WS3 Shared Semantics Working Notes 20 October

Back to Shared Semantics

Back to start

Overview

- Went over highlights of the IAOA/Ontolog session on standards and ontology integration.
- Looked at a new Legal ontology
- Discussed implementation of cross reference using SKOS Match information.

Joint IAOA-OOR-Ontolog "Ontologies and Standards" mini-series

This was a session just prior to today's call, jointly presented by the IAOA and OOR. There were some presentations which of direct relevance to these Shared Semantics sessions so we had a brief discussion on these. Links are given below.

Session Page

TC37 Presentation

InterIOp Presentation

Highlights / discussion points

The mind map of ontologies may inform the different kinds of ontology we want to relate to, per our existing conversations about treatment of ontologies in the wild.

Shared Semantics

LKIF

New legal ontology found, called LKIF. The published part of this is LKIF-Core.

See paper:

Question:

What is the status of this?

We don't know. MB to read through it properly and confirm on this.

Meanwhile it shows another example of the kind of ontology that may exist and that we may wish to map to for Global Terms.

Added a snapshot of part of this ontology in the External Ontologies model section, for illustration.

Note that the LKIF-Core material uses an upper ontology lattice and that this differs from our lattice (as we would expect). Note also that it defines a number of 'boundary' terms which are in the lattice and from which the legal-specific ontology terms are derived. Some of these correspond to identical or near identical terms in our existing Global Terms material. Some do not.

SKOS Matches

Looking at the draft mappings we put in last week (recall that what's shown here as SKOS Match does not use SKOS metadata since that does not yet exist in the model; it is merely an illustration of how those would be used if we finalize and adopt these proposals).

Revisited the discussion on SKOS Match.

Previously: had concluded that we could use this to point to a UML Class if that had a URI.

Having thought about these, we now have some reservations about this.

The problem is not syntactical (whether the target UML term has a URI) but semantic: does it really represent a “Concept” and therefore would it really be correct to refer to the target term as a SKOS Concept?

Concluded that this is only valid if the UML model is one in which the modeler intended to model concepts and not OO class as native UML Class diagrams are intended to convey.

This comes back to the 'Model Theory': what is the relationship between the model and what is modeled.

Agreed that there is a distinction between a 'Concept' and a 'Designation of a Concept'.

Clarified that the above two terms are in the sense meant in the ISO standard ISO 1087.

Scenarios

Considered several possible scenarios in which UML standards might be referred to in this work. These are:

1. UML model intended to represent UML Classes 2. UML model extended to indicate that it represents something other than OO Classes 3. UML model in which the classes are intended to represent something other than OO Classes, but in which the modeler has not formally indicated this by some formal extension.

An example of (2) is the ISO 20022 Business Model, in which stereotypes are used to indicate something which is not an OO Class but a “Business Element” and the like.

An example of (3) is the REA model, which is presented as an ontology but modeled in unextended UML.

On (3) we would consider that the intention of the model to represent semantics is conveyed by the context in which the whole model is presented as an ontology.

These principles would apply to mappings in the FIBO model content as well as in the Global terms / Shared Semantics. However, in the former case we are more likely to be referring to models that are not presented as semantic models or ontologies, since there are none for securities, loans etc.

Treatment of these

We can do one of two things:

1. For a model which really is UML (really stands for OO Classes) we would replicate the UML model as it stands, and then create a similar model in which there are Concepts (SKOS Concept) for each or any of the elements which we consider do actually represent a business concept. We would show relationships between the Concept and its designation in the UML model elements; 2. For a model which is intended as an ontology, we would replicate the model but use some local extension to indicate the elements as being representative of Concepts.

It would appear that the model profile to use for this would be the SKOS profile since that has the concepts syntax.

These SKOS Concepts would then be at the target end of the SKOS Match (and if needed, SKOS relationships for broader and narrower matches).

The way in which we do this should match the principles set out in ISO 1087 for representing the relationships between a Concept and a Designation of a Concept. These follow the Peircean approach of triadic relationships.

Detailed Notes Capture

These are the notes we made at the time, in order:

Diagram: REA Derivation

SKOS Issues

SKOS requires a URI SKOS requires 'SKOS Concept' at each end

Is this two separate issues?

SKOS relates a concept to a concept. the property axioms with domain and range are empty and so apply to anything with a URI. HOWEVER: It must relate concept to concept.

this depends how UML has been used:

1. As a Concept e.g. in REA 2. As an OO Class.

How to tell when a UML Class model is defining a Concept. Concept v Designation of a Concept.

Choose a specific thing that relates a promary concept. can then reuse some of these properties. Whether we call them Concept or Designation.

1. Whole UML model is an Ontology by assertion 2. Indivisual elements are extended to formally identify that they represent meaningful concepts 3. no such assertion has been made; we take a view on an element by element basis and then cross reference this to a similar model with Designations asserted.

Concept: something in the problem domain Designation of a Concept: Documented in a standard ISO 1087.

In ISO 1087, the term “Designation” is documentd. Designation is a sign or a symbol referring to the thing. Could be a sign, symbol, acronym and so on as long as truly synonymous.

Multilingual - pair of Name+Language

See Peirce: Representamen?

Recall that county codes are symbols not acronyms. These are a symbol in the above sense.

We want the Concept not the related names and symbols in our ontology. Use ISO 1087 to provide the means to specify these other terms and associate them with a concept.

Decisions

given UML, we can identify things which are Designations, as such. Then represent Concept.

How to represent Concept: SKOS Concept? OR something in ISO 1087.

Separation of conceptual model from database. ISO 1087 embodies that theory.

So look at ISO 11179 for this.

Our model is a Conceptual Model, with designations specifically in US English.

Names and labels

Name of the Class Preferred Label (the thing with the blanks)

Have metadata for each of these.

Provide views that provide to the end user on the web, the Preferred Label.

and then the Pref Label may also be in their language.

Underlying name in the model would be CamelCase. With possible numerics. See also LexGrid in bioinformatics.

Appendix 1: Peirce Terms

From:

http://www.helsinki.fi/science/commens/terms/representamen.html

Representamen (cf. Sign; see also Object, Interpretant)

“I use “sign” in the widest sense of the definition. It is a wonderful case of an almost popular use of a very broad word in almost the exact sense of the scientific definition. [—] I formerly preferred the word representamen. But there was no need of this horrid long word. On the contrary, it requires some stretching to cover such imperative ejaculations of drivers, as “Hi!” or “Hullah”…” (A Draft of a Letter to Lady Welby, SS 193, 1905)

“A Sign, or Representamen, is a First which stands in such a genuine triadic relation to a Second, called its Object, as to be capable of determining a Third, called its Interpretant, to assume the same triadic relation to its Object in which it stands itself to the same Object. The triadic relation is genuine, that is its three members are bound together by it in a way that does not consist in any complexus of dyadic relations. That is the reason the Interpretant, or Third, cannot stand in a mere dyadic relation to the Object, but must stand in such a relation to it as the Representamen itself does. Nor can the triadic relation in which the Third stands be merely similar to that in which the First stands, for this would make the relation of the Third to the First a degenerate Secondness merely. The Third must indeed stand in such a relation, and thus must be capable of determining a Third of its own; but besides that, it must have a second triadic relation in which the Representamen, or rather the relation thereof to its Object, shall be its own (the Third's) Object, and must be capable of determining a Third to this relation. All this must equally be true of the Third's Thirds and so on endlessly; and this, and more, is involved in the familiar idea of a Sign; and as the term Representamen is here used, nothing more is implied. A Sign is a Representamen with a mental Interpretant. Possibly there may be Representamens that are not Signs. Thus, if a sunflower, in turning towards the sun, becomes by that very act fully capable, without further condition, of reproducing a sunflower which turns in precisely corresponding ways toward the sun, and of doing so with the same reproductive power, the sunflower would become a Representamen of the sun. But thought is the chief, if not the only, mode of representation. ('A Syllabus of Certain Topics of Logic', EP 2:272-3, 1903)

“In every genuine Triadic Relation, the First Correlate may be regarded as determining the Third Correlate in some respect; and triadic relations may be divided according as that determination of the

Third Correlate is to having some quality, or to being in some existential relation to the Second Correlate, or to being in some relation of thought to the Second for something.

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   A Representamen is the First Correlate of a triadic relation, the Second
Correlate being termed its Object, and the possible Third Correlate being
termed its Interpretant, by which triadic relation the possible Interpretant
is determined to be the First Correlate of the same triadic relation to the
same Object, and for some possible Interpretant.
   A Sign is a Representamen of which some Interpretant is a cognition of a
mind." ('A Syllabus of Certain Topics of Logic', EP 2:290-291, 1903)
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"… I confine the word representation to the operation of a sign or its relation to the object for the interpreter of the representation. The concrete subject that represents I call a sign or a representamen. I use these two words, sign and representamen, differently. By a sign I mean anything which conveys any definite notion of an object in any way, as such conveyers of thought are familiarly known to us. Now I start with this familiar idea and make the best analysis I can of what is essential to a sign, and I define a representamen as being whatever that analysis applies to. If therefore I have committed an error in my analysis, part of what I say about signs will be false. For in that case a sign may not be a representamen. The analysis is certainly true of the representamen, since that is all that word means. Even if my analysis is correct, something may happen to be true of all signs, that is of everything that, antecedently to any analysis, we should be willing to regard as conveying a notion of anything, while there might be something which my analysis describes of which the same thing is not true. In particular, all signs convey notions to human minds; but I know no reason why every representamen should do so.

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   My definition of a representamen is as follows:
   A REPRESENTAMEN is a subject of a triadic relation TO a second, called
its OBJECT, FOR a third, called its INTERPRETANT, this triadic relation
being such that the REPRESENTAMEN determines its interpretant to stand in
the same triadic relation to the same object for some interpretant."
    It follows at once that this relation cannot consist in any actual event
that ever can have occurred; for in that case there would be another actual
event connecting the interpretant to an interpretant of its own of which the
same would be true; and thus there would be an endless series of events
which could have actually occurred, which is absurd. For the same reason the
interpretant cannot be a definite individual object. The relation must
therefore consist in a power of the representamen to determine some
interpretant to being a representamen of the same object." (Lowell Lectures,
CP 1.540-542, 1903)
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"A representation is that character of a thing by virtue of which, for the production of a certain mental effect, it may stand in place of another thing. The thing having this character I term a representamen, the mental effect, or thought, its interpretant, the thing for which it stands, its object." (A Fragment, CP 1.564, c. 1899)

"A sign, or representamen, is something which stands to somebody for something in some respect or capacity. It addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the interpretant of the first sign. The sign stands for something, its object. It stands for that object, not in all respects, but in reference to a sort of idea, which I have sometimes called the ground of the representamen. "Idea" is here to be understood in a sort of Platonic sense, very familiar in everyday talk; I mean in that sense in which we

say that one man catches another man's idea, in which we say that when a man recalls what he was thinking of at some previous time, he recalls the same idea, and in which when a man continues to think anything, say for a tenth of a second, in so far as the thought continues to agree with itself during that time, that is to have a like content, it is the same idea, and is not at each instant of the interval a new idea." (A Fragment, CP 2.228, c. 1897)

"... representation necessarily involves a genuine triad. For it involves a sign, or representamen, of some kind, outward or inward, mediating between an object and an interpreting thought. Now this is neither a matter of fact, since thought is general, nor is it a matter of law, since thought is living. ('The Logic of Mathematics; An Attempt to Develop My Categories from Within', CP 1.480, c. 1896)

"Since no one of the categories can be prescinded from those above it, the list of supposable objects which they afford is,

What is.

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Quale - that which refers to a ground
Relate - that which refers to ground and correlate
Representamen - that which refers to ground, correlate, and interpretant
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It." ('On a New List of Categories', W 2:55, 1867)

The concept in question (or a related form) is highlighted with a brown font. Selected definition-like characterizations are highlighted with a light grey background. Quotes are presented in reverse chronological order.

Abbreviations (CP, EP, etc.) and sources; see here