Hong Kong Connectathon #0

APEHC

April 22, 2023 Hong Kong STP

Grahame Grieve

FHIR: The web, for Healthcare

Open Community

- Make it easier to exchange healthcare information
- Open Participation - uses web infrastructure (social media)
- Lead by HL7 - deeply connected to world wide health community

Open Standard

- Describes how to exchange healthcare information
- Public Domain (http://hl7.org/fhir)
- A web API - web standards where possible
- Continuity with existing healthcare standards

Freely available

- Known address: http://hl7.org/fhir
- License: Creative Commons Public Domain (CC0):
  - “No Rights Reserved”
  - You can copy, modify, distribute and perform the work, even for commercial purposes, all without asking permission
  - The most open of open licenses
- Anyone can do anything with the content
  - There can be no disputes about ownership of rights to do anything with the FHIR content: HL7 waived it’s rights
  - But we do protect our trademark (written permission)

Building the FHIR culture

- Open community – anyone can join
- Produces open standards – community treasure
- Foundation: solid governance backed by ANSI

- Build by iteration and continuous demonstration that trust is rewarded
- Connectathons, Face to face meetings, teleconferences, email lists, community forums, instant messaging, stack overflow

Building on the Idea

- A small passionate community rapidly grew around the idea
- Built specification, tools, demonstrations, web presence
- Took some exemplars into production
- Over time, community matured, governance stabilised & reconciled
- Selected by Argonaut (US EHR vendors) + Apple for C2B use
  - various national uses (e.g. English NHS)
- More pilots, more success around the world
- Rapid growth in community – meetings, social media,

FHIR Maturity Model

- FHIR is based on software development principles adapted from open source: release early, test thoroughly
- Goal is a really well tested specification
  - Side effect is a changing specification
- Well trodden path: draft -> connectathon -> trial use -> “Normative”
- Maturity Model captures this process

FMM Artifact Rules

Draft

- **FMM0** = the artifact has been published on the current build. (Start here)

Draft or Trial Use

- **FMM1** = Considered substantially complete and ready for implementation.
- **FMM2** = Tested (Connectathon) and successfully supports interoperability among at least three independently developed systems

Trial Use

- **FMM3** = Passed STU ballot + evidence of broad review - e.g. at least 10 distinct implementer comments leading to change
- **FMM4** = Tested across its scope, balloted, and implemented in multiple prototype projects. Implementer consultation required forbreaking changes.
- **FMM5** = Published in two formal publication release cycles + implemented in at least 5 independent production systems

Normative

- Passed HL7 normative ballot, no breaking changes, stop tracking FMM level

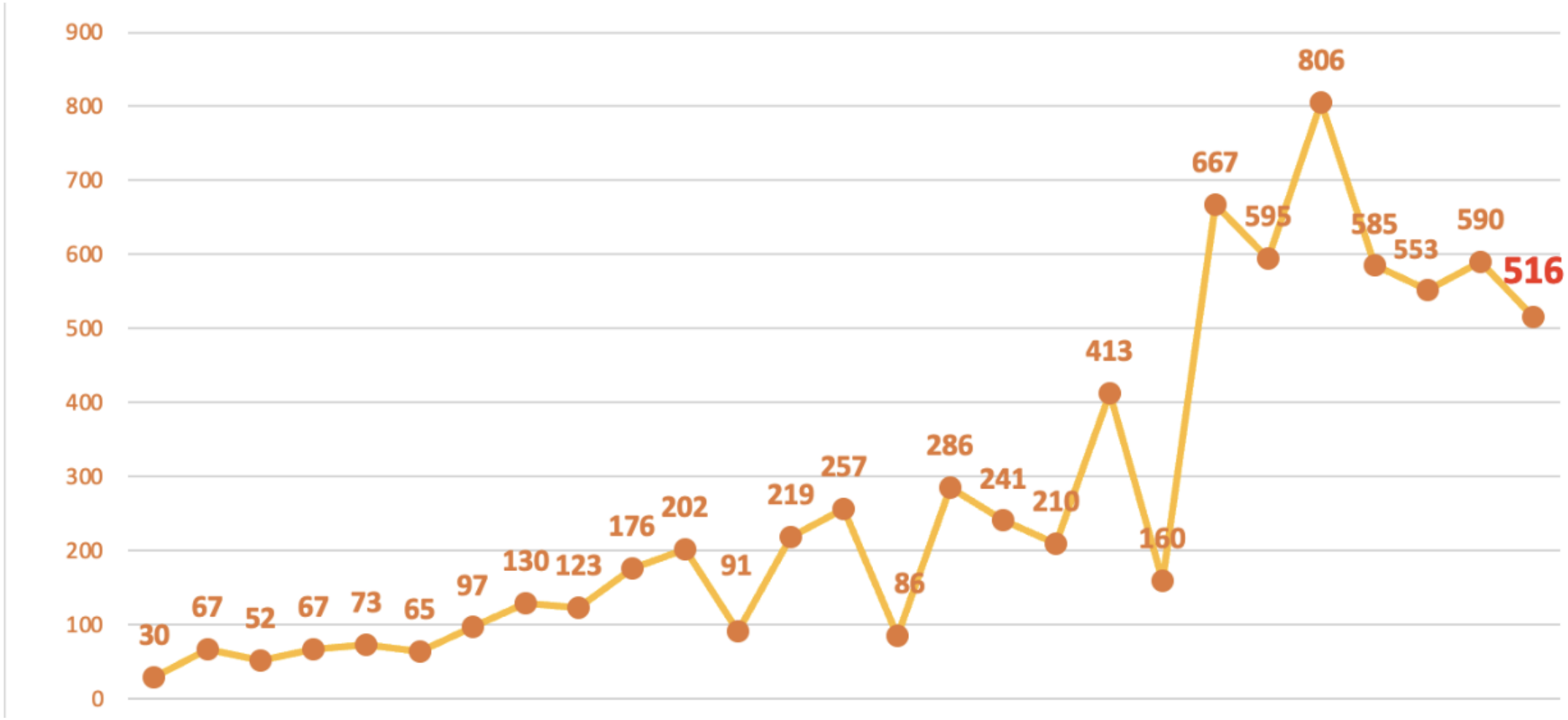
FHIR Connectathons

- A critical part of the overall process
- Serve multiple purposes:
  - Demonstrate that the community values the specifications being tested (or not)
  - Test that the exchange works, and revise specification to get balance correct
  - Allow implementers to test their systems early in the development cycle
  - Bring developers and expert users together – create ongoing community
  - Get feedback about real progress for the sponsors
- A proper specification has community endorsement based on real outcomes: that’s the treasure

FHIR Connectathon Process

- Purpose: to ***connect*** people and systems around use cases
- Divided into tracks for relevant use cases (= specifications)
- Typically 1-2 days in length with some degree of report back at end
- Tracks cover / may contain:
  - Tutorial materials
  - Development of test cases / collateral
  - Group discussion of purpose
  - Actual exchange of content / issue clarification & triage
  - Testing to prove outcomes
- Testing the idea -> testing the specification -> testing the systems

Main FHIR Connectathon Participation



Hong Kong Connectathon Context

- Establish the use cases
  - Government leadership / strategic vision and architecture
- Scope the tracks, choose leadership
- Invite participants
  - Who will bring servers? Clients?
- Hold the event
  - Expectation of regular followup
  - Background continuous process
- Assess success criteria (participation, maturity moving along)

International Specifications

- IPS: International Patient Summary
  - A set of agreed summary information about a patient
  - Common Content + Terminology rules
  - Portable as they travel (tourist/refugees/civil disruption)
  - Doesn’t specify how transfer happens
- IPA: International Patient Access
  - A common way to access information for a patient in any country
  - Unbundle US Patient access from US Specific content rules
  - Because consumer technology is international in focus
  - Doesn’t make rules about content, just how to access information

The IPS


Subject
Author
Attester
Custodian
Medication Summary
Allergies and Intolerances
Problem List
Immunizations
History of Procedures
Medical Devices
Diagnostic Results
Vital Signs
Past History of Illness
Pregnancy status + history summary
Social History
Functional Status Autonomy/ Invalidity
Plan of Care
Advance Directives
„Header“
Required
Recommended
Optional

IPS Scope

- Agreed Content model
- Agreed Terminology
  - Big lift for some
- Some exchange described (more coming)

FHIR Ecosystem

- Specifications
- Key Tools
- Community

FHIR Ecosystem: Specifications

- Specifications
  - Base FHIR specification
  - FHIR Language packs (coming soon, thanks WHO)
  - Implementation Guides
    - National | Business Use Case | Domain | Solution / Application level
- Human and Computer Readable
  - Each specification is a web site
  - Each specification produces a package (NPM package)
  - Computers find / use the specification to do computer things
    - Validation | Code Generation | Design support | Run Time UI Support | AI / analysis |

FHIR Ecosystem: Key Tools

- Validator – Validate Resources (not applications)
- Publisher – Production and Publication of Implementation Guides
- Registries
  - IGs / Artifacts / Applications / Comparison / Package -> all for discovery
- Simplifier / Sushi / Trifolia / Art-Deco
  - Help with the design / consultation process
- Terminology Service
  - Look up / Meaning / Validation / Translation
- Test Cases – common test cases for tools

Validation Functionality

Method	XML	JSON	RDF	Structure	Cardinality	Values	Bindings	Invariants	Profiles	Questionnaires	Business Rules
XML Schema	✓			✓	✓	✓					
XML Schema + Schematron	✓			✓	✓	✓		✓	✓[1]		
JSON Schema		✓		✓	✓	✓			✓[2]		
ShEx			✓	✓	✓	✓	✓[3]				
Validator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Validation Operation[4]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

FHIR Ecosystem: Community

- HL7 / HL7 Hong Kong – formal support
- FHIR community – informal
- http://chat.fhir.org
- WeChat channel for China
- https://stackoverflow.com/questions/tagged/hl7-fhir
- FHIR Leadership is highly available. One is native chinese

Empowering Patients

- Make data accessible to Patients
- Make data from patients accessible to system
- Allowing patient to control data sharing between parties
- Creating a single common patient record

- But: Services not Data are empowering
- FHIR offers the ability to extend services to the patient

Coordinated Care

- Common Frustration of Patients:
  - Scheduling/Communication problems
  - Conflicting care plans / payment options
  - Conflicting system definitions of success
  - Must be resolved by the patient
- FHIR enables Services for
  - distributed care plan
  - virtual clinical review
- Virtual Institutions (internet hospitals, institutional boundaries)
- Integrated Home Care (medication management)

FHIR & Disruption

FHIR disrupts healthcare (& healthcare IT):

- Significantly reducing the cost of data exchange
- Making it easy and natural to use the web
- Encouraging the development of open community
- Building a solid base to scale computation about healthcare

At the same time as wider web / open community transforms are happening.

Join a community….