# From Elise:

3. RDF Files - Informative

Because these are informative, I might be willing to let some issues go to FTF if you fix the most challenging problems, but these still really need of a lot of work.  We had several calls, I sent some guidelines that we've been using for FIBO, and tried to provide feedback but there are still some serious issues with what was submitted.

Note that the ontologies were clearly not exported from the MagicDraw file, and although I didn't compare the two, don't understand why there is such a big disconnect.  You'll need to explain that, and replace the ancillary file with something that matches the ontologies, or don't bother with it next time around.

[cbc] The RDF was exported from CCM and manually edited to confirm with your stylistic & syntactic requirements. The semantics should be the same. Of course as with any such primitive process, mistakes are common.

Some issues:

1. It looks like these two RDF files were generated out of a tool like Protege, then hand edited.
2. That process left some challenges - IRIs are not consistent, entity declarations are missing, and there are both default and xml:base IRIs declared.  Your ontologies should only use xml:base, to facilitate extension at a minimum.  Having two IRIs for an ontology can be a problem for any others that import them, which is why we have consistently used xml:base only for ontologies submitted for standardization.  IRI prefixes should be lower case.  All of the header information and IRIs are out of date as well - this is 2020 last time I looked.   These are minor issues compared with the content, though.

[cbc] There is a point where these conventions make reuse of tools, existing materials and industry expertise difficult. But ok.

1. In the base ontology - class names must be nouns, not adjectives/adverbs, so classes called Temporal and Reflexive are a problem, among others.  Actually the latter should be replaced with a restriction on situation.  A situation can involve other situations - use of a property called 'involves' with a restriction saying that a situation 'involves min 0 situations' would do what I think you want from a logical perspective.  The class called 'Reflexive' should be removed in favor of the restriction.  That's not only not a noun, but it is a reserved term in OWL.  The class Temporal should, at least, be renamed TemporalThing, although I would prefer that you delete it and add the restrictions/properties to the appropriate class, which I believe is Occurrence in your model.

[cbc] There is no “Reflexive” in the model – where did you see it? I don’t think we need Temporal any more – the properties can have a domain of situation.

1. The definitions of Occurrence and Activity are confusing and don't seem right to me - I recommend that you use the definitions from ISO PSL, which are close to, if not exactly what the current provenance and pedigree working group is using.  John Butler can provide their working definitions, or I would be happy to reach out to him for those, if you are not happy to use the definitions in FIBO for the same concepts.

[cbc] We can look at various definition sources.

1. The use of multiple classification and subclassing of these things makes the ontology even more difficult to understand.

[cbc] Not sure why you would think that.

1. Observations should likely be modeled as events, and activities, such as intervention activities, are something else (activities) that may involve multiple events.

[cbc] An industry expert recommended removing the event/activity distinction for now, as you know there are various opinions about formalizing these concepts.

(d) A number of your definitions are really tough to understand, in fact.  For example, the definition of ImmunizationActivity, which is 'statements about an activity specialized to immunization' really makes very little sense unless someone understands that this whole ontology is about modeling statements about things, not the things themselves ... which the ontology still doesn't actually do.  If you are modeling statements then make each statement a subclass of statement.  If you are modeling activities, then they should have the semantics of an activity.

[cbc] That definition is not correct – must be a holdover. There is a separation between statements and what the statement describes.

If an immunization activity is really about giving a patient a vaccine, then that's an entirely different from a clinician stating that they have given a specific immunization to a patient.  Statements of facts may be related to situations that a given clinician is addressing - those connections aren't obvious to me in your model, either, and I would think this is precisely what you should be modeling.

(e) Composite classes such as DeviceActivityMethod are not well defined and I am concerned about creating blends like this, which are semantically confused, so this should be split into multiple classes accordingly with proper definitions.

[cbc] This kind of composite concept is fundamental to MDMI as the context-specific referent. It is already “split” into multiple classes (device and activity method) that are then combined for explicit context. It should also be noted that this is actually a thing the talk about in the domain. If we were referencing an independent domain ontology (like FIBO) these may be in a more MDMI specific extension layer, but another such layer seemed overkill for an example.

(e) Many of your property names are not verbs - examples include 'about', 'aboutParticipant', then there are properties that are very specific, very data model like, which should be removed in favor of reusing higher level properties in restrictions.

[cbc] about: using the same term as RDF/XML for the subject of a statement seemed like a good idea, but we can add “is” .

[cbc] properties that are very specific : These kinds of composite concepts are fundamental to MDMI as the context-specific referent. It is already “split” into multiple more general properties that are then combined for explicit context. If we were referencing an independent domain ontology (like FIBO) these may be in a more MDMI specific extension layer, but another such layer seemed overkill for this example.

1. Many of your definitions still need work - to be ISO 704 compliant they need (1) to be partial sentences, no leading articles, no punctuation, and able to replace the term in a sentence, and (2) follow a sort of Aristotelian form - <x> (where x is the parent class or property) 'that' ... where what follows 'that' includes differentia from other siblings, parents or subclasses for classes, and for properties, either ground verbs, or in some cases start with 'indicates' or 'specifies' or ... some similar verb that is appropriate and points to whatever qualifiers are included in the property's intended definition.

[cbc] we can look at the definitions, Richard has a good list.

This is NOT an exhaustive list, just some examples of the problems I found.   I'm willing to help, but don't have a lot of free time over the next week and a half, so if you want me to help you we will need to set up a call for Monday afternoon, 3/16, pacific time, preferably about 2 pm pacific / 5 pm eastern, and go from there.

# From Richard

MDMI model Ontology:

* Definitions:
  + Aristotelian definitions: Every definition should be of the form: a/an parentClass that… (or at least clearly translatable to such a proposition). Thus, every direct subclass of “entity” should have a definition along the lines of “an entity that…”. While the strict formatting is not a requirement, I find it useful to at least think through the definitions in this way. When I did so, I noted the following classes that seem to have definition (or placement in the model) issues:
    - activity method: not at all clear that this is an entity at all, it seems more like process. Further, the definition is entirely unclear. I can imagine what a technique might be (though, again, not an entity), but I have no idea what a device might be that, by itself, constitutes a method.
    - “role of actor”
    - “occurrence”
    - “intervention request”
    - “observation request”
    - “repetitive”. The problem runs deeper here. “Repetitive” is not a noun. Classes are always nouns or noun phrases. At best, this should be “repetitive occurrence”. Though, once put that way, it becomes obvious that this is simply a (Boolean) dataTypeProperty (canRepeat, mustRepeat?) that has “occurrence” as its domain.
    - “state of affairs”
    - “belief”. I am not at all clear that a belief is a state of affairs. It may be a state of affairs that I have a belief, but the belief itself seems to me to be something else entirely. Put more directly into context, is it not the case that the kinds of opinions that matter here are captured as artifacts that are intended to produce or constrain actions (or something along those lines) and isn’t it, therefore, the artifacts that matter?
    - Everything under “value” (see notes below on that branch).
  + Defintion syntax: The following have syntax issue (punctuation (P) or capitalization (C) issues):
    - “organization” P
    - “person” P
    - “activity” P
    - “event” P C
    - “state of affairs” P
    - “quality” P
    - “role of actor” C
    - “author” C
    - “participant” P
    - “status” P
  + Participant branch: Participant is defined as a kind of role, yet its children are defined as things, e.g, “a person”, not as role, e.g., “a patient”, of a thing(s). It is not clear to me why you need to define anything on this branch using the role approach at all as you do not have qualifications in your model to differentiate a single entity functioning in multiple roles in any case.

[cbc] Definitions: Agree

[cbc] Participant: yes, the definitions should say “a role of” not “a person”, etc. The role concept seems well established in the domain, even if not fully exploited in the example.

* Odd Restriction:
  + “activity” does not need to have the equivalence restriction—it is trivial. I assume it is in place to enforce the idea that no individuals are simply activities, but must be instances of exactly one of the subclasses, but such a restriction is really not necessary.

[cbc] can be removed. This is a result of a “complete” subclass in the model.

* Odd Classes:
  + “temporal”: I have a number of concerns about this. First, my assumption is that this was introduced to provide for reification so as to provide for time-series support on temporally constrained items. My comments below mostly assume this.
    - “temporal” is not a noun. If it is to persist, it should be “temporal thing” (or something like that).
    - If we need “temporal thing” at all, it should not have subclasses as listed. Rather, the relationship to “situation” should be specified through an ObjectProperty.
    - “temporal thing”, at least according to the definition, applies to everything that is not temporally transcendent. Within this ontology, that includes everything. As such, the concept is trivial. I suggest that this might be resolved by eliminating the class and creating a set of dataTypeProperty’s in the traditional manner that permit specification of start date and end date and apply them simply to the “situation” domain. After all, reification is really only critical if properties come and go against the same thing, e.g, nameX applies from timeA to timeB, name Y applies from timeB+1 to present. That is not the case here, so I do not understand the need for reification when simple dataTypeProperties can cover the need.

[cbc] we can remove it and move the domain of the properties to situation.

* + “value”: This branch confuses me. There are two sources of this:
    - Some of the items seem to entirely parallel items that are present in another OMG specification, FIBO. Not sure why those classes have not been leveraged (with an adjustment to name-space, of course—I am not suggesting that part or all of FIBO be imported).
    - The definitions are all largely simply indicating the range rather than defining the class.
    - Some of the items under “value” seem a whole lot more like dataTypeProperties than classes, though following the FIBO approach, I can let this go.

[cbc] As there are many potential sources of foundation concepts we have not tried to pick any for the example, if this were done for real we would do so. We can look at the definitions.

* Object Properties:
  + “about participant” should be “is about participant” (object properties need to be verbs or verb phrases).
  + “repetition…” should be “has repetition…” in every case in the hierarchy.
  + The “impacts” hierarchy is odd. A request is not an impact, at least not obviously so. I have no idea what “results in” means in this context. If not reworked, some annotations to explain what is going on here is called for.
  + In many cases, the definitions are pretty much definitions of the range(s), not the relationship specified, e.g., see “has method”.

[cbc] ok.

* Data Properties:
  + “has id” does not have any syntax/xsd restrictions. This might be OK, but wanted to make sure that this was a conscious decision.

[cbc] intended to keep the form of an ID open.

* + DataTypes: use of datatypes for StatementMode: I don’t have a huge issue with this in principle, but it is inconsistent with OMG best practices where individuals are typically used. (I suspect EK will have a stronger opinion.)
  + [cbc] don’t care. Used common OWL/RDF pattern.

MDMI Example Ontology:

* Definitions:
  + “immunization activity” is defined as a set of statements. Statements are not activities.
  + “vital sign” is defined as a measure, as such, it is not a health condition. Rather it is some sort of metric that pertains to subjects. It should either be moved or re-defined accordingly.
  + Definition syntax: The following have syntax issues (either punctuation (P) or capitalization (C) issues):
    - “encounter” P
    - “procedure” P
    - “allergic reaction” P
    - “clinical situation” P
    - “encounter” P
    - “procedure” P
    - “health condition” P
    - “allergy” P C
* Reference Failures:
  + “Activity” is referenced wrongly—the imported concept should be used: https://www.omg.org/spec/MDMI/MDMIGenericStatementModel/Activity Other   
      
    There are multiple instances of the same problem:
    - Device
    - Entity
    - Observation
    - Opinion
    - Quality
    - Quantity
    - StateOfAffairs
    - Subject
    - Value (see notes regarding that above)
  + A few terms have a variation on the above problem in that they are explicitly duplicated:
    - “actor” (oddly, this was duplicated without capitalization, unlike the rest)
    - ActivityMethod
    - PhysicalLocation
    - Situation
    - Substance
* “clinical activity”:
  + I am not at all clear as to why “clinical” activity is classified under “situation/clinical situation” rather than under “activity” as it is clearly defined as an activity, as are the children of it. Does, perhaps, “activity” in the generic ontology mean something different than what is specified?
* “procedure” should be “clinical procedure” so as to reduce the chance of ambiguity as the usage expands.
* Object Properties:
  + “laterality” is not a verb.