
• Describe the long term vision
  - Version 1 focuses on limited areas for success
• Select industry standards and specifications
• Reduce the number of options to increase interoperability
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Version One Device Connectivity Standards

**PAN Interface**

**Device Manager**

- **IEEE 11073-10404™** Pulse oximeter
- **IEEE 11073-10407™** Blood pressure monitor
- **IEEE 11073-10408™** Thermometer
- **IEEE 11073-10415™** Weighing scale
- **IEEE 11073-10417™** Glucose meter
- **IEEE 11073-10441™** Cardiovascular Fitness Monitor
- **IEEE 11073-10442™** Strength Fitness Equipment
- **IEEE 11073-10471™** Independent Living Activity
- **IEEE 11073-20601™** Optimized exchange protocol

**Bluetooth**

Bluetooth Health Device Profile Specification

**USB**

USB Personal Healthcare Device Class Specification
Next Phase

- **IEEE Standards work**
  - IEEE P11073-10406™ Basic 1-3 lead ECG
  - IEEE P11073-10418™ International normalized ratio (INR) monitor
  - IEEE P11073-10419™ Insulin pump
  - IEEE P11073-10420™ Body composition analyzer
  - IEEE P11073-10421™ Peak flow monitor
  - IEEE P11073-10443™ Physical activity monitor
  - IEEE P11073-10472™ Medication monitor

- **Bluetooth work**
  - Power reduction

- **Continua work**
  - Working through the next round of use cases
Version One Health Record Standards

Health Record Interface

Sender

Receiver

- Personal Healthcare Monitoring (PHM) Reports
- Based on:
  - CCD
  - CDA Release 2

Cross-Enterprise Document Sharing (XDS)
- Based on:
  - XDR
  - OASIS ebXML
  - SOAP
  - HTTP
  - MTOM

Home-based Remote Patient Monitoring (RPM) System

Patient

Vital Sign Devices

Healthcare Provider

Electronic Health Record System

EHR / PHR

Labs
Plugfests

- There have been 10+ plugfests as the standards, specifications, and guidelines matured
- Tested the Continua Guidelines, IEEE standards, USB specification, Bluetooth specification, and HL7 profiles
- The plugfests have found issues with the developing standards and interoperability
- Resulted in clarifications in the final documents
• In October 2008, Continua presented the first public demonstration
• Fifteen companies participated
• Demonstrated scenarios in disease management and health and fitness
#1- Heart Failure + COPD

**PAN Interface**
- Device
- Manager

**XHR Interface**
- Sender
- Receiver

Wireless Pulse Oximeter

Wireless Weighing Scale

Wired Blood Pressure Monitor

**EHR**
- Connecting for Health

**PHILIPS**
- Telehealth Service

**PHM Report**
- Weight
- BP + Pulse
- SpO2

**Device Manager**

**Intel**
- Wired + Wireless

**Sender**

**Receiver**

#2- Obesity + Diabetes Type 2

**PAN Interface**
- Device
- Manager

**XHR Interface**
- Sender
- Receiver

**Device Manager**
- Wired Glucose Meter
- Glucose Meter with Wired Agent
- Wired Weighing Scale
- Independent Living Hub Medication Monitor

**Telehealth Service**
- PHM Report
  - Glucose
- PHM Report
  - Weight

**Independent Living Hub**
- Telehealth Service

**Medication Monitor**
- Telehealth Service

**Wired**

**PHR**
- Google Health
- IBM

**ORACLE**
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Conclusions

- Strong industry momentum (e.g. > 160 organizations in Continua, > 115 in IEEE, > 35 in Bluetooth)
- Long term architecture created
- Ten+ plugfests held over the last year to test the standards and interoperability
- MOUs in place between Continua, IHE, IEEE, Bluetooth
- Standards, specifications, and guidelines are completing
- First public demonstration held in October ‘08
- Reference code available within Continua
- Device certification program in place
- First products are applying for certification
- Continua work groups addressing reimbursement and regulatory matters
Invitation to Get Involved!

Continua Health Alliance
For more information, please visit: www.continuaalliance.org

ISO/IEEE 11073 Personal Health Device WG
For more information, please contact: phd-chair@ieee.org

Bluetooth Health Devices Working Group
For more information, please contact: med-chair@bluetooth.org

USB Personal Healthcare Device Class
For more information, please visit: Personal Healthcare on http://www.usb.org/developers/devclass_docs

Digital Health Group

* Other names and brands may be claimed as the property of others.