HL7 Mobile Health NEWS

HL7 Mobile Health Work Group   **November 2013**   Volume 1, Issue 2

MOBILE TECHNOLOGY DRIVES MOBILE HEALTH: DISRUPTIVE TECHNOLOGY MEETS GLOBAL DEMAND

With the phenomenal rise of mobile devices & smart phones globally in the past few years, we have now entered the mobile age – the agricultural age, the industrial age, the scientific age, the information age and now the mobile age!

Move over chalk & slate, paper & pencil, keyboards & laptops, here comes "swish , swipe & a tap" on a mobile devices.

"Beam me up Scotty!"

This global transformation is bringing a change that is impacting our world in every way - how we interact, play, read, write, watch, study, research, work or even relax.

Traditional methods of doing research, developing solutions and subsequent adoption and utilization by end-users in this information & digital age at a break-neck speed is also seeing a change that is rapidly adapting/ adopting to this wave.

Regulators are scrambling to stay ahead of the curve by defining policies and regulations that will help leverage its benefits but at the same time, hopefully, not throttle or chock innovation. Mobile Health is in the midst of this explosion!

There are over 150,000 mobile health apps available to providers, consumers and other stakeholders. While most (all?) of them can't communicate with each other, some do have a connectivity to their own back-end on the server.

Around the globe, Mobile Health case studies and implementation experiences are taking fledgling steps towards leveraging mobile health to provide access and (health) care to populations not only in the urban centers but also to rural, underserved and remote regions of the world.

These examples demonstrate how health problems of today's information society and the needs of data and knowledge intense heterogeneous based healthcare solutions are being met by bleeding-edge mobile solutions that were in the cradle of research till recently but they lack the STANDARDS based framework.

Think ATMs for money, think WIFI for your laptops and smart phones connected and online anywhere, think cell phones working in a foreign land; STANDARDS are foundational to the global successes these industries have seen and this is the direction that health (IT) industry is taking globally.

In summary, as we transition to a digital record framework (access, capture, and dissemination of information) use of mobile health will continue to rise.

As mobile devices become more and more ubiquitous, accessing our Health Information is only a few tap/swipe away!

Gora Datta is (founding) co-chair HL7 Mobile Health Work Group,HL7 Ambassador & Group Chairman & CEO, CAL2CAL

In this issue:

HL7 Mobile Health NEWS

Mobile/PHR gap analysis by Tim McKay, PhD, CISSP

Mobile/PHR (Personal Health Record) Gap Analysis Completed

The PHR-S functional model, as created, did not anticipate the wide use of mobile devices (smartphones, tablets) as actors within the system. This raised a question about the adequacy of the current PHR-S model given the pervasive use of mobile devices by consumers. For example, in the United States, there are more in-use mobile phones than people, and most mobile phones being purchased today are smartphones. These smart devices are now being used to access PHR information and increasingly their use will supplant access through personal computers. In addition, some Personal Health Records systems now available are designed solely for use on mobile devices.

There are two main findings from the analysis. First, the PHR-S, as it currently stands, does not need to be updated to accommodate mobile devices. That is, within the model, function names, statements, descriptions, and conformance criteria are written in a flexible manner that is device agnostic. Personal computers or smart mobile devices can equally conform to existing standards related to system functionality, system support, security, privacy, and data interoperability.

Second, there is need to create one or more mobile-centric functional profiles for the PHR-S. PHR systems can only be certified against functional profiles, and it is clear that providing additional guidance in relation to a mobile-centric PHR-S can be helpful to system

developers and lead to a greater standardization of common methods, especially in relation to security controls. For example, how location services and cameras are used by a PHR system have significant implications for consumer privacy.

The completed analysis contains lists of issues concerning mobile device capabilities, context of use of mobile devices, and mobile device user behaviors. These lists can be of help in any similar gap analysis for other HL7 workgroups in determining the need to update models, standards, and in the creation of new functional profiles. The complete report is available for download on the Mobile Health Workgroup Wiki.

Tim McKay, Ph.D., is Director, Digital Integration for Kaiser Permanente's Internet Services Group. He is an active member of both the HL7 Mobile Workgroup and PHR subgroup of the EHR Workgroup.

HL7 Mobile Health NEWS

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HL7 MH Low Medium Income Countries Activities, by Nathan Botts,

The HL7 Mobile Health (mHealth) Low to Medium Income Countries/Settings (LMIC) Sub-workgroup (SWG) works to develop and provide an actionable approach for wide-scale adoption of health information technology standards within settings with limited information communication technologies (ICTs) Some LMIC settings lack or have nascent approaches to collecting, sharing, and receiving health-related information in standardized, sustainable methods. Often this is due to a lack of broad access and affordability of ICTs such as computers, Internet connectivity and even reliable electricity, much less Electronic Health Record (EHR) systems. The proliferation of cellular services and cell phones, enables mower cost ICT access., Thus mHealth has risen as a more accessible approach to communicating health needs and services, especially in rural LMIC settings.

The HL7 mHealth LMIC SWG has identified that LMIC settings can benefit from frameworks that describe gradual methods of adoption of standards-based guidelines and resources that will help promote interoperable mHealth-based solutions. This approach may help reduce the number of ad hoc, one-off, proprietary, silo approaches present in the marketplace and promote more scalable and interoperable solutions to support their efforts. One of the first projects that the HL7 mHealth LMIC SWG is working to develop is a Framework (comprised of guidelines and resources) that will help explain how adoption of health IT standards can benefit LMIC settings and how this can promote wide-scale adoption of mHealth technologies. The Framework seeks to provide a repeatable model for using a staged approach to migrate from paper or non-standard solutions to standards-based mobile health systems.

Anticipated goals of the LMIC mHealth Framework include:

♦ increased continuity of care;
♦ leveraging and utilization of existing resources;
♦ increased quality and safety of care;
♦ movement from paper-based approaches toward computerized systems;
♦ lowering the cost of health care provision;

♦ integration / harmonization of mHealth-related operations with other safety net operations;
♦ improve the timeliness and efficiency of mHealth-related
♦ improved logistical tracking and utilization of resources

In parallel, the HL7 mHealth LMIC SWG has been engaging partners and responding to opportunities for developing LMIC use cases. These use cases will help to inform and pilot framework development, with a specific focus on maternal and child health. Projects currently being considered, and in development include community health efforts in Nigeria and Niger of West Africa, and similar efforts in Bengal, India. Focusing on these types of efforts is timely in that as these technologies continue to develop and are increasingly adopted, all nations will benefit if implemented in an interoperable and sustainable manner. Bringing these issues to international attention is paramount, especially as it relates to recent press on the establishment of the Standards & Interoperability Framework's EU-US eHealth Cooperation Initiative. This initiative focuses on establishing goals and projects related to the development of internationally interoperable EHRs and cooperation on the challenges to developing an eHealth/Health IT proficient workforce. The HL7 mHealth LMIC SWG applauds this effort and wants to ensure that the unique, and in many cases, critical needs of LMIC settings should be central to this conversation.

The HL7 mHealth LMIC SWG is always seeking further members, collaborators, experts and workgroup support. The team currently meets on Mondays at 11am ET and encourages anyone interested in these and related issues to visit and/or participate.

♦ Marshall, C., Lewis, D., Whittaker, M. (2013) mHealth technologies in developing countries: a feasibility assessment and a proposed framework. Health Information Systems Knowledge Hub. University of Queensland, Australia.
♦ http://wiki.siframework.org/EU-US+eHealth+Cooperation+Initiative

Nathan Botts, PhD is Senior Study Director for Center for Health IT, Westat and Chief Technology Officer at HealthATM

HL7 Mobile Health NEWS

University Research by Professor Christopher Doss, PhD

North Carolina Agricultural and Technical State University is developing a laboratory dedicated to mHealth for the home environment. The focus of this research is to facilitate extending the reach of caregivers into the home environment. This will be achieved through the development of SAAD (socially assistive agents for domotics), which incorporates a home care interconnection network (HCIN). The HCIN allows various mobile medical devices, sensors, and mobile computing systems (e.g. tablets, smartphones, embedded processors, etc.) to interact. SAAD is a socially assistive agent designed to facilitate self-care for an elderly subject in his or her own home and to engage the subject socially and emotionally.

The HCIN will incorporate smart-house technology, or domotics, seamlessly with the socially assistive agent. Once the systems are in place, SAAD will be capable of directing the use of these devices based on medical use cases. Thus, SAAD will facilitate aging in place. In addition, SAAD will have a Web presence so that interested parties may track and conveniently communicate with the subject, and the entire system will be self-managing (that is, autonomic).

While the HCIN allows for interconnection of various devices, SAAD will be embodied as an avatar endowed with speech and displayed on one of several monitors throughout the house, specifically, the one currently closest to the subject. The system on which the agent is implemented will recognize lexical items and emotion-expressing prosody from speech recorded by a microphone, and it will recognize facial expressions and spontaneous gestures. Biophysical data from sensors attached to the subject and other devices throughout the home will give further clues as to her/his psychological and physical state.

When implemented in the field, a SAAD system will be installed throughout the home of an elderly person, as shown in Figure 1. The avatar will appear on the monitor and speak to the subject. As the subject moves from room to room, the avatar will appear on the monitor in the corresponding room. SAAD will contain a server, stored in an out-of-the-way place designated as the media room, as well as several interactive units installed throughout the home in strategic locations. A SAAD interactive unit will contain a large-screen monitor mounted on a wall along with several speakers and a local processor for audio and visual rendering.

The subject will be monitored with devices such as a Kinect or LeapMotion device. They will also be outfitted with other unobtrusive sensors that will appear to the subject as such things as wrist bands or small clip-on devices. The voice and sensor data will be collected and possibly preprocessed by the local processor. Cameras to collect data for recognizing facial expressions and gestures, as well as identifying emergency situations such as a fall, will be located strategically, physically couple with a monitor when appropriate, but always integrated with an interactive unit and its local processor. Collecting visual data requires the cooperation of the subject in ways not required for audio data, and the onus is on SAAD to induce this cooperation

Christopher Doss, PhD: Associate Professor of Department of Electrical and Computer Engineering at North Carolina A & T State University

University Research by Professor Christopher Doss, PhD
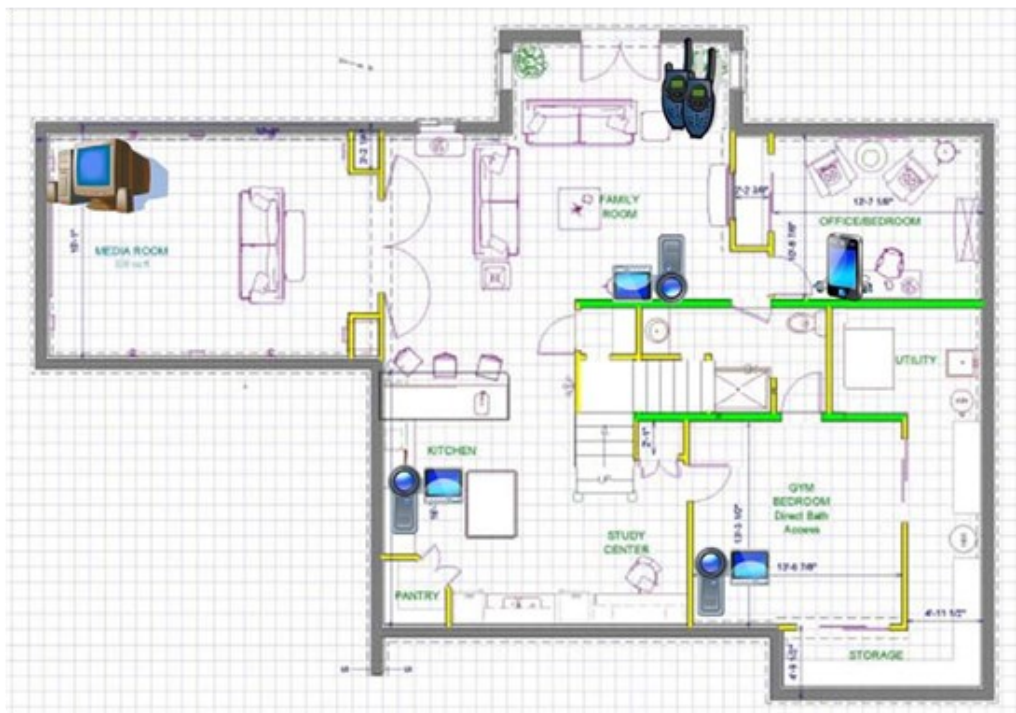
Figure 2 Physical Layout of SAAD System (using material from http://www.3dplanview.com/)

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Security Challenges with Mobile Devices by Tony Walsh, CISSP

Personally-owned mobile devices at work has become one of the top security concerns. In healthcare organizations, mobile devices are making it easier to gain access to protected health information (PHI). For example, text messaging is often used because it is a fast and convenient way to communicate. Some physicians have even insisted that nurses contact them by text message only with patient updates or lab results.

The major security concern is that PHI now resides outside of the organization. The messages could reside on the personally-owned devices of both the sender and recipient of the message as well as their cell phone carriers (Verizon, T-Mobile, etc.). The carriers retain a copy of all text messages on their computer systems. Employers have no way of managing the retention of text message on their employees' personally owned devices.

While text messaging is convenient, it is not guaranteed that the text message was received because:

- Text messages are lower priority on the voice/data transmission hierarchy by phone service providers. Text messages may not get the urgent attention required for the situation.
- Cell phones need access to either a cell phone tower signal or if it is properly configured, a WiFi hot spot. There are still some "dead zones" within certain areas buildings and in rural areas where there is no phone reception. Even if there is WiFi, the access point may be controlled by a key or password.

- The text message could be mistakenly sent to the wrong recipient. It happens to all of us at one time or another, whether it's email or phone numbers. A list of names or numbers pop up as we start to enter in the recipient's contact information. Your thumb or finger moves too fast and poof – you've selected the wrong recipient.

The three minimum security controls that everyone needs to take include:

- Password-protect your device. This prevents someone from powering up the device.
- Enable the automatic lock out feature after a predetermined period of inactivity.
- Encrypt the data stored internally within the device.

  The owner's manual or the service provider can help with enabling these controls.

Tom Walsh, CISSP is a nationally recognized speaker and a co-author of four books on healthcare information security.

Tom has over 22 years of information security experience.

Prior to starting his healthcare consulting business in 2003, Tom's experience included being the first information security manager for a large, multi-hospital healthcare system in Kansas City.

HL7 MOBILE HEALTH WORK GROUP 's ELEVATOR PITCH!

HL7 MOBILE HEALTH WG MISSION

- The HL7 Mobile Health Work Group creates and promotes health information technology standards and frameworks for mobile health.

6

HL7 MOBILE HEALTH WG CHARTER

- Identify (and develop, as applicable) data standards and functional requirements that are specific to the mobile health environment
- Identify and promote mobile health concepts for interoperability as adopted and adapted for use in the mobile environment
- Coordinate and cooperate with other groups interested in using mobile health to promote health, wellness, public health, clinical, social media, and other settings.
- Provide a forum where HL7 members and stakeholders collaborate in standardizing to enable the secure exchange, storage, analysis, and transmission of data and information for mobile applications and/or mobile devices.

7

HL7 Mobile Health WG Activites

- Impact of MH Standards:
  - Messaging
  - Document Architecture
  - Functional Model
  - Services
  - Modeling (DAM, DIM)

- Impact of MH:
  - Security   - Social Media
  - Usability   - LMIC
  - Affordability   - Interoperability

8

In SUMMARY!

- MOBILE HEALTH
  - Not a vertical domain
  - But a horizontal framework that cuts across and impacts all health care domains
- As we transition to a digital record framework; (access, capture, dissemination of information) use of Mobile Health will continue to rise
- As Mobile Devices become more and more ubiquitous, accessing our Health Information is only a few tap/swipe away!
- TRULY A DISRUPTIVE FRAMEWORK!

27

(EXTRACTS FROM MOBILE HEALTH WORK GROUP Sep'13 WGM PRESENTATION)

HL7 Mobile Health NEWS

Mobile Health Events & News

UPCOMING

- [**HL7 WGM , Jan 2014, San Antonio, TX**](#)
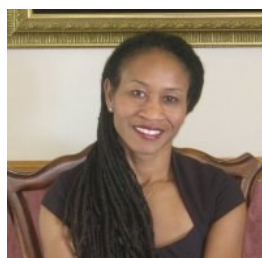- [**HIMSS14, Feb 2014, Orlando, FL**](#)

MEETINGS, WEBSITE

The HL7 Mobile Health Work Group general meetings are held on Friday weekly at 11am EST(US).

WEB: www.HL7.org/Special/committees/mobile

WIKI: wiki.HL7.org/index.php?title=Mobile_Health

ListServ: mobilehealth@lists.HL7.org

HL 7 Mobile Health co-Chairs

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Next issue

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