Dear Keith,

Sorry for the late response, it always takes me some time to get my head around the CRMarchaeo issues;-).

1.       Great that we can work together CRM-EH/CRMarchaeo compatibility

2.       Question on “How Cuts, Fills and Interfaces actually relate”

We moved the type “Cut, Fill, ...” to the property “AP11.1 has type” which is attached to “AP11 has physical relation”, as displayed in Figure 5 and 7. So A3 [3] can have several  “physical relations” of type “cuts” to other “A8 Stratigraphic Units” like illustrated in Figure 5.

Apart from that an A3 may “AP12 confine” several A2 Volume Units (We came up with “Volume” instead of “Deposit” based on your earlier comments, what is your opinion?).

Do you think this model can describe the situation or are we missing something? Maybe we have to try to model all the relations in the example and then see if something is missing.

3.    “One event of removal process may produce many stratigraphic interfaces - I wouldn’t say so. It produces One stratigraphic interface, and Many physical interfaces. 1 stratigraphic relation = 1 event (of uncertain duration). I think that’s pretty fundamental to stratigraphic recording.”

I believe you are right here and we have to correct that.

4.       Maybe we should try to model an example with Pauls latest model and with CRMarchaeo to see what’s missing or if there are places where we are uncertain if the semantics are correct.

Does anybody has a suggestion how we proceed organisationally with the review process of CRMarchaeo. Some people are doing bits and pieces, but we probably need a place where to put the latest version for review and comments and maybe somebody to organise the collaboration.

Posted by Keith May on 12/11/2014

Hi Gerald,

I note and agree your final point “but we probably need a place where to put the latest version for review and comments and maybe somebody to organise the collaboration.”

I guess a place that shows the latest reviewed version is something ARIADNE partners will need too in due course?

1. Yes, and should be easier if we get a place to share the ‘latest/current’ version.

3. Thanks for confirmation

4. Sounds good but not sure how much time/resource is available in the near future (i.e. Paul and me), but again a shared review space might help with that too ?

**2. With regard to choosing how to express the properties of Physical Relationships:**

I believe what we need is a way to explicitly ‘semantically’ express that some Physical Relationships only ‘make sense’ between A2s (deposits/volumes) and A3s (cuts interfaces) while some only ‘make sense’ between A2s and A2s; and some only between A3 (cut interface) and both A2s – A3s.

**So archaeologically:**

A2 (deposit) **Fills** A3 (cut interface)               – but **cannot** be a relationship with A2 i.e. A2 (deposit) cannot Fill an A2 (deposit)

A3 (cut interface) **Is Filled by** A2 (deposit)     – but **cannot** be a relationship with A3 i.e. A3 (cut) cannot ‘is Filled by’ an A3 (cut)

A3 **Cuts** A2 or A3                                          – A3(cut) can ‘Cuts’ either A2 (deposit) or A3 (cut)

A2 or A3 **Is Cut by** A3                                  – cannot have a ‘is cut by’ relationship with A2 (deposit)

A2 (wall) **Is bonded with** A2 (wall)                – cannot have a ‘Is bonded with’ relationship to A3

A2 (wall)  **Butts** A2 (wall)                               – cannot have a ‘Butts’ relationship to A3

A2 (wall) **Butted By** A2 (wall)                        – cannot have a ‘Butted by’ relationship to A3

A2 **Jointed with** A2 (timber)                         – cannot have a ‘Jointed with’ relationship to A3

In an email exchange with Ceri we considered the ways to include the semantics of the above and he sent the following outline of how to express the relationships in (generalised) RDF.

Yes with sub-properties you can declare the type of thing permissible on both sides of the relationship (e.g.):

archaeo:AP11c\_fills

rdfs:domain archaeo:A2\_Deposit;

            rdfs:range archaeo:A3\_cut\_interface .

You can’t do that with the ‘property of a property’ approach.

I think it does matter, otherwise may just as well use a totally generic model with zero semantic implications:

:Fred has\_property (has\_type=’name’) “Fred”;

                has\_property (has\_type=’age’) “52”;

                has\_property (has\_type=’gender’) “male”.

Etc.

A slightly more complete answer, although only to the points you raised, not necessarily an exhaustive model of all possible physical relationships

– no property number identifiers but you get the idea:

@prefix rdf: <[http://www.w3.org/1999/02/22-rdf-syntax-ns#](http://www.w3.org/1999/02/22-rdf-syntax-ns)> .

@prefix rdfs: <[http://www.w3.org/2000/01/rdf-schema#](http://www.w3.org/2000/01/rdf-schema)> .

@prefix owl: <[http://www.w3.org/2002/07/owl#](http://www.w3.org/2002/07/owl)> .

@prefix archaeo: <<http://www.ics.forth.gr/isl/CRMarchaeo/>> .

archaeo:fills rdfs:label "fills"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                rdfs:domain archaeo:A2\_Stratigraphic\_Deposit\_Unit ;

                rdfs:range archaeo:A3\_Stratigraphic\_Interface ;

                owl:inverseOf archaeo:is\_filled\_by .

archaeo:is\_filled\_by rdfs:label "is filled by"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                owl:inverseOf archaeo:fills .

archaeo:cuts rdfs:label "cuts"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                rdfs:domain archaeo:A3\_Stratigraphic\_Interface ;

                rdfs:range [owl:unionOf (archaeo:A2\_Stratigraphic\_Deposit\_Unit archaeo:A3\_Stratigraphic\_Interface)] ;

                owl:inverseOf archaeo:is\_cut\_by .

archaeo:is\_cut\_by rdfs:label "is cut by"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                owl:inverseOf archaeo:cuts .

archaeo:is\_bonded\_with rdfs:label "is bonded with"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                rdfs:domain archaeo:A2\_Stratigraphic\_Deposit\_Unit ;

                rdfs:range archaeo:A2\_Stratigraphic\_Deposit\_Unit .

archaeo:butts rdfs:label "butts"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                rdfs:domain archaeo:A2\_Stratigraphic\_Deposit\_Unit ;

                rdfs:range archaeo:A2\_Stratigraphic\_Deposit\_Unit ;

                owl:inverseOf archaeo:butted\_by .

archaeo:butted\_by rdfs:label "butted\_by"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                owl:inverseOf archaeo:butts .

archaeo:jointed\_with rdfs:label "jointed with"@en ;

                rdfs:subPropertyOf archaeo:AP11\_has\_physical\_relation ;

                rdfs:domain archaeo:A2\_Stratigraphic\_Deposit\_Unit ;

                rdfs:range archaeo:A2\_Stratigraphic\_Deposit\_Unit .

**N.B.**  Gerald: **Above & Below** – seem to have ‘crept’ into the CRMarchaeo documentation for AP11 “has physical relation” but are Not physical relationships that EH (or MoLAS and others) specifically record in the field as a standard part of Single Context Recording. (if used they can create confusion with stratigraphic relationships, so although clearly such relationships exist - along with others like ‘adjacent’ - we would not include them in the AP11 scope note).

p.s. “Volume” instead of “Deposit” works OK I think and is certainly more generic to cover structural timbers, walls, etc – I can’t suggest anything better.

Posted by Gerald Hiebel on 13/10/2014

Hi Keith,

Thanks for the mail, I do understand better now your point with the physical relationships and the semantics you want to express. We see with Martin what he suggests for this, to me Subproperties seem a sensible way.

Thanks as well for the “above and below” issue. I understand your point that it is not documented in relation to physical relationships and the  possible confusion it may cause. But if we do not use these how are we going to model the physical situation of one layer (context) being on top or under another layer (context).  I wonder if we have to think of integrating profile drawings as source of information on physical relations that are used to conclude on stratigraphic relations?  You showed me once a book on archaeological methods and excavation sheets where they (I believe it was a French sheet) noted in the Harris Matrix the physical relation the stratigraphic is based on. Was there an enumberation of physical relationships on the sheet and do they correspond to the EH ones?

We will look for a place to put the document,

Posted by Gerald on 1/12/2014

Hi Keith, all

Before we put up CRMarchaeo for general review we wanted to have your corrections and improvements and additions included as it makes sense to have your expertise in first. Martin also wanted to make clear that the modelling is an ongoing process as CRM-SIG is responsible for CRMarchaeo now and it is not an ARIADNE deliverable that would have to be finished at a specific date.  We prefer to send a text as a token from one editor to the next rather than having a public document.

On the question of point 2. Physical Relationships Martin argued that the property of property solution makes Physical Relationship to a class which will allow for an open vocabulary of Physical Relationships and also allow for the reference to sketches or pictures as justification. The semantic restrictions of specific Physical Relationships he would rather put in a further EH extension than into the general CRMarchaeo ontology. Modelling with subproperties and modelling with intermediate class (property of property) can be made compatible at any later time by use of OWL rules.

I read through Pauls thoughts on CRMarchaeo, thank you very much for that!

Is it possible for you to write directly into the word document your suggestions for changes and correct errors?