OFHIR

A FHIR Ontology

Initial Goal

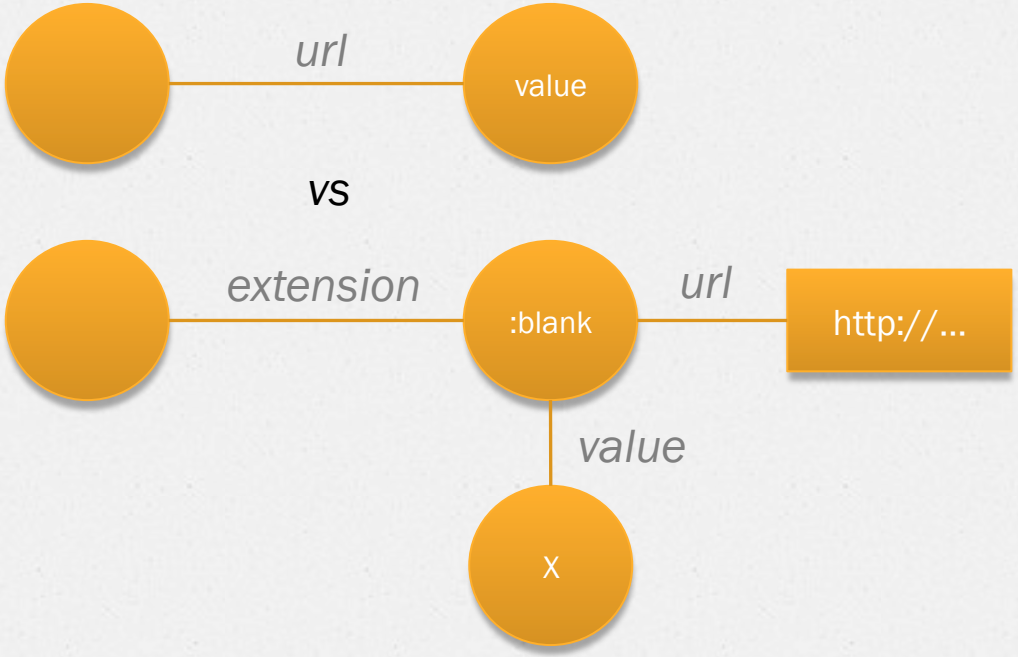
- Formalize existing FHIR RDF semantics in OWL
- Align with current FHIR RDF work conducted by Josh Mandel and Eric Prud'hommeaux
- Enhance FHIR interoperability with other modeling frameworks using RDF

Approach

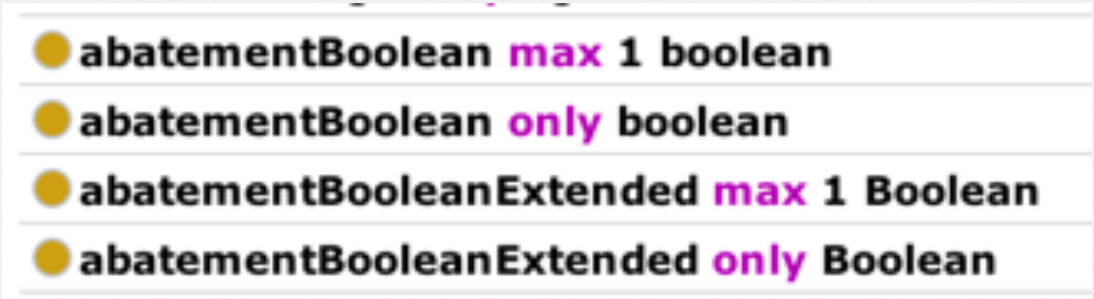
- A ‘lower level’ ontology that is very faithful to the FHIR physical model
- A ‘higher level’ ontology that is aligned with FHIR conceptually but also more intuitive to the semantic community
- Initially favored the latter but perhaps both approaches are needed

An Example: FHIR Extensions

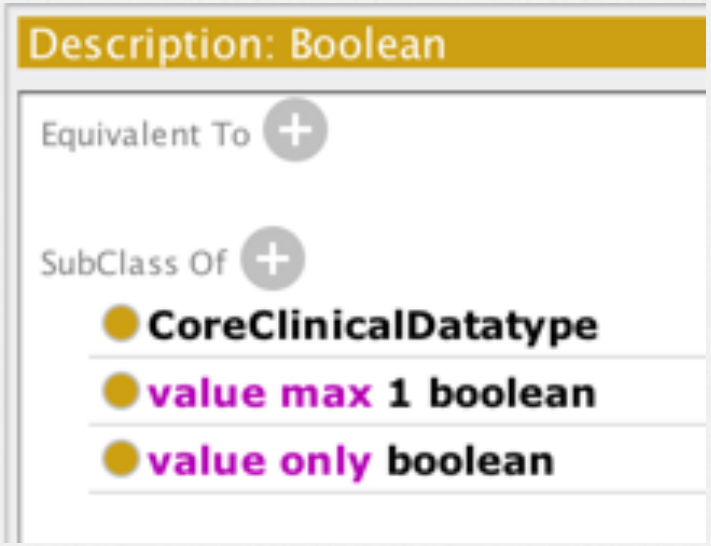
```
<[name] xmlns="http://hl7.org/fhir" url="identifies the meaning of the extension (uri)">
 <!-- from Element: extension -->
 <value[x]><!-- 0..1 * Value of extension --></value[x]>
</[name]>
```



Primitives vs Extensible Primitives



An Extensible Boolean



How to distinguish FHIR extensions?

- Extension statement resides in a separate namespace from FHIR Core
- Extension predicate derives from the 'extension' property hierarchy
- Some implications on core ontology design
  - The 'severity'/FOAF challenge

Extension Property Hierarchy

New FHIR Concepts

- A new OWL class
- Extends ‘Other’
- Must be in an extension namespace

Modifying Extensions

- Problematic in semantic space
  - Attribute modifies class semantics
  - May be due to conflated semantics in FHIR
- Example
  - Negation Indicator
  - Certain statuses (e.g., refuted, improbable, …)

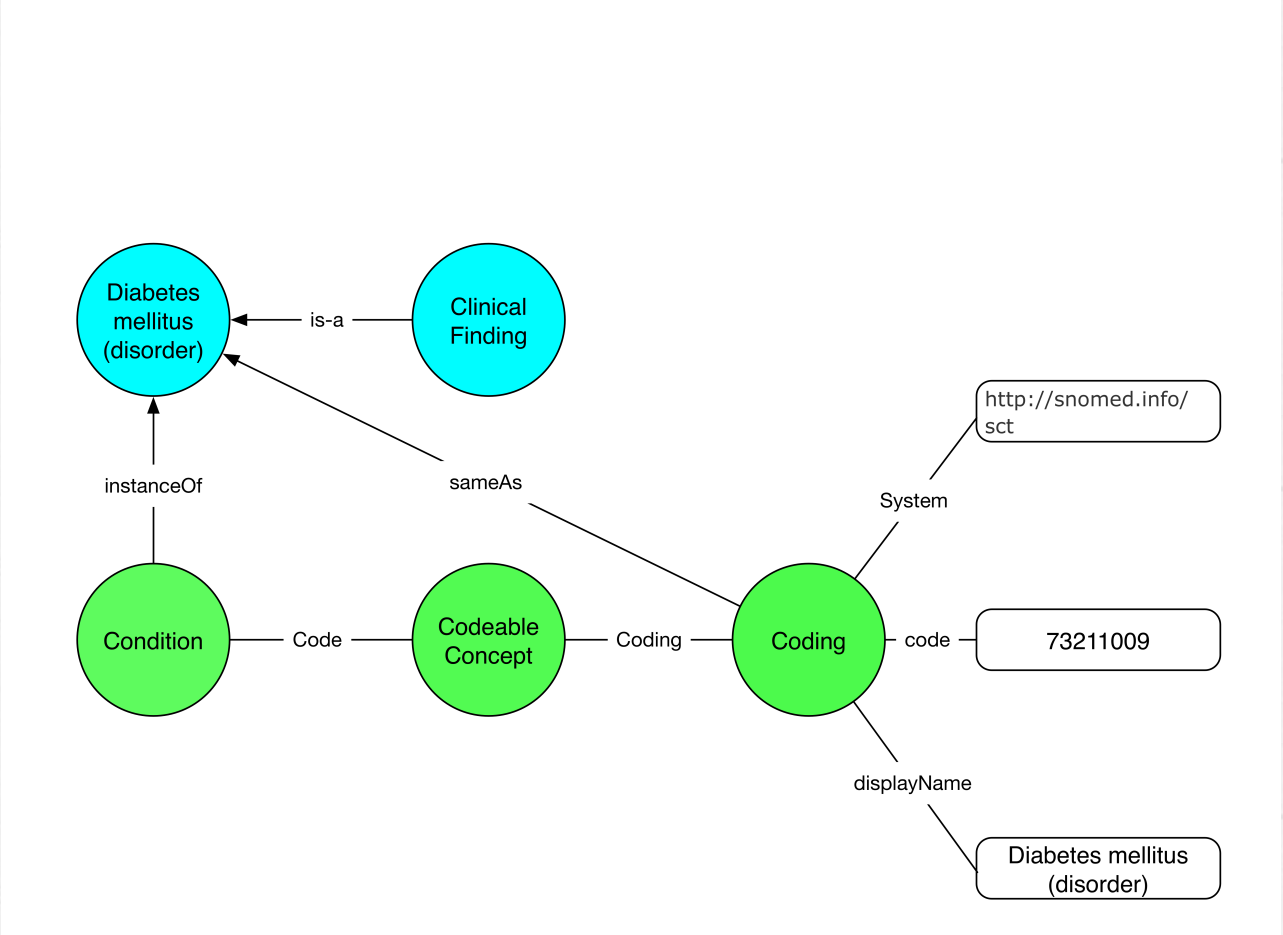
Bridging ‘higher level’ vs ‘lower level’ ontologies

- Modified concepts as restriction classes on the modifying extension
  - ConditionPresence ~ Condition where status != refuted
  - ConditionRefuted ~ Condition where status == refuted

Terminology

- Interesting question:
  - Can OWL better ‘link’ terminology to model?
  - OFHIR and SNOMED both ontologies

Terminology Alignment (Hypothetical)



Next Steps

- Update to reflect newer DSTU 2 specification
- Address known issues
- Decide what is proper ‘level’ for this ontology
- Nail down core open questions
- Align with FHIR RDF effort
- Validate whether approach supports conversion from FHIR RDF – FHIR XML – FHIR JSON.

Demonstration of Current Ontology