DevDays
10th Edition

HL7® FHIR® DevDays

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The Evolution of the FHIR Specification

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ORGANIZED BY firely

Who am I?

- Grahame Grieve
- FHIR Product Director
- FHIR Community Lead

Learning Objectives

- Learn why the FHIR Community works the way it does

- Know the jargon for the FHIR development process

- Understand how this impacts on your own development process

- Learn how to contribute to the FHIR community and specification

The Genesis of FHIR

- Need for a new standard…

- How would it be developed?
  - Like an existing standard
  - Like open source software? (Xtreme Programming)

- What does an "Agile Standard" look like?

- What does standard development look like in the web era?

FHIR Agile Development

- Publish early, often, deliver frequently

- Iterative, incremental

- Close Cooperation between people

- Working software is the primary measure of progress

- Simplicity is essential

- Self-reflection and ongoing adjustment to processes

https://en.wikipedia.org/wiki/Agile_software_development

FHIR Standards Development

- Stability

- Comprehensive requirements gathering

- Formal balloting cycles

- Documented/fixed process – reliability

- Cooperation between nations / large corporatons

https://en.wikipedia.org/wiki/Agile_software_development

Open FHIR Community

Ways the community meets:

- http://chat.fhir.org – default fall back for everything

- DevDays!

- FHIR Meetups – organised locally

- Informally at every other Health IT event
  - HL7 events – our home

- http://community.fhir.org

- stackoverflow.org

HL7 Development Processes

Communication Channels:

- Working Group Meetings (WGM)

- Email Lists

- Teleconferences (telecon) (mostly zoom meetings now)

- Connectathons

Connectathons

- Center of the FHIR process

- Combined meeting of the standards & implementers

- Practice actually exchanging content
  - Multiple tracks with different intent, storyboards, process

- Testing the specification (different to IHE)

- Building the community

- Baking the results of testing into the specification

Balloting

- Announce the sign up (HL7 members only)

- Publish a candidate standard

- Signed up members comment(s) in detail -> Jira tasks
  - Vote negative if any comments are significant issues

- Committees resolve the issue in discussion with balloter

- Balloter withdraws negative if resolution is ok

- Document 'passes' if all negatives are withdrawn
  - There's a resolution process if negatives are not withdrawn

- Edited document is posted as formal release (= milestone)

Key HL7 Committees

- FHIR-I – FHIR infrastructure – the base infrastructure (API, etc)

- PA – Patient/Admin – Patient / Practitioner / Organization

- O&O – Orders & Observations – Observation / Diagnostics

- PC – Patient Care – Condition / Care Plan etc

- Pharmacy - Medications

- FM – Financial Management

- FMG – FHIR Management group – coordination between all the other groups

- TSC – Technical Steering Committee – ultimate authority over the standards

- + 50 others!

Relevant Web Sites

- http://hl7.org/fhir - the spec!
- http://fhir.org – supporting material
- http://jira.hl7.org – FHIR task tracking
- https://confluence.hl7.org – HL7 documentation/supporting material
  - Documentation gradually coalescing here
- http://registry.fhir.org – Single index of known profiles etc
- Todo: Single index of known tutorial training/material e.g. youtube etc

FHIR Product Content

Standard Level	Description
Draft	• Not complete/reviewed enough to be safe for implementation. • Known issues or still be in the "in development" stage. • solicit feedback from the implementation community and/or to give implementers some insight as to functionality likely to be included in future versions of the specification. "Use at your own risk"
Trial Use (D)STU	• Well reviewed; ready for use in production systems; balloted and approved as an official standard. • Not yet seen widespread use in production across • **Future versions may make significant (breaking) changes**
Normative	• This content has extensive review and production implementation. • content is considered to be stable and has been 'locked' • Subjecting it to FHIR Inter-version Compatibility Rules
Informative	• Provided for implementer assistance - not rules follow. • Typical: tables of contents, registries, examples, and implementer advice
Deprecated	• This portion of the specification is outdated and may be withdrawn in a future version. • Avoid adding where possible

FHIR Product Life Cycle – the Maturity Model

Draft

FMM 1   • PLUS the artifact produces no warnings during the build process
             • Artifact substantially complete and ready for implementation
               Resource etc approved the underlying resource/profile/IG proposal

FMM 2   • PLUS artifact tested >3 independently developed systems (semi-realistic
               data and scenarios, reported to FMG

FMM 3   • PLUS + verified to Quality Guidelines;
             • Balloted ->10 distinct comments from >3 organizations → >1 change

FMM 4   • PLUS tested across its scope, published in a formal publication
             • Implemented in multiple prototype projects.
             • Implementer consultation for subsequent non-backward compatible changes

FMM 5   • Published in two formal publication release cycles at FMM1+ (i.e. Trial-Use
               level)
             • Implemented >5 independent production systems in >1 country

Normative

Past Publications of FHIR

- 2011 – First Created

- 2014 – Release #1 (DSTU1)

- 2015 – Release #2 (DSTU2)

- 2017 – Release #3 (STU3)

- 2019 – Release #4 Some normative content

Future FHIR plans

- R4B:
  - Change to a few specific immature resources (research, medication registration) → changes fold into R5
  - No changes that impact on existing implementations
  - Expected mid-2021

- R5:
  - Next Major release
  - Early-mid 2022? (hard to say…)
  - Many more resources plan to go normative, or significant increase in FMM

Which version of FHIR should you use?

- R1: no longer in use any project we know about

- R2: still used for US argonaut, a few new projects in that community

- R3: Significant adoption in Europe – still new projects happening
  - a little adoption elsewhere in the world

- R4: Main focus for implementation in most countries, new projects
  - Has regulatory support in USA
  - Normative API – solid basis going forward

- R4B: Not clear who will implement

- R5: That depends…

What does this mean to you?

- Always check the maturity:

4.8 Resource CodeSystem - Content

Vocabulary ⬀ Work Group	Maturity Level: N	Normative (from v4.0.0)

9.5 Resource CarePlan - Content

Patient Care ⬀ Work Group	Maturity Level: 2	Trial Use	S

- Should you implement immature artifacts?

Supporting Multiple Versions

- Converting between versions

- API Strategy

- Persistence Strategy

Converting Between Versions

- R3 Diff Documentation (http://hl7.org/fhir/diff.html)

- R3/R4 Transform Script

- Java Convertor

- Version Independent Façade

API Strategy

- The whole exchange is versioned (search parameters, obligations)

- Use multiple end-points, one per version
  - Simple, but different URLs for the same record

- Single end-point, multiple versions
  - fhirVersion parameter on the mimetype in request
  - `GET [base]/$versions`
  - Server has default version

- We publish conversion maps for Resource and search parameter names

Persistance Strategy

- Store Resources with known version (implicit, or explicit)

- In general 3 options:
  - Store resources as you get them (and convert on the fly if needed)
  - Store resources in your preferred version (and convert if needed)
  - Extract information from resources and store in (relational?) database

- Or… Do all 3 things at once:
  - Store resources as you first received them (for audit trail)
  - Store resources in your preferred version (for flexibility)
  - Build specific tables for particular indexing (for performance)

FHIR Life cycle

- FHIR development process leads to publishing multiple different versions
  - Versioning is hard
  - In some fantasy universe, it's not a problem

- There are multiple strategies for dealing with this challenge
- None of them are perfect

What does this mean to you?

- Should you be involved in the community
  - No: you can use the standard, and the tools, and move on
  - Yes: the more you are involved, the more you benefit
    - Knowledge, time, energy, $$, influence

- Should you be an HL7 member?
  - No: You can use the standard, and make tasks
  - Yes: if you ballot, you carry more weight, and you can vote on resolution
    - + you are helping build the community

Contact

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