

The 42nd joint meeting of the CIDOC CRM SIG and ISO/TC46/SC4/WG9 and the 35th FRBR - CIDOC CRM Harmonization meeting

27 - 30 November, 2018

Deutsches Archäologisches Institut(DAI)

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27 November 2018 crm-sig issues discussed

ISSUE 345: properties having domain or range deprecated classes

Decision: The crm-sig voted in favor of deprecating P58 *has section definition (defines section)* and P149 *is identified by (identifies)* in view of their ranges having already been deprecated.

Furthermore, they voted in favor of MD's new scope note for P59 *has section (is located in or within)* as a result of E46 Section definition having been deprecated.

The scope note for P59 *has section (is located in or within)* changed **from:**

P59 *has section (is located in or within)*

This property links an area to the instance of E18 Physical Thing upon which it is found. It is typically used when a named E46 Section Definition is not appropriate. E18 Physical Thing may be subdivided into arbitrary regions. P59 *has section (is located on or within)* is a shortcut. If the E53 Place is identified by a Section Definition, a more detailed representation can make use of the fully developed (i.e. indirect) path from E18 Physical Thing through P58 *has section definition*, E46 Section Definition, P87 is identified by E44 Place Appellation. A Place can only be located on or within one Physical Object.

To:

P59 *has section (is located in or within)*

This property links an area, i.e., an instance of E53 Place to the instance of E18 Physical Thing upon which it is found. This area may either be identified by a name, or by a geometry in terms of a coordinate system adapted to the shape of the respective instance of E18 Physical Thing. Typically,

names identifying sections of physical objects are composed of the name of a kind of part and the name of the object itself, such as "The poop deck of H.M.S. Victory", which is composed of "poop deck" and "H.M.S. Victory".

We had planned to start the meeting with issue 397, but the sig considered it was best to go over the scope note for E54 Dimension, revised by MD.

ISSUE 347: Dimension and Data sets.

The crm-sig discussed the proposal by MD to relax the definition of E54 so that it will represent the approximation of true quantities obtained through measurements, derived quantities computed indirectly from observation data comparable to reality or of quantities produced by simulation of reality-like situations, and reviewed his new attempt at drafting a scope note on E54 Dimension.

Some observations regarding the scope note were the following:

- The scope note seems to conflate dimensions obtained from measuring events to data produced by observations; is dimension about actual approximations or hypothetical values?
- Assuming that the outcome of a measurement is an instance of E54 dimension, there may be as many dimensions as there are numerical values for measurements.
- The scope note is too long; the topic of § 4 revolves around the numerical values approximating E54 Dimension, rather than dimension proper. Plus, it's explicitly giving guidelines, and resembles more a FAQ section rather than a scope note.

They were addressed by MD, who explained that dimensions are not numerical values; rather an instance of E54 Dimension an approximation of a quantifiable property at some particular conditions. What is of interest is the dimension, approximated by a range of indeterminacy –within which fall the numerical values produced by the measurements.

The crm-sig agreed that there should be explicit guidelines to writing scope notes, maybe like newspaper articles.

HW: SS and GB were assigned with redrafting the scope note and to recast the parts that resemble guidelines as “best practices” instead.

ISSUE 397: Dimension Intervals

Decision: After discussing MD's proposal, the crm-sig decided in favor of introducing a new property Pxx had duration linking an instance of 52 Time-Span to an instance of E54 Dimension.

Also the sig decided to accept the proposed subproperties of Pxx had duration in CRM-RDFS . These are: P90a_has_lower_value_limit and P90b_has_upper_value_limit . Consequently, the sig decided to deprecate P83 had at least duration (was minimum duration of), P84 had at most duration (was maximum duration of), because they compete with an interval interpretation of P90.

The domain of new Pxx had duration should be the E52 Time-Span and its range should be E54 Dimension.

Migration paths from the deprecated properties are to be made explicit.

The alternative proposal of introducing a class Exx Temporal Duration, such that it is a subclass of E54 Dimension, and define properties it will participate in, was rejected by the crm-sig.

The idea is that duration, defined by time intervals, can be treated as a kind of dimension, and thus be defined by its inner and outer limits -corresponding to the lower and upper value, respectively. Deprecating the specific properties for temporal duration (P83/P84) in favor of a more generically applied set of properties will help increase the consistency of the model.

The alternative proposal by RL, that the said property be called 'has dimension' was not further discussed.

HW: MD was assigned with writing the scope note Pxx had duration.

ISSUE 327: Monetary amount Identity

The crm-sig has decided to close Issue 327. Agreeing to redraft the scope note for E54 Dimension, also resolved the problem of capturing the amount of a monetary value.

ISSUE 390: Scope note of E94 Space Primitive (12.08-13.01)

The crm-sig reviewed MD's new scope note for E94 Space Primitive and agreed on it with minor revisions. Thus, the scope note has changed **from**:

E94 Space Primitive

Subclass of: E59 Primitive Value

Scope Note: This class comprises instances of E59 Primitive Value for space that should be implemented with appropriate validation, precision and references to spatial coordinate systems to express geometries on or relative to earth, or any other stable constellations of matter, relevant to cultural and scientific documentation.

An E94 Space Primitive defines an E53 Place in the sense of a declarative place as elaborated in CRMgeo (Doerr and Hiebel 2013), which means that the identity of the place is derived from its geometric definition. This declarative place allows for the application of all place properties to relate phenomenal places to their approximations expressed with geometries.

Definitions of instances of E53 Place using different spatial reference systems always result in definitions of different instances of E53 place approximating each other.

Instances of E94 Space Primitive provide the ability to link CRM encoded data to the kinds of geometries used in maps or Geoinformation systems. They may be used for visualisation of the instances of E53 Place they define, in their geographic context and for computing topological relations between places based on these geometries.

Note that it is possible for a place to be defined by phenomena causal to it or other forms of identification rather than by an instance of E94 Space Primitive. E94 Space Primitive is not further elaborated upon within this model. Compatibility with OGC standards is recommended.

TO:

E94 Space Primitive

Subclass of: E59 Primitive Value

Scope Note: This class comprises instances of E59 Primitive Value for space that should be implemented with appropriate validation, precision and references to spatial coordinate systems to express geometries on or relative to earth, or any other stable constellations of matter, relevant to cultural and scientific documentation.

An E94 Space Primitive defines an E53 Place in the sense of a declarative place as elaborated in CRMgeo (Doerr and Hiebel 2013), which means that the identity of the place is derived from its geometric definition. This declarative place allows for the application of all place properties to relate phenomenal places to their approximations expressed with geometries.

Instances of E94 Space Primitive provide the ability to link CRM encoded data to the kinds of geometries used in maps or Geoinformation systems. They may be used for visualization of the instances of E53 Place they define, in their geographic context and for computing topological relations between places based on these geometries.

Note that it is possible for a place to be defined by phenomena causal to it, such as a settlement or a riverbed, or other forms of identification rather than by an instance of E94 Space Primitive. Any geometric approximation of such a place by an instance of E94 Space Primitive constitutes an instance of E53 Place in its own right. E94 Space Primitive is not further elaborated upon within this model. Compatibility with OGC standards is considered good practice.

The question how a Space Primitive, which under this definition is a literal, can also be a place (“This class comprises instances of E59 Primitive Value for space ...” vs. “Any geometric approximation of such a place by an instance of E94 Space Primitive constitutes an instance of E53 Place in its own right”) was addressed by means of the E94 Space Primitive defines a place in the declarative sense, which in its turn approximates a phenomenal place

SS said that the last paragraph should be made more explicit in terms of declaring the path.

ISSUE 393: Scope of E95 spacetime primitive. (12.00-12.16)

The crm-sig reviewed the scope note proposed by MD and accepted it, with minor adjustments. The scope note is changed **from**:

E95 Spacetime primitive

Subclass of: [E59](#) Primitive Value

Scope Note: This class comprises instances of E59 Primitive Value for spacetime volumes that should be implemented with appropriate validation, precision, interval logic and reference systems to express date ranges and geometries relevant to cultural documentation. A

Spacetime Primitive may consist of one expression including temporal and spatial information like in GML or a different form of expressing spacetime in an integrated way like a formula containing all 4 dimensions.

An E95 Spacetime Primitive defines an E92 Spacetime Volume in the sense of a declarative spacetime volume as defined in CRMgeo (Doerr & Hiebel 2013), which means that the identity of the spacetime volume is derived from its geometric and temporal definition. This declarative spacetime volume allows for the application of all E92 Spacetime Volume properties to relate phenomenal spacetime volumes of periods and physical things to propositions about their spatial and temporal extents.

Definitions of spacetime volumes using different spacetime reference systems always result in definitions of different spacetime volumes approximating each other.

Note that it is possible for a spacetime volume to be defined by phenomena causal to it or other forms of identification rather than by an instance of E95 Spacetime Primitive. In this case, this property must not be used for approximating the respective instance of E92 Spacetime volume with an instance of E95 Spacetime Primitive.

E95 Spacetime Primitive is not further elaborated upon within this model. Compatibility with OGC standards are recommended.

To:

E95 Spacetime primitive

Subclass of: [E59 Primitive Value](#)

Scope Note: This class comprises instances of E59 Primitive Value for spacetime volumes that should be implemented with appropriate validation, precision and reference systems to express geometries being limited and varying over time on or relative to Earth, or any other stable constellations of matter, relevant to cultural and scientific documentation. A Spacetime Primitive may consist of one expression including temporal and spatial information such as in GML or a different form of expressing spacetime in an integrated way such as a formula containing all 4 dimensions.

An E95 Spacetime Primitive defines an E92 Spacetime Volume in the sense of a declarative spacetime volume as defined in CRMgeo (Doerr & Hiebel 2013), which means that the identity of the spacetime volume is derived from its geometric and temporal definition. This declarative spacetime volume allows for the application of all E92 Spacetime Volume properties to relate phenomenal spacetime volumes of periods and physical things to propositions about their spatial and temporal extents.

Instances of E92 Spacetime Volume defined by P169 that use different spatiotemporal referring systems are always regarded as different instances of the E92 Spacetime Volume.

It is possible for a spacetime volume to be defined by phenomena causal to it, such as an expanding and declining realm, a settlement structure or a battle, or other forms of identification rather than by an instance of E95 Spacetime Primitive. Any spatiotemporal

approximation of such a phenomenon by an instance of E95 Spacetime Primitive constitutes an instance of E92 Spacetime volume in its own right.

E95 Spacetime Primitive is not further elaborated upon within this model. Compatibility with OGC standards are recommended.”

ISSUE 391: Harmonizing Space Primitive

The crm-sig discussed the section of the document “Implementing the CIDOC Conceptual Reference Model in RDF” regarding the representation of E94 Space Primitive in RDF as `rdfs:literal`.

They agreed on the content of the footnote –namely to revisit SP5 Geometric Place Expression and maintain SP6 Declarative Place on crm-geo. Finally, they decided to postpone the discussion on the relation between datatypes and E41 Appellation until an agreement is reached on the issue concerning content representation, in view of the implementation guidelines with very long literals (383,395 etc.).

HW: GH has been assigned with review the document and give prefixes to the ogc classes.

ISSUE 380: Qualified properties P79 & P80:

HW: The crm-sig appointed MD to extend the text on the qualified properties P79 *beginning is qualified by* & P80 *end is qualified by*, and associate them with P83 *had at least duration (was minimum duration of)* and P84 *had at most duration (was maximum duration of)*, in a way that the qualifications accommodate difference of opinion on the relevant timespans.

ISSUE 288: Issue about P82 and P81 usage

The text “Guidelines for using P82a, P82b, P81a, P82b” was accepted as an appendix to the document “Implementing the CIDOC Conceptual Reference Model in RDF”.

The sig also complemented the text of 288 by adding a citation to Christian’s Emil relative work and decided to update the uploaded text to the site and the crm-sig be listed as the author of “Guidelines for using P82a, P82b, P81a and P81b”.

The text is in the appendix A

ISSUE 376: Scope note of E5 Event.

The crm-sig discussed the new scope note for E5 Event, by MD.

The new scope aims at defining events without a recourse to states –i.e. not as “change of states”. Such a treatment would necessitate the definition of states, a very difficult task to undertake, especially in view of the fact that states are not ontological concepts as well, but are construed negatively as the absence of events. To make sure that states are not implied/implicated by the definition of event, the phrase “change of state” has been substituted by “processes and interactions”, whereas the results of an event are dubbed “effects that are not necessarily permanent” –to ensure that they are contrasted from states that are typically ascribed the property of persisting.

Mentioning that processes and interactions are coherent, aims at clarifying that to qualify as an event, a delimited phenomenon must be uninterrupted. If it stops and resumes, we are talking about two instances of that particular type of event.

Some of the issues raised in the meeting revolve around the properties of events, which only model participation and attendance (presence at the event). In general, no other type of more specific involvement can be accounted for in the case of events.

MD argued that to define the specific properties of a participant's involvement in an event, one must first know what the type of the event is. Otherwise, it is impossible to determine the type of involvement in it or any other properties inherent to the event.

The scope note is changed from:

E5 Event

Scope note: This class comprises changes of states in cultural, social or physical systems, regardless of scale, brought about by a series or group of coherent physical, cultural, technological or legal phenomena. Such changes of state will affect instances of E77 Persistent Item or its subclasses.

The distinction between an E5 Event and an E4 Period is partly a question of the scale of observation. Viewed at a coarse level of detail, an E5 Event is an 'instantaneous' change of state. At a fine level, the E5 Event can be analysed into its component phenomena within a space and time frame, and as such can be seen as an E4 Period. The reverse is not necessarily the case: not all instances of E4 Period give rise to a noteworthy change of state.

TO:

E5 Event

Scope note: This class comprises distinct, delimited and coherent processes and interactions of a material nature, in cultural, social or physical systems, involving and affecting instances of E77 Persistent Item in a way characteristic of the kind of process. Typical examples are meetings, births, deaths, actions of decision taking, making or inventing things, but also more complex and extended ones such as conferences, elections, building of a castle, or battles.

While the continuous growth of a tree lacks the limits characteristic of an event, its germination from a seed does qualify as an event. Similarly the blowing of the wind lacks the distinctness and limits of an event, but a hurricane, flood or earthquake would qualify as an event. Mental processes are considered as events, in cases where they are connected with the material externalization of their results; for example the creation of a poem, a performance or a change of intention that becomes obvious from subsequent actions or declarations.

The effects of an instance of E5 Event may not lead to relevant permanent changes of properties or relations of the items involved in it, for example an unrecorded

performances. Of course, in order to be documented, some kind of evidence for an event must exist, be it witnesses, traces or products of the event.

While instances of E4 Period always require some form of coherence between its constituent phenomena, in addition, the essential constituents of instances of E5 Event should contribute to an overall effect; for example the statements made during a meeting and the listening of the audience.

Viewed at a coarse level of detail, an E5 Event may appear as if it had an 'instantaneous' overall effect, but any process or interaction of material nature in reality have an extent in time and space. At a fine level, instances of E5 Event may be analyzed into component phenomena and phases within a space and timeframe, and as such can be seen as a period, regardless of the size of the phenomena. The reverse is not necessarily the case: not all instances of E4 Period give rise to a noteworthy overall effect and are thus not instances of E5 Event.

The issue is closed

ISSUE 309: Temporal Primitives

HW: The crm-sig has assigned Achille Felicetti and Wolfgang Schmidle to provide examples for the temporal properties

- P173 starts before or with the end of (ends after or with the start of)
- P174 starts before the end of (ends after the start of)
- P175 starts before or with the start of (starts after or with the start of)
- P176 starts before the start of (starts after the start of)
- P182 ends before or with the start of (starts after or with the end of)
- P183 ends before the start of (starts after the end of)
- P184 ends before or with the end of (ends with or after the end of)
- P185 ends before the end of (ends after the end of)

ISSUE 395: Symbolic Content

The crm-sig reviewed MD's proposal and agreed to introduce a new property Pxxx has symbolic content', linking instances of 'E90 Symbolic Object' to instances of 'E62 String'. The said property will be a subproperty of P3 has note'.

The scope note given by MD was accepted as a working definition and underwent minor modifications. The examples provided by RS were also accepted as felicitously describing the new property. The proposal that the property's name be changed to a less misleading label, such as Pxxx Symbolic Value' or Pxxx Consists of' was not discussed at length.

The issue would be revisited again, in the context of issues 394 & 383.

Pxxx has symbolic content

Domain: E90 Symbolic Object

Range: E62 String

Subproperty of: [E1](#) CRM Entity. P3 has note: [E62](#) String

Quantification: many to many (0,n:0,n) ??

Scope note: This property associates an instance of E90 Symbolic Object with a complete, identifying representation of its content in the form of an instance of E62 String.

This property only applies to instances of E90 Symbolic Object that can be represented completely in this form. The representation may be more specific than the symbolic level defining the identity condition of the represented. This depends on the type of the symbolic object represented. For instance, if a name has type "Modern Greek character sequence", it may be represented in a loss-free Latin transcription, meaning however the sequence of Greek letters.

As another example, if the represented object has type "English words sequence", American English or British English spelling variants may be chosen to represent the English word "colour" without defining a different symbolic object. For a symbolic object such as "European traditional name", no one string may define its content; on consequence this property could not be applied.

Examples:

- * The materials description (E33) of the painting _has symbolic content_ "Oil, French Watercolors on Paper, Graphite and Ink on Canvas, with an Oak frame."
- * The title (E35) of Einstein's 1915 text _has symbolic content_ "Relativity, the Special and the General Theory"
- * The story of Little Red Riding Hood (E33) _has symbolic content_ "Once upon a time there lived in a certain village ..."
- * The inscription (E34) on Rijksmuseum object SK-A-1601 _has symbolic content_ "B"

HW: RL was assigned with doing editorial work on the scope note by MD.

ISSUE 240: New "encoding" property for E90 Symbolic Object

The crm-sig decided to close this issue since it is the same with 395. It is agreed that P2 "has type" is sufficient to capture the different kinds of encoding.

ISSUE 394: Solution for Dualism of E41 Appellation and rdfs:label

The crm-sig discussed MD's proposal that in the RDFS implementation of the CRM, P1 can have two ranges, Literal and E41 Appellation, and that P1_is_identified_by is a superproperty of rdfs:label, bearing in mind that any decision reached would affect other types of primitive values, as it would carry over to them. There were some objections raised because of allowing two distinct datatypes as a possible range for P1, however the crm-sig voted in favor of MD's proposal, marking that

- (i) it should be explicitly stated that it forms a technical solution that is part of the implementation of crm in rdf (CEO), and
- (ii) it is a solution best understood as an implicit way to describe instances of E41 Appellation. An alternative path of P1 is given as best practice –namely one going through E41 Appellation –Pxx has symbolic content –Literal.

The issue is closed, the discussion may be continued in the issue 383.

ISSUE 260: Review specializations of Appellation.

The crm-sig has decided to keep Issue 260 open. E51 Contact Point has been deprecated from crm-base, in line with the guideline that classes with no properties pointing to them are not to be declared. However, E51 should be moved to the Parthenos model instead.

HW: GB is assigned to write a scope note and transfer the examples.

28 November 2018 crm-sig issues discussed.

ISSUE 363: Form and persistence of RDF identifiers

Following the decision to put together a document that offers guidance on recommended techniques for using the CIDOC-CRM in an RDF implementation, the crm-sig reviewed the text drafted by MD and RL (*Encoding the CIDOC Conceptual Reference Model in RDF*).

The sig accepted the content (i.e. scope, table of contents, guidelines given) of the document as a draft and decided that the document be uploaded under Best Practices, with its reworked title (*Implementing the CIDOC Conceptual Reference Model in RDF*), credited to M.Doerr and R.Light.

The scope of this document was explicitly stated –it serves as an implementation guideline, it’s not part of the crm as such.

HW: RL is assigned with collecting comments and doing editorial work on the document.

It was decided to edit the guideline “For Appellations being described indirectly via a URI, we recommend the use of E41 Appellation > P72 has language > E56 Language.”, found under the section *Language of an Appellation*, to “...E33 Linguistic object > P72 has language > E56 Language” instead.

The proposal to document a subclass of E41 Appellation, namely “Linguistic Appellation”, in the rdf representation of the crm was accepted.

Also the sig decided that after this meeting we should have an rdf expression of the 6.2.5 CRM version following these guidelines and we should also define the mappings for the deprecated classes and properties.

ISSUE 389: Label-free RDF classes.

Following GB’s veto, the crm-sig has rejected the proposal to define number-only rdf classes and properties as equivalent to the corresponding full form. Labels will be a part of the identifiers.

That the preferred labels for the classes are in English should pose no problem, nor does it indicate a bias towards English. The fact that in very few occasions the labels accompanying the identifiers have undergone change from one version to the next, does not mean that it’s best to dispose of the labels altogether, but rather indicates that the relations between the different versions of the model must be treated through a migration mechanism.

Finally, the sig decided that we should have a proper migration mechanism for any version and we should add a section about this mechanism to the *“Implementing the CIDOC Conceptual Reference Model in RDF”* document.

ISSUE 403 new technical paper on CIDOC-CRM URIs NAMESPACE MECHANISM

Proposal:

HW: TV, RS will communicate with CG at FORTH to resolve the problem regarding the fragment identifiers' reference. The outcome of this discussion is to be incorporated in the document "Implementing the CIDOC Conceptual Reference Model in RDF" by MD -related issue 363.

It has been stated that FORTH almost single-handedly and pro-bono maintains a great number of compatible versions, together with a large number of byproducts that need become available with each new release. Furthermore, it has been proposed by MD that other institutions should take up some of the burden.

FB has proposed that a way out of this situation, and gave a number of alternative solutions, namely establishing a partnership to carry it out the IT-work or create a community of paying members.

It was decided that this be treated as a new issue for the crm-sig to decide upon.

MD mentioned that looking for sponsorship should go through CIDOC, and that the organization should be in agreement. Furthermore, since this will involve asking for international sponsorship, any financial transactions should be 100% transparent. He also proposed that –if CIDOC and everyone in the crm-sig agrees with looking for sponsorship –this could be handled through FORTH, because it's a non-profit organization overseen by/under the supervision of the Greek state –hence transparency in any financial transactions would not be an issue.

Furthermore, he inquired whether other institutions such as the Getty, the British Museum and Leibniz community (association?) would be interested in forming some sort of 'federation' among them to carry on with this work. Responses were far from conclusive.

MD, GB are assigned with contacting Monika Hagedorn-Saupe to check if CIDOC endorses this proposal. Once they have an official response, people will be able to comment on the issue.

ISSUE 402 Representing compound name strings

It was agreed that the crm-sig should look at the best practices adopted by international communities, and then re-address the issue of finding a meaningful way to represent massive compound names (such as properties, person street compounds etc) in the next crm-sig meeting.

HW: NC, TV, MR (shall provide input about the meaning of the compounds), SS and RS are assigned with providing input.

ISSUE 399 Appellations that ARE URIs

The crm-sig has decided that Issue 399 is covered by the solution proposed for Issue 363 and the solution regarding the dualism of E41 Appellation and rdfs:label. The issue has been closed.

ISSUE 398 Scope note of E62 String

MD's attempt at a new scope note for E62 string was accepted by the crm-sig. The issue is closed. The scope note of E62 String changed from:

E62 String

Scope Note: This class comprises the instances of E59 Primitive Values used for documentation such as free text strings, bitmaps, vector graphics, etc.

E62 String is not further elaborated upon within the model

To:

E62 String

This class comprises coherent sequences of binary-encoded symbols. They correspond to the content of an instance of E90 Symbolic object. Instances of E62 String represent only the symbol sequence itself. They may or may not contain a language code.

In contrast, instances of other subclasses of E59 Primitive value represent entities in mathematical spaces other than that of symbol sequences, by using binary-encoded symbols, such as date expressions or numbers in decimal encoding. For instance, different syntactic forms of a date expression may represent the same date, but consist of different strings.

ISSUE 383: 'has content' property

The crm-sig has discussed MD's proposal regarding defining a new property of E90 Symbolic Object, such that it captures the actual content of a symbolic object and has accepted it as is. (Issue 395).

HW: The crm-sig has assigned GB, NC and RS to come up with solutions accounting for both cases of linking an instance of E90 Symbolic Object to other instances of E90 Symbolic Object composing it, as well as for cases where the same instance of E90 Symbolic Object is conveyed through different means/encodings –i.e. things that might be considered as the equivalent to 'spelling variants'.

Presentation by Dominic Oldman

Dominic Oldman presented the Research Space project

Presentation by Martin Doerr

Martin presented the CRM-inf argumentation

ISSUE 334: Scholarly reading

The crm-sig examined the proposed scope note and properties of I8 Conviction and accepted them. It was decided that I8 Conviction is to be included in the CRMInf classes.

I8 Conviction:

Subclass of: E2 Temporal Entity

Superclass of: I2 Belief
I9 Citation

Scope note: This class comprises convictions by individuals or groups about the truth or not of some state of affairs.

Examples:

- My belief that Gaius Suetonius Tranquillus was deliberately lying about Nero.

In First Order Logic:

$I8(x) \supset E2(x)$

The crm-sig also reviewed the definition of I1 Argumentation and found that I1 Argumentation had mistakenly be listed a subclass of E13 Attribute Assignment. Despite Attribute Assignment being easily construed as a part of an argument/argumentation, it is not seen as an integral part. The scope note of I1 Argumentation declares it a kind of E7 Activity, hence it was decided that it be listed under E7 Activities instead. The old and the new definition can be found below:

I1 Argumentation:

Subclass of: E13 Attribute Assignment
Superclass of: S4 Observation
I5 Inference Making/S5 Inference Making
I7 Belief Adoption

Scope note: This class comprises the activity of making honest inferences or observations. An honest inference or observation is one in which the E39 Actor carrying out the I1 Argumentation justifies and believes that the I6 Belief Value associated with resulting I2 Belief about the I4 Proposition Set is the correct value at the time that the activity was undertaken and that any I3 Inference Logic or methodology was correctly applied.

Only one instance of E39 Actor may carry out an instance of I1 Argumentation, though the E39 Actor may, of course, be an instance of E74 Group.

Properties: J2 concluded that (was concluded by): I8 Conviction

Examples:

- My classification and dating of this bowl (I5)
- My adoption of the belief that Dragendorff type 29 bowls are from the 1st Century AD (I7)

I1 Argumentation:

Subclass of: E7 Attribute Assignment
Superclass of: S4 Observation
I5 Inference Making/S5 Inference Making
I7 Belief Adoption

Scope note: This class comprises the activity of making honest inferences or observations. An honest inference or observation is one in which the E39 Actor carrying out the I1 Argumentation justifies and believes that the I6 Belief Value associated with resulting I2 Belief about the I4 Proposition Set is the correct value at the time that the activity was undertaken and that any I3 Inference Logic or methodology was correctly applied.

Only one instance of E39 Actor may carry out an instance of I1 Argumentation, though the E39 Actor may, of course, be an instance of E74 Group.

Properties: J2 concluded that (was concluded by): I8 Conviction

Examples:

- My classification and dating of this bowl (I5)
- My adoption of the belief that Dragendorff type 29 bowls are from the 1st Century AD (I7)

Furthermore, the crm-sig discussed the proposed scope note and label for I9 Citation. The scope note and the properties taking it as an argument were accepted with minor adjustments (see below). There

were a few concerns regarding what counts as an instance of an I9 Citation; it was specifically mentioned that the scope note read into an activity type (i.e.: if it is about an E73 Information Object, then an instance of I9 Citation involves an active interpretation) whereas both its superset, I8 Conviction, and I2 Belief, which is at the same level as I9 Citation, express states.

It was explained that the link to E73 Information Object is made explicit, in order to capture situations where there is no ambiguity in the data and the authenticity of its provenance is not disputed (representing the default case). Requests that this class also captures cases where there is ambiguity in the data or where the authenticity of the provenance is disputed were not accepted.

There was disagreement on the label however. Some of the alternatives put forth were I9 Scholarly Reading, I9 Provenanced Comprehension, I9 Quoting and they are to be reviewed in the next crm-sig meeting.

I9 Citation

Subclass of: I8 Conviction

Superclass of:

Scope note: This class comprises beliefs in the correct reading or scholarly interpretation of the overt message intended by an instance of E73 Information Object (“source”), in which the interpretation of the source is formulated as a set of formal propositions or regarded to be unambiguously given in a natural language form. An instance of I9 Citation implies believing the authenticity of the respective instance of E73 Information Object relative to an explicitly stated provenance, but does not mean believing the respective propositions. Rather, the truth of the cited message is the subject of another scholarly interpretation process. It further does not pertain to arguing about hidden or cryptic meanings of a source, which is the subject of yet another scholarly interpretation process.

29 November 2018 crm-sig issues discussed.

We started with a presentation on Linked Art, by Robert Sanderson.

In the discussion that followed, the topic shifted to the Phases vs States distinction, which are considered extremely relevant in the CRMsoc family model, as well as the CRMinf. The discussion reverted to the temporality of properties and the possibility of adding a temporal parameter/feature to relations that are considered relatively stable over a timespan/time interval. In that sense, these timed relations could be modelled as states.

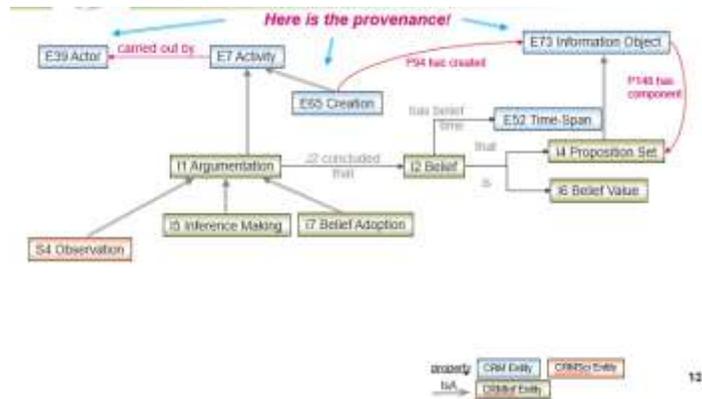
It was noted, however, (MD) that such an approach would be introducing ambiguity to the model as states would supersede all other properties. It was proposed that timed relations best be modelled by invoking a Phase (in the sense of a “thing” exhibiting stable properties bound to its evolution), a Social institution (like marriage), an Activity or a Mental attitude (like a belief state, an intention), to which an appropriate type can be applied instead. The type could be determined on the basis of the most generic subset of timed relations.

The discussion reverted back to the notions of Phase, Social Institution, Activity and Mental Attitude –to which an appropriate type can be applied –were brought up again. The discussion extended to what these types of relations might be. Some of the ideas put forth were:

- social institutions,
- plans (i.e. documented intentions to carry out some action),
- economic activities,
- qualities/properties ascribed to people (gender being an instance thereof)
- activity-based social relationships (friendship for instance), family relations

The abovementioned concepts relate to what is proposed to be the scope of CRMsoc –namely, social relations, cast in terms of relations between people, people and “things” (such as rights, transactions etc.) and to the Business Model, which is best considered in terms of Obligation and Compensation – payment being part thereof. The discussion (and its outcomes) regarding Phases and the Temporality of Properties should be considered in this context as well.

HW assignments are to be found under Issue 358 CRMsoc and scope of CRM modules.



ISSUE 364: Create Profile Markup Language/Schema

In accordance with the decisions reached in the crm-sig meeting (Lyon, May 2018), regarding (a) tools that allow users create data profiles using classes and relations of CIDOC CRM and local extensions and (b) refining the meaning of application profile –i.e. picking out the classes and properties that one deems useful for a project/domain from the ontology and its extensions --the sig decided to change the name of application profile to ontology profile. By ontology profile we mean a mechanism to denote CRM constructs collected from CRM and extensions that are useful for data entry and mapping in a certain domain. This mechanism should have the following capabilities:

- It should allow the extraction of latest definitions of the respective classes and properties.
- It should automatically produce a list of super classes and properties needed for querying (in this profile).
- It should check validity with respect to updates on referred RDFS sources.
- There may be a suggester to exclude properties from inheritance. If you have types in biological discourse, may not be interested in many of its inherited properties.

- Furthermore, there should be local additions/extensions in terms of properties and classes, which are also to be included in the profile

MD and the SIG asked RS to provide some profile examples. We just need a file (package) to say these are 5? properties taken from rdf instance of CRM (first we have to decide the syntax and then to choose properties and classes from various profiles).

The issue should be discussed at length through the crm-sig mailing list.

ISSUE 348: Using crm

DECISION: The crm-sig has decided to close Issue 348 and refer to the issue on creating ontology profiles instead.

ISSUE 184: Examples in CRMarcheo

The crm-sig has declared ISSUE 184 resolved. The new CRMarcheo version (1.4.7) whose classes and properties have been revised, its diagrams updated and content rearranged is already up on the CIDOC CRM website. Version 1.4.7 of CRMarcheo also incorporates examples provided by Eleni Christaki

ISSUE 282: Mappings of CRMarchaeo and EH

During the discussion, Achille commented that Keith May was contacted before meeting. He was not entirely sure whether there is a need to do an actual “mapping” between CRMarchaeo to CRM-EH, but rather just agree on some statement regarding their mutual compatibility, due to them having been derived from the “parent” ontology of CIDOC CRM. He was also interested to know whether the recent SIG’s decision to deprecate the Allen operators and its impact on CRMarcheo has been considered and what that impact was.

MD commented that since now CRMarcheo represents a more recent development, it is preferable to have a sort of migration path from CRM-EH to CRMarcheo, possibly enriching the latter, and/or a mapping on how to query CRM-EH via CRMarcheo.

AF proposed that the sig take into account the paper entitled “Implementing archaeological time periods using CIDOC CRM and SKOS” by Ceri Binding .

HW: The crm-sig has assigned MD with providing a migration between time primitives and Allen operators and introducing deprecation information in CRM base.

DECISION: The crm-sig has decided that the complete text, including the mappings, is to be uploaded on the crm-site, under best practices.

ISSUE 283: Superproperties of CRMarcheo

Achille presented his homework on superproperties for CRMarchaeo properties. We discussed his proposal with the following order:

(a) The crm-sig discussed the observed clash between the domain of **AP1 produced (was produced by) and the domain of its CRMbase superproperty (P108 has produced (was produced by))** –namely A1 Excavation Process Unit (listed as a subclass of E64 End of Existence) and E 12 Production (listed as a subclass of E63 Beginning of Existence and E11 Modification), respectively.

AF and GB who were assigned to find superproperties to the CRM archeo properties, worked around the problem by proposing that A1 production be listed as a subclass of E81 Transformation. The crm-sig rejected this solution and proposed that a different solution be explored.

Namely, instead of declaring A1 Excavation Process Unit (the domain of AP1 produced (was produced by)) a subclass of E6 Destruction, it should be declared a subclass of either S1 Matter Removal or S2 Sample Taking, which, in their turn, are to be declared as subclasses of E63 Beginning of Existence, which solves the problem. It's more likely that the most appropriate superclass for A1 Excavation Process Unit is S1 Matter Removal though, because we don't expect all the activities in the context of an excavation to be sampling processes. The branch of the relevant classes' hierarchy could look like this:

A1 Excavation Process Unit isA S1 Matter Removal isA E63 Beginning of Existence. It should work for the other CRM archeo properties that have A1 as their domain, namely

- AP2 discarded into (was discarded by),
- AP4 produced surface (was surface produced by),
- AP5 removed part or all of (was partially or totally removed by),
- AP6 intended to approximate (was approximate),
- AP10 destroyed (was destroyed by).

HW: AF should rework the solution, along the lines proposed in the meeting..

(b) The most suitable candidate for a superproperty **to AP3 investigated (was investigated by)** was O8 observed (was observed by), which required the range of AP3 to change into a class that does not clash with S15 Observable Entity (i.e. the range of O8 observed).

It was proposed that the new range for AP3 investigated (was investigated by) be changed from E53 Place to E27 Site.

AP3 investigated (was investigated by) [old]:

Domain: [A9](#) Archaeological Excavation

Range: [E53](#) Place

Quantification: one to many (0,n:0,1)

Scope note: This property identifies the 3D excavated volume instance of E53 Place, i.e., a three-dimensional volume, that was actually excavated during an A1 Excavation Process Unit.

Examples:

The Excavation Process Unit excavating the Stratigraphic Volume Unit (2) excavated the place where the Stratigraphic Volume Unit (2) was.

In First Order Logic:

Properties:

AP3 investigated (was investigated by) [new]:

Domain: [A9](#) Archaeological Excavation

Range: [E27](#) Place

Quantification: one to many (0,n:0,1)

Scope note: This property identifies the 3D excavated volume instance of **E27 Site**, i.e. a three-dimensional volume that was actually investigated during an A9 Archaeological Excavation.

Examples:

The Archeological Excavation investigating the Stratigraphic Volume Unit (2) excavated the site which the Stratigraphic Volume Unit (2) was part of (P46).

A7 Embedding currently have S16 State as superclass, that exists no more. Decision: to change superclass of A7 to E3 Condition State. E3 needs to be revised to fit properly (George in charge).

(c) Regarding the superproperties of CRMarcheo properties whose domain is set to A7 Embedding (a subclass of S16 State):

It was proposed that the restrictions imposed on E3 Condition State be relaxed or alternatively that S16 State be allowed as a suitable range for P44 has condition state (is condition state of). However, S16 State has been deprecated –which means that it is no longer an option. The alternative of changing the scope of E3 Condition State is to be followed.

It was mentioned that structural characteristics of an object could be seen as extending condition states (f.i. an object with its lid open vs the same object with its lid closed) into phases –the latter are applicable to living beings as well (i.e. not solely confined to conservation contexts).

On the other hand, it was proposed that A7 Embedding is best defined a subclass of E26 Physical Feature rather than S16 State/(extended) E3 Condition State. So, more thought is to be put on the superproperties of CRMarcheo properties whose domain or range is A7 Embedding.

PROPOSAL:

- A7 Embedding be declared a subclass of E26 Physical Feature.
- The scope of E3 Condition state be updated taking into consideration physical and structural features of objects (aka Phases). This is to be handled separately either under ISSUE 369 (Timed relations) or under ISSUE 329: States and situations.

DECISION: The crm-sig decided to accept this proposal. Furthermore, it was decided that S16 will consistently be changed to an updated E3 Condition State.

HW: GB is assigned with consistently changing S16 to an updated E3 Condition State.

(d) Regarding the superproperties of AP11 has physical relation (is physical relation of), AP13 has stratigraphic relation (is stratigraphic relation of) and AP14 justified by (is justification of), it was mentioned that they cannot be reduced to subproperties of CRMbase properties. They correspond to .1 metaproperties, which means that only their type needs be specified –not their substance.

(e) AP15 is or contains remains of (is or has remains contained in)

(f) AP21 contains (is contained in)

(g) The rest of the properties of CRMarcheo were assigned to their respective superproperties without problems:

- a. **AP7 produced** (O17 generated)
- b. **AP8 disturbed** (O18 altered)

- c. **AP9 took matter from** (O18 altered)
- d. **AP12 confines** (O7 contains or confines)
- e. **AP16 assigned attribute to** (P40 assigned attribute to)
- f. **AP17 is found by** (O8 observed)
- g. **AP18 is embedding of (is embedded)** (P44 has condition)

ISSUE 337: Excavation Interface

Decision: New A10 Excavation Interface class to be included in CRMarchaeo documentation. No need for a new APxx property since O7 confined could be used instead. O7 has as range S10 Material Substantial but this is consistent with S22 Segment of Matter, as once is dug out it corresponds to an S10. The fully articulated path could be expressed like this:

A1 Excavation Process Unit -> AP4 produced surface -> A10 Excavation Interface

A10 Excavation Interface -> O7 confined -> S22 Segment of Matter

Also during the discussion we realized the scope note of E81 Transformation needed a slight addition. It was also noted that the range of both P123 *resulted in (resulted from)* and P124 *transformed (was transformed by)* were incorrect.

HW: The sig decided that this will be a new issue and assigned SS to provide new definitions for E81 Transformation and the properties P123 and P124

The issue 337 is closed

ISSUE 338: Excavation Area and plans

Proposed classes Excavation Permission, Activity Plan and Permission Declaration, and the related properties, will be included as part of the new CRMsoc. Examples from archaeological world will be proposed.

HW: AF is to collaborate with CRMsoc team to provide them with the specifications on how to implement the integration of the proposed classes.

DECISION: This issue is closed. Discussions regarding the said classes and their respective properties are to be undertaken in the context of CRMsoc.

ISSUE 360: LRM harmonization with FRBRoo.

New scope note for F3 Manifestation.

The crm-sig reviewed the proposed scope note for F3 Manifestation and decided that it needed further editing. The sentence in underscore replaced the original “For example, hardcover and paperback are two distinct publications (i.e. two distinct instances of F3 Manifestation) even though authorial and editorial content are otherwise identical in both publications.”, which seemed to refer to physical objects rather than the respective types of manifestations.

The new scope note for F3 Manifestation can be found below:

F3 Manifestation

Subclass of: F2 Expression

Scope note: This class comprises products rendering one or more Expressions. A Manifestation is defined by both the overall content, and the form of its presentation. The substance of F3 Manifestation is not only signs, but also the manner in which they are presented to be consumed by users, including the kind of media adopted.

An F3 Manifestation is the outcome of a publication process where one or more F2 Expressions are prepared for public dissemination, but it may also be a unique form created directly on some carrying material without the intent of being formally published.

An instance of F3 Manifestation typically incorporates one or more instances of F2 Expression representing a distinct logical content and all additional input by a publisher such as text layout and cover design, in particular if labour is divided between an author and a publisher. Additionally an F3 Manifestation can be identified by the physical features for the medium of distribution if applicable. For example, publications in the form of hardcover and paperback editions would be two distinct instances of F3 Manifestation, even though authorial and editorial content are otherwise identical in both publications.

In case of industrial products such as printed books or music CDs, but also digital material, an instance of F3 Manifestation can be regarded as the prototype for all copies of it. In these cases, an instance of F3 Manifestation defines all of the features or traits that instances of F5 Item display in order to be copies of a particular publication. In case of industrial products, instances of F3 Manifestation are also instances of E99 Product Type, normally nowadays identified by characteristic identifiers such as ISBN numbers.

New scope note for F5 Item.

The crm-sig reviewed the new version for the scope note of F5 Item by PLB and accepted it as such. The new scope note can be found below:

F5 Item

Subclass of: F54 Utilised Information Carrier

Scope note: This class comprises physical objects (printed books, scores, CDs, DVDs, CD-ROMS, etc.) that were produced by (P186i) an industrial process involving a given instance of F3 Manifestation. As a result, all the instances of F5 Item associated with a given instance of F3 Manifestation are expected to carry the content defined in that instance of F3 Manifestation, although some or even all of them may happen to carry a content that significantly differs from it, due to either an accident in the course of industrial production, or subsequent physical modification or degradation.

The notion of F5 Item is only relevant with regard to the production process, from a bibliographic point of view. Cultural heritage institutions' holdings are a distinct notion: a holding certainly can be equal to an instance of F5 Item, but it also can be either "bigger" than one (e.g., when two instances of F5 Item are bound together (in the case of printed books), or physically united in any other way, or when an instance of F5 Item is enhanced through the addition of manuscript annotations, or any material that was not intended by the publisher, such as press clippings, dried flowers, etc.), or "smaller" than one (e.g., when a one-volume instance of F5 Item (in the case of printed books) is interleaved and rebound as two volumes, or when pages were torn

away from it, or when one CD from a two-CD set is missing, etc.). From an operational point of view, cultural heritage institutions do *not* deal with instances of F5 Item, but with storage units. However, it was not deemed necessary to declare an additional class for the notion of Storage Unit. Storage units can be easily accounted for through the E19 Physical Object class from CIDOC CRM, and the relationships between storage units and instances of F5 Item through the *P46 is composed of (forms part of)* property from CIDOC CRM. If needed, an instance of E19 Physical Object can be typed as a storage unit through the *P2 has type (is type of)* property.

Examples:

- John Smith's copy of Charles Dickens's *The Pickwick Papers* published in 1986 by the Oxford Clarendon Press, ISBN 0-19-812631-X
- The exemplar of Samuel Beckett's *Waiting for Godot* published in 1956 by Faber and Faber that was once possessed by Edward Gordon Craig [who pasted a press clipping on it, so that the storage unit currently held by the National Library of France and identified by shelfmark '8-EGC-2044' consists of both this instance of F5 Item and the press clipping pasted by its former owner]
- The exemplar currently held by the Library of Congress, and identified by call number 'M3.3.H13 J4 1752 Case', of George Frideric Handel's *The Choice of Hercules* published in London by J. Walsh around 1751 [Note: this exemplar is bound with an exemplar of *Jephtha*, by the same composer, published in London by J. Walsh in 1752; these two distinct instances of F5 Item therefore make up a single storage unit, i.e., they both *P146i forms part of* the same instance of E19 Physical Object]

Enhancing the scope note of P128 to point to the fact that carrying a symbolic object is never precisely complete

The crm-sig reviewed MD's scope note for P128 carries (is carried by) and accepted it with minor modifications by SS, see below:

MD's scope note:

P128 carries (is carried by)

Domain: E18 Physical Thing

Range: E90 Symbolic Object

Subproperty of: E70 Thing.P130 shows features of (features are also found on):E70 Thing

Superproperty of: E24 Physical Man-Made Thing. P65 shows visual item (is shown by): E36 Visual Item

Quantification: many to many (0,n:0,n)

Scope note: This property identifies an E90 Symbolic Object carried by an instance of E18 Physical Thing. Since an instance of E90 Symbolic Object is defined as an immaterial idealization over potentially multiple carriers, an individual realization on a physical carrier may be defective due to deterioration or shortcomings in the process of creating the realization compared to the intended ideal. As long as these defects do not substantially affect the complete recognition of the respective symbolic object, we still regard that it carries an instance of this Symbolic Object. If these defects are of scholarly interest, the individual realization can be modeled as a Physical Feature. Note, that any instance of E90 Symbolic Object incorporated (P165) in the carried Symbolic Object is also carried by the same instance of E18 Physical Thing

New, revised scope note (SS): accepted.

Scope note: This property identifies an E90 Symbolic Object carried by an instance of E18 Physical Thing. Since an instance of E90 Symbolic Object is defined as an immaterial idealization over potentially multiple carriers, any individual realization on a particular physical carrier may be defective, due to deterioration or shortcomings in the process of creating the realization compared to the intended ideal. As long as such defects do not substantially affect the complete recognition of the respective symbolic object, it is still regarded as carrying an instance of this E90 Symbolic Object. If these defects are of scholarly interest, the particular realization can be modelled as an instance of E25 Man-Made Feature. Note, that any instance of E90 Symbolic Object incorporated (P165) in the carried symbolic object is also carried by the same instance of E18 Physical Thing.

Decision: the change to the scope note was accepted.

New scope note for Rxx 'has part (forms part of)'.
The new property and its proposed scope note were accepted as such by the crm-sig.

Rxx has part (forms part of)

Domain: F1 Work

Range: F1 Work

Subproperty of: R10 has member (is member of)

Subproperty of: E89 Propositional Object. P148 has component (is component of): E89 Propositional Object

Quantification: (0,n:0,n)

Scope note: This property associates an instance of F1 Work with another instance of F1 Work that forms part of it in a complementary role to other sibling parts, conceived at some point in time to form together a logical whole, such as the parts of a trilogy. This property is transitive. In contrast, the property R10 has member may, for instance, also associate with the overall instance of F1 Work translations, adaptation and other derivative work that do not form a logical whole with sibling parts.

Examples:

- Dante's textual work entitled 'Divina Commedia' **Rxx has part** Dante's textual work entitled 'Inferno'
- Giovanni Battista Piranesi's graphic work entitled 'Carceri' (F15) **Rxx has part** Giovanni Battista Piranesi's graphic work entitled 'Carcere XVI: the pier with chains'

R4 embodies (is embodied in).

The crm-sig discussed the proposed scope note for R4 'embodies (is embodied in)' and decided to redraft it, in order to better showcase the examples and the manner of presentation. The resulting scope note, which has been approved by the crm-sig, is the following.

R4 embodies (is embodied in)

Domain: F3 Manifestation
Range: F2 Expression
Subproperty of: E73 Information Object. P165 incorporates (is incorporated in): E90 Symbolic Object
Quantification: (0,n:0,n)

Scope note: This property associates an instance of F3 Manifestation with one or more instances of F2 Expression, which are rendered by this instance of F3 Manifestation, in the way to be presented to users. The content of the embodied instances of F2 Expression should be defined at a symbolic level (such as a text or notated music) more abstract than the embodying instance of F3 Manifestation (such as a book or a oriented score).

Examples:

The publication identified by ISBN '2-222-00835-2' (F3) *R4 embodies* the text of Marin Mersenne's 'Harmonie universelle' (F2)

The CD entitled 'Musique de la Grèce antique = Ancient Greek music = Griechische Musik der Antike', released in 2000 and identified by UPC/EAN '794881601622' (F3) *R4 embodies* A recording of the Atrium Musicæ Ensemble's performance of a fragment of Euripides' textual and musical work entitled 'Orestes' (F26)

LRMer to LRMoo mapping: LRM-E3-A3

In what concerns the Intended Audience attribute, it was proposed that instead of coming up with a new Rxx property such that would link an F2 Expression to an activity pattern, to be used by a specific group of people –which, in its turn would function as a constraint on the type of the activity –the alternative of extending *E71 Man-made Thing : P103 was intended for (was intention of): E55 Type* is best opted for. The reasoning is that the description “children’s book” does not evoke a particular use in the context of given group; what it does instead, is relate the designated object to the group of people it is suited for –in this case children.

Decision: Given the disagreement, it was decided that expanding the scope of P103 ‘was intended for (was intention of) be formed into a new issue.

ISSUE 371: new scope of Fxx Collective Agent.

The scope note for Fxx Collective Agent drafted by PR was accepted as such, taking into account MZ’s comment in the last paragraph. The new scope note can be found below:

Fxx Collective Agent

Subclass of: E74 Group
Superclass of: F11 Corporate Body
F39 Family

Scope note: This class comprises recognizable groups or organizations of persons that have the potential of acting as a unit to produce some intentional result of bibliographic interest for which they can be collectively considered responsible.

A group of people becomes a Collective Agent when it identifies itself by a name that identifies it within an appropriate context and exhibits sufficient organizational characteristics to permit it to perform actions that reflect agency. Groups that are constituted as meetings, conferences, congresses, expeditions, festivals, fairs, etc. are examples of Fxx Collective Agent as long as they self-identify by a specific name, rather than being referred to by a generic description of the gathering, and can act as a unit (such as by publishing their proceedings, or approving a report). These collective actions may be performed by representatives selected by the whole, rather than by all individual members acting together.

Instances of Collective Agent include commercial or corporate entities and other legally registered bodies, as well as organizations and associations, musical, artistic or performing groups, governments, and any of their sub-units. Collective Agents may be members of other Collective Agents, although directly or indirectly all Collective Agents are composed of persons. The membership of many types of Collective Agents will continue to evolve over time. A Collective Agent may continue to exist even if it has no members for a time (for example, a committee whose members all resign prior to the expiration of their terms but then a new complement of members is appointed).

Married couples and other concepts of family (F39) are regarded as particular examples of Fxx Collective Agent.

In the wider sense, this class also comprises holders of official positions viewed collectively, independent of the current holder of the office, such as the president of a country. In such cases, it is possible that the Fxx Collective Agent has only ever had a single member.

A group of persons known by a/ using a joint pseudonym (i.e., a name that seems indicative of an individual but that is actually adopted as a persona by two or more people acting together) is a particular case of Fxx Collective Agent.

Examples:

- International Federation of Library Associations and Institutions (F11)
- 81st World Library and Information Conference
- Bibliothèque nationale de France
- Exxon-Mobil (E40)
- The Beatles
- King Solomon and his wives (F39)
- The President of the Swiss Confederation
- Nicolas Bourbaki
- Betty Crocker
- Ellery Queen

Properties:

P107 has current or former member (is current or former member of): E39 Actor

(P107.1 kind of member: E55 Type)

The issue is closed

ISSUE 401: Parent of F4 Manifestation Singleton

Given that Manifestation Singleton has been deprecated in LRM and the scope of E3 Manifestation has been broadened to incorporate its instances, it was proposed that the same thing happen with FRBR too. The proposal was met with consensus.

ISSUE 358: CRMsoc & scope of CRM modules

The discussion also included a demonstration of OntoME by FB, proposing that it be used as a means to extend the crm in a dynamic way for specific projects but in a common space. It was proposed (FB) that OntoME be further developed jointly by organizations participating in the crm-sig. It was agreed that no decision can be reached unless the goal and horizon of such a project are explicitly and formally stated, together with an estimation of the cost and resources that such an endeavor would require. And it would have to be communicated to the crm-sig, which is to determine whether they will engage in such a project.

HW: The crm-sig has assigned **TV & FB** to supply the full text document, outlining the intended and practical scope of CRMsoc, as well as propose naming conventions for the CRMsoc entities and properties by the next crm-sig meeting.

HW: **MD** will provide some classes from Social Institutions and **NC** will give us data up to the next meeting. The model is intended to cover social relations, economic activities, plans and rights.

HW: **MD** is to send a first attempt at defining the notions of Phase by email.

HW: **MD, FB** (who will be providing use cases) and **RS** (who will be providing examples and data) are assigned with working on the Business Model.

HW: **RS** to participate and coordinate the development of CRMsoc family model and take part in the discussion regarding the temporality of properties.

HW: **RS** will also participate in the discussion regarding the temporality of properties.

ISSUE 368- Presentation of CRMtex by Achille

Achille made a short presentation but there was no enough time for discussion. The issue will be discussed again in the next sig.

30 November 2018 crm-sig issues discussed.

ISSUE 400: CRMgeo; super classes of SP5

Discussing about super properties of SP5, we decided that space primitive is a geometric place expression. Thus, we changed the subclass definition of SP5

From

SP5 Geometric Place Expression

Subclass of: [E73](#) Information Object,

[E47](#) Spatial Coordinates,

To

SP5 Geometric Place Expression

Subclass of: [Geometry](#) ,
[E94 Space Primitive](#)

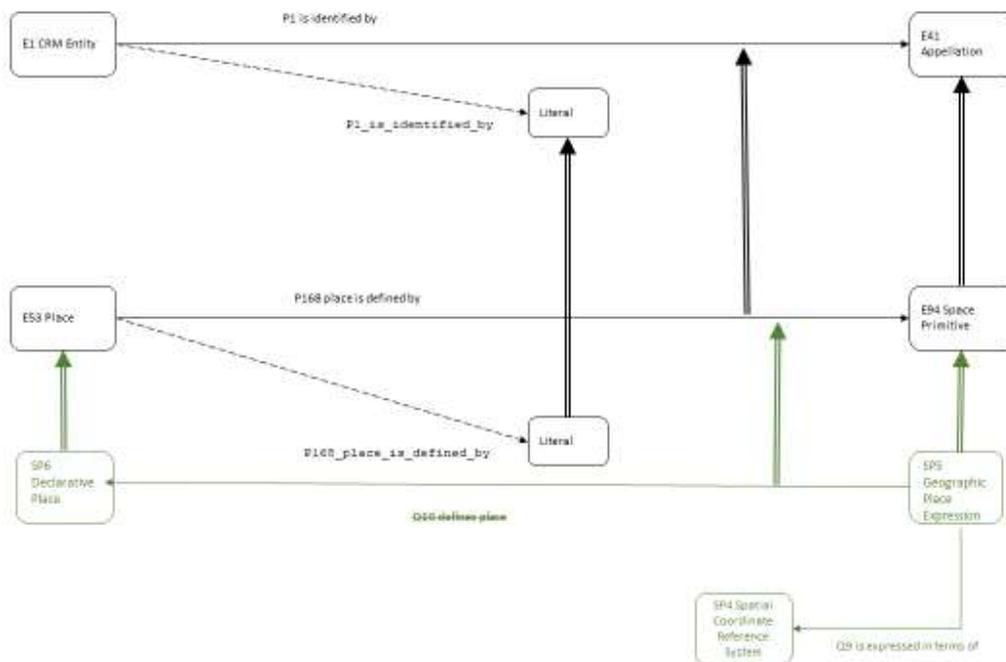
Decisions:

We concluded that we need the shortcuts in CRMgeo for the supeproperties of CRMgeo properties:
These are:

(a) approximate by geometry, (b) falls within geometry, (c) includes geometry

We also decided that:

- Q10 is obsolete
- CRMbase properties declared in the extension must be included in CRMgeo
- in an implementation gulideline should be included that E94 should take care of SP5
- taking the occasion of Francesco commentary about the notation of quantification in the introduction that it should be compatible with the UML, the sig assigned to Steve to review to the introduction of CRM the guidelines that users of the crm should follow and to add some comments about the provenance of this notation.



It was suggested that the implementation guidelines for E94 (Doerr & Light, Implementing the CIDOC Conceptual Reference Model in RDF) should transfer to SP5 as well. This has been assigned to GH.

HW: SS was assigned to find a suitable place in the introduction of the crm in order to point to the Implementation guidelines, so that the users of the crm will benefit from them.

ISSUE 275: Space Primitive

The crm-sig reviewed the scope note by MD for a .1 property on PXX 'is approximated by' –namely PXX.1 'has type': E55 Type.

MD proposed that the approximations the relevant .1 property evokes (eg. by a bounding box, footprint, polygon, centroid, etc.) be made part of CRMgeo rather than CRMbase –the latter already being overpopulated with material from geo.

Seeing as CRMbase must close within this year, the crm-sig resolved to discuss the .1 property on P189 approximates on their next meeting.

ISSUE X: NEXT CRM-SIG MEETINGS.

The next crm-sig meeting is to be held at Heraklion, Crete, in March 2019 (26th –29th).

The following crm-sig meeting is proposed to be held in Paris, in June 2019 (11th –14th).

The one after that, is proposed to be held at Heraklion, Crete, in October 2019 (22nd-25th).

ISSUE 277: Adjustment of the scope note of E55 Type

The crm-sig reviewed MD's text about types in the introduction of the CRM. The overall text has been accepted with minor modifications.

It was proposed that the alternatives to the E21.xx Artist reference (see below) be addressed in a separate issue –maybe it needs be dropped. However, it is mentioned in the context of unreferenced competing theories. MD has taken on to look for bibliography.

The new text can be found below:

About Types:

Virtually all structured descriptions of museum objects begin with a unique object identifier and information about the "type" of the object, often in a set of fields with names like "Classification", "Category", "Object Type", "Object Name", etc. All these fields are used for terms that declare that the object belongs to a particular category of items. In the CRM the class E55 Type comprises such terms from thesauri and controlled vocabularies used to characterize and classify instances of CRM classes. Instances of E55 Type represent concepts (universals) in contrast to instances of E41 Appellation, which are used to name instances of CRM classes.

For this purpose the CRM provides two basic properties that describe classification with terminology, corresponding to what is the current practice in the majority of information systems. The class E1 CRM Entity is the domain of the property P2 has type (is type of), which has the range E55 Type. Consequently, every class in the CRM, with the exception of E59 Primitive Value, inherits the property P2 has type (is type of). This provides a general alternative mechanism to specialize the classification of CRM instances to any level of detail, by linking to external vocabulary sources, thesauri, classification schemas or ontologies.

Analogous to the function of the P2 has type (is type of) property, some properties in the CRM are associated with an additional property. These are numbered in the CRM documentation with a '.1' extension. The range of these properties of properties always falls under E55 Type. The purpose of a property of a property is to provide an alternative mechanism to specialize its domain property through the use of property subtypes declared as instances of E55 Type. They do not appear in the property

hierarchy list but are included as part of the property declarations and referred to in the class declarations. For example, P62.1 mode of depiction: E55 Type is associated with E24 Physical Man-made Thing. P62 depicts (is depicted by): E1 CRM Entity.

The class E55 Type also serves as the range of properties that relate to categorical knowledge commonly found in cultural documentation. For example, the property P125 used object of type (was type of object used in) enables the CRM to express statements such as “this casting was produced using a mould”, meaning that there has been an unknown or unmentioned object, a mould, that was actually used. This enables the specific instance of the casting to be associated with the entire type of manufacturing devices known as moulds. Further, the objects of type “mould” would be related via P2 has type (is type of) to this term. This indirect relationship may actually help in detecting the unknown object in an integrated environment. On the other side, some casting may refer directly to a known mould via P16 used specific object (was used for). So a statistical question to how many objects in a certain collection are made with moulds could be answered correctly (following both paths through P16 used specific object (was used for) - P2 has type (is type of) and P125 used object of type (was type of object used in)). This consistent treatment of categorical knowledge enhances the CRM’s ability to integrate cultural knowledge.

Types, that is, instances of E55 Type and its subclasses, can be used to characterize the instances of a CRM class and hence refine the meaning of the class. A type ‘artist’ can be used to characterize persons through P2 has type (is type of). On the other hand, in an art history application of the CRM it can be adequate to extend the CRM class E21 Person with a subclass E21.xx Artist. What is the difference of the type ‘artist’ and the class Artist? From an everyday conceptual point of view there is no difference. Both denote the concept ‘artist’ and identify the same set of persons. Thus in this setting a type could be seen as a class and the class of types may be seen as a metaclass. Since current systems do not provide an adequate control of user defined metaclasses, the CRM prefers to model instances of E55 Type as if they were particulars, with the relationships described in the previous paragraphs.

Users may decide to implement a concept either as a subclass extending the CRM class system or as an instance of E55 Type. A new subclass should only be created in case the concept is sufficiently stable and associated with additional explicitly modelled properties specific to it. Otherwise, an instance of E55 Type provides more flexibility of use. Users that may want to describe a discourse not only using a concept extending the CRM but also describing the history of this concept itself, may choose to model the same concept both as subclass and as an instance of E55 Type with the same name. Similarly it should be regarded as good practice to foresee for each term hierarchy refining a CRM class a term equivalent of this class as top term. For instance, a term hierarchy for instances of E21 Person may begin with “Person”.

One role of E55 Type is to be the CRM’s interface to domain specific ontologies and thesauri or less formal terminological systems. Such sets of concepts can be represented in the CRM as subclasses of E55 Type, forming hierarchies of terms, i.e. instances of E55 Type linked via P127 has broader term (has narrower term). Such hierarchies may be extended with additional properties. Other standard models, in particular richer ones, used to describe terminological systems can also be interfaced with the CRM by declaring their respective concept class as being equivalent to E55 Type, and their respective broader/narrower relation as being identical with P127 has broader term (has narrower term), as long as they are semantically compatible.

In addition to being an interface to external thesauri and classification systems, E55 Type is an ordinary class in the CRM and a subclass of E28 Conceptual Object. E55 Type and its subclasses inherit all properties from this superclass. Thus together with the CRM class E83 Type Creation the rigorous scholarly or scientific process that ensures a type is exhaustively described and appropriately named can be modelled inside the CRM. In some cases, particularly in archaeology and the life sciences, E83 Type Creation requires the identification of an exemplary specimen and the publication of the type definition

in an appropriate scholarly forum. This is very central to research in the life sciences, where a type would be referred to as a “taxon,” the type description as a “protologue,” and the exemplary specimens as “original element” or “holotype”.

Finally, instances of E55 Type or suitable subclasses can describe universals from type systems not organized in thesauri or ontologies, such as industrial product names and types, defined and published by the producers themselves for each new product or product variant.

In the frame of the above discussion, the crm-sig assigned to MD the HW of the issue 367 about adding a subproperty to P2 such that it will allow pointing to the CRM property list exclusively (thus leaving P2 to do its work of typing the activity itself).

ISSUE 392: Design or Procedure and Physical things.

The crm-sig reviewed the updated scope note for E29 Design or procedure by MD and accepted it. The text can be found below:

E29 Design or Procedure

Scope note: This class comprises documented plans for the execution of actions in order to achieve a result of a specific quality, form or contents. In particular it comprises plans for deliberate human activities that may result in new instances of E71 Man-Made Thing or for shaping or guiding the execution of an instance of E7 Activity.

Instances of E29 Design or Procedure can be structured in parts and sequences or depend on others.

This is modelled using P69 has association with (is associated with)...

Designs or procedures can be seen as one of the following:

1. A schema for the activities it describes
2. A schema of the products that result from their application.
3. An independent intellectual product that may have never been applied, such as Leonardo da Vinci’s famous plans for flying machines.

Because designs or procedures may never be applied or only partially executed, the CRM models a loose relationship between the plan and the respective product.

ISSUE 336 Assistance for reducing to core CRM model

It was decided that the HW provided by CEO regarding the conservative extension of the domain and range of properties of the crm, now listed under “Assistance for reducing to core CRM model” (Definition of the Definition of the CIDOC Conceptual Reference Model, version 6.2.4, pp. xviii-xix) should be renamed “Conservative Extension of the Scope of CIDOC CRM by Model Extensions”. The issue is closed, and any possible debates on concerning its title should be addressed through a new issue.

ISSUE 326: Resolving inconsistencies between E2, E4, E52 and E92

HW: CEO and MD are to review two cases of merging properties, under restricted IsA, namely:

- P4 has time span (is time span of) [D: E2 Temporal Entity, R: E52 Time-span] with P10 falls within (contains) [D: E92 Space-time Volume, R: E92 Space-time Volume], and

- P7 took place at (witnessed) [D: E4 Period, R: E53 Place] with P161 has spatial projection (is spatial projection of) [D: E92 Space-time Volume, R: E53 Place]).

ISSUE 382: where to stop documenting the provenance

MD and CM were assigned to start the discussion on best practices on epistemology of the knowledge base –regarding where to stop documenting the provenance. The aim is to arrive at a document which will have the status of a recommendation for using the crm.

ISSUE 396: Scope note of J2 concluded

The crm-sig reviewed and accepted the new scope for J2 concluded by MD, plus the new domain proposed for the property. The reasoning backing these changes is that (i) an argument does not necessarily start a belief; it may either confirm it, if the value of the belief does not change, or it may cause it to change –i.e. result in a new conviction.

The new scope note can be found below:

J2 concluded:

Domain: I1 Argumentation

Range: I8 Conviction

Scope note: This property associates an instance of I8 Conviction with the instance of I1 Argumentation that concluded or confirmed it."

The issue is closed.

ISSUE 362: P70 documents.

The crm sig reviewed and accepted the revised scope note for P70 documents, by SS. The new scope makes explicit that P70 documents is to be preferred over its superproperty P67 refers to, when the crm entity in its domain is some sort of authoritative (or other) document, the context of which is asserted to be true. The superproperty is to be preferred in case the topic referred to is fictional (or when no claims are made with respect to its truth).

The new scope note can be found below:

Scope note:

This property describes the CRM Entities documented by instances of E31 Document.

Documents may describe any conceivable entity, hence the link to the highest-level entity in the CRM hierarchy. This property is intended for cases where a reference is regarded as making a proposition about reality. This may be of a documentary character, in the scholarly or scientific sense, or a more general statement.

The issue is closed

APPENDIX A

Guidelines for using P82a, P82b, P81a, P81b

November 30, 2018

Properties "P81 ongoing throughout" and "P82 at some time within" are defined in the CRM as [E61](#) Time Primitive, i.e., (closed, contiguous) intervals on the natural time dimension in which we live.

Since the E61 Time Primitive of the CRM cannot be expressed in RDF directly, in the official RDF implementation of the CIDOC CRM, we define four properties replacing P81 and P82 which express the Time Primitives as xsd:dateTime values.

P81 ongoing throughout

Property P81 describes the maximum known temporal extent of an E52 Time-Span, i.e. the extent it is ongoing throughout. It is replaced in this RDF version by the property "P81a_end_of_the_begin" and "P81b_begin_of_the_end", to be used together.

"P81a_end_of_the_begin" should be instantiated as the earliest point in time the user is sure that the respective temporal phenomenon is indeed ongoing. We call it "end_of_the_begin", because it also constitutes an upper limit to the end of the indeterminacy or fuzziness of the beginning of the described temporal phenomenon.

"P81b_begin_of_the_end" should be instantiated as the latest point in time the user is sure that the respective temporal phenomenon is indeed ongoing. We call it "begin_of_the_end", because it also constitutes a lower limit to the beginning of the indeterminacy or fuzziness of the end of the described temporal phenomenon.

It is correct to assign the same value to "P81a_end_of_the_begin" and "P81b_begin_of_the_end", if no other positive knowledge exists. It is also correct not to instantiate P81 for a time span, if there is no evidence that the temporal phenomenon was definitely occurring at a particular time.

If a value for "P81a_end_of_the_begin" is given with a precision less than that of xsd:dateTime (i.e. seconds), such as in days or years, the implementation should "round it up" to the last instant of this time expression, e.g. 1971 = Dec 31 1971 23:59:59. Respectively, for "P81b_begin_of_the_end" the implementation should "round it down", e.g. 1971 = Jan 1 1971 0:00:00. [to note that this form is explicitly chosen against other potential ways to express imprecision, for the purpose of normalization and calculation. Potentially add that this works for any time interval year, month, day, minute, second etc.]

P82 at sometime within

Property P82 describes the narrowest known outer bounds of the temporal extent of an E52 Time-Span, i.e. the described temporal phenomenon is definitely ongoing “at some time within” this interval. It is replaced in the official RDF version by the properties "P82a_begin_of_the_begin" and "P82b_end_of_the_end", to be used together.

"P82a_begin_of_the_begin" should be instantiated as the latest point in time the user is sure that the respective temporal phenomenon is indeed not yet happening. We call it “begin_of_the_begin”, because it also constitutes a lower limit to the beginning of the indeterminacy or fuzziness of the beginning of the described temporal phenomenon.

"P82b_end_of_the_end" should be instantiated as the earliest point in time the user is sure that the respective temporal phenomenon is indeed no longer ongoing. We call it “end_of_the_end”, because it also constitutes an upper limit to the end of the indeterminacy or fuzziness of the end of the described temporal phenomenon.

It is not correct to assign the same value to “P82a_begin_of_the_begin” and “P82b_end_of_the_end”. If a value for “P82a_begin_of_the_begin” is given with a precision less than that of xsd:dateTime (i.e. seconds), such as in days or years, the implementation should “round it down” to the first instant of this time expression, e.g. 1971 = Jan 1 1971 0:00:00. Respectively, for “P82b_end_of_the_end” the implementation should “round it up”, e.g. 1971 = Dec 31 1971 23:59:59.

It must always hold that “P82a_begin_of_the_begin” is before “P82b_end_of_the_end”, “P81a_end_of_the_begin” and “P81b_begin_of_the_end”.

It must always hold that “P82b_end_of_the_end” is after “P82a_begin_of_the_begin”, “P81a_end_of_the_begin” and “P81b_begin_of_the_end”.

“P82a_begin_of_the_begin” and “P82b_end_of_the_end” should always be assigned a value for any past phenomenon. The scholarly practice of not giving outer bounds for an event, because they are not known down to a desired precision (e.g. of three years), is not helpful for automated reasoning. In that case, the machine may conclude that a historical event could have happened at the time of the dinosaurs. Therefore any value is better than no value, even if it is relatively far away from the most likely value. It is an error to associate any implicit degree of approximation with these values. Only for phenomena that may not yet have ended at the time of documentation can the end of the time-span be omitted.

Negative Time Interval for P81

If a respective reasoning is installed, and no evidence exists about the point in time that the phenomenon was definitely ongoing, one may specify “P81a_end_of_the_begin” as being later

than “P81b_begin_of_the_end”, indicating that the indeterminacy of knowledge (not of being) of the begin overlaps with the indeterminacy of knowledge (not of being) of the end [Holmen, Jon; Ore, Christian-Emil Smith. educing event chronology in a cultural heritage documentation system. In : Frischer, Bernard, Jane Webb Crawford and David Koller (eds), Making History Interactive. Computer Applications and Quantitative Methods in Archaeology (CAA). Proceedings of the 37th International Conference. Archaeopress 2010 ISBN 9781407305561].

APPENDIX B

Abbreviations' list for the names of the persons referred in the minutes:

Acronym	First Name	Last Nam	Institution
AF	Achille	Felicetti	PIN, IT
CB	Chrysoula	Bekiari	ICS FORTH, GR
CEO	Christian Emil	Ore	University of Oslo, NO
CG	Christos	Georgis	ICS FORTH, GR
CM	Carlo	Meghini	CNR, IT
ET	Eleni	Tsouloucha	ICS FORTH, GR
FB	Francesco	Beretta	CNRS/Université de Lyon, FR
FK	Florian	Kraütli	MPIWG, DE
FM	Francesca	Murano	Universita di Firenze, IT
GB	George	Bruseker	ICS FORTH, GR
GG	Guenther	Goerl	Fau Erlangen NBG/ Bibl. Hertz, DE
GH	Gerald	Hiebel	University of Innsbruck, AT
MD	Martin	Doerr	ICS FORTH, GR
ML	Matteo	Lorenzini	ACDH-OAW,AT
MR	Mélanie	Roche	BnF, FR
NC	Nicola	Carboni	University of Zurich, CH
OB	Oguzhan	Balandi	Foto Marburg, DE
PH	Peter	Haak	Metaphacts, DE
PR	Pat	Riva	Concordia University, CA
RL	Richard	Light	UK
RS	Rob	Sanderson	J.Paul Getty Trust, USA
SS	Stephen D.	Stead	PPL, UK
TH	Thomas	Hänsli	Universität Zürich, CH
TV	Thanasis	Velios	UAL, UK
VA	Vincent	Alamercery	Université de Lyon, FR
WS	Wolfgang	Schmidle	DAI, DE