The 41st joined meeting of the CIDOC CRM SIG and ISO/TC46/SC4/WG9 and the 34th FRBR - CIDOC CRM Harmonization meeting

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Tuesday 22/5/2018
ISSUE 375: Scope note of P8 took place on or within
The sig discussed and accepted TV's proposal. Thus, the phrase in the scope note of P8 has changed from:

"P8 took place on or within (witnessed) is a shortcut of the more fully developed path from 'E4 Period' through 'P7 took place at,' 'E53 Place', 'P156 occupies', to 'E18 Physical Thing'."

To:

"P8 took place on or within (witnessed) is a shortcut of the more fully developed path from 'E4 Period' through 'P7 took place at', 'E53 Place', 'P156i is occupied by', to 'E18 Physical Thing'."

In addition, the sig proposed that the document be proofread to make sure that the inverse path expressions are marked with an "i". CEO has been assigned to write an explanation to the terminology found in the introduction about the meaning and the use of "i".

ISSUE 374: Scope note of E94 Space Primitive
The sig accepted the amendment proposed by TV in E94 Space Primitive. Thus, the last paragraph of the scope note of E94 has changed from:

"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. In this case, this property must not be used for approximating the respective instance of E53 Place with an instance of E94 Space Primitive. E94 Space Primitive is not further elaborated upon within this model. Compatibility with OGC standards is recommended."

To:

"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."

ISSUE 275: Space primitive

The sig discussed the examples provided by OE. The discussion resulted in the following remarks:

- Characteristics of interest, such as 'close by/ around/ centroid', cannot be captured by existing properties, but can be used as .1 vocabulary on this property. In addition to that, these characteristics can be captured by an approximation property of greater complexity (such that it covers the more difficult examples here), which will be part of CRMgeo. MD said that maybe we need two .1 properties: one for quantification and one for qualification.

- Potentially the list vocab would be any place preposition, CEO will work on this.

- That which cannot be expressed in the approximation vocab, can be placed in a note. This note should be on the place that is approximated (i.e the domain place, NOT the range place).

- Related: rules should be stated in CRM regarding the position of notes. Not knowing where to find them, will not be productive/efficient/useful. MD proposes to open a new issue for the position of notes in the guidelines of using CRM. If, for example, there is someone involved in an architectural project and more information needs be conveyed regarding his involvement in the said project, then the note should be placed on the event node instead of the person node. In other words, the note should be added to the most characteristic node. MD will do the HW.

- The examples provided are accepted as a vocabulary.

- The property will be added in CRMbase. with the name PXX.1 has type: E55 Type

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

The sig reviewed the issue regarding the inconsistencies of E2, E4, E52 and E92. CEO suggests intensifying the discussion in order to move towards a solution for next meeting. MD and CEO agree to push forward. MD will send link to CEO on restricted IsA. There is a possibility to merge P4 with P7 or P10 but it would require this restricted IsA.

ISSUE 317: Time Appellation

The sig examined this issue and decided that there is no real issue. The issue is closed.

ISSUE 288: Issue about P82 and P81 usage

The sig went over the text of guidelines. The new text can be found in Appendix A. During the discussion, the sig decided the following:

- To open a new Issue for re-examining the properties P79 and P80 in order to check if they are well designed and adequate to the task.

- To be clarified: how do we document how the original date was noted. Eg. Did the curator put in May 2017. It is rightly represented as an interval, but how to represent this string? It might be subject of a new issue about the creation of a new qualified

property to assign precision to a string or to a date expression. Martin will add by tomorrow a reference to potential ways to express date expressions?

- To accept the document in this form. It can be improved with examples. GB will do some editing before it goes up. Homework would be to add some examples. CEO and OE would contribute examples and graphics for the next version of the text.

- To open a new issue regarding site Improvements: In particular, the category of FAQ questions makes no sense as it stands. The documents under FAQ should be moved to a different category, which could be called 'Best Practices'. The latter should go under the current 'model' section. We could retain an FAQ section but in that case, we need to see it from the new / end user point of view. What are they looking for in an FAQ? The present FAQs are more advanced modelling. Homework: GB and RL.

- To reorganize the website, by adding the model under the section "The Model"; by coming up with a proposal to review the structure of the section "Resources" and by making documents and models concerning extensions of the CRM directly accessible through the main site.

ISSUE 367 E13 Attribute Assignment

The sig reviewed the scope note proposed by MD. Taking into consideration the discussion on this issue and the proposal put forth by Sanderson (10/4/12017) concerning issue 340, the sig reviewed the subclasses of E13 and decided to delete the following classes: E38 (since it cannot be distinguished from E36), E40 (since it forms an unnecessary leaf node), as well as E44, E45, E46, E47, E48, E49, E50, E51 (since these last 8 classes can be substituted for E41 Appellation).

The old and the new scope note of E13 can be found under Appendix B. In addition, the sig has decided the following:

- to add a subproperty of P2, such that it will allow pointing exclusively to the CRM property list (thus leaving P2 to do its work of typing the activity itself). E.g. assigned relation /concerned property E55 (CRM Properties)

- to open a new Issue regarding best practices on the epistemology principles that the knowledge base is built upon, which should serve as guidelines as to when to stop documenting the provenance of information. A preliminary approach to this issue can take place through email exchanges.

ISSUE 336: Assistance for reducing to core CRM model

The sig reviewed the text about the logical theory provided by CEO. This text describes the scope of CRMbase and that of the extensions in terms of logic (e.g., as sets). The text can be found under Appendix C.

The sig decided the following:

- The text should have an introduction of two phrases explaining the usefulness of expressing the differences in scope among the CRMbase and its extensions in terms of a logical theory; extending the model may cause expanding the domain and range of a property, as a corollary.

- MD is assigned the homework of formulating the introduction stating the utility of expressing the differences in scope among the CRMbase and its extensions in terms of a logical theory. The rest of the text by CEO should follow.

- The text is overall accepted, needs editing. This is assigned to GB.

- The text should go at the end of the modelling extensions section of the CRM document.

ISSUE 365: A top-level ontology on which CRM and all its extensions will be depended

The sig discussed about the method to develop the CRM Super. Comments include:

- We need to find the top level relations in CRMbase that will form CRMsuper. CRMsuper will consist of the root relations that one needs to be able to query, in order to return any fact within the graph.
- We need to restate what CRMsuper will be. It is not a top level ontology per se, but a declaration that must exist in CRMbase and any harmonized extensions, such that it clearly marks out the minimal set of top level relations within the ontology, which allow complete querying of the graph to the extent that all possible facts are returned. The minimal set of top level relations in any extension of CRM will be the set of top level relations of CRMbase + any additional relations it declares that are either out of scope of CRMbase OR extend the scope of existing top level relations (by widening their meaning).
- GB + CEO are assigned to pick out the heads in CRMbase as homework.

ISSUE 364 Create Profile Markup Language/Schema

The sig reviewed the comments regarding the announced homework for   tools allowing users create data profiles using classes and relations of CIDOC CRM and local extensions and addressed refining the meaning of an application profile. What is meant by that, is that end users should be able to pick out from the ontology and its extensions these classes and properties deemed useful for their project/domain. This way one can easily handle the ontology for a specific task. This is a separate issue from template management functionality.

Questioning how to produce and represent the documentation specification of CRM and marking up the docx, so that it could produce an xml file format –following the current practices in cidoc-crm.org regarding the representation of entities and relations discretely – was one of the topics addressed. It was suggested that we look at ontology management environment display features –a topic best tackled through collaborative work. A reference was made to Collections Trust, namely that they moved away from xml, in favour of a multimedia wiki with Multilanguage features. We should find more info about this.

The sig came to the following conclusions:

It is 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:

- Allow the extraction of latest definitions of the respective classes and properties.

- Automatically produce a list of super classes and properties needed for querying (in this profile).
- Check validity with respect to updates on referred RDFS sources.
- There may be a suggester mechanism to exclude properties from inheritance. For instance, one may not be interested in many of the inherited properties of types in a biological discourse.

GB was assigned to try and connect the work described above with the idea of a template manager that will continue this work at the data level.

ISSUES: 361 Recording an E41 in RDF & 363 Form and persistence of RDF identifiers

The sig decided to merge these issues seeing as they both relate to the encoding of CIDOC classes and properties, in rdf. Thus the sig decided to close the issue 361 and the discussion will continue on issue 363.

The sig also reviewed the text produced by Richard Light and there was agreement on the particular challenges that need be addressed and resolved by this text –namely:

1. identifiers - their role and value, labels and reconciliation in RDFnds,
2. RDF and the problem of primitive values (strings, names, dates, space, spacetime), (the existing ontology must mediate what a machine can represent)
3. how to represent properties of properties,
4. identifiers - their role and value in RDFnds, (questions of reconciliation and instance managing)
5. Types, SKOS recommendation and other possible ontological extensions.
6. Identifiers of CRM classes and n relations themselves (update processing)
7. Recording strings
8. Statements expressing the translation of the ontology into RDFS using IsA and other mechanisms.

The sig also discussed the creation of manuals like this for applying to other formats.

In addition, the sig made the following decisions and recommendations concerning the CRMbase:

(a) to open a new issue 'has content that will work from E90 and allow the semantic capture of the actual content of a symbolic object. To be modelled on the R33 property of FRBRoo. MD was assigned with formulating this property

(b) to recommend that all nodes in rdf have labels. If someone needs to track appellation, (s)he can capture the content through the new property of E90.

(c) to create a general section recording symbolic objects (to talk about the content question), which can be referenced by the name recording section.

(d) to form a list of recommended data types for the primitive types.

Richard and MD, GB, OE, TV are assigned with reviewing the text on encoding CRM in rdf.

ISSUE 268: Coins 2 CRM (again)

The sig reviewed the discussion of this issue and decided to close it as obsolete.

Wednesday 23/5/2018

ISSUE 358: CRMsoc and scope of CRM modules

We started with template issue and decided to dispense with material that was deemed repetitive. An idea would be to only make a reference to the CRMbase document and the formulation of all its basic principles, etc. The sig decided that it would be best if we opened a new issue about the templates and assign TV to write the reference phrase.

Issue 358 concerns coming up with an introductory text stating the scope of CRMsoc. The text is to be provided by FB and TV.

ISSUE 369: Timed Relations

We discussed and reviewed the emails exchanged by FB and MD regarding the CRM properties whose temporal validity may be shorter than that of their domain and range. MD's proposal regarding the examples supplied by FB during the meeting in Plakias was also put to discussion.

The sig subsequently focussed on MD's comment regarding institutionalized social relations. MD drew the following figure 1, representing the properties of institutional ownership on the board:
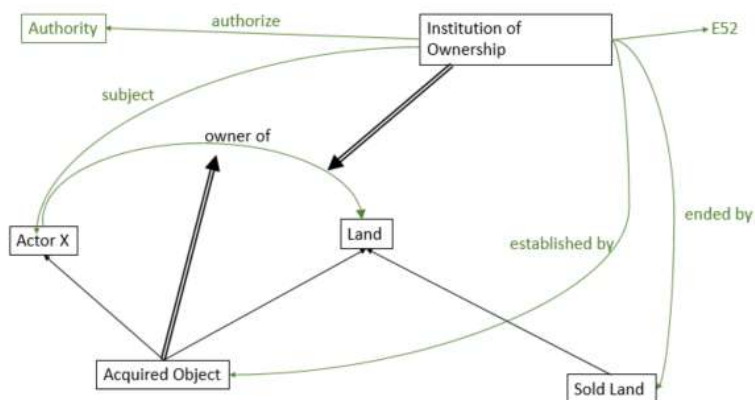

Figure 1: Timed relations

The discussion on 'institutional ownership' has given rise to a new temporal entity, one that aims to capture the state/quality/relation brought into being through social acts (and can adequately represent the knowledge available to historians). This will be a starting point for common work that aims at capturing the information, which is currently proposed to be modelled with timed relations. FB,MD, OE and others are assigned with pushing forward the foundation of CRMsoc.

Finally, the sig has decided to open a new issue on modelling social relationships.

ISSUE 371: E74 Group (from LRMoo discussions)

After a brief introduction by PR, we discussed the difference between LRM agent and E39 Actor. MD drew the following figure 2, on the board.
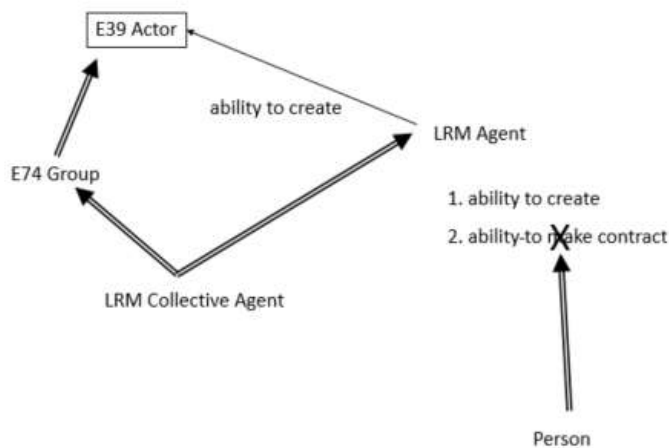

Figure 2: E74 Group

The sig reviewed PR's proposal concering the modification of the scope note for E74 Group, so that it clearly corresponds to LRM-E8 Collective Agent. The revised scope note can be found in appendix D.

The sig decided that E39 actor and LRM E6 Agent are equal and that a LRM Collective Agent should be introduced as a separate subclass of E74 Group in LRMoo..

ISSUE 360 :   LRMoo

The sig reviewed the HW assigned to PRand TA about LRMoo.

F1 Work

We first discussed splitting R10, in order to create an equivalent to LRM-R18 work has part. The discussion moved to the transitivity of R3 and R10 and how they will be consistent with one another. The R3 of an F1 will not necessarily realize the parent of F1, which motivates declaring a non-transitive sub-relation of R10 under the name "complementary synchronous".

TA drew figure 3, on the board and MD argued for 4.

'realizes completely

R10 member of (transition)

has part

Rxx ~~component~~

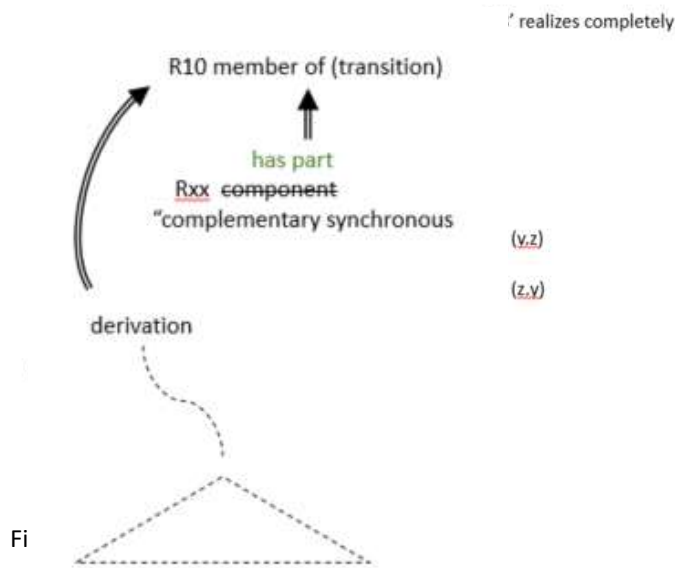"complementary synchronous

(v,z)

(z,v)

derivation

Fi

Figure 4 Splitting R10 (b)

The sig made minor changes to the scope note of F1 (see appendix E). The propositional content was accepted, but editing is needed in order for the scope note to follow the harmonization rules proposed. MD repeated that we should describe substance, identity, existence, utility and purpose.

R10 has member (is member of)

We discussed TA's comment: "We need LRMoo to have a property that is equivalent with LRM-R18. I do not really mind having R10 has member to express both parallell versions and subparts, but if so we will need to distinguish between parallell versions and parts using subproperties of R10"

The sig accepted MD's comment "At some point exist together and are intended to exist together simultaneously hold at some point in time" and decided to add a new property, Rxx has part, such that it is a superprperty of R10. We should spell-out the role of this property as a generalization over more specific forms of membership.

The sig assigned PR and TA to rewrite the scope note (see Appendix E) and Martin to write the scope note of the new property: Rxx has part

R3 is realised in (realises) [=LRM-R4]

The sig discussed the comments made by MZand TA (APPENDIX E) and distinguished among three different work realization notions:

1. "comprehensively realizes" and "partially or comprehensively realizes" '

2. "comprehensive realization" alone, which requires the instantiation of a specific work.

3. Not distinguishing between comprehensive and partial realization. Rather express comprehensive realization by explicit description of derivative chains between expressions.

Which of the three notions should be used, has been left open by the sig.

R5 has component (is component of)

The sig reviewed the scope note and accepted it, except for the text in purple highlight, which is still undergoing revision (see APPENDIX E). The said text indicates how to express components of different authorship, a typical example of which is poetry later put to music, f.i. Cavafy-Cohen. (the criterion is authorship coming from another distinct work, not just pre-existing.)

The sig proposed to re-examine the conditions for incorporating foreign expressions as parts.

F2 Expression

The sig reviewed the proposal concerning F2. The revised scope note can be found under appendix E. The decision has been made to add original examples from previous F22 of FRBRoo3, to check if F2 Expression is a superclass of F34 KOS and if R41 is needed.

F3 Manifestation

The sig reviewed the proposal about F3 and concluded that when F3 becomes an F2, then F3 could 'incorporate' itself. This is not permitted on the property level.

Specific incorporates property from manifestation to expression. The typical case is not rendered signs (manifestations) but rather expressions (non-rendered signs).

MD is assigned with adding a reference to the fact that an F3 can also be an E99 Product Type.

There also needs to be a text to explain how LRM differs from FRBRoo with regards to manifestation product type and manifestation singleton.

R4 embodies (is embodied in)

The sig reviewed the scope note (see Apendix E) and discussed whether it must be retained or can be dropped instead. If dropped, then the model would be simplified. The property, however, exists in the LRM proper, where it helps distinguish between the incorporation of rendered and non-rendered signs. Its scope note should be extended to indicate a symbolic level of incorporation as well, taking into account that if the quantification is 1 to n, the F3 must incorporate at least one expression.

The sig assigned this HW to MD.

R7 is materialization of (is materialized in) [=LRM-R4]

The sig reviewed and revised the scope note of R7 (Appendix E).

F30 Manifestation Creation [=LRM-R7 manifestation creation]

The sig reviewed and revised the scope not of F30 (see APPENDIX E). It was commented that the word 'pubic' can sometimes refer to the person who created the manifestation (e.g. a manuscript produced by someone, which (s)he had no intention of communicating to the public)

Thursday 24/5/2018

ISSUE 372

The sig accepted PR's proposal and the scope note of E21 Person was changed. The new scope note can be found under Appendix F. Also the sig have noticed that an effect of this is that we need to be able to track dependencies between the super model and the extension such that if there is a change or proposed change to a class in CRMbase, this decision would be telegraphed to the extension for consultation / agreement.

ISSUE 360 LRM

The sig resumed reviewing the current version of FRBR-LRM.

F5 Item

The sig accepted PR's comment that we do not need specific properties between F5 Item and Fn Storage Unit since an instance of F5 Item can either P46 be composed of an instance of Fn Storage Unit, or can P46i form part of an Fn Storage Unit (or be equal to it). In fact, unless we need a specific property for the equivalence relation between an item and a storage unit, the CIDOC CRM property P46 is composed of (forms part of) should suffice. Hence, the scope note of F5 Item, was changed accordingly (see Appendix E).

The sig also decided to enhance the scope note of P128, in order to point out that carrying a symbolic object is never precisely complete. MD was assigned the relevant HW.

F50 Controlled Access Point

It should be deleted

Fn storage unit

Fn storage unit is not accepted in the model, and it was decided that a paragraph is to be added to the scope note of F5 Item, regarding the use of P46 and E19 to model the storage unit as an object, instead (HW assigned to PLB)

F34 KOS

The title of F34 KOS was changed to Controlled vocabulary, and there were changes made to the scope note (see Appendix E).

F35 Nomen Use Statement

F35 isA E89, there were changes made to its subclasses and the poison example was erased (see Appendix E).

F12 Nomen

There were changes made to the subclasses of F12 Nomen and its scope note (see Appendix E).

The sig decided to initiate a discussion for forming a theory of giving information objects an identity. MD has called for participants in this discussion. OE has agreed to participate.

F33 Reproduction Event

F33 Reproduction Events are to be restricted to item-based reproductions only. The sig revised the scope note. (See appendix E)

F54 Utilised Information Carrier (Change name?)

Despite a proposal to deprecate this class having been put forth, the sig was resolved upon keeping it and revising its scope note (see Appendix E). Its label is still pending.

R30 produced (was produced by)

It has been deleted.

R31 is reproduction of (has reproduction)

It has been deleted.

F41, F42, R40, R41, R42

Representative expression attributes were also addressed. Hence, the sig has reviewed the scope notes of F41, F42, R40, R41, R42 and decided the following:

F41: it will be deprecated.

F42: Minor changes have been made to it (see Appendix E). It should be reworked and the properties should be redesign (HW assigned to MD)

R40: hould be re designed.

Next meeting

It has been decided that the next meeting will take place in early December.

ISSUE 332 : Properties of S10 Material Substantial of CRMsci

The sig has reviewed the following scope notes:

S11: minor changes were made (see Appendix G) and they were accepted. MD was assigned to check the compatibility with DOLCE

S22: : minor changes were made (see Appendix G) and they were accepted.

Furthermore, the sig accepted MD's proposal concerning the superclasses of S2.

S2 Sample Taking is regarded as a subclass of E63 Beginning of Existence. O5 removed is a subproperty of P92 brought into existence.

The sig reviewed the scope note of S13 Sample. No changes were made. TV was assigned to consider when/how the identity of the samples inherit/preserve the identity conditions from the original sample and to come up with an articulate chain of logical properties for associating sub-sampling to the original object.

Finally the sig reviewed the scope not of O4 sampled at (was sampling location of) and made the appropriate changes. (see Appendix G).

Friday 25/5/2018

ISSUE 347: Dimension and Data sets

The sig discussed MD's proposal about relaxing the definition of E54 to represent an approximation of a true quantity of a thing or phenomenon provided by a measurement, or a

derived quantity computed indirectly from observation data comparable to reality, or a quantity produced by simulation of reality-like situations.

Some comments are:

- the phrase "An instance of E54 Dimension is specific to an instance of E70 Thing" in the scope note of P43 is too specific and incompatible with the above approach. There are some consequences to this particular approach.

- We should consider the properties of a physical thing.

A conclusion was that closeness or overlap of given bounds of approximation are the means to reason on the compatibility with a common reality or item. Arrays and time series are regarded as "complex" dimensions.

The sig assigned MD with rewriting the scope note for E54.

ISSUE 293: How to determine observable entities?
The sig decided to change the name of this issue to "How to determine observable entities". We will continue on this, after we have finished with the definition of dimension (issue 347, above)

ISSUE 366: Belief conditions for the input data of the data evaluation processThe sig has assigned TV, MD and OE to resolve this issue.

ISSUE 294: E55 Type relations
ML and GB were assigned to improve the definitions agreed upon in previous meetings. These are:

a) "E55 Type. restricted to: E4 Period", many-to-one. , IsA appears in

b) "E55 Type. typical for: E4 Period", many-to-one, Isa appears in

c) "E55 Type. appears in: E4 Period", many-to-many.

a restriction to multiple periods is to be modelled by an auxiliary period.

a hiatus is to be modelled by "not appears in", using Carlo Meghini's theory of negative properties.

d) CRMarcheo or CRMSci may define "first appears in", "last appears in".

Next meeting
The sig discussed next meetings again and agreed that: .

the 41rst will take place during the last week of November / first week of December. There will be a doodle by means of which to schedule the next meeting.

the 42nd will take place at the end of March 29th in Crete

ISSUE 340: Classes without properties

In the discussion, we agreed that having a class solely for merging branches is not a good enough reason as we can simply do multiple instantiation. The point is that the resulting class of the merged branches is narrower in scope from the what would result from multiple instantiation and therefore we should rewrite the minimality statement in order to express that. The sig asked Thanasis to rewrite the statement .

ISSUE 357: FOL representation for shortcuts

CEO has been assigned with checking all shortcuts FOL formulation

ISSUE 345: properties having domain or range deprecated classes

Martin will initiate call for a vote by email.

ISSUE 339: References to the examples of CRM text

We have decided to add bibliographic references to the site and ask people to contribute concerning the acceptability of citations. We have also discussed making an effort to add the publications to Zotero.

ISSUE 277: Adjustment of the scope note of E55 Type

The sig reviewed the proposed scope note by CEO. The word "typically" was accepted, but the overall text must be compatible with the introductory text to CRM on types. MD was assigned to rewrite that.

ISSUE 191: Range of P31

The sig reviewed MD's proposal and accepted that "the identity and coming into existence of a Physical Man-made thing must not be bound to the fact of an accidental or intentional Modification of any microscale - this can adequately be described as adding a man-made feature to the thing (and if not, it is indeed a production), but must be tied to the functional identity of the thing, in the same way we describe it for aggregates"

After careful examination of the scope note of P31, the range of P31 was changed from E24 to E18 and the scope note was marked as obsolete. The issue was finally closed and a new one was opened, so as to keep track of the discussion concerning the modification of the scope notes for E24 and P31, in line with MD's proposal.

ISSUE 373: Managing CRM and CRM extension versions

The sig discussed the proposal put forth by TV and decided to ask GB, OE and FB to collaboratively come up with an improved design for the site of CIDOC-CRM and for its implementation.

APPENDIX A: ISSUE 288: Guidelines for using P82a, P82b, P81a, P81b

Guidelines for using P82a, P82b, P81a, P81b

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".

<mark>(can add illustrations to make these easier to read/comprehend)</mark>

"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 [see Christian-Emil Ore XXX].

APPENDIX B: ISSUE 367: E13 Attribute Assignment

Here is the old scope note:

E13 Attribute Assignment

Subclass of: E7 Activity

Superclass of: E14 Condition Assessment

                E15 Identifier Assignment

                E16 Measurement

                E17 Type Assignment

Scope note: This class comprises the actions of making assertions about properties of an object or any relation between two items or concepts.

This class allows the documentation of how the respective assignment came about, and whose opinion it was. All the attributes or properties assigned in such an action can also be seen as directly attached to the respective item or concept, possibly as a collection of contradictory values. All cases of properties in this model that are also described indirectly through an action are characterised as "short cuts" of this action. This redundant modelling of two alternative views is preferred because many implementations may have good reasons to model either the action or the short cut, and the relation between both alternatives can be captured by simple rules.

In particular, the class describes the actions of people making propositions and statements during certain museum procedures, e.g. the person and date when a condition statement was made, an identifier was assigned, the museum object was measured, etc. Which kinds of such assignments and statements need to be documented explicitly in structures of a schema rather than free text, depends on if this information should be accessible by structured queries.

==

Here is the new accepted scope note:

E13 Attribute Assignment

Subclass of: E7 Activity

Superclass of: E14 Condition Assessment

                E15 Identifier Assignment

                E16 Measurement

                E17 Type Assignment

Scope note: This class comprises the actions of making assertions about one property of an object or any single relation between two items or concepts. The type of the property asserted to hold between two items or concepts can be described by the property P2 has type.

For example, the class describes the actions of people making propositions and statements during certain scientific/scholarly procedures, e.g. the person and date when a condition statement was made, an identifier was assigned, the museum object was measured, etc. Which kinds of such assignments and statements need to be documented explicitly in structures of a schema rather than free text, depends on whether this information should be accessible by structured queries.

This class allows for the documentation of how the respective assignment came about, and whose opinion it was. Note that all instances of properties described in a knowledge base are the opinion of someone. Per default, they are the opinion of the team maintaining the knowledge base. This fact must not individually be registered for all instances of properties provided by the maintaining team, because it would result in an endless recursion of whose opinion was the description of an opinion. Therefore, the use of E13 Attribute Assignment marks the fact, that the maintaining team is in general neutral to the validity of the respective assertion, but registers someone else's opinion and how it came about.

All properties assigned in such an action can also be seen as directly relating the respective pair of items or concepts. Multiple use of E13 Attribute Assignment may possibly lead to a collection of contradictory values. All cases of properties in this model that are also described indirectly through a subclass of E13 Attribute Assignment are characterised as "short cuts" of a path via this subclass. This redundant modelling of two alternative views is preferred because many implementations may have good reasons to model either the action of assertion or the short cut, and the relation between both alternatives can be captured by simple rules.

APPENDIX C. ISSUE 336: Assistance for reducing to core CRM model

CRMbase (or an extention of it) may be extended by declaring subclasses of existing classes as well as superclasses. In the former case, all properties of the CRM class will hold for the subclasses. In the latter case, the scope of the CRMbase will be extended and a property of the CRMbase class may hold for the new superclass but not necessarily. In the case a property p of a class A also holds for a new superclass B it should be a conservative extension. That is, when restricted to the original class the extended property, p', is identical to the original property p. In general a superproperty is said to be a conservative extension of a subproperty when it is identical to the sub property when restricted to its domain and range.

Taken on its own, CRMbase is not affected by such a conservative extension of scope, since it is not concerned with A. This is similar to what in logic is called a conservative extension of a theory. This construct is necessary for an effective modular management of ontologies, but is not possible with the current way RDF/OWL treats it.

In first order logic the conservative extension of a property can be expressed as follows. Assume that A and C are subclasses of B and D respectively and that p, p' are properties between A,C and B, D respectively:

$$A(x) \supset B(x)$$
$$C(x) \supset D(x)$$
$$P(x,y) \supset A(x)$$
$$P(x,y) \supset C(y)$$
$$P'(x,y) \supset B(x)$$
$$P'(x,y) \supset D(y)$$

If p' is a conservative extention of p then

$$A(x) \wedge C(y) \wedge P'(x,y) \equiv P(x,y)$$

APPENDIX D. ISSUE 371: E74 Group (from LRMoo discussions)

E74 Group

Subclass of: E39 Actor

Superclass of: E40 Legal Body

Scope note: This class comprises any named gatherings or organizations of two or more people that have acted or have the potential to act collectively to produce some intentional result for which they can be collectively considered responsible.

In the wider sense this class also comprises holders of official positions viewed collectively, which used to be regarded in certain contexts as one actor, independent of the current holder of the office, such as the president of a country. In such cases, it may happen that the E74 Group never had more than one member.

A joint pseudonym (i.e., a name that seems indicative of an individual but that is actually used as a persona by two or more people) is a particular case of E74 Group.

A gathering of people becomes an E74 Group when it exhibits sufficient organizational characteristics to be collectively held responsible for actions performed together. These might be communication, creating some common artefact, a common purpose such as study, worship, business, sports, etc. Occasional groups and groups that are constituted as meetings, conferences, congresses, expeditions, festivals, fairs, etc, are examples of E74 Group as long as they are identified by a specific name, rather than 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.

Married couples and other concepts of family are regarded as particular examples of E74 Group.

Examples:

Exxon-Mobil (E40)

King Solomon and his wives

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)

APPENDIX E: ISSUE 360 LRMoo
F1 Work

Subclass of: E89 Propositional Object

Superclass of: F14 Individual Work (deprecate)

F15 Complex Work (deprecate)

F16 Container Work

F21 Recording Work

Scope note: This class comprises distinct intellectual ideas conveyed in artistic and intellectual creations, such a poems, stories or musical compositions.

A Work is the outcome of an intellectual process of one or more persons. Inherent to the notion of work is the existence of recognisable realizations of the work in the form of one or more expressions. Works are often regarded as finished and discrete e.g. when declared as such by the creator of the work or based on the elaboration or logical coherence of its content. However, works may be recognized as existing but unfinished e.g. if the creators deliberately or accidentally never explicitly finished a particular Expression but have left behind partial expressions.

In the absence of explicit information about the initial conception, which is rarely available, the first expression created constitutes witness of the beginning of existence of a Work.

A Work can evolve over time, such as through revised editions. A Work may be elaborated by one or more Actors simultaneously, in parallel or over time. Additional expressions of a Work can continue to be created over time.

The boundaries of a Work have nothing to do with the value of the intellectual achievement but only with the dominance of a concept.

The main purpose of this class is to enable bringing together intellectually equivalent Expressions in order to display to a user all available alternatives of the same intellectual or artistic content.

R10 has member (is member of)

Domain: F1 Work

Range: F1 Work

Superproperty of: Rxx has part (-> the complementary synchronous part)

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. This property is transitive. An instance of F1 Work may neither directly nor indirectly be member of itself. Instances of F1 Work that are not member of another one may not share a common member.

Examples: Dante's textual work entitled 'Divina Commedia' *R10 has member* Dante's textual work entitled 'Inferno'

Giovanni Battista Piranesi's graphic work entitled 'Carceri' (F15) *R10 has member* Giovanni Battista Piranesi's graphic work entitled 'Carcere XVI: the pier with chains'

R3 is realised in (realises) [=LRM-R4]

Domain: F1 Work

Range: F2 Expression

Superproperty of: F20 Performance Work. R12 is realised in (realises): F25 Performance Plan

F21 Recording Work. R13 is realised in (realises): F26 Recording

F1 Work. R40 has representative expression (is representative expression for): F22 Self-Contained Expression

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

Quantification: (0,n:1,n)

Scope note: This property associates an instance of F2 Expression with an instance of F1 Work.

This property expresses the association that exists between an expression and the work that this expression conveys. Our factual knowledge of how a given work is historically realised into expressions is often limited. Therefore, this property makes it possible to express the association between instances of F2 Expression and the work it conveys without identifying the particular instances of Expression that were the source.

Examples: Dante's work entitled 'Inferno' (F1) *R3 is realised in* the Italian text of Dante's 'Inferno' as found in the authoritative critical edition *La Commedia secondo l'antica vulgata a cura di Giorgio Petrocchi*, Milano: Mondadori, 1966-67 (= Le Opere di Dante Alighieri, Edizione Nazionale a cura della Società Dantesca Italiana, VII, 1-4)

Mozart's work entitled 'Il dissoluto punito ossia il Don Giovanni' (F1) *R3 is realised in* the notated music of the Prague version, as found on manuscript Ms 1548 of the National Library of France (F2)

Properties: R3.1 has type: E55 Type

R5 has component (is component of)

Domain: F2 Expression

Range: F2 Expression

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 F2 Expression X with a structural component Y that conveys a part of the overall work realized by X, such as volumes, chapters, paragraphs.

Any part of an expression that conveys complete propositions, such as a single phrase, can be documented using the more general property *P148 has component (is component of)*.

Any part of an expression that does not completely follow meaningful boundaries, such as lines or pages of text or portions visible on images can be documented using the property *P106 is composed of (forms part of),* and not with *R5 has component (is component of)*. Fragments in particular can be documented with the more specific property *R15 has fragment (is fragment of)*.

The property does not cover the relationship that exists between pre-existing expressions that are re-used in a new, larger expression and that new, larger expression. Such a relationship is modelled by *P165 incorporates*.

Examples: The Italian text of Dante's textual work entitled 'Divina Commedia' (F2) *R5 has component* the Italian text of Dante's textual work entitled 'Inferno' (F2)

The musical notation of Mozart's Singspiel entitled 'Die Zauberflöte' (F2) *R5 has component* the musical notation of Mozart's aria entitled 'Der Hölle Rache', also known as 'The Queen of the Night's Aria' (F2)

The visual content of the map entitled 'Wales – The Midlands – South West England', scale 1:400,000, issued by Michelin in 2005 (F2) *R5 has component* the visual content of the inset entitled 'Liverpool', scale 1:200,000, set within the compass of the map titled 'Wales – The Midlands – South West England', scale 1:400,000, issued by Michelin in 2005 (F2)

F2 Expression

Subclass of: E73 Information Object

Superclass of:

F34 KOS (just check)

F43 Identifier Rule just check to see along with linked open data rules

F25 Performance Plan

F26 Recording

F3 Manifestation

Scope note: This class comprises the intellectual or artistic realisations of *works* in the form of identifiable immaterial objects, such as texts, poems, jokes, musical or choreographic notations, movement pattern, sound pattern, images, multimedia objects, or any combination of such forms that have objectively recognisable structures. The substance of F2 Expression is signs.

An Expression is the outcome of the intellectual or creative process of realizing a Work. Subsequent expressions conveying the same work may be created over time.

Expressions do not depend on a specific physical carrier and can exist on one or more carriers simultaneously, including human memory, but expressions cannot persist without a carrier.

The form of F2 Expression is an inherent characteristic of the F2 Expression. Differences in form implies different Expressions (e.g., from text to spoken word, a transcript of a recording). Similarly, differences in language or means of performance imply different Expressions (e.g., translations or arrangements for different instruments). Thus, if a text is revised or modified, the result is considered to be a new F2 Expression. While

theoretically any change in signs will result in a new Expression, conventionally the context and use will determine the rules for distinguishing among expressions.

Examples: The Italian text of Dante's 'Divina Commedia' as found in the authoritative critical edition '*La Commedia secondo l'antica vulgata a cura di Giorgio Petrocchi'*, Milano: Mondadori, 1966-67 (= Le Opere di Dante Alighieri, Edizione Nazionale a cura della Società Dantesca Italiana, VII, 1-4) (F2 and E33)

The Italian text of Dante's 'Inferno' as found in the same edition (F22 and E33)

The signs which make up Christian Morgenstern's 'Fisches Nachtgesang' [a poem consisting simply of '—' and '˘' signs, arranged in a determined combination] (F22)

Properties: R4 carriers provided by (comprises carriers of): F3 Manifestation Product Type

R5 has component (is component of): F2 Expression

R15 has fragment (is fragment of): E90 Symbolic Object

R41 has representative manifestation product type (is representative manifestation product type for): F3 Manifestation Product Type (it might be not needed)

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, its physical form and presentation. The substance of F3 Manifestation is signs and the way signs are presented to be consumed by users.

A F3 Manifestation is the outcome of a publication process where one or more F2 Expression 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 must incorporate one or more instances of F2 Expression and all additional input by a publisher such as text layout and cover design. Additionally a F3 Manifestation can be identified by the physical features for the medium of distribution if applicable. 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.

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.

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: (1,n:0,n)

Scope note: This property associates one or more instances of F2 Expression with an instance of F3 Manifestation which is the rendering of these expressions.

Examples: The publication identified by ISBN '2-222-00835-2' (F3) *R4 incorporates* 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 incorporates* A recording of the Atrium Musicæ Ensemble's performance of a fragment of Euripides' textual and musical work entitled 'Orestes' (F26)

R7 is materialization of (is materialized in) [=LRM-R4]

Domain: F5 Item

Range: F3 Manifestation

Subproperty of: E24 Physical Man-Made Thing. P128 carries (is carried by): E73 Information Object

Quantification: (1,1:0,n)

Scope note: This property associates a manifestation with one of its exemplars or its only exemplar. Instances of F5 Item correspond to the kinds of physical unit(s) specified in the manifestation, regardless of possible later changes.

Even though an item may exhibit defects with respect to the intended manifestation, it is still regarded to carry the manifestation, as long as it is produced or made accessible as a functional item by its creators.

Examples: The item held by the National Library of France and identified by shelf mark 'Res 8 P 10' (F5) *R7 is materialization of* the edition of Amerigo Vespucci's textual and cartographic work entitled 'Mundus novus' issued in Paris ca. 1503-1504 (F3)

F30 Manifestation Creation [=LRM-R7 manifestation creation]

Subclass of: F28 Expression Creation

Scope note: This class comprises the activities of selecting, arranging and elaborating one or more expressions to the level of the actual or intended sensory impression

of a respective carrier or other persistent presentation means of it with the purpose of communicating it to some public.

Examples: Establishing in 1972 the layout, features, and prototype for the publication of 'The complete poems of Stephen Crane, edited with an introduction by Joseph Katz' (ISBN '0-8014-9130-4'), which served for a second print run in 1978

Creating the article by Allen Renear, Christopher Phillippe, Pat Lawton, and David Dubin, entitled 'An XML document corresponds to which FRBR Group 1 entity?' as online available at <http://conferences.idealliance.org/extreme/html/2003/Lawton01/EML2003Lawton01.html>

Properties: R23 created a realisation of (was realised through): F19 Publication Work

R24 created (was created through): F3 Manifestation

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 Fn Manifestation. As a result, all the instances of F5 Item associated with a given instance of Fn Manifestation are expected to carry the content defined in that instance of Fn 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. Storage unit might be different. Use E19 physical object and P46 composed of (forms part of).

Examples: Marin Mersenne's personal copy of his own 'Harmonie universelle' without any manuscript addition and without Charles Racquet's manuscript score, as a mere witness of the 1st edition of 'Harmonie universelle', Paris, 1636 [the same physical object can be regarded at the same time as an instance of F5 Item inasmuch as it is a witness of a publication, and as an instance of F4 Manifestation Singleton inasmuch as it contains manuscript annotations and additions and as it served as the basis for a subsequent production process]

Any other copy of the original edition of Marin Mersenne's 'Harmonie universelle', Paris, 1636

Any copy of the modern reprint publication of Marin Mersenne's 'Harmonie universelle', Paris, 1986, ISBN '2-222-00835-2'

Properties: R7 is example of (has example): F3 Manifestation Product Type

F34 Controlled Vocabulary

Subclass of: [E32](#) Authority Document

   [E29](#) Design or Procedure

   [F2](#) Expression

Scope note: This class comprises documents that establish controlled terminology (nomina) for consistent use. They may also describe relationships between entities and controlled terminology and relationships between entities. Note that any meaningful change in a Controlled vocabulary that affects the validity status of its elements defines a new release (Expression) of the Controlled vocabulary. Note that identifiers created following a rule in a Controlled vocabulary are to be regarded as being taken from this Controlled vocabulary, even though not explicitly spelled out. This definition of Controlled vocabulary reflects current library practice and not the use of the term in general. Knowledge Organisation Systems (KOS) are regarded as special cases of F34 Controlled Vocabulary. <mark>Add example(s): Pat.</mark>

Examples: LCSH February 20 to March 19 2012

   DDC 19 [19th English edition, published only in print by Forest Press in 1979]

Properties**:**   [R34 has validity period (is validity period of): E52 Time-Span](#)

F35 Nomen Use Statement

Subclass of: F12 Nomen

Scope note: This class comprises statements relating an instance of E1 CRM Entity with a particular instance of F12 Nomen and its prescribed usage in a given context.

Examples: <mark>Add example from DDC or UDC.</mark>

   '010 __ |a sh 85082387'…'450 __ |a Equations, Maxwell' [MARC 21 encoding of a variant subject access point, from the same source]

   'PTBNP|20891'…'200 1‡a   Whitman, ‡b   Walt, ‡f   1819-1892' [UNIMARC encoding of the preferred access point for a personal name, from the authority file of the National Library of Portugal, as found on VIAF, http://www.viaf.org/processed/PTBNP%7C20891, on 28 September 2015]

   '001   FRBNF119547493'…'100   w.0..barus.$aGončarova$mNatal'â Sergeevna$d1881-1962' [INTERMARC encoding of the preferred access point for a personal name, from the authority file of the National Library of France, [http://catalogue.bnf.fr/ark:/12148/cb119547494/ INTERMARC](http://catalogue.bnf.fr/ark:/12148/cb119547494/), as of 15 June 2012]

   '001   FRBNF119547493'…'100   w.0..c.rus.$aГончарова$mНаталья Сергеевна$d1881-1962' [INTERMARC encoding of a parallel access point from the same source]

'001 FRBNF119547493'…'400 $w....b.eng.$aGoncharova$mNatalia$d1881-1962' [INTERMARC encoding of a variant access point from the same source]

'<eac-cpf […]> <control> <recordId>beinecke.7h44jbj</recordId> […] </control>' … '<cpfDescription> <identity> <entityType>family</entityType> <nameEntry xml:lang="eng" scriptCode="Latn"><part localType="100a">Boswell family</part> […] </nameEntry> […] </identity> </cpfDescription> […] </eac-cpf>' [EAC encoding of the preferred access point for a family]

Properties: R32 is warranted by (warrants): F52 Name Use Activity

R35 is specified by (specifies): F34 KOS

(R35.1 has status: E55 Type)

R36 uses script conversion (is script conversion used in): F36 Script Conversion

R37 states as nomen (is stated as nomen in): F12 Nomen

R38 refers to thema (is thema of): E1 CRM Entity

R39 is intended for (is target audience in): E74 Group

R54 has nomen language (is language of nomen in): E56 Language

R55 has nomen form (is nomen form in): E55 Type

R56 has related use (is related use for): F35 Nomen Use Statement

(R56.1 has type: E55 Type)

F12 Nomen

Subclass of: E89 Propositional Object

Superclass of: F35 Nomen Use Statement

Scope note: This class comprises associations between an instance of any class, and signs or arrangements of signs following a specific syntax (sequences of alphanumeric characters, chemical structure symbols, sound symbols, ideograms etc.) that are used or can be used to refer to and identify that instance. The scripts or type sets for the types of symbols used to compose an instance of F12 Nomen have to be explicitly specified. Spelling variants are regarded as different nomina, whereas the use of different fonts (visual representation variants) or different digital encodings does not change the identity.

An arbitrary combination of signs or symbols cannot be regarded as an appellation or designation until it is associated with something in some context. In that sense, the F12 Nomen class can be understood as the reification of a relationship between an instance of E1 CRM Entity and an instance of E41 Appellation. Two instances of F12 Nomen can happen to be associated with two identical instances of E62 String and yet remain distinct, as long as they either refer to distinct instances of E1 CRM Entity, or as long as they are associated with

distinct instances of other classes through one or more than one of the other properties of the F12 Nomen class (while referring to the same instance of E1 CRM Entity).

An instance of F12 Nomen associates a combination of signs with an instance of E1 CRM Entity on the basis of a cultural or linguistic convention: by associating a nomen string with anything, the instance of F12 Nomen establishes a meaning that is not inherent in the instance of E62 String that is associated with it. Depending on context of use, nomens associated with identical strings can involve instances of different things in the real world even within the same language (polysemy and homonymy). Conversely, the same thing can be referred to through any number of nomens (synonymy). In the controlled environment of a bibliographic information system, though, synonymy is avoided and the instances of E62 String associated with a given instance of F12 Nomen would generally be disambiguated, so that each nomen string is associated with only one instance of E1 CRM Entity within the specific scheme.

The identity of an instance of F12 Nomen is determined by the combination of the thing it refers to, the choice and order of the symbols used within the instance of E62 String that represents it, and the specific instances of the various classes with which it is associated through all other properties of the F12 Nomen class. Variation in the symbols used (such as transliteration into another script) or variation in their ordering usually results in a distinct instance of F12 Nomen, but variation in the visual representation of the symbols present in the instance of E62 String that represents the instance of F12 Nomen (such as different fonts that may be used to present alpha-numeric or character strings) does not result in a different nomen string.

Instances of F12 Nomen are assigned and associated with instances of E1 CRM Entity either formally (such as by bibliographic agencies) or informally through common usage. When they are assigned formally, the construction of the instances of E62 String that represent them may follow predetermined rules.

The act of naming something may involve the combination of various symbolic objects, which may be instances of F12 Nomen in their own right, and therefore refer to distinct instances of E1 CRM Entity, or just be used as qualifiers. A frequent example is provided by the tradition consisting of naming persons by juxtaposing a given name (such as 'John'), and a last name (such as 'Smith') which is shared by all members of the same family. The given name alone can be sufficient to refer unambiguously to a given individual in a given context, but not in a wider context, in which the combination of given name plus last name proves necessary. Similarly, the combination of given name plus last name may be ambiguous in an even wider context, in which case the need for further qualifiers (such as a nickname, or, in the context of bibliographic control, dates and statement of occupation) can be felt. An instance of F12 Nomen can therefore be decomposed into further reifications that refer to distinct things through distinct strings, and/or instances of E90 Symbolic Object that serve merely as qualifiers and do not refer to anything in particular.

F33 Reproduction Event

Subclass of: E12 Production, F30 Publication Event

Scope note: This class comprises activities that consist in producing items of a new instance of Fn Manifestation that preserve both the content and layout found on items of a pre-existing instance of Fn Manifestation. The individual instance or instances of F5 Item that was or were used as a source for this process may be precisely identified or not. Such activities result in products known as facsimiles, reproductions, reprints, reissues, or new releases.

Examples: The 2014 publication of Daniel Wilson's 'Caliban: the missing link' by Cambridge University Press (a facsimile edition of the 1873 publication by Macmillan)

The 2015 publication of Harry Partch's 'Two studies on ancient Greek scales' by Schott (which reproduces Harry Partch's holograph manuscript)

Properties:

R30 produced (was produced by): Fn Manifestation

Rn reproduced object (was object reproduced by): E84 Information Carrier

Rn reproduced publication: Fn Manifestation

F54 Utilised Information Carrier Change name?

Subclass of: Physical object

Superclass of: F53 Material Copy

F5 Item

Scope note: This class comprises physical objects that carry one or more instances of Fn Manifestation.

Examples: The physical features created on my PC's hard drive when I clicked on the link <http://cidoc.ics.forth.gr/docs/cidoc_crm_version_4.0.pdf>, and thus downloaded a reproduction of the electronic file titled 'Definition of the CIDOC Conceptual Reference Model… version 4.0' that is stored on the ICS FORTH's servers in Heraklion, Crete (F53)

Any copy of the modern reprint publication of Marin Mersenne's 'Harmonie universelle', Paris, 1986, ISBN '2-222-00835-2' (F5)

Properties: R6 carries (is carried by): Fn Manifestation

F42 Representative Expression Assignment

Subclass of: E13 Attribute Assignment

Scope note: To be reworked. This class comprises activities through which an Agency declares (implicitly or explicitly) that a given instance of F2 Expression is representative for a given F15 Complex Work, i.e., that some attributes of that instance of F2 Expression (most prominently, information about the title) can be inferred to also apply to that instance of F15 Complex Work, no matter in which particular expression it is realised.

The reasoning behind this is that the Work title is known through the title of an Expression that is deemed representative of the Work, and the title of the representative Expression is known through

the title of a Manifestation that is deemed representative of the Expression that is representative of the Work.

For instance, by using the qualified controlled access point 'Poe, Edgar Allan, 1809-1849. Murders in the rue Morgue (French)' for the French rendition of Poe's 'Murders in the rue Morgue' by Baudelaire, an Agency implicitly states that the French text does not constitute a representative F2 Expression for Poe's F1 Work, however the original English text does constitute a representative F2 Expression for Poe's F1 Work.

Examples:	Selecting the text embodied in the 1775 edition of Richard Brinsley Sheridan's textual work entitled 'St. Patrick's Day' as the representative expression for Richard Brinsley Sheridan's textual work entitled 'St. Patrick's Day' and citing that publication as the source for the authority record created by the Library of Congress for that work
	Selecting the musical notation embodied in the 2007 edition of John Tavener's musical work entitled 'The Eternal Sun' as the representative expression for John Tavener's musical work entitled 'The Eternal Sun' and citing that publication as the source for the authority record created by the National Library of France for that work
	Selecting the publication expression of the 1983 edition of Stanley Karnow's textual work entitled 'Vietnam, the war nobody won' as the representative expression for the series entitled 'Headline series' and citing that publication as the source for the authority record created by the Library of Congress for that series
	Selecting the publication expression of the issue dated October 2002 of the periodical entitled 'The New Courier' as the representative expression of the periodical entitled 'The New Courier' and citing that publication as the source for the bibliographic record created by the National Library of France for that periodical
	Selecting the content of the manuscript identified by shelfmark 'MS-8282' within the collections of the National Library of France, Department for Music, as the representative expression of Stanislas Champein's musical work entitled 'Vichnou' and citing that manuscript as the source for the authority record created by the National Library of France for that work
Properties:	R44 carried out by (performed): F44 Bibliographic Agency
	R50 assigned to (was assigned by): F1 Work
	R51 assigned (was assigned by): F2 Expression
	Rn de-assigned: F2 Expressions
	Rn declared aspect: E55 Type

APPENDIX F: Issue 372, scope note of E21 Person

E21 Person

Subclass of: E20 Biological Object

E39 Actor

Scope note: This class comprises real persons who live or are assumed to have lived.

> Legendary figures that may have existed, such as Ulysses and King Arthur, fall into this class if the documentation refers to them as historical figures. In cases where doubt exists as to whether several persons are in fact identical, multiple instances can be created and linked to indicate their relationship. The CRM does not propose a specific form to support reasoning about possible identity.
>
> In a bibliographic context, a name presented following the conventions usually employed for personal names will be assumed to correspond to an actual real person (E21 Person), unless evidence is available to indicate that this is not the case. The fact that a persona may erroneously be classified as an instance of E21 Person does not imply that the concept comprises personae. So, we keep this in CRMbase. The E21 Person will be the two pragraphs

Examples:

Tut-Ankh-Amun

Nelson Mandela

APPENDIX G: issue 332: Properties of S10 Material Substantial of CRMsci

S11 Amount of Matter

Subclass of: S10 Material Substantial

Superclass of: S12 Amount of Fluid

                S13 Sample

Scope note: This class comprises fixed amounts of matter specified as some air, some water, some soil, etc., defined by the total and integrity of their material content. In order to be able to identify and recognize in practice one instance of S11 Amount of Matter, some sort of confinement is needed that serves as a constraint for the enclosed matter and the integrity of the content, such as a bottle. In contrast to instances of E18 Physical Thing, no stability of form is required. The content may be put into another bottle without losing its identity. Subclasses may define very different identity conditions for the integrity of the content, such as chemical composition, or the sequence of layers of a bore core. Whereas an instance of E18 Physical Thing may gradually change form and

chemical composition while preserving its identity, such as living beings, an instance of S11 Amount of Matter may lose its identifying features by such processes. What matters for the identity of an instance of S1 Amount of Matter is the preservation of a relevant composition from the initial state of definition onwards.

S22 Segment of Matter

Subclass of: S20 Physical Feature

Scope Note: This class comprises physical features with relative stability of form and structure within a declared spatial volume of interest. The spatial extent of an instance of S22 Segment of Matter may be declared or defined by a researcher or observer usually because the arrangement and composition of substance is characteristic for the surrounding matter or can be interpreted as traces of its genesis and subsequent internal and external processes it was exposed to. The defining spatial extent is typically declared on a continuous matter by means of geometric determination without observable boundaries on all sides or any side. It may however be extracted at some point in time along the declared boundaries.

An instance of S22 Segment of Matter is regarded to be existing from the time on it completely solidified with a structure that is still preserved in a recognizable way at the time of its spatial definition. Its existence is regarded to end when its respective integrity is partially or completely corrupted. Uncorrupted subsections of an instance of S22 Segment of Matter may continue to exist as segments of matter in their own right beyond the existence of the containing instance, and may have solidified before it.

Typical examples are segments of archaeological or geological layers. They are regarded as uncorrupted even if they have undergone conformal deformations, such as compressions or shifts, as long as the effects of these deformations do not destroy the relevant structures of interest. This means that the defining spatial volume may be only geometrically valid for an instant of time for which it was declared, and undergo before and after deformations. In some cases, it may be possible to calculate the initial volume at the time of solidification, for instance for petrified bones compressed in Jurassic layers.

S3 Measurement by Sampling

Subclass of: S2 Sample Taking

                S21 Measurement

Scope note: This class comprises activities of taking a sample and measuring or analyzing it as one unit of activity, in which the sample is typically not identified and preserved beyond the context of this activity. Instances of this class describe the taking of one or more samples regardless whether they are explicitly identified in documentation or preserved beyond this activity. The dimensions observed by the respective measurement of this particular sample are regarded as dimensions of the

instance of S10 Material Substantial at the place from which the samples were taken. Therefore, the class S3 Measurement by Sampling inherits the properties of S2 Sample Taking. O3 sampled from: S10 Material Substantial and O4 sampled at: E53 Place, and the properties of S21(E16) Measurement. P40 observed dimension: E54 Dimension, due to multiple inheritance. It needs not instantiate the properties O5 removed: S13 Sample and O24 measured: S15 Observable Entity, if the sample is not documented beyond the context of the activity.

O4 sampled at (was sampling location of)

Domain: S2 Sample Taking

Range: E53 Place

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

Scope note: This property associates an instance of S2 Sample Taking with the instance of E53 Place ("spot") at which this activity sampled. It identifies the narrowest relevant area on the material substantial from which the sample was taken. This may be known or given in absolute terms or relative to an instance of the material substantial from which it was taken. If samples are taken from more than one spot, the sample taking activity must be documented by separate instances for each spot.

The property P7 took place at, inherited from E4 Period, describes the position of the area in which the sampling activity occurred; this latter comprises the space within which operators and instruments were contained during the activity, and the sample taking spot.

Appendix H: List of contributors' name abbreviations.

Name	abbreviation
Trond Aalberg	TA
Vincent Alamercery	VA
Chryrssoula Bekiari	CB
Francesco Beretta	FB
Patrick Le Boeuf	PLB
George Bruseker	GB
Martin Doerr	MD
Øyvind Eide	OE
Richard Light	RL
Matteo Lorenzini	ML
Christian-Emil Ore	CEO
Pat Riva	PR
Melanie Roche	MR
Thanasis Velios	TV
Maja Zumer	MZ