The Future of Interoperability: APIs + Traditional Interfaces

“ALL MAJOR ELECTRONIC HEALTH RECORD VENDORS WILL SOON INCLUDE AN OPEN, CAPABILITIES-BASED API IN THEIR PRODUCT, PRESENTING NEW OPPORTUNITIES FOR CUSTOM DATA FLOW SOLUTIONS TO CONNECT PATIENTS AND PROVIDERS.”

Dave Shaver, HL7F
CTO/Founder
Corepoint Health
HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC.)

SITUATION: THERE ARE 14 COMPETING STANDARDS.

14?! RIDICULOUS!
WE NEED TO DEVELOP ONE UNIVERSAL STANDARD THAT COVERS EVERYONE’S USE CASES. YEAH!

SITUATION: THERE ARE 15 COMPETING STANDARDS.

http://xkcd.com/927
Dave Shaver
HL7 Volunteer and Community Member
1993-2017

Board member of both HL7.org and FHIR.org
Co-Chair INM, FHIR Governance Board

HL7 Fellow

Dave Shaver
CTO/Founder
Corepoint Health
1997-2017
POLL #1

Why are you joining us today?
HL7 in one sentence

• “HL7 makes it easier to integrate!”
• “HL7 is a framework for negotiation”
• “When you have seen one HL7 interface you’ve seen... one”

  – Wes Rishel

• "Communication and interoperability are not a science. They are an art form perfected over time."

  – Keith Boone

(@motorcycle_guy) "On Models" (http://motorcycleguy.blogspot.com/2013/08/on-models.html)
Pick Two

- Fast, Good, Cheap
- Scope, Time, Budget
- Risk, Resources, Quality
- Privacy, Accuracy, Security
- Cheap, Light, Strong
- Fast, Small, Flexible
- **Cheap, Flexible, Interoperable**
Dave’s Triple Constraint

• **Usable**
  - Specific department
  - Across many facilities (customers)

• **Flexible**
  - Supporting many workflows
  - Configurable

• **Interoperable**
  - Across departments, workflows, and care settings
  - For “Free” because it is a “necessary evil”
HL7 2.X Connectivity

EHR

Export

Import

LIS

Export

Import
Hospital – Engine

Corepoint Integration Engine

EHR

LIS
Dietary
HomeHealth
RIS
The Dream

St. Francis' Hospital

Corepoint Integration Engine

EHR

LIS
Dietary
HomeHealth
RIS

HIE

St. Luke's Hospital
Elsewhere Health System
Lab Information System as Monolithic Application

“Single source of truth” for Phlebotomist

- Where is the patient?
- What samples do I draw?
- Is the ordered canceled?
- Update status
LIS with Proprietary Connectivity

Still “single source of truth” for Phlebotomist – on one or two screens
Mobile App – FHIR Connectivity backbone

Leverage a standard in a proprietary manner
Real World: HL7 2.X + FHIR Integration

Multiple Sources of Truth
Mobile App – FHIR Integration

Multiple Sources of Truth

- Pathology
- Referring Physician Portal
- EHR
- LIS

FHIR

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FHIR to FHIR

EHR

Corepoint Integration Engine

FHIR

LIS

Dietary

HomeHealth

RIS
SMART on FHIR

About this test
This report evaluates your potential risk of heart disease, heart attack, and stroke.

Your Results
CRP level test

Total cholesterol level

Desirable

LDL "bad" cholesterol

Optimal

HDL "good" cholesterol

Low

Normal

High

Your risk
You show an elevated risk of cardiovascular disease.

Your risk would be lowered to:

15% if your blood pressure were 120mm Hg
15% if you didn’t smoke and all levels were optimal
15% if you quit smoking

What now?

Diet and exercise can improve your cholesterol levels

Staying smoke-free is one of the best ways to improve your heart disease risk

Ask your doctor about statins or other medications that can lower cholesterol

Consider retesting in 1 or 2 weeks to exclude a temporary spike in blood levels

Original Design: David McCandless & Stefanie Posavec for Wired Magazine // informationisbeautiful.net

Reynolds Risk Score Calculator // ReynoldsRiskScore.org

Development and validation of improved algorithms for the assessment of global cardiovascular risk in women:
The Reynolds Risk Score. Ridker et al. JAMA 2013;309:611-619

C-reactive protein and parental history improve global cardiovascular risk prediction: The Reynolds Risk Score for Men.
POLL #2

How are APIs impacting you today?
POLL #3

How many APIs do you expect to see in use at your organization in two years?
What’s driving the industry toward web APIs?
POLL #4

Do you think HIT vendors will open up APIs?
Motivations for APIs

- Access data at the source of truth when needed in real time
- Modernization of infrastructure
- Moving from transactions (HL7, CDA, X12) to discrete data
- Increased breadth of care coordination (patient, providers, payers, pharma, government)
- Broader data availability (in-home monitoring, self-assessment, and other IoT impacts... but not FitBit)
- Most critically: Capability-based rather than workflow-based
Hospital Integration Workflow with Open API

Internal Sharing
- Application Suite and Records
- Hospital Intelligence

External Sharing
- Open API
- Patient App: Complete medical history and predictive intelligence
- Rx of patient choice
- Downstream LIS
- ACOs, State Registries, Downstream Hospitals
What’s the difference between traditional interfaces & APIs?

- HL7® v2
- FHIR®
- Web Services
Transactions vs. Granular data

- It takes dozens of database roundtrips and multiple workflows to gather enough data to send a typical HL7 transaction
  - ADT = MPI + Bed Census + Provider Directory + Payer Dictionary + Terminology

- *Pushing* data from the source of truth constantly vs *pulling* data as needed

- Access to application-specific data (“API tied to the database”)

What’s the role of HL7 FHIR in API data exchange?
POLL #5

How will FHIR impact your job/business?
Technology vs. Interoperability

- Vendor-specific API allows peek inside walled garden
- Industry-wide standard provides interoperability
- Excitement over REST/XML/JSON should not overshadow data model standardization
- Eliminating technical hurdles while providing standard profiles and infrastructure
- The “magic” of FHIR is accessing data at the source of truth
How will APIs and FHIR open the door to new workflow solutions?
How do you see FHIR being used by your organization?
Internal Integration

- The HIS database will become much more transparent
- Market dynamics totally unclear but likely massive
- PACS vs. VNA
- Pendulum: Best-of-breed vs. monolithic – FHIR cause disruption to the cycle
- Point/departmental modules could return
External Integration

• For the first time SMART on FHIR allows external, web-based applications access to some/all of the medical record
  – Care coordination, disease management, insurance workflows, etc

• FHIR Messages and CDA on FHIR could bring new era to “one format for all” interoperability

• If FHIR APIs are opened up, the outcome is even more transformative
  – e.g., patient portals become OAuth access to source of truth
  – Data aggregated and used in unexpected ways (both positive and negative)
How will HIEs, integration engines, and API managers work together?
Hybrid Integration Environment

Bi-Directional Interoperability
Any protocol. Any standard. Any application.

Connecting Internal Applications
- Population Health
- EHR
- Sister EHR
- LIS
- Scheduling

SOAP Web Services
- HL7 V2, TCP/IP
- RESTful FHIR API
- XML, FTP

External Data Exchange
- Patient App
- LIS
- Rx of patient choice
- ACOs, State Registries, Downstream Hospitals

Corepoint Integration Engine

FHIR Open API
Other Protocol
POLL #7

How do you plan to manage FHIR APIs in the future?
POLL #8

Q&A up next

Next steps...
Q&A – Resources

- Grahame Grieve, FHIR Product Director
  - onfhir.hl7.org
  - www.healthintersections.com.au

- www.fhir.org – FHIR Foundation
- www.hl7.org/fhir – Standard
- www.smarthealthit.org – SMART on FHIR
- More Blogs:
  - wiki.hl7.org/index.php?title=FHIR_Blogs

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