



HL7 mFHASt Standard

Mobile Framework for Healthcare Adoption
of Short-Message Technologies

Project of the HL7 Mobile Health Workgroup

HL7 mFHASt Goal

- To provide standards for communicating health services through short message technologies (SMTs) (e.g. SMS, Instant Message, Twitter, etc.)
- To increase opportunities for consumer / patient engagement and timely communication
- To improve communication and response time among providers of health services

HL7 mFHASt Importance

- Brevity of message for bandwidth sensitive settings (e.g. LMIC, Rural Health)
- Brevity of message for increasing human processing and response
- Increased opportunities for low infrastructure settings

mFHASt Status

- Evolved out of mHealth Low & Middle Income Countries (LMIC) sub-workgroup activities
- HL7 project/product (normative standard) in development
- Project approved by HL7 SD April 2015
- Approved by TSC September 2015
- Comment-only ballot submitted Dec 2016
- Meeting Thursdays @ 2pm EST

mFHASt Short-message Concept

- Short messages within the mFHASt standard are meant to be
 - Brief
 - Low Payload
 - Easily Processed by Humans at its endpoint
 - Orientation is for fast, meaningful communication between people and care providers using garden variety technologies with no assumption of having sophisticated apps or services

Message Size Research

- *Creativity loves constraints and simplicity is at our core. Tweets are limited to 140 characters so they can be consumed easily anywhere, even via mobile text messages. There's no magical length for a Tweet, but a recent report by Buddy Media revealed that **Tweets shorter than 100 characters get a 17% higher engagement rate.***

Short-message Technology Basics

- “Short-Message Technology” encompasses the realm of technologies related to SMS, text messages, instant messages (e.g., iMessage, FaceBook Message, Twitter, WhatsApp, Google Chat, Unstructured Supplementary Service Data (USSD) messages etc..)
- Emphasizing brief messages of approximately 160+/- characters
- Low-cost, low infrastructure, low learning-curve

OTT vs SMS

- OTT - over-the-top messaging is third parties providing instant messaging services as an alternative to text messaging services provided by a mobile network operator, particularly WhatsApp, which is narrowly focused to replace text messaging on Internet connected smartphones.
- Traditional SMS – Cellular network based data transmission limited to approximately 145-160 characters.

mFHASt Business Cases

- Public Broadcast
- Private Broadcast
- B2P/P2B
- P2P

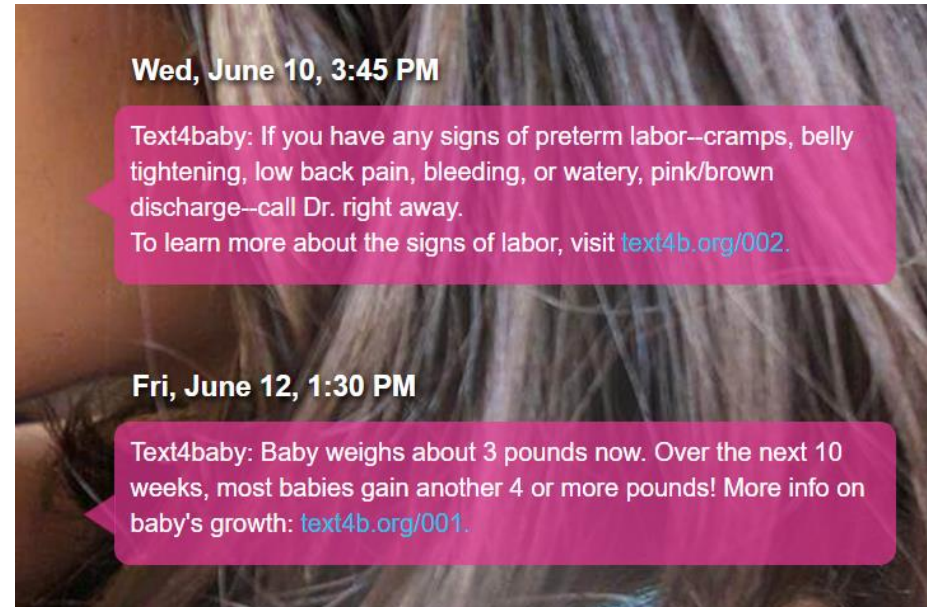
Public Broadcast

- Sent to all subscribers of a specific short message service (e.g., Amber Alert)
- No PII, PHI



Private Broadcast

- More personalized messages according to a particular cohort (e.g. CDC Text4Baby)
- Assumed that no PII/PHI is transmitted, but subscription to the cohort increases exposure



B2P/P2B Messaging

- Directed messaging between a person and an organization (e.g., appointment reminders, field survey)

SMS + Cue Card Interface

General Strengths

Can be used with any phone
Ongoing cost is low (SMS)
Many workers familiar with SMS

General Weaknesses

Requires basic literacy skills
Changing survey requires new cue card
Hard to enter in free-form notes
No confirmed receipt of data delivery
Worker can forget or lose cue card
Quite easy to fake visits (copy old SMS)

Our Results: Accuracy & Efficiency


We measured 4.5 errors per 100 entries
The average interaction was 97 seconds

SMS Cue Card

1. Create a new SMS Message

Press Center Button
Select "Messages"
Select "Create Message"
Select "New Short Message"

2. Switch to Numeric Input Mode

Press Menu Button 
Select "Entry Mode"
Select "Numeric"

3. Enter the ID of the Current Patient

Aamir Khan	- Press 1
Abhishek Bachchan	- Press 2
Aishwarya Rai	- Press 3
...	

4. Enter a Space

Press *

11. Enter the Patient's Cough

No Cough	- Press 1
Rare Cough	- Press 2
Mild Cough	- Press 3
Heavy Cough	- Press 4
Severe Cough (with blood)	- Press 5

21. Check Yourself

Your finished message should be formatted similarly to the following:
10 372 62 68 4 1030007

P2P Messaging

- P2P SMT messages represent unique instances in which a personal exchange occurs between two individuals to discuss healthcare.



mFHASt.org Evidence-Base



HL7 MFHASt RESEARCH & DEVELOPMENT ENVIRONMENTAL SCAN

How to Prevent a Heart Attack: Text Patients on Healthy Habits

An article reporting results of a clinical trial in Australia. <http://jama.jamanetwork.com/article.aspx?articleid=2442937>

From the Wall Street Journal summary: A recent study has found evidence suggesting text messages could reduce one's odds of a second heart attack. A six-month clinical trial in Australia found that patients recovering from a heart attack were more likely to maintain lower blood pressure, less body fat and lower cholesterol levels than a control group when the patients received text messages asking and giving suggestions about their health routines. Patients receiving the texts also were more likely to be active and to quit smoking than the patients in the control group, who didn't receive such texts.

Author: Analyzed by M'lynda Owens 0 Comments Article rating: No rating ★★★★★

Wearable Sensor/Device (Fitbit One) and SMS Text-Messaging Prompts to Increase Physical Activity in Overweight and Obese Adults: A Randomized Controlled Trial

A report summarized in HIMSS TIGER news digest June 13, 2016

From the summary article: Mobile devices have increasingly penetrated our life and have become one of the study subjects in clinical informatics. Well-designed randomized trials are rarely used for these studies. A recent publication in the telemedicine journal and e-health tested the utility of Fitbit, a wearable device, in comparison with SMS messaging in prompting overweight and obese adults to increase their physical activity [5]. Sixty-seven adults enrolled in the study. The results suggest that a Fitbit and SMS mixed approach achieves a small increase in moderate- to vigorous-intensity physical activity at a 6-week follow-up and SMS reminders are insufficient in increasing physical activity beyond 1 week.

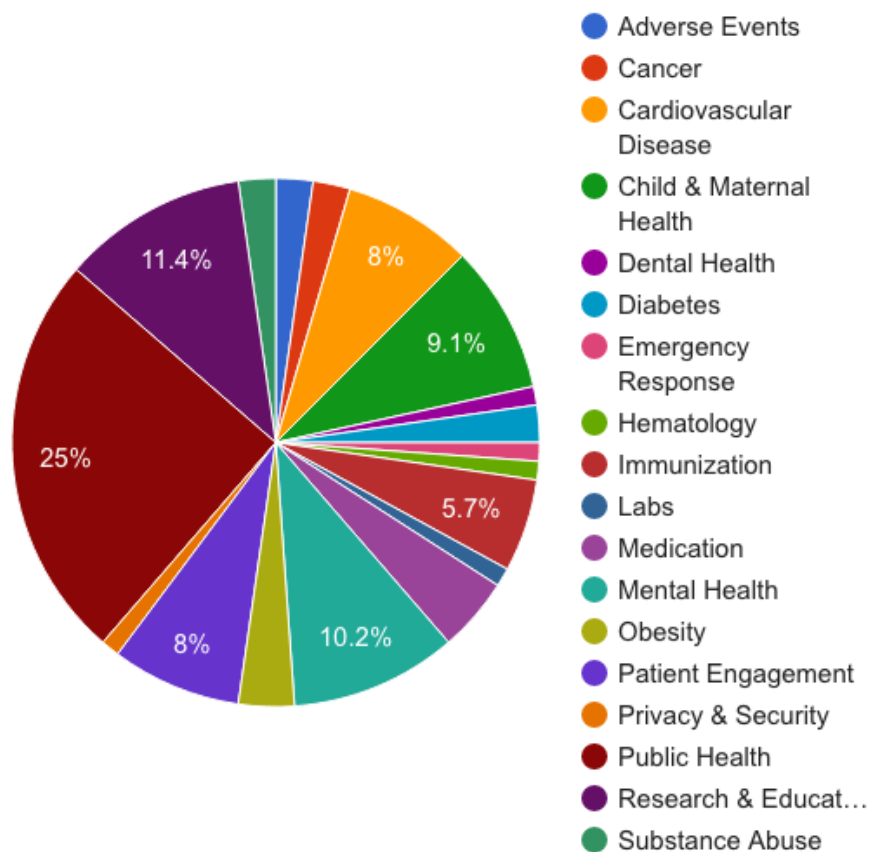
Search

CATEGORIES

- > Adverse Events (2)
- > Cancer (1)
- > Cardiovascular Disease (6)
- > Child & Maternal Health (10)
- > Dental Health (1)
- > Diabetes (4)
- > Emergency Response (1)
- > Hematology (1)

HL7 mFHASt Workgroup

Preliminary Findings: Domain



% of Total (n=75)	Healthcare Domain
24%	Public Health
12%	Research & Education
10%	Child & Maternal Health
9%	Mental Health
9%	Patient Engagment
8%	CardiovascularDisease
5%	Immunizations
4%	Diabetes
4%	Medication
3%	Substance Abuse

mFHASt Comment-Only Ballot

- Ballot submitted for comment-only review 12/5/2016
- Ballot status – Approved (13 lucky votes)
- Total of 7 comments

mFHASt Message Requirements - Context

mFHASt Message Context

- SHALL either mobile human originate or mobile human terminate.
- SHOULD constrain textual message length to 140 to 160 characters.
- SHOULD constrain message package size to achieve average latency levels depending on available network bandwidth (e.g., 3G vs 4G).
- SHOULD utilize secure mobile device access and storage practices where applicable to the implementation.

mFHASt Message Requirements - Content

- **mFHASt Message Content**
- SHALL have a unique id identifying the sender of the message.
- SHALL include an identifier type, and an id that is unique within that type.
- SHALL have a unique message identifier.
- SHALL include the date and time the message was sent.
- SHALL have one or more recipient identifier(s).
- SHALL designate message criticality.
- SHALL be composed of a documented structure.
- SHALL have a concatenation ID for message chaining.
- SHOULD have a designation as to the activity type (e.g. domain such as immunization) message.
- SHOULD have a specification for multiplicity (e.g. 1:1 or 1:N) (broadcast, duplex, single-channel)

mFHASt Message Requirements - Transport

mFHASt Message Transport

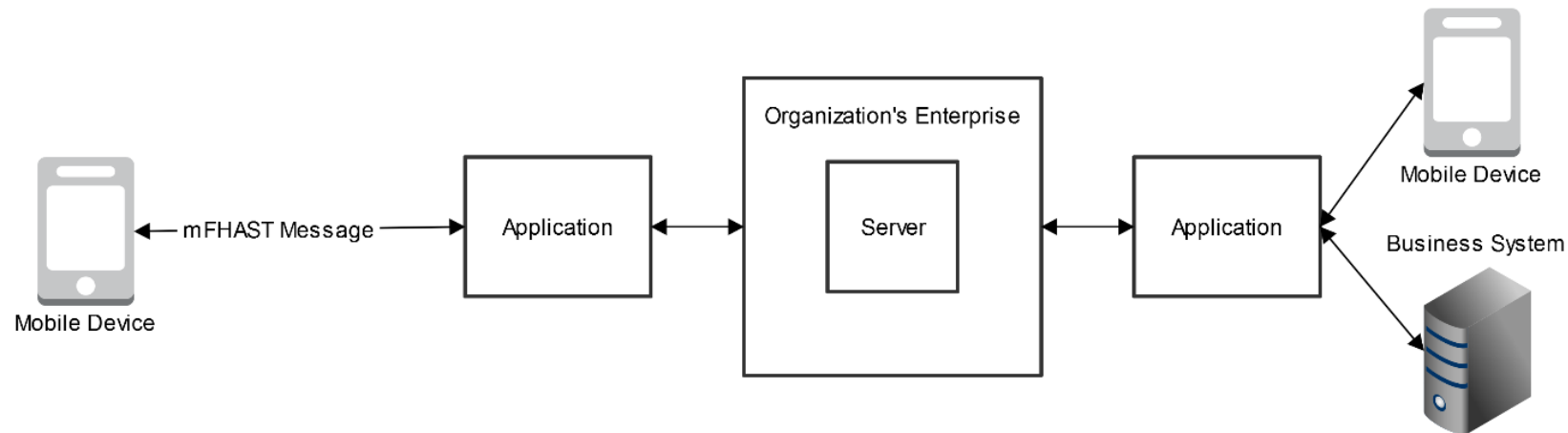
- SHALL provide system acknowledgement of successful receipt
- SHALL [IF] utilize secure transport channels where applicable to the implementation.
- SHOULD have the ability to address a large number of endpoints.
- SHOULD utilize multiple paths between the sources and destination in order to improve the probability of successfully transmitting a message.

mFHASt Implementation Use Case

Insert some descriptive bullets

Should the server block be at the top with branches to the devices

Change the lines so that there is a parallel for the different flows of communication



Healthcare Short-Message Technology Promotion & Dissemination

HL7 mFHASt

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Tweets Tweets & replies

mfhast @mfhast · Apr 10
Diabetes Text-Message Self-Management Support Program (SMS4BG): A Pilot Study

Diabetes Text-Message Self-Management Support ...
From the article abstract: "The increasing prevalence of diabetes and costly long-term complications associated with poor glycemic control are issues facing health serv...
mfhast.org

mFHAST Project Timeline 2017-2018

- Q4 2016: Comment Only Ballot submitted!
- Q1 2017: Ballot reconciliation
- Q2-Q3 2017: Project on hold
- Q4 2017: New meeting series to begin
- Q2 2018: STU Ballot to be submitted

Project and contact information

- Standing meetings are on Thursdays at 2 PM Eastern
- Project Evidence Base: <http://mfhast.org/>
- Project Lead: Nathan Botts: nathanbotts@westat.com