RDF for Semantic Interoperability

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The *RDF for Semantic Interoperability* group (or *RDF group*) is a sub-group of the HL7 ITS work group and a joint collaboration with the W3C Healthcare and Life Sciences group on Clinical Observations Interoperability to facilitate the use of RDF as a common semantic foundation for healthcare information interoperability.

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How to Participate

Anyone may join this group simply by participating in the work, which is conducted mainly on the public HL7 and W3C mailing lists listed below and on a weekly teleconference. You are encouraged to become an HL7 member, but not required unless you wish to take a leadership role in an HL7 group, such as becoming a co-chair. You are also encouraged to have your organization become a W3C member, but not required. See benefits of W3C membership.

Mailing lists (please cross post to both):

- HL7 ITS work group mailing list - Subscribe
- W3C HCLS mailing list - Subscribe

Weekly Teleconference

- Agenda and Logistics

Work Projects

FHIR RDF and Ontology

Champions: Claude Nanjo, Tony Mallia, Eric Prud'hommeaux, Marc Twagirumukiza, Hans Cools

FHIR RDF and Ontology work is being done both on our weekly Tuesday teleconference and on our Wednesday task force call: http://wiki.hl7.org/index.php?title=ITS_RDF_ConCall_Agenda

Edits to the FHIR RDF/ontology pages

Grahame explained this editing policy:

- editor makes minor presentational changes themselves
- major presentation changes - discuss with the group in ontology stream in zulip
- minor substantiative changes (edge cases, clarifications) decide in ontology chat + create gForge task with link to chat for record
- major changes / breaking changes - analyse in ontology chat, create gForge task, dispose in committee, record in gForge

Deliverables and Editors

0. **Finish deciding on the FHIR RDF representation and ontology**
Status: See Issues List

1. **FHIR Linked Data Module page? (currently FHIR RDF/ontology module page)**, explaining FHIR RDF and ontology module.
Editors: David Booth
Status: Initial version is done. Needs a few edits.

2. **"RDF representation of resources" page**, explaining FHIR RDF serialization (equivalent to existing FHIR XML and JSON pages).
This page should be analogous to the FHIR XML and FHIR JSON pages. There may still be material in FHIR RDF draft on W3C github, that may be used.
Editors: Grahame Grieve, Tony Mallia, David Booth and Andy Stechishin
Status: Done

3. **FHIR Ontology introductory page**, explaining how the the OWL ontology generally works, how it can be used, and link to the download.
See FHIR Ontology draft on W3C github, which will be moved to the HL7 github when stable.

Editors: Tony Mallia, David Booth and Andy Stechishin
Status: Needs to be written.

4. **Modify the FHIR spec build process**, to produce RDF versions of all examples, and to produce downloadable OWL ontology.
Editors: Grahame Grieve
Status: Done

5. **Downloadable FHIR ontology** (generated by the FHIR spec build process). This would be a single file (fhir.ttl) that bundles the whole FHIR ontology. It will be generated by the build process (which is written in java).
Editors: Grahame Grieve (and Michael van der Zel?)
Status: Needs to be updated to current ontology decisions.

6. **Modify the supported reference implementations to convert FHIR XML/JSON<-->RDF**, just as for XML and JSON. The reference implementations are (partially) generated by the build process, so this involves modifying the build process.
Editors: Grahame Grieve and Michael van der Zel?
Status: Done? 8/23/2016: Grahame believes this is done. Michael did the C# and Grahame did the Java. The Java version goes in both directions; grahame isn't sure about the C# implementation. The build process uses the java version to generate the examples in Turtle.
This should be discussed between Graham, Michael and Eric.

7. **ShEx implementation of FHIR RDF-->XML, for round tripping**, for use as a validator and as a utility for translating between FHIR serializations. **ISSUE: Will this be generated by the build process?**
This should be discussed between Graham, Michael and Eric.
Editors: Eric Prud'hommeaux
Status: NOT NEEDED because of the item above (Grahame (and Michael?)s code.

8. **Tutorial or example of using FHIR RDF and FHIR ontology** The could be an updated and clean-up version of the "Side-by-side" document drafted by Tony Mallia. @@ TODO: Add link@@
Editors: TBD

Status: This needs lots of editing.

9. **Test suite** to validate FHIR XML<->RDF round tripping. This test suite would be in addition to the examples in the FHIR spec.
Editors: Grahame Grieve and Eric Prud'hommeaux (to be confirmed)
Status: Grahame believes this is not needed, because the examples were chosen to exercise all use cases.

10. **Formal specification of FHIR/RDF** See http://w3c.github.io/hcls-fhir-rdf/spec/
Formally define the mapping from ElementDefinition to ShEx as implemented in Harold's code.
Audience: Developers of RDF tools for profiles, novel resources and extensions.
Editors: Eric Prud'hommeaux
Status: Eric created a draft. Some sections are missing.

Background

- FHIR Ontology Requirements
- FHIR Examples For Driving FHIR Ontology Development
- Reviews of four FHIR ontology approaches:
  - FHIR ontology from Cecil Lynch
    Review of Cecil Lynch's FHIR ontology
  - FHIR ontology slides from Claude Nanjo
    Review of Claude Nanjo's FHIR ontology
  - FHIR ontology slides from Eric Prud'hommeaux
    Review of Eric & Josh's FHIR ontology
    FHIR as RDF wiki page (Josh Mandel and Eric Prud'hommeaux)
    Mapping C-CDA to FHIR RDF using ShEx (EricP)
      Example of ShEx GenR from SWA4LS tutorial
      ShEx Primer from the W3C RDF Validation Workshop
  - FHIR ontology slides from Tony Mallia

Review of Tony's FHIR ontology

- FHIR RDF Mapping - Potential Strategies
- FHIR RDF github page
- RIM Ontology (ORIM) Overview

High-level concept mapping to RDF (AR typeCodes, etc.)

Champions: Tony Mallia, Rob Hausam

- Wiki page for term info work
- High Level Mapping Project
- Discussion

Comparison of FHIR to RDF element mappings [Side by side documentation of approaches]

Approach for Code Systems, Concepts and Value Sets [Terminology approach]

Turtle Code samples [FHIR Ontology] [FHIR SNOMED CT Bridge Ontology] [Fragment of OWL SNOMED CT]

Next Steps

- @@ TODO @@

Computable Semantic Links from FHIR to the RIM

- HL7 Project Scope Statement (PSS) for computable semantic links from FHIR to RIM

ICD-11 and SNOMED

Champions: Tony Mallia, Daniel Karlsson, Hans Cools

- ACTION: Tony to find out more details about how iCat handles ICD-11 ont and report back [recorded in http://www.w3.org/2014/11/18-hcls-minutes.html#action01]
- Discussion

Next Steps

- @@ TODO @@

Use Cases

Champions: Guoqian Jiang, others? COI Use cases on W3C wiki

- ACTION: Guoqian to figure out whether he can share URI conventions for ICD-11 [recorded in http://www.w3.org/2014/11/25-hcls-minutes.html#action07]
- Discussion

Goals of use cases:

- Drive and unify diverse efforts, e.g., FHIR ontology

Kinds of use cases desired:

- Simple enough for use in slide presentations
- Realistic enough to be convincing

Use case ideas:

- Migration of CCDA to FHIR (EricP)
- Utility on FHIR RDF that would motivate mapping of FHIR XML to FHIR RDF (EricP)

Next Steps

- EricP will present C-CDA example on Dec 23.
- Waiting for Guoqian for broader discussion of use cases.

PhUSE-FDA project (formerly CDISC2RDF)

Champions: Kerstin_Forsberg, Ingeborg, Tim Williams, (and Charlie Mead?)

- ACTION: Kerstin and Ingeborg to prepare a status and future state ideas for PhUSE-FDA work [recorded in http://www.w3.org/2014/11/18-hcls-minutes.html#action05]
- Discussion

Next Steps

- DBooth scheduled @@@@ to discuss PhUSE-FDA project on Jan 6 teleconference.

C-CDA RDF representations

Champions: Eric Prud'hommeaux, Joshua Phillips

- ACTION: Eric to establish/make a wiki page for C-CDA RDF representations work [recorded in http://www.w3.org/2014/11/18-hcls-minutes.html#action06]
- ACTION: Eric and Joshua to report on C-CDA RDF representations work plan [recorded in http://www.w3.org/2014/11/18-hcls-minutes.html#action07] -- PENDING? (On Dec 16 call I thought Eric said this was done pending review, but I cannot seem to find it.)
- Discussion

Next Steps

- EricP will present C-CDA example on Dec 23.
- @@ TODO @@

Standard URI Representations

- File:URI.pdf - Outline of URI approach presented to HL7 ~2012

Common model for data element management and value set binding

Group Discussion on February 17, 2015

- Scope of the project
  - ISO 11179 - Metadata Registry Standard
  - CIMI - Clinical Information Modeling
  - CTS2 Value Sets Management
  - Data Validation and Transformation task force
    - OWL reasoning
    - ShEX

- Use Cases
  - CDISC
  - CIMI
  - PhEMA - EHR-Driven Phenotype Algorithm Authoring and Execution
    - NQF Quality Data Model (QDM)
    - HL7 FHIR Model Element
- Related Links
  - EU project SALUS uses ISO11179 - SemamticMDR http://www.srdc.com.tr/projects/salus/blog/?p=181
  - Enterprise Vocabulary Services: http://evs.nci.nih.gov/
  - An earlier project between AstraZeneca and IBM to build a ISO11179 based "Clinical Reference Library" http://www.slideshare.net/kerfors/designing-and-launching-the-clinical-reference-library

Group Discussion on February 10, 2015

- http://www.w3.org/2015/Talks/0203-11179-egp/
- Guoqian Jaing and Eric Prud'hommeaux also discussed work at Mayo on a common model for data element management and value set binding, leveraging ISO 11179
- Eric also asked who else would be interested in a data Validation and Transformation task force, and three people indicated interest (Ingeborg, Alejandra, Kerstin_Forsberg).
- http://www.w3.org/2015/02/10-hcls-minutes.html

Initial Proposal

- Proposed by Guoqian Jiang

Category: ITS RDF