

50th CIDOC CRM SIG and 43rd FRBRoo Harmonization meeting 22-25 June 2021

University of Oslo, Faculty of arts, Unit for digital documentation

Online on Zoom

Participants

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22 JUNE 2021

7.1.1

MD announced CIDOC CRM v7.1.1 is released and has a DOI number. Also that the process for submitting it to ISO has started.

It took longer than originally anticipated –aside the content, revising the formatting was very onerous but worth our time because this allowed breaking the text down to logically coherent constituents and transforming it to xml. It has also made producing the rdfs automatically feasible.

CIDOC CRM v7.1.1 is the final official version that should form the basis of all translation initiatives.

528: Guidelines and protocols for translating CIDOC CRM

PM gave an overview of the direction that the work of the translation initiative is leading to (proposed guidelines documents and the topics they should cover) and where they expect that a closer collaboration with the SIG is required). Link to PM’s slides [here](#).

Discussion points:

MD reported that the team at ICS-FORTH working on the implementation of the CIDOC CRM website have cut down the official document to pieces (coherent sections of Introduction; Class definitions; Property definitions). Versioning will be made available for each of these sections. Translations are also linked with their respective sections, at least for these CIDOC CRM versions that have them. **Breaking the document down to suitable sections** will be part of the prototype that FORTH will produce. It will result in a style-free, xml format of the text. Breaking down the text in sections matching the ones used for the original documents could also be implemented in translations. If it works, it could serve as the basis for the interchange protocol with all the translation initiatives. And a remark: it is practically impossible to keep 8+ translations in sync with the Official (English) document. The translations, where available, should refer to their respective English version, so users will know if translation x corresponds to the official v7.1.1 or a prior one. Links to the relevant text of the respective version should be shown –to be compared with the Official and/or current version of the CRM.

Translations of obsolete versions of the CRM will be reworked to fit the xml partitioned document sections. This way, versioning will also be available for translations (under resources).

GB wanted to know where on the site will the guidelines be published (once they are ready) –as a means to increase their visibility, and how will the versioning of translations be implemented on the site

CB: translations appear under Resources>Translations with information on their corresponding English version

MR is anxious to know when/whether this work will be extended to LRMoo and other CRM family models.

PM: in principle the guidelines and the workflows identified can be directly applied to other models.

GB the xml exchange formats and the guidelines will have to be kept in sync.

PR noted that the translation groups that might be interested in translating a particular extension do not necessarily involve the same people working on the translation of CRMbase, for that same language. Given the number of projects that people working on extensions are involved in, the guidelines documents should be kept relatively small or they'll discourage candidates.

DECISION: continue with this line of work.

HW: **GB** to determine the most suitable place on the website for the translations and the translation guidelines to appear under.

373: Managing the CRM and CRM extension versions

Proposal by the editor's group to close the issue because it has been overridden by 528 (managing the extensions should follow the process described for the translations).

GB objected to that, on the grounds that 528 is a guideline for translations, whereas issue 373 aimed at building a stable community-driven specification for developing a tool that would generate CIDOC CRM.

MD understood that the idea for issue 528 was to develop the CRM side to the point that it supports generating versions of CIDOC CRM.

Counter proposal: Acknowledge that there is a link btw 528 and 373. Postpone deciding on the current issue until 528 has been resolved (at least the part relevant for automatically generating valid CRM versions). Report the results of resolving 373 here when the time comes.

Everyone in agreement with that.

Decision: Keep 373 open, Link it with issue 528 and any relevant decisions reached in it, should feed into 373.

494: Scope note guidelines

MD presented his HW.

SIG members thought the text very clear and helpful. It was marked that it is one of the documents that need to be translated in other languages, to help the work of various translation initiatives.

HW: EC, MR, NG, PR read [the text](#) closely and provide feedback

351: Modelling Principles

TV explained what the present state of this issue is. The drafting of a didactic text regarding the principles that the CRM was based on, was followed by a period of extensive reviewing up to the point where SIG members thought it was too difficult to approach such a long document in a linear fashion. It was decided that the text be broken down to sections and be reworked in Gitlab. Since then, there has been no systematic work on the document –in fact, there are comments in the Google doc that have not been moved to the Git repository.

There's still pending issues to be dealt with. These are summarized in the WD. But what we need to discuss at this stage is (i) whether we work on the document through Git or Google docs or directly through the website, and (ii) to assign someone with reviewing it.

Discussion Points:

MD suggested working on Google docs because it's the most up-to-date version. He also suggested to publish the [current version](#) on the website (as a *draft*) and then republish once the text has been finalized. Maybe under "Using the CRM"?

SdS: It's one of the documents that should be partitioned through the website and then be translated at a later stage. He prefers Google docs in this instance because he doesn't have access to the document stored in Gitlab.

GB: It's an issue to consider together with 373/528 with respect to where to publish it in the website.

VOTE whether to continue editing the Modelling Principles document through Google docs and officially stop maintaining the Git version.

In favor: 8

Against: none

Decision: Continue editing the Modelling Principles document through Google docs.

HW: MR, EC, OE will review the document

VOTE whether to publish the document in its draft version on the CRM site.

In favor: 10

Against: 0

Decision: motion passes

[491: Guidelines for submitting a modelling issue](#)

CEO presented [HW](#) (things to be taken into consideration when submitting a new modelling issue and an example)

Discussion points:

SdS contended that people shouldn't be discouraged from submitting issues and that's setting the bar too high for most. Maybe these requirements should hold for the first HW instead.

GB we should not just generate issues for the sake of generating new issues though, and this proposal prevents it from happening.

Vote: To incorporate it in the overall workflow proposed for issue 354 (for modelling issues, in a decidable form should follow this template).

In favor: 12

Against: 0

Decision: Motion passes

Issue closed.

[541: CIDOC CRM Small Edits Checklist](#)

PM presented his HW ([spreadsheet](#) where he's made a note of typos and formatting inconsistencies) asked whether SIG members consider this as something they'd be willing to use.

SdS maintains that can be incorporated in GB's HW for issue 354

GB we should consider ways to report such errors. He expects sheets like that to be filled in the period between SIG meetings.

MD thinks it should appear on the website

Vote to put this on the website, incorporate it in GB's HW for 354

In favor: 13

Against: 0

Decision: motion passes

[Kai Niebes: A pedagogical graph based visualisation tool for CRM](#)

Q&A:

PF: can you export the graph in rdf? You can produce examples like that for using cidoc crm.

KN: not implemented yet. Waiting for the rdf for cidoc crm v7.1.1, which should be very soon.

FB: a web application? Could someone use it now? Does it only work with any rdfs schema or is it CIDOC CRM-oriented?

KN: it is designed as a web application. Not hosted anywhere now, but it will probably be hosted in Cologne. There are still a lot of issues to handle before people can use it. The code will be made available freely, once he has finished his BA Thesis. Definitions and class files are based on Json, because it was designed as a web-application.

MD: The basic problem when it comes to using the CRMBase and family models is that one is encumbered by an overall 500-600 properties. Would you consider applying a mechanism for identifying typical errors and point users to the right set of classes and properties that they should be using to document a particular piece of information? Like when you're documenting an instance of E67 Birth, would the system recommend what properties would link from E67 to other relevant classes (like mother, father, time, place etc.)

KN: he would like the application to be useful, there are many parameters that he needs to consider still. It's definitely something he would be interested to work on, but not as part of his BA Thesis. Any pointers on resources regarding common modeling mistakes would come in handy, because it sounds an interesting implementation.

SdS: We have a color-coding scheme reflecting the semantics of CRM classes that could be incorporated in your visualization of the graph.

[425: Definition of Ixx Situation in CRMinf](#)

TV presented the HW that he and AK had for this issue.

- (i) Provide the missing reference to the paper by Gangemi that the definition of I11 Situation was based on:

A. Gangemi and P. Mika. Understanding the semantic web through descriptions and situations. In Proceedings of DOA/CoopIS/ODBASE 2003 Confederated International Conferences DOA, CoopIS and ODBASE, LNCS. Springer, 2003.

- (ii) Draft an example to showcase the use of this class.
- a. the persistence of the value of the pH for sample XIV during the period of the pH measurement, which took place one month after the application of Ca(OH)₂ dispersion to the sample (Giori et al., 2002)
 - i. **Reference:**
Rodorico Giorgi, Luigi Dei, Claudius Schettino & Piero Baglioni (2002) A NEW METHOD FOR PAPER DEACIDIFICATION BASED ON CALCIUM HYDROXIDE DISPERSED IN NONAQUEOUS MEDIA, *Studies in Conservation*, 47:sup3, 69-73, DOI: 10.1179/sic.2002.47.s3.014

Discussion points:

MD: likes the example, but the definition of the class is incomplete, what is still missing is a property whereby to link I11 to the timespan for which the situation was assessed.

FB: The example we discussed is more relevant for CRMsci not CRMinf. It does not raise an argument, merely reports on an observation. Furthermore, the relevance of Gangemi's paper is not clear to him. He thinks this construct can be directly applied to CRMbase or CRMsoc even, instead. And the example is very physics-related. Also, the last version of CRMinf dates from October 2019 and the evolution of the model is not visible to anyone not involved in maintaining it.

MD: Situation was moved to CRMinf because it is an epistemic construct. Arguments heavily draw on situations (they are about situations or they are grounded on situations). As for the relevance of the paper by Gangemi: the definition of Situation follows from Gangemi & Mika (2003)'s line of work. As for the discussions re. the evolution of the model, they are documented in the issue and are accessible through the website.

Vote to accept the example:

In favor: 7

Against: 0

Decision: motion passes.

HW: DH to provide suchlike examples from the perspective of museums and exhibitions.

HW: ET to start a new issue re the property linking I11 to the timespan for which it held.

New issue: Time-span for instances of I11 Situation

The scope -note of I11 Situation anchors a particular observed state of affairs to the time-span over which it holds. This information is missing from the class-definition, as there is no property linking it to this temporal aspect.

Propose: to introduce a property linking instances of I11 to their respective E52 Time-Spans.

HW:

510: Belief adoption

PF & MD presented HW on I7 Belief Adoption that results in the model being augmented through the introduction of new classes and properties whereby to link them, plus updating the scope note of I7. Link to the presentation

[here](#) and examples from the project RICONTRANS that motivated the expansion of the model [here](#) (the part relevant for inscriptions).

Discussion points:

SdS: concerned with Jxx3 assuming meaning: it reads as if it should be pointing to an instance of I7 Belief, but what it is really pointing to is Ixx Meaning Comprehension, which has created an I4 Proposition Set, which is believed. So the label is a bit problematic but it should be fixed really easy.

The meaning comprehension and the belief adoption also involve characters that cannot be identified but need be inferred. The whole point of using I9 Provenanced Comprehension was to shortcut all of that process. But in the case where the process was available (someone wanted to document that they've read a particular character in a specific way), then the fuller path should be used and all the micro-statements about individual characters should be taken into consideration in reconstructing the meaning one assumes.

So is the intention that we do away with I9 Provenanced Comprehension? Is there a list available of things that should be deprecated?

PF: The model still needs to be elaborated further. It is at a very initial stage now. What it highlights is the different processes of making inferences.

There may be errors in the Meaning Comprehension f.i. and we should be able to locate where in the chain of the argumentation occurs the mistake (carries over).

DH: This should work for writing in alphabetical writing systems or syllabaries. But where pictograms come into play, it is possible that they can get misrepresented for ornamental imagery. And it is the belief of the researcher that ultimately weighs in, in identifying an inscribed drawing as a pictogram or just a picture.

GB: The model proposed follows the basic formulation of forming a belief in an academic research environment. He does not understand why they are relevant for CRMinf. It fits in CRMtex, and also could be implemented as a sub model that is applicable to all subtypes of argumentation.

MD: the argument here being if a particular inscription is a pictogram or an icon. What we opt for is a matter of opinion. The interpretations of hieroglyphic scripts and symbols fall in the scope of CRMtex. The models are to be kept apart, what is highlighted here is how they are interfaced. It doesn't really matter which model these (meaning comprehension and provenance) concepts are declared in, as long as their relation is made explicit.

SdS: we should assign HW and then revise accordingly. This material needs to be presented in a way that allows us to apprehend what this model entails: in terms of what needs to be decided, and how it impacts the CRM family models. Also, he cannot make up his mind on the spot regarding the proposed changes. Last, he has spotted an error in the overall model put forth: I10 Provenance is not right; it's treated as a subclass of I8 Belief whereas it currently is a subclass of I4 Proposition Set. There are too many things that cannot be processed as the model stands.

PF: no supplementary documentation available at this stage. They have been working out of examples, but they will be producing documentation.

Proposal: MD and PF to work on scope notes for the classes mentioned here, work out the substance and position of I10 Provenance in the overall scheme plus elaborate on the properties suggested, work out examples that illustrate the case in point. We need an example in context.

HW: MD & PF to work on the proposal.

387: CRMInf examples

SdS presented his HW: reworking the fully articulated path that is shortcut by *J12 used (was used by)*.

The full path should go as follows.

- I7 Belief Adoption. *J11 used manifestation*: F3 Manifestation. *R7i is materialized in*: F5 Item.

Vote on accepting it:

In favor: 8

Against: 0

Outcome: motion passes

Decision: Update the definition of J12 accordingly –HW SdS.

CRMdig

Presentation by MD. Link to presentation [here](#). The relevant set of examples from RICONTRANS (i.e. the project that motivated the expansion of the model) can be found [here](#).

Topics to be elaborated in the model:

- Harmonization with CRMInf, CRMsci, PROV-O, Parthenos Entities Model
- Digitization
 - see how the human activity relates to the reaction of the machine: for the moment, the human activity that sets in motion the machine reaction and the machine reaction itself are inseparable. What is the temporal and other connection between these two events? Can they be seen as one and the same event?
- Formal Derivation
 - Metadata descriptions for digital objects carry over from original to derivatives (assuming the latter retain features of the original digital object)
- Unreliable transfer
- The relation among D9 Data Object and E54 Dimension and PE22 Dataset (D9 IsA E54 AND D9 IsA PE22)
- The relation between D3 Formal Derivation and S6 Data Evaluation
- D7 Digital Machine Event as E7 Activity vs. triggering an activity.

Discussion points:

CRMdig is highly relevant for work undertaken in many projects

–the creation of digital documents, documenting their provenance are regularly used.

Proposal: to pursue this line of work further. Form a working group, formally raise a number of issues through the SIG mailing list and take it from there. The working group should brainstorm and come up with a version of CRMdig –the merging point of CRMdig, PEM (and PROV-O?). Once a concise document has been formed, the editing process will move to the CIDOC repository.

Furthermore, we need to update PEM on the site as a compatible extension –to be reviewed by the SIG. But it has been idle. Maybe it deserves an issue.

HW: GH, ML, SdS, CEO. to look at the documents and work on an agenda –make issues out of it. Links to the documentation can be found here: [About CRMdig](#), [PEM v3.1](#), [Repository for 3D Model Production and Interpretation in Culture and Beyond](#), [CRMdig v3.1](#), [3D-metadata](#), [CRMdig presentation\(2.3\)](#)

423: F54 Utilized information carrier

PR: from the perspective of LRMoo, F54 becomes an issue for CRMdig. It's no longer relevant for LRMoo.

New issue: CRMdig update

CRMdig is highly relevant for work undertaken in many projects, but has been idle for far too long and needs to be updated.

Topics that can be elaborated in the model:

- Harmonization with CRMinf, CRMsci, PROV-O, Parthenos Entities Model
- Digitization
 - see how the human activity relates to the reaction of the machine: for the moment, the human activity that sets in motion the machine reaction and the machine reaction itself are inseparable. What is the temporal and other connection between these two events? Can they be seen as one and the same event?
- Formal Derivation
 - Metadata descriptions for digital objects carry over from original to derivatives (assuming the latter retain features of the original digital object)
- Unreliable transfer
- The relation among D9 Data Object and E54 Dimension and PE22 Dataset (D9 IsA E54 AND D9 IsA PE22)
- The relation between D3 Formal Derivation and S6 Data Evaluation
- D7 Digital Machine Event as E7 Activity vs. triggering an activity.
- F54 utilized Information Carrier within the model

Decision of the 50th SIG: to pursue this line of work further. Form a working group, formally raise a number of issues through the SIG mailing list and take it from there.

WG: CEO, SdS, GH, ML

HW: GH, ML, SdS, CEO. to look at the documents and work on an agenda –make issues out of it. Links to the documentation can be found here: [About CRMdig](#), [PEM v3.1](#), [Repository for 3D Model Production and Interpretation in Culture and Beyond](#), [CRMdig v3.1](#), [3D-metadata](#), [CRMdig presentation\(2.3\)](#)

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516: Transfer of Custody (examples)

GB provided two examples from the Getty Provenance Index.

- the transfer of custody of the work described as “Von der Velden ein Ufer an der See” from Johann Matthäus von Merian to the Auction House Heldevier (Jacob) for the purpose of sale, ca. 1716
- the transfer of custody of the painting ‘Mrs. Fitzherbert’ to the art dealer Knoedler from Parke-Bernet Galleries (New York, NY, USA) ca. March 1941

Discussion points:

The problem with the references remains. The system doesn’t allow users to save a link, so we could just cite Getty Provenance Index and the web address for the site and the object seen and the date, whatever the style one goes for. To be worked out by the Editors’ group.

Vote on whether to accept the examples. The references to the Getty Provenance Index need to be sorted out and then the issue can close.

In favor: 10

Against: 0

Decision: accepted.

535: Pxxx represents instance of type (examples)

MD presented his HW. Some minor editing took place on the fly.

- The top right image on page 87 in the book ‘Pharaoh’s Birds’ by John Miles (E36) *represents instance of type* hoopoe (*Upupa epops*) (E55).
[This image is a reproduction of a photograph. The same book shows at the top of page 35 an image representing an unnamed ancient Egyptian relief depicting a hoopoe and other ‘Birds of the Marshes’. In contrast to the photograph, the latter image of the ancient Egyptian depiction shows intentionally typical rather than individual characteristics of the respective species, and should therefore be associated with the property *P138 represents* with the species name hoopoe (*Upupa epops*)]. (Miles, 1998)
- The visual content of Monet’s painting from 1868-1869 held by Musée d’Orsay, Paris, under inventory number RF 1984 164 (E36) *represents instance of type* magpie (*Pica pica*) (E55). [The editors give this example under the assumption that Claude Monet, as impressionist, created the painting following a real impression of a particular magpie. It was clearly not meant as a prototypical representation of this bird] (Musée d’Orsay, 2020)
- The top image on page 44 in the book ‘Wildblumen Kretas’ by Vangelis Papiomytoglou (E36) *represents instance of type* *Cistus creticus* L. (E55). [This image is a reproduction of a photograph. The plant produces an aromatic resin that has been exported from Crete to Egypt and other areas since the Bronze Age] (Papiomytoglou, 2006)

Vote for all the examples at once:

In favor: 8

Against: 0

Decision: examples accepted in the model.

Issue closed

476: Represents instance of type

Since the scope note, the label and the examples have been decided upon, Pxxx represents instance of type becomes ***P199 represents instance of type*** then. The definition can be found in the [Appendix](#). It is relevant for v7.2.

498: Places of disjoint areas

MD presented HW (new scope note for E53 Place) to convey the meaning that instances of E53 Place need not be one contiguous area (can be aggregations of disjoint areas).

Discussion points:

DH came up with some examples:

- Old settlement of Helsinki (or Helsingfors) located in the area of the modern airport, not on the coast. The same story with Upsala in Sweden.
 - NOTE: These constitute E7 Activities, which have a spatial projection of two disjoint areas, jumping to say so to another place.
- The capitals transferred in modern time: Moscow-St Petersburg-Moscow.
 - NOTE: Here we have a move of an administrative unit, which we use to model as a special case of E4 Period.
- “Normal” examples are countries with islands etc.

OE: the island examples and Kaliningrad are good examples, the move of the capital and the Helsinki example are not valid. They form different places, each connected to a specific period. He claims that each of the two examples lists two disjoint places.

MD: not really, these places are regarded as instances of E92 STV and the fact that their spatial projection differs from time to time does not raise an issue.

Vote on whether to accept the proposed scope note. Start a new issue to review examples in E4 Period and add a clarification based on the examples provided by Daria.

In favor: 6

Against: 0

Decision: edits to the scope-note accepted. Details in the [Appendix](#).

New issue –examples for E4 Period.

The examples by Daria to find their way into E4 Period.

Examples set:

- Old settlement of Helsinki (or Helsingfors) located in the area of the modern airport, not on the coast. The same story with Upsala in Sweden.
 - NOTE: These constitute E7 Activities, which have a spatial projection of two disjoint areas, jumping to say so to another place.
- The capitals transferred in modern time: Moscow-St Petersburg-Moscow.
 - NOTE: Here we have a move of an administrative unit, which we use to model as a special case of E4 Period.
- “Normal” examples are countries with islands etc.

HW: GH, MD, OE, SdS to proofread

496: Types for P2 has type

TV gave an outline of the overall issue: in a number of scope-notes we make recommendations about type-restrictions on classes, but we have not collected said type restrictions in a resource.

Taking into consideration the list of classes/properties that recommend some type restriction and the list of types used in Linked Art, the SIG needs to decide:

- (a) The type-restrictions recommended for CRM
- (b) The criteria to identify suitable thesauri that can be recommended in the CIDOC CRM document.

Discussion points:

MD: we had previously discussed that we should provide minimal vocabularies that are relevant for the CRM classes/properties that refer to types, where to link external vocabularies using skos relations. We should work with a list of the types mentioned in the scope-notes, offer a minimal vocabulary for each type.

Propose to split the issue: (a) NEW ISSUE –provide the content for a recommended CRM-SIG vocabulary, and (b) 496 –decide what the functional role of a minimal vocabulary will be.

No objections there.

Decision:

- (i) Functional role of a minimal vocabulary (how it would work technically - what people can do with it).
HW: MD & PR; TV –to proofread.
- (ii) Start a new issue regarding the content of the minimal vocabularies for type-restriction in the CRM.

New issue: content of the minimal vocabularies for restricting the CIDOC CRM Types

Outline: Provide content for a recommended CRM-SIG vocabulary based on reviewing CRM scope notes and using the outcome of issue 496. No HW assignment until 496 is resolved.

490: How to model a file

MD presented HW (definition of P190': Pxx has representative content). [Link](#) to HW in the Appendix.

Discussion points:

SdS, TV problem with understanding what the scope-note claims. He does not see how the proposed scope-note resolves the problem it set out to resolve.

TV difficulty with identifying which file we're talking about in the scope-note.

CEO: is the relation similar btw an instance of F2 Expression and F3 Manifestation? A generalization of R4 embodies (is embodied in), in fact.

The scope note is really dense and far from self-explanatory.

We need to put together a number of examples that illustrate the case in point. The text is extremely abstract that one cannot identify what problem this aims to resolve.

Examples needed:

CEO: IPR legislation. Copies of the same contract shared among various services stand for the same object. The point is concrete, but needs to be made explicit.

MD: wants to use canonical editions of Aristotle for instance. And someone else rewrite the definition and discuss it anew.

SdS: contends that Aristotle is not an ideal example. One could use the CRM text -given that we are all familiar with it and it comes with multiple levels of representation. Suggested that MD rewrite the scope note by using the full example from the CRM.

MD: very few people that are familiar with the editorial process involved in the CRM will understand the example SdS proposed. He thinks that Aristotle or Legislation form better examples but he can try and formulate one from scratch.

CEO: will try to help with examples for F3 Manifestation and with reformulating.

MD: cannot make the text less abstract, someone else has to take over

DECISION: CEO, TV, OE to provide an alternative formulation that will be discussed at a later stage.

530: Bias in data structures

[Presentation](#) by EC.

Discussion points:

MD: understanding bias in data structures is a misrepresentation of the actual problem. And the scope of the CRM is clearly stated and does not encourage bias.

What they should be aiming for is to identify the bias that may be introduced by the intended use of one particular data construct. It is not the data construct as such that gets identified as a source of bias.

GB: besides investigating whether constructs in an ontology further entrench bias, they could also review the process of ontology building, and dialogue and see if bias manifests in that case too.

EC: we all come from particular perspectives and that translates into our understanding of the world. However, bias comes into play when it comes to existing power structures. In which case, you cannot just undo bias, because it's a symptom of some sort of inequity. Identifying sources of bias serves to raise the issue, and for their part they are interested in identifying sources of bias in ontology/data structures.

518: How do we interpret periods in the CRM

The sig reviewed the example by MD & AK that supports treating settlements as instances of E7 Activity.

- The settlement activity of the population of Lerna IV and Lerna V (E7)

TV: is the example to be used in juxtaposition with the example for E4 Period? Or do we not need to do that? The purpose of the issue was to illustrate how we define E4 Periods in the CRM.

MD: we should probably link the example to E4 Period –do we typically repeat examples to superclasses for didactic reasons? Should we rework it to make it suited for E4 Period too?

SdS: maintains that the example looks like an instance of E4 Period instead of E7 Activity. It refers to a collection of actions, not one particular thing that someone did at a given time. However, it could be considered the collective activity of one group. The difference should be made explicit, which requires a lot of work before we can use it in the CRM. The example should not be repeated as such with additional comments in E4. Rather, we should use variants of this example for the respective classes. Showcase that it is the level of granularity in one's perspective that determines whether an instance of a settlement will relate to an E7 Activity or an E4 Period.

DECISION: MD to provide the set of examples and to start an e-vote on them.

517: Does the axiom of non-reflexivity follow from the definition of transitivity?

CEO shared some background information on this issue (MD had suggested that all transitive relations should be non-reflexive, CEO had objected to that) and presented his HW.

CRM properties are binary relations over classes. The possible relations are: transitivity, symmetry, asymmetry, reflexivity, irreflexivity. Binary relations (i.e. Ps in the CRM universe) correspond to partial orderings, i.e. they do not hold for every pair of elements. Reflexivity depends on whether the partial ordering has been defined as strict ($<$ hence non-reflexive) or non-strict (\leq hence reflexive). Asymmetry implies irreflexivity.

Whether transitive relations are also irreflexive in the CRM, stems from whether Ps are defined as strict partial orderings –which they are. Hence, the axiom of non-reflexivity does not follow from the axiom of transitivity, but from the fact that the CRM properties are construed as strict partial orderings.

We need to add an axiom for asymmetry to the transitive properties, as this practice would implicate that they are also irreflexive.

Specifically, for P198: we either define it to be irreflexive or asymmetric –this is missing information for the time being, which allows a non-strict interpretation of the property.

Proposal: To adjust all the relevant scope notes and add the necessary FOL axioms (for P198, add asymmetry in the list of axioms).

Discussion Points:

MD: We had decided that transitive properties with part-of semantics referring to discrete objects were to be treated as irreflexive, whereas transitive properties with part-of structures referring to continua (places, STVs) were going to be treated as reflexive (i.e. as a non-strict partial ordering). This needs to be spelled out.

For all transitive properties with part-of semantics, we should check whether they form a tree structure (based on their quantification).

SdS: useful to create an FAQ to explain this structure and FOL/axioms in English.

TV: instead of an FAQ, maybe we can review the definitions in the glossary (intro to the CRM) and see how comprehensible they are from the perspective of a non-expert in FOL.

PR: we need to incorporate this bit in the guidelines for writing scope notes.

CEO: maybe write clauses that explains transitivity, asymmetry, irreflexivity, to be added to all relevant scope notes.

Decision: proceed as indicated below

HW: CEO check all the transitive properties for asymmetry/non-reflexivity and report on the next meeting –share list with MD and then go over it at the SIG.

HW: MD to reformulate the definitions of axioms in English, and then SdS will proofread. The resulting text to be incorporated in (a) the glossary, (b) the scope note guidelines, (c) and where necessary into the individual scope notes.

429: P72 has language

PR presented the background and the current state of the issue -all proposals put forth. Two of them looked more promising, but (1) cannot be used to document a passive understanding of a language (which is often what gets documented –rather than the expressed ability to produce grammatically correct sentences in that language) and (2) requires redrafting of F51 Pursuit –not to mention that it has been moved to CRMsoc.

- (1) E21 Person P14i performed {P14.1i in the role of E55 Type = author}: F28 Expression Creation R17 created:
F2 Expression P2 has type: E33 Linguistic Object P72 has language: E56 Language
- (2) E21 Person P14i performed: F51 Pursuit R60 used to use language: E56 Language

Still, PR suggests opting for the 2nd suggestion.

Discussion points:

GB: contends that we should define a new property in CRMsoc, on a par with P45 consists of (D: E18, R: E57). It is a shortcut, in many cases we don't have information for the activity, hence, we shortcut it.

MD: does not object to GB's proposal. At the same time, the aspect of someone having an ability is something that might be useful for CRMbase. All sorts of skills can be documented like that. These skills can be subtyped too: f.i. levels of proficiency in a given language.

Documenting skills, does not necessarily amount to documenting instances of skills being applied (E7 Activity).

Which means that there should be a direct property associating a person with a skillset. Define the notion of skill formally and clearly.

GB: generalizing skills and provide specializations thereof (language, violin, etc.) is something he's OK with.

Decision: move forward with defining a skill property, connecting E21 to E55.

HW: MD, GB, PR & TV will proofread.

484: missing examples (time primitives)

MD walked the SIG through the examples (a) and (b) for P182, the example for P183, and the example for P173i (because the example for the forward going property made no sense).

P182 ends before or with the start of (starts after of with the end of)

- a. Lerna III (E4) *ends before or with the start of* Lerna IV (E4)

[“The site at Lerna probably was not left uninhabited for long after the destruction of the House of the Tiles and the raising of the tumulus. If there was a gap corresponding to the earliest stage of EH III in the Argolid, as has been suggested by some (see, e.g., Manning 1995: 55–60), it was a brief one. In Rutter's

view, the short life of the Fourth Settlement began ca. 2200/2150 b.c. and ended ca. 2050/2000 b.c.”] (Banks & Reese, 2013)¹

- b. The use of LH I graves of Krisa in Phocis (E4) *ends before or with the start of* LH III phase of reuse of the graves of Krisa in Phocis (E4)

[“...a *possible* hiatus in the occupation of certain sites such as the settlement of Krisa in Phocis, which was well occupied in the MH and LHIII periods. LHIIIB pottery from this settlement has already been identified, but no certain example of LHIIA pottery.]

(Phialon 2018)²

Vote to accept the examples

In favor: 8

Against: 0

Outcome: the two examples to be introduced in the definition of P182

P183 ends before the start of (starts after or with the end of)

The use of the Tomb Four from Nikitopoulou group in Nihoria in the MHIII-LHI period (E4) *ends before the start of* the period of reuse of the Tomb Four from Nikitopoulou group in LHIIIA (E4).]

[“Of the six tombs excavated in the Nikitopoulou group [...] the finds in Tomb Four are of MH II or MH III-LH I date, with the exception of the finds with the Northern group of material, which is uniformly dated to LHIIA2, end the ewer in the middle of the floor, dated LHIIA1. [...] The preserved evidence seems clearly to indicate use in the MHIII-LHI use in the MHIII-LHI period followed by a period of reuse in LHIIIA, a pattern matched at architecturally similar sites such as *13:Kaminia* and *10:Gouvalári*”]³

Vote to accept the examples

In favor: 7

Against: 0

Outcome: the example to be introduced in the definition of P183

P173i ends after or with the start of

LMIIIB (E4) *P173i ends after or with the start of* the Tutankhamun period (1332-1323 B.C.E.) (E4)

[Evidence for this is provided by the scarab seal found at Poros in a context of LMIIIB. The scarab belongs to the type “nh.s n Jmn”. During the Akhenaten period the production of these scarab seals stopped (the name of Amun is not referred to during his reign). So the scarab could not have been produced before the Tutankhamun period and

¹ **Courtney Banks, E.** (2013). *The Settlement and Architecture of Lerna IV; Results of excavations conducted by the American School of Classical Studies at Athens*, 6. Princeton: American School of Classical Studies at Athens.

² **Phialon, L.** (2018). *Funerary Landscapes in Middle Helladic and Early Mycenaean Central Greece: an Update*, *Ageus – Society for Aegean Prehistory*

³ **Boyd, M. J.** (2002). *Middle Helladic and early Mycenaean mortuary practices in the southern and western Peloponnese*. Oxford, Archaeopress.

is probably a later production.]
(Karetsou, 2000)⁴

Discussion: The example using the forward going property doesn't make sense, whereas the inverse property makes a legitimate claim.

Vote to accept the examples

In favor: 7

Against: 0

Outcome: the two examples to be introduced in the definition of P182

Decision: examples (a) and (b) for P182, as well as the examples for P183 and P173i are to be introduced in the definitions of the respective properties.

24 JUNE 2021

CRMsoc –presentation by GB

Discussion Points:

FB: important aspects of the model are grounded on basic concepts of social philosophy and social psychology. Their meanings are commonly agreed on, and can be apprehended by a larger community.

MD: Diagram for Institutional Fact. No mention to the fact that Norms and Rules provide feedback to the Social Collective.

re. the Activity of giving a speech (diagram for Bil C-15 Canadian Parliament): that's a misrepresentation. The correct path goes through: E7 Activity. P67i is referred to by: E73 Information Object. P129 is about: E29 Design or Procedure –and you'd have to specify the type of the activity too.

The scope notes should not copy definitions of basic concepts from various sciences/disciplines. Rather, the classes one ends up defining correspond to identifiable individuals. How do you identify these things? What are your means of verification.

OE: not sure how come both the subject and the target of Institutional Fact are instances of E1 CRM Entity –f.i. can an E3 Condition State be the subject of an Institutional fact? And by Institution we do not mean "organization".

FB: He would prefer it if "Institutional Fact" were dubbed "Social Connotation", in the sense of an added (unintentional) meaning. In the course of history, battles of larger and smaller significance have taken place. It can be the case that a minor battle (in terms of size of colliding armies) is deemed more important in the collective memory/conscience compared to its objective importance. That's where the notion of "Social Connotation" comes into play.

It incorporates notions like a state of mind (in reality, a propositional object that can be shared among individuals.

⁴ **Karetsou, A.** (2000). *Kriti-Aigyptos: politismikoi desmoi trion chilietion*. Athens: Archaeological Museum of Herakleio

Furthermore, the class “Speech Act” should be discussed some more. Invited SIG to participate in the discussion for CRMsoc through OntoME.

GB: Institutional Facts are considered something along the lines of E2 Temporal Entity. It is a very high-level class that can be specialized with things like Name-status, Type-status, Ownership-status, that fixes the Domain and Range to the appropriate entity. But in principle anything can be ascribed a function. Institutional facts can be held by Social Collectives that seem quite ad hoc or even artificial. “Social Connotation” could be a superclass of “Institutional Fact”.

The goal of this presentation was not meant for the SIG to approve the classes and properties proposed thus far. But he would like some feedback in terms of whether they like where CRMsoc is going.

CEO: wants this work to continue

GH: the model feels extremely relevant for some of the projects he’s currently working on.

PM: CHIN is in favor too.

DECISION: Given the direction that CRMsoc has taken and the need for a new extension (see issues [419](#), [420](#)), CRMsoc would be a new document altogether. So, the current draft version (0.1) that is available on the site should close. And the scope of the model should change too -a new text is required.

HW: GB, FB to provide the abstract

413: F51 Pursuit and F52 Name Use Activity to CRMsoc.

GB gave an outline of this issue. F51 and F52 have been deprecated in LRMoo and were supposed to be introduced to CRMsoc. It is important that ongoing work on CRMsoc does not create conflict with these classes –that’s not so much the case with F51 Pursuit but F52 Nomen Use Activity could cause frictions (see. how Appellations go through Institutional Facts in CRMsoc), in which case they should be put somewhere else.

Discussion:

PR: This is very relevant for LRMoo, it is important that we offer mappings to the deprecated classes. And they need to know whether they can point the users to CRMsoc or if they need to provide alternative mappings. A solution to this problem might be to reintroduce them in LRMoo but add a comment that they were intended for a different extension, that is not available yet (or still)

MD: We can either discuss this in the present issue or formulate a new one, where to discuss identity conditions for extended activities. Pursuit is relevant for this discussion and so is the Settling Activity that we discussed in Issue 518.

FB: Pursuit is a notion he’s always had trouble understanding. He would like to participate in any discussions re. where to put it –especially since it might end up in CRMsoc. In what concerns the Name Use Activity, there is the aspect of someone going by a certain name for a given time because that’s how people call him or it could be treated like an institutional fact.

Last comment: does LRMoo still have the class “Personnage de roman”?

PR: Yes, F38 Character. It’s one of the classes that were supposed to go to CRMsoc. It was not a core concept for the LRMoo, but she would like it if it existed somewhere in the CRM universe.

GH: working with Linguists has shown him that Name Use Activity is a very useful class. It makes sense for it to appear in CRMsoc. To push it to CRMsoc means that we have decided on the classes and properties of CRMsoc and have produced the rdf for it.

Outcome of discussions: It is acknowledged that the decision to move F51 and F52 out of LRMoo and into CRMsoc was a hasty one. The issue cannot be resolved unless the scope and classes/properties of CRMsoc are clearly defined. They can be reintroduced to LRMoo with the indication that they are intended for a different model.

419: Activity Plans

TV gave an outline of the issue –pointing to 3 directions:

- (a) Activity plans to remain in CRMsoc –but they are not quite central to it.
- (b) Activity plans to be reintroduced to CRMbase –definitely not core
- (c) Activity plans to be made an extension in its own right –makes sense, only model that is future oriented

MD: Activity Plans and the Business Model (commercial transactions, that are important for museum documentation) should become part of the same extension.

FB: he's not exactly thrilled with lumping together business exchanges and activity plans for museums. But he's gonna go with it.

CB: Harmonizing the Spectrum model backs option (c). The model documents transactions AND restoration activities/activity plans (as in retroactive techniques to apply, given a certain condition state). It's a highly specialized model and it would encumber CRMbase infinitely to add to it all these classes and properties whereby to link them.

GB: also in agreement

Vote on making Activity Plans a separate extension of CRM. This makes sense as it is a construct focusing on possible future events rather than past events mainly concerning the CRM and its extensions otherwise. (or core to an extension where things may be added/ like business transactions)

In favor: 12

Against: none

Outcome: motion passes

HW: reformulate the scope of the extension (intro text) and decide to work either on OntoMe or another system (despite the classes already being there).

Coordinator: TV

Group: SdS, MD, FB

DECISION: Once the scope of the extension has been formulated, close the issue. A new space on the website has to be created for this model, CRMact (suggested name).

408 Rights Model Enriched

GB: hasn't had time to do the HW

A quick note by MD, that rights form instances of Activity Plan of sorts. They can also be seen as instances of Institutional Fact. They foresee reactions to situations.

GB: agrees with this remark. There should be some path to connect institutional facts to rights that goes through activity plans in CRMsoc.

FB: CRMsoc will be the home for Rights, Law being the specialization of Social Representations that has acquired some official status.

Further elaboration of Institutional Facts and Activity plans should resolve the issue.

420: Social Transactions and Bonds

TV presented the current state of the issue: it's mainly about examples for the time being. HW by AK. The examples are about classes socExx Provision and socExx Business Obligation.

(a) Discussion for one example in particular:

“Payment of F 1.000(socXExx Provision) to Fokolo Mango and Co (E40 Legal Body) *carried out by* A. Apostolaton (E21 Person), *in the role of* “mediator”

SdS: This is a property example, that could appear under P14 in CRMbase. However, we typically disallow examples which refer to classes from extensions in CRMbase, so we should probably skip this, until we have an idea which model will host said classes and the set of properties linking them to one another and CRMbase.

Everyone in agreement with this proposal.

(b) A problem that TV & AK need feedback from the SIG to resolve, is that according to the recommendations for citations (Harvard), archival material should come with an author and a year of publication. But he's not sure how to declare that, because this is the accountant's log book

PR: For some weird reason, ships are considered as the authors of their logs, but in these examples the archival material is the account book of the ship, so she doesn't know how to declare the author.

SdS: we can assume it to be a log book, and give the name of the ship and do away with all the extra information; f.i. **Account book 'D.S.Skylitsis', 1896**. The full citation should go at the references list.

Everyone in agreement with this proposal for the citation.

Vote on accepting the reformulated examples:

In favor: 9

Against: none

Outcome: the examples are accepted, remains to be seen which model they will be a part of (to be discussed in a new issue). Details for the examples in the [appendix](#).

Decision: accept the examples and start a [new issue](#) re. the CRM-extension that will host classes socExx Provision and socExx Business Obligation plus the set of relevant properties whereby to link from and to them.

The two classes could either become part of the new extension for Activity Plans and Business Transactions ([419](#)) or they could lie in the newly-defined scope of [CRMsoc](#).

HW for AK, MD, TV, SdS, FB to work on the properties and examples.

Issue closed

[NEW ISSUE]: Which family model should classes (i) Provision and (ii) Business Obligation appear under?

This issue is about the CRM-extension that will host classes socExx Provision and socExx Business Obligation plus the set of relevant properties whereby to link from and to them.

The definitions of the classes and their examples have been agreed upon in the context of issue [420](#).

The two classes could either become part of the new extension for Activity Plans and Business Transactions ([419](#)) or they could lie in the newly-defined scope of [CRMsoc](#).

HW for AK, MD, TV, SdS, FB to work on the properties and examples.

360 LRMoo

PR walked the SIG through the present state of the issue. A number of sub-topics to be discussed.

F5 Item

Its superclass changed to E18 Physical Thing, which results in a clash with the range of *R18 created* (R: F28 Expression Creation, R: F5 Item) and *R28 produced* (D: F32 Carrier Production Event, R: F5 Item). They are IsA P108 has produced (D: E12 Production, R: E24 Physical Human-Made Thing), but E24 IsA E18.

Proposal: They don't need a more general superproperty, but a more specific superclass for F5 Item (E24 Human-Made Physical Thing). This should reflect in the scope note. See [appendix](#) for the details

Discussion:

Since a wall-print would count as an instance of F5, the phrase "An instance of F5 Item that is stored on a part of a larger electronic support[...]" should be rephrased to "An instance of F5 Item that is stored on a part of a larger physical support[...]"

Vote to accept the proposed changes in the definition of F5 Item

In favor: 14

Against: none

Outcome: passed

F30 Manifestation Creation

The scope note had been reformulated but the outcome didn't read well. PR provided another formulation. Details in the [appendix](#).

Vote to accept the proposed changes in the definition of F30 Manifestation Creation

In favor: 10

Against: none

Outcome: passed

R4 embodies (is embodied in)

The scope note needed some reformulation, plus the quantification is not right (many-to-many with no constraints).

Discussion:

PR: We cannot have an Expression without a Manifestation. We may not be able to find any items of that Manifestation, but there must have been a Manifestation of that Expression at one time, or it wouldn't have been possible to talk about an Expression in the first place.

TA: Which begs the question if the definition of F2 Expression should be changed, because as it now stands, an instance of F2 can exist in human memory too –meaning that the quantification is fine as it is. Submitted publications that have not been accepted, do not correspond to instances of F3 Manifestations.

Proposal: Only alter the domain quantification of the property, as an instance of F3 Manifestation must embody at least one instance of F2 Expression, and check whether the scope-note of F2 Expression needs to be reworked. Also, review and accept the wordsmithing in the scope-note. See the [appendix](#) for the details.

Vote to accept the proposed changes in the definition of R4 embodies

In favor: 11

Against: none

Outcome: passed

F34 Controlled Vocabulary (edits)

Proposal: deprecate F34, it has a number of superclasses, (E29, E32 and F2). F2 Expression suggests that there exists some F1 Work which can be realized by F34 (isA F2). The identity of the corresponding F1 remains a puzzle. Furthermore, the only property linking from F34 (R34 has validity period) does not seem particular to it. So, R34 can be deprecated too.

Discussion points:

SdS: he is concerned that it won't be possible to offer a migration path if we accept to do away with F34 and R34. Should R34 fall under the model for Activity Plans? He doesn't want the property be deprecated until a migration path has been devised –also what model will host it. Maybe say that "This (class/property) is a candidate for moving to a different extension, you will need to migrate data recorded in this manner". So keep F34, in order to keep R34 for the time being.

PR: we could move examples to the higher classes as well.

Vote to

- Include an example of KOS (ISO list of codes for languages/countries) under F1 Work
- Include a classification code as example for F12 Nomen
- Include a code from the ISO list as an example of F12 Nomen for a language/country
- Keep F34 and R34 until we can provide a migration plan for R34.
- Note for F34 and R34 that "This (class/property) is a candidate for moving to a different extension, you will need to migrate data recorded in this manner"

In favor: 11

Against: none

Outcome: passed

F35 Nomen Use Statement

Proposal: Since F12 Nomen is no longer just a string, the properties that were linking from F35 can now link from it. As a result, F35 can be deprecated and the domain of R35 & R36 can change to F12. Have a classification example for F12, deprecate R32, R37, R38 and R55.

Discussion points:

MD: the examples need to be formulated in a way that reflects that F12 associates instances of E1 CRM Entity with their E41 Appellations. It works as an F35 Name Use Statement, hence a migration path should be made available. So **not** “‘杜甫’ [the name of a Chinese poet of the 8th century, in simplified Chinese characters]”, **but** “‘杜甫’ as the name for a Chinese poet of the 8th century, rendered in simplified Chinese characters”.

SdS: Since F12 has effectively become F35 and has absorbed all of its properties, how should one treat the instances of F12 Nomen that predate its redefinition?

PR: there’s always R33 has content, and the string (that used to be F12 Nomen) is documented with this property.

Vote on the following.

- to deprecate **F35 Nomen Use Statement**
- to add the following examples to F12 Nomen (a classification number, and class caption)
 - '595.7' [classification number for Insecta in the 23rd edition of the Dewey Decimal Classification]
 - 'Insecta'[caption for the class '595.7' in the English language 23rd edition of the Dewey Decimal Classification]
- change the domain of **R35/R36/R54** from F35 Nomen Use Statement, to F12 Nomen
- change the range of **R35 is specified by** [D: F35 Nomen Use Statement, R: F34 Controlled Vocabulary] to F2 Expression (since we really don’t want to keep F34 Controlled Vocabulary in LRMoo in the long run – see [above](#))
- keep **R33 has content** in **F12 Nomen**.
- Keep **R38 refers to thema** (change its domain and range to **F12 Nomen** and **E1 CRM Entity**, respectively) and make it a subproperty of **P1i identifies**
- deprecate **R32/R37** (migration path goes through R33) /**R55**

In favor: 11

Against: none

Outcome: passed

HW: PR to update the examples for F12 Nomen using the first example (杜甫’ as the name for a Chinese poet of the 8th century, rendered in simplified Chinese characters) as a template.

[R36 uses script conversion](#)

Proposal to change the domain of R36 from F35 to F12, delete the superproperty, change the scope-note accordingly and the presentation of the examples.

The template for examples is “Hui Deng” as the name of ... (F12) *uses script conversion* Pinyin (F36)

Vote to accept the proposed changes in the definition of **R36 uses script conversion**

In favor: 11

Against: none

Outcome: passed

HW: PR to redraft the examples according to the template.

[R54 has nomen language](#)

Proposal: change the domain of R54 from E35 to F12, change the label of the property to *has language* (because the domain is set to F12), change its superproperty to P2 has type, fix the examples following this template

“The name ‘Colón Cristóbal’ as (F12) *has language* spa [Spanish] (E56)

Vote for the proposal

In favor: 12

Against: none

Outcome: passed

HW: PR to redraft the examples according to the template.

NOTE: Check the examples in E56 –[new issue](#) for CRMbase.

[R56 has related use](#)

PR presented a proposal for changing the definition of R56.

Discussion points:

MD: relabel it to “has coreference”, and also make it more explicit in the scope note that the two instances of Nomen co-refer.

Some editing took place

SdS: suggested that PR review the text of the scope note and the examples in the light of R36 and the changes implemented there (especially the part re. the .1 property concerning the transliterations).

Decision: Postpone until next SIG meeting. We have left things as are documented in the [appendix](#) (without having reached a decision for R56 that is). In the next sig we'll need to assign more than one session for LRMoo.

HW to PR to double check according to the suggestions made. Also, share the google doc where open issues for LRM are laid out with the rest of the SIG asking for comments.

[\[NEW ISSUE\]: Style of language examples for E56 Language](#)

The library community use ISO 3-character language codes. Change the examples for E56 Language in CIDOC CRM to conform to that, and also change the references. Rather than citing grammars/grammatical descriptions of the languages used as an example, ISO 693-2 (Codes arranged alphabetically by alpha-3) should be referenced.

25 JUNE 2021

[332: Properties of S10 Material Substantial of CRMsci](#)

TV presented his HW

- (i) scope note and examples for S24 Sample Splitting
- (ii) redrafted scope note for S27 split (was source for) to reflect change in the domain
- (iii) definition of O29 removed sub-sample (was removed by)

Vote on accepting the scope note for S24, O27 and O29.

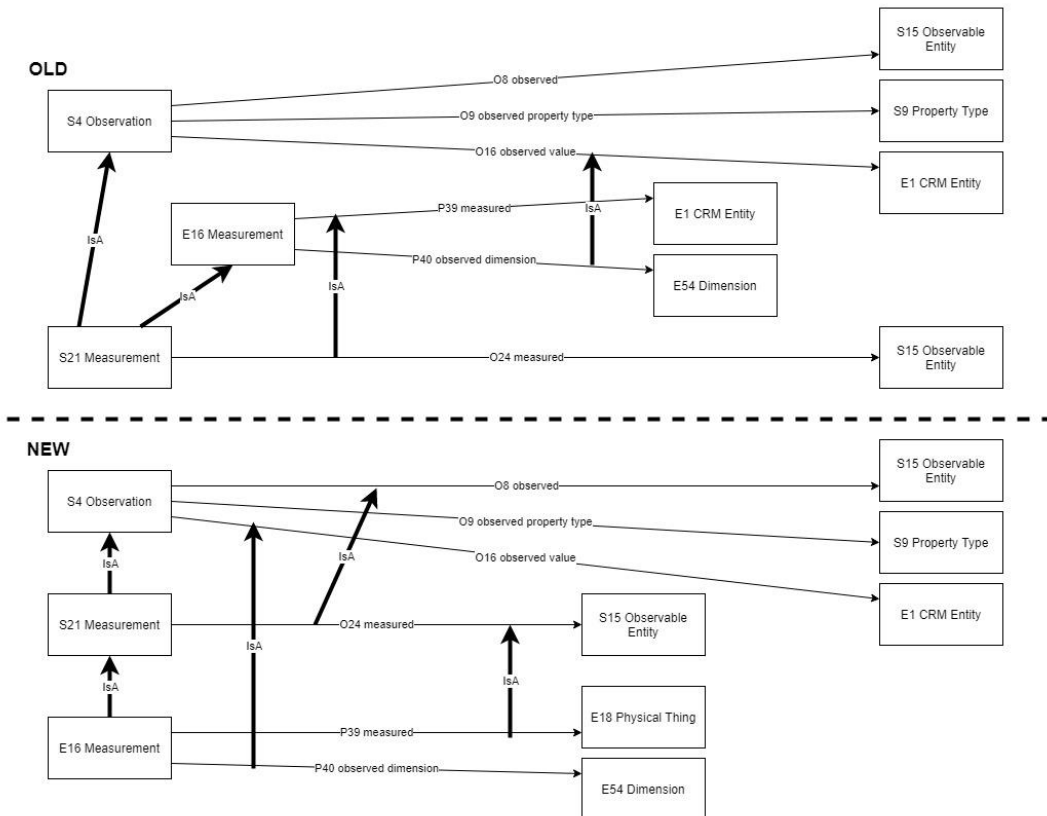
In favor: 7

Against: none

Decision: Accept. Details in the [appendix](#).

[537: How does reducing the range of P39 measured affect CRMsci?](#)

HW presentation by MD –proposed changes are reflected in the diagram below



Discussion points:

SdS: The axiom declaring the equivalence btw O12 and E18 from E18 and its specializations only appears in the FOL, not in the scope note. Must be explicitly stated in the scope note too.

Proposal:

Vote to accept changes in the model and in the definitions of S21, O16, O24, O12, O9. Start a new issue on correcting the definition of O12 (addition of the axiom in the scope-note) and resolve it in an e-vote.

In favor: 6

Against: none

Outcome: Accepted

Decision: Accept proposed changes (details in the [appendix](#)). **Close issue 537** and start a new on the scope note of O12.

[NEW ISSUE]: [Correct the scope note of O12 \(to reflect the equivalence axiom\).](#)

The scope note of O12 has dimension (is dimension of) needs to be redrafted, in order to include a fully-fledged explanation of the equivalence with P43 from E18 and downwards.

HW: MD to redraft the scope note for O12 (make sure to flesh out the axiom of equivalence in the scope note). Then share the redrafted scope note with TV, who will start an evote.

531: [Observable Entity](#)

MD presented his HW.

Summary of proposals put forth:

- alter the definition of S4 Observation (for the proposed definition see [appendix](#))
 - NOT (S4 Observation IsA E13 Attribute Assignment)
 - Scope-note of S4 Observation redrafted
 - deprecation of properties O9 observed property type and O16 observed value
 - introduction of new property Oxx observed Situation [D: S4 Observation, R: Sxx Observable Situation]
- redrafting of S15 Observable Entity (for the proposed definition see [appendix](#))

Discussion points:

MD: Observable Entities should be determined on the basis of some rule of thumb. Any instance of Measurement measures a Situation. Proposed to postpone deciding on [issue 388](#), until after we have had some concrete understanding of the relation between Situation and measurement types.

SdS: scope note of S15 Observable Entity refers to a “confinement of the event”. Is this confinement spatial, temporal or both? This part needs to be reworked to evoke the right kind of confinement.

TV: is not confident that we have defined Sxx Situation well enough (in terms of scope-note, properties linking from it, examples) to be using it in other places?

SdS: in agreement, I11 Situation in CRMInf is poorly defined. MD’s HW (Oxx observed situation: Sxx Observable Situation) is a subset thereof. A particular instance of I11 Situation that can be subject of measurements and observations. I11 refers to persisting value ranges, the subset we’re talking about relates to measurable/observable value ranges.

Discussion on the appropriate model for Sxx Observable Situation to be incorporated in. CRMsci or CRMInf?

MD: CRMInf might be more appropriate

OE: Observable Situation is highly relevant for the documentation of performing arts. The documented “objects” are of a different nature compared to the museum objects and the restoration activities performed on them –that form the basis of CRMsci. Does not seem very fitting for CRMsci.

The context of an Observation must be included in the documentation system. This requires Observable Situation to be properly defined. In the case documenting theatrical productions, the Observable Situation would help provide context on the thing documented: one particular performance; a series of performances during once season; multiple series of performances spanning over multiple seasons etc.

MD: Apart from the treaty on what an observable entity is, no scope-note available at the moment for Observable Situation. His proposal is about implementing constraints on the I11 Situation (isA I4 Proposition Set). He needs help on how to confine the Proposition Set, possibly in the form of examples. By providing an adequate definition for Observable Situation we can start working towards reconciling Observations (simple and multiple) with Attribute Assignment.

SdS: We need to start by finding examples to determine the rules for inclusion in Observable Situation. If Observable Situation is to go to CRMInf, he could start writing a definition for a new Ixx class. But it won’t be

made part of the CRMInf next release yet. He will attempt writing a definition for its linking properties [Jxx observed situation (was observed by) and Jxx held at least for]

OE: examples from the performative arts.

DH: provided the example of Monet's painting "Soleil levant" which marks the beginning of Impressionism.

MD: the examples do not to be referenced for the time being, they serve to help us identify the defining aspects of Observable Situation. What we're interested in, is types of events –not an actual event that was documented in such and such manner.

Discussion re. the representation of complex constructs in CRM

GH: the more we go into proposition sets that we're using in CRMInf, the more we see that the relevant concepts are poorly documented in RDF. Maybe we should focus on finding a solution to represent these things.

SdS: NC mentioned that RDF-Star is a step in that direction.

OE: there is a common practice of using named graphs that must be taken into consideration, but it should not drive the models we're working with. Can we just start thinking whether we'll have to change from RDF? and should this be the case, what are we going to express the CRM in? Even TEI, which is XML-based, does not consider the XML to necessary for its expression. They are not going to abandon it any time soon, but they are not bound to it for eternity. There is an analogy with CIDOC CRM and RDF.

MD: We need an FOL equivalent for named graphs.

CEO: one cannot make an FOL representation without using a name for a set of propositions. We should not swap to a second order logic, or higher level still.

Vote on pursuing this issue by attempting to define a more general concept of Observation and see how that translates into defining Observable Situations in CRMInf. Postpone 388.

In favor: 10

Against: none

Outcome: accepted

HW: SdS (definitions for I12 Observable Situation, Jxx observed situation, Jxx held at least for)

HW: OE provide examples from the performing arts, MD categorical examples.

400: CRMgeo: Superclasses of SP5

CEO presented the issue and informed the SIG of the Editors' proposal to close the issue (on the grounds of there being nothing left to do).

Note: issue 469 (that spawned from issue 400) was decided to be merged with 365 in the 45th SIG meeting. The 48th SIG meeting assigned HW to ES, MF, CEO, OE to work on 365, but it has been idle since. FB could be invited to participate.

The only loose end from the main stream of this issue is how to maintain the superproperty table:

(a) as a separate spreadsheet, or

(b) to be extracted from the new database?

MD: to close the issue, and see as part of the other issue the format whereby to declare the top properties of the CRMbase and those of the family models that are not covered by the CRM.

TV: This has been included in an e-vote and has passed. So there's nothing left to do here.

Vote to formally close the issue

In favor: 8

Against: none

Outcome: passes

Issue Closed

474: Editorial check of changes in CRMarchaeo

CEO presented the last piece of HW before the issue can close: the FOL and transitivity axiom for AP25 occurs during (includes).

Note: it is possible that we might need to reformulate the scope-note to ensure that the transitivity axiom in the FOL is reflected in it.

Vote to accept the FOL representation

In favor: 8

Against: none

Outcome: FOL axioms accepted. Details on the added axioms below

$AP25(x,y) \supset P176(x,y)$

$AP25(x,y) \supset P185(x,y)$

$AP25(x,z) \wedge AP25(z,y) \supset AP25(x,y)$

Issue closed

539: Examples of AP7 –reference to the excavation records from Akrotiri

AK presented the state of the issue. According to the description, Eleni Christaki was going to provide information re. the identity of the volcanic ash and pumice layers in the excavation reports from Akrotiri. ECh reported back that the identity of such layers is not documented in the original records.

Proposal: to circumvent this problem, AK suggested to add a sentence in the example mentioning that “The Archival Material is taken from the excavation records held by the Ephorate of Antiquities of Cyclades”.

Vote on adding that clause:

In favor: 7

Against: none

Outcome: passed.

HW: SdS to reformulate the clause.

Plan the next SIG meetings (autumn 2021 and spring 2022).

Mid-October is convenient for most, Tuesday 11th through Friday 15th October 2021. On Zoom. Everyone in agreement

Dates for the spring meeting: February 8-11th.

We could book a room at FORTH, where teleconferencing is possible so as to run a hybrid meeting (both physical and virtual participation). We could even run tests in advance and see how this goes –many laptops, many connections, extra noise, not everyone having a direct view of the whiteboard, recording microphones needed.

HW: CB to contact technicians at FORTH to set up this hybrid meeting at Orphanoudakis (or maybe the big Auditorium). To be assisted by OE, TV, SdS and anyone with teaching experience in organizing and running test rounds.

518: How do we interpret periods in the CRM

CIDOC CRM Implementation in RDF –v.7.1.1

Presentation by ETz.

Link to gitlab [here](#). Contains (a) the RDFS implementation of CIDOC CRM v7.1.1, (b) the agreed-on policies used to generate the RDF encoding of CIDOC CRM v7.1.1 (stemming from the document Implementing the CIDOC CRM in RDF, by MD and RL), (c) outcome of the policies.

He has also produced an XML style-free text of the CIDOC CRM v7.1.1 (link [here](#)). For scope-notes and examples he has used HTML. Images are encoded in base64 format.

The labels for classes and properties translated into other languages are also available in this format. The next step is to link available translations of Classes/Properties to their English counterparts so that end-users can navigate through the translated specifications. The goal is to document the translations and their relations to the official English version through the CIDOC CRM site, and automatically generate a machine readable XLM form of the text –to be shared with the translation groups to provide translations for the newest version.

Re the introduction (of use to the translation groups):

MD: divide the introduction in major chapters (do not go into too much detail). Markup all CRM Classes and Properties appearing in the Intro. Automatically generate Table, where possible.

ETz: This has been implemented to a certain extent. He can share the output of this work with the Translation WG ASAP.

PM: shared a [link](#) where the segments in which CHIN have broken down the document for the French translation. Link for the .md file [here](#).

MD: Someone should review the policies ETz referred to and there are a number of decisions that have to be made by the SIG.

- Should the official RDF still contain P81 and P82 pointing to literal or should these be substituted by P81a/b and P82a/b that point to literals? It can yield alternative treatments of time intervals.
- Should this policy be also implemented for P170i? He maintains that this a/b split of the property should be implemented for P170i as well.

- for the moment we have a separate module for PCs –should they be integrated in the official RDF?
- E61 Time Primitive should it be xsd:dateTime in the official RDF? Propose to discuss this in a new issue.
- Datatypes of Primitives that are specified as either xsd datatypes or literals. However, a decision must be reached re. E94 Space Primitive and E95 Spacetime Primitive.

The character set in use for the Chinese tags, should be used in the generated RDF. CB to discuss with MD.

PW reported that the version he shared with MD mixes traditional and simplified Chinese. He will share the edited translation again, within a few days.

DECISION: Start a [new issue](#) about the automatic generation rules for the RDF from the CIDOC CRM definition document. Whenever an inconsistency is spotted btw the definition of the CRM and the generated RDF, it must immediately reported to the CRM SIG.

DECISION: Start a new issue where to collect and discuss all available translations of the CRM in a word format.

HW: CB, ET

[NEW ISSUE]: [Automatic generation rules for deriving the RDF form from the CIDOC CRM definition document.](#)

Where to discuss topics:

- Should the official RDF still contain P81 and P82 pointing to literal or should these be substituted by P81a/b and P82a/b that point to literals? It can yield alternative treatments of time intervals.
- Should this policy be also implemented for P170i? He maintains that this a/b split of the property should be implemented for P170i as well.
- for the moment we have a separate module for PCs –should they be integrated in the official RDF?
- E61 Time Primitive should it be xsd:dateTime in the official RDF? Propose to discuss this in a new issue.
- Datatypes of Primitives that are specified as either xsd datatypes or literals. However, a decision must be reached re. E94 Space Primitive and E95 Spacetime Primitive.

HW: ETz

[NEW ISSUE]: [Start a new issue where to collect all available translations of the CRM in a word format.](#)

SdS: we can use the chunks that PM and the Canadian French translation initiative have arrived at, on the basis of which to generate the XML format, from which future translations are to be based on. If this is not enough, ETZ can use the level 2 labels instead.

For translations and previous versions of classes/properties to be accessed from one point on the site, classes/properties in all versions and available translations need to be linked to the class and property hierarchy, rather than the version (and the language). So for the history of a particular property, the entry point would be the said property. Similarly with the classes. At a next step.

ETz: For the moment, each version has its own problems. Be it with formatting, be it with text missing etc. The SIG has to decide whether we'll be loading all word files for all versions (even the most short-lived ones) on the site or if we consider some to be more important, and only load them.

SdS: Only go for published versions (they have an RDF implementation). Avoid draft versions. What is required is providing the navigation mechanism for classes and properties across (official) versions.

TV: We'll soon need to transition to Drupal 9. We need not duplicate the effort by providing all this content on Drupal 7, only to have to redo the whole thing for Drupal 9.

HW: CB and ET to contact translation initiatives in order to collect them.

Appendices

Appendix I: List of abbreviated names

AG	Anais Guillem	University of California, Merced, US
AK	Akihiro Kameda	National Museum of Japanese History, JP
TV	Athanasios Velios	UAL, UK
AK	Athina Kritsotaki	ICS-FORTH, GR
CEO	Christian-Emil Ore	University of Oslo, NO
CB	Chrysoula Bekiari	ICS-FORTH, GR
DH	Daria Hookk	The State Hermitage Museum, RU
DF	Donatella Fiorani	Sapienza Universita di Roma, IT
ET	Eleni Tsouloucha	ICS-FORTH, GR
ETz	Elias Tzortzakakis	ICS-FORTH,GR
EC	Erin Canning	Linked Infrastructure for Networked Cultural Scholarship, CA
FB	Francesco Beretta	LARHRA, FR
GB	George Bruseker	Takin.solutions, BU
GH	Gerald Hiebel	Universität Innsbruck, AT
JW	Jan Wieners	University of Köln, DE
KN	Kai Niebes	University of Köln, DE
MZ	Maja Žumer	University of Ljubljana, SI
MaDo	Maliheh Dorkhosh	Ferdowsi University Masshad, IR
MD	Martin Doerr	ICS-FORTH, GR
MN	Massoomeh Ninkia	Kharazami University, IR
ML	Matteo Lorenzini	ETH Zürich, CH
MR	Mélanie Roche	Bibliothèque Nationale de France, FR
MM	Mercedes Menandez	UNU-MERIT, NL
MvR	Muriel van Ruymbeke	Liège Université Geomatics Unit, BE
NC	Nicola Carboni	University of Geneva, CH
NG	Nils Geißler	Universität zu Köln, DE
OE	Øyvind Eide	Universität zu Köln, DE

PR	Pat Riva	Concordia University, CA
PF	Pavlos Fafalios	ICS-FORTH, GR
PM	Philippe Michon	CHIN, CA
PC	Pierre Choffé	Bibliothèque Nationale de France, FR
PW	Puyu Wang	Shanghai Normal University, CN
SK	Sakiko Kawabe	National Museum of Japanses History, JP
SE	Sanaz Emami	Univeristy of Tehran, IR
SK	Sarantos Kapidakis	University of West Attica,GR
SIS	Slavina Stoyanova	Universität zu Köln, DE
SH	Stephen Hart	CHIN,CA
SdS	Stephen Stead	Delving/ Paverprime/ UAL, UK
TA	Trond Aalberg	NTU/OSLOMET, NO
VA	Vincent Alamercery	LAHRA/Université de Lyon, FR;

Appendix II: Model changes

476: Pxxx represents entity of type

Pxx represents instance of type

Domain: E36 Visual Item

Range: E55 Type

Subproperty of: P138 represents (has representation)

Quantification: _____

Scope Note: This property establishes the relationship between an instance of E36 Visual Item and an instance of E55 Type that characterises the thing depicted. This property is used when the identity of the thing depicted is unknown or unrecorded, but is clearly a particular thing of that type. If the instance of E36 Visual Item directly depicts the concept of the E55 Type rather than an instance of a thing of that type, then this should be represented using E36 Visual Item P138 represents E55 Type.

This property is a shortcut of the more fully developed path from E36 Visual Item through P138 represents, E1 CRM Entity, P2 has type, E55 Type.

Examples:

- a. The visual content of photograph gri_2012_m_2_b001_f001_d01_e005_0148 (E36) *represents instance of type* automobile (E55)
[Reference: <https://www.getty.edu/research/collections/object/10062J>]
- b. The top right image on page 87 in the book ‘Pharaoh’s Birds’ by John Miles (E36) *represents instance of type* hoopoe (*Upupa epops*) (E55).
[This image is a reproduction of a photograph. The same book shows at the top of page 35 an image representing an unnamed ancient Egyptian relief depicting a hoopoe and other ‘Birds of the Marshes’. In contrast to the photograph, the latter image of the ancient Egyptian depiction shows intentionally typical rather than individual characteristics of the respective species, and should therefore be associated with the property *P138 represents* with the species name hoopoe (*Upupa epops*)]. (Miles, 1998)
- c. The visual content of Monet’s painting from 1868-1869 held by Musée d’Orsay, Paris, under inventory number RF 1984 164 (E36) *represents instance of type* magpie (*Pica pica*) (E55). [The editors give this example under the assumption that Claude Monet, as impressionist, created the painting following a real impression of a particular magpie. It was clearly not meant as a prototypical representation of this bird] (Musée d’Orsay, 2020)
- d. The top image on page 44 in the book ‘Wildblumen Kretas’ by Vangelis Papiomytoglou (E36) *represents instance of type* *Cistus creticus* L. (E55). [This image is a reproduction of a photograph. The plant produces an aromatic resin that has been exported from Crete to Egypt and other areas since the Bronze Age] (Papiomytoglou, 2006)

498: the scope note of E53 can be sets of contiguous areas

The scope note changed

FROM (v7.1.1)

E53 Place

Subclass of:

E1 CRM Entity

Scope note:

This class comprises extents in space, in particular on the surface of the earth, in the pure sense of physics: independent from temporal phenomena and matter.

The instances of E53 Place are usually determined by reference to the position of “immobile” objects such as buildings, cities, mountains, rivers, or dedicated geodetic marks, but may also be determined by reference to mobile objects. A Place can be determined by combining a frame of reference and a location with respect to this frame.

It is sometimes argued that instances of E53 Place are best identified by global coordinates or absolute reference systems. However, relative references are often more relevant in the context of cultural documentation and tend to be more precise. In particular, we are often interested in position in relation to large, mobile objects, such as ships. For example, the Place at which Nelson died is known with reference to a large mobile object – H.M.S Victory. A resolution of this Place in terms of absolute coordinates would require knowledge of the movements of the vessel and the precise time of death, either of which may be revised, and the result would lack historical and cultural relevance.

Any instance of E18 Physical Thing can serve as a frame of reference for an instance of E53 Place. This may be documented using the property *P157 is at rest relative to (provides reference space for*

TO (v7.2)

E53 Place

Subclass of:

E1 CRM Entity

Scope note:

This class comprises extents in the natural space we live in, in particular on the surface of the Earth, in the pure sense of physics: independent from temporal phenomena and matter. They may serve describing the physical location of things or phenomena or other areas of interest.

Geometrically, instances of E53 Place constitute single contiguous areas or a finite aggregation of disjoint areas in space which are each individually contiguous. They may have fuzzy boundaries.

The instances of E53 Place are usually determined by reference to the position of “immobile” objects such as buildings, cities, mountains, rivers, or dedicated geodetic marks, but may also be determined by reference to mobile objects. A Place can be determined by combining a frame of reference and a location with respect to this frame.

It is sometimes argued that instances of E53 Place are best identified by global coordinates or absolute reference systems. However, relative references are often more relevant in the context of cultural documentation and tend to be more precise. In particular, we are often interested in positions in relation to large, mobile objects, such as ships. For example, the Place at which Nelson died is known with reference to a large mobile object – H.M.S Victory. A resolution of this Place in terms of absolute coordinates would require knowledge of the movements of the vessel and the precise time of death, either of which may be revised, and the result would lack historical and cultural relevance.

Any instance of E18 Physical Thing can serve as a frame of reference for an instance of E53 Place. This may be documented using the property *P157 is at rest relative to (provides reference space for)*.

490: How to model a file

Propose to define property

Pxxx has representative content

Domain: E73 Information Object

Range: E73 Information Object

Subproperty of: E73 Information Object. P165i is incorporated in (incorporates): E73 Information Object

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

Scope note: This property associates an instance of E73 Information Object with a complete, identifying representation of its content in the form of another instance of E73 Information Object.

This property only applies to instances of E73 Information Object that can completely be represented by discrete symbols, in contrast to analogue information. The representing object may be more specific than the symbolic level defining the identity condition of the represented. This depends on the type of the information object represented. For instance, if a text has type "Modern Greek character and punctuation marks sequence", it may be represented in a formatted file with particular fonts, meaning however only the sequence of Greek letters. Any additional analogue elements contained in the representing object will not be regarded to be part of the represented.

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.

In a knowledge base, typically, the represented object will appear as a URI without a corresponding file, whereas the representing one will appear by the URI of a binary encoded file existing outside the knowledge base proper, or even a paper edition.

420: Social transactions and bonds

socExx Provision (examples)

- A. Syrmas paying 53 francs to A. Kourinis [Captain A. Syrmas (provider) paid A. Kourinis (receiver) 53 francs for buying 41 bars of soap.
[The purchase was made on behalf of the ship-owner company.]
(Account book 'D.S.Skyliytsis', 1896)]
- A. Kourinis handing out 41 bars of soap to A. Syrmas. (Account book 'D.S.Skyliytsis', 1896)
- the ship-owner company paying the forfeit of 40,000 francs to the local Port Authorities [On 12th December 1909, the ship-owner company (Empeirikos and others (provider)) paid a forfeit of 40,000 francs to the local Port Authorities (receiver) for damages that their ship had caused to another ship. The payment is an instance of socEXX Provision without exchange.]
(Account book 'Andriana', 1910)]

- A. Syrmas paying 50 pounds sterling to policemen
[Captain A. Syrmas (provider) paid 50 pounds sterling to policemen (receiver) to prohibit the ship's crew from leaving the ship.]
(Account book 'D.S.Skylitytsis', 1896)
- the service of policing the ship provided to A. Syrmas by policemen
(Account book 'D.S.Skylitytsis', 1896)
- the ship-owner company (provider) giving a gift of 200,000 francs to the Captain A. Syrmas
[The payment is an instance of socExx Provision, but it does not entail a business obligation.]
(Account book 'D.S.Skylitytsis', 1896)
- the payment of 1,000 francs by A. Syrmas to Foscolo Mango and Co. on 24/5/1899
[During the 3rd voyage of the ship "D.S.Skylitsis" from Constantinople to Genova, which lasted from 8th May 1899 until 2 June 1899, there was an instance of a transaction between the captain of the D. S. Skylitsis and A. Apostolaton, the latter acting as a mediator on behalf of Foscolo Mango and Co. The transaction took place on 24th May 1899, and A. Apostolaton received 1,000 francs on behalf of Foscolo Mango and Co..]
(Account book 'D.S.Skylitsis', 1900)

socExx Business Obligation (examples)

- the obligation of A. Syrmas to pay 1,000 francs to Foscolo Mango and Co.
[During the 3rd voyage of the ship "D.S.Skylitsis" from Constantinople to Genova, which lasted from 8th May 1899 until 2 June 1899, there was an instance of a transaction between the captain of the D.S. Skylitsis and A. Apostolaton, the latter acting as a mediator on behalf of Foscolo Mango and Co. The transaction took place on 24th May 1899, A. Apostolaton received 1,000 francs on behalf of Foscolo Mango and Co.. A. Syrmas's obligation was terminated by that payment.]
(Account book 'D.S.Skylitsis', 1900)

FULL REFERENCES:

- Account Book of ship Andriana, 5/6/1906-5/2/1910 Captain A.Syrmas, Book no 15.
- Account Book of ship D.S.Skylitytsis, 28/9/1895-19/10/1896 Captain A.Syrmas,Book no5
- Account Book of ship D.S.Skylitytsis, 7/19/98 1899 and 1900. Captain A.Syrmas, Book No 6

360 LRMoo

F5 Item

Subclass of: E18 Physical Thing (change to E24 Physical Human-Made Thing)

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.

An instance of F5 Item that consists of a physical object or set of objects with clear physical boundaries is also an instance of E22 Human-Made Object. An instance of F5 Item that is stored on a part of a larger physical support (such as an electronic file among others on a disc) can also be considered to be an instance of E25 Human-Made Feature.

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 (F5, E22)
- 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] (F5, E22)
- 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*]
- the physical features created on my PC's hard drive on 2021-06-10 when I clicked on the link <https://doi.org/10.26225/FDZH-X261> and downloaded from the server of the website www.cidoc-crm.org a reproduction of the electronic file named "cidoc_crm_v.7.1.1.pdf" containing the text of version 7.1.1 of the "Definition of the CIDOC Conceptual Reference Model" published April 2021 (F5, E25)

Properties: [R7](#) is materialization of (is materialized in): [F3](#) Manifestation

F30 Manifestation Creation

Subclass of: [F28](#) Expression Creation

Superclass of: F33 Reproduction Event

Scope note: This class comprises the activities of selecting, arranging and presenting one or more instances of F2 Expression on a carrier or other persistent presentation means with the purpose of communicating it to some public. It includes the specification of the presentation as to sensory impression (such as visual appearance or audio rendition).

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

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

Properties: [R24](#) created (was created through): [F3](#) Manifestation

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 an instance of F3 Manifestation with one or more instances of F2 Expression which are rendered by this instance of F3 Manifestation. The manifestation formats the expression(s) in the way they are to be presented to some public, including specifying the intended sensory impression (such as visual appearance or audio rendition). 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 notated score).

Examples: The publication identified by ISBN '2-222-00835-2' (F3) *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) *embodies* a recording of the Atrium Musicæ Ensemble's performance of a fragment of Euripides' textual and musical work entitled 'Orestes' (F2).

F35 Nomen Use Statement

R56 has related use

Domain: [F12](#) Nomen

Range: [F12](#) Nomen

Subproperty of: (none)

Shortcut of: E89 Propositional Object (1) *Pi identifies*: E1 CRM Entity *Pi is identified by*: E89 Propositional Object (2)

Quantification: (0,n:0,n)

Scope note: This property associates an instance of F12 Nomen with another instance of F12 Nomen, which co-refers to the same instance of E1 CRM Entity. In addition, the nomens may be related in some context, such as replacing former use, etc.. This property is transitive.

The property R56.1 allows for specifying the particular kind of relationship that holds between the content (the associated instances of E62 String) of the domain nomen and the range nomen, such as by being a derivation, an alternative, a lexical variant, etc. Typing the association may introduce a meaning of the inverse direction which may cause loss of transitivity.

Examples: ‘Čajkovskij, Petr Il’ič’ (F12) *is related to* ‘Пётр Ильич Чайковский’ (F12), with *has type* transliteration (E55).

‘The Lord of the Rings’ (F12) *is related to* ‘Le Seigneur des anneaux’ (F12), with *has type* original language (E55).

‘IFLA’ (F12) *is related to* ‘International Federation of Library Associations and Institutions’ (F12), with *has type* acronym.

‘Siam’ (F12) *is related to* ‘Thailand’ (F12).

‘595.7’ (F12) *is related to* ‘Insecta’ (F12). [The latter being the caption for the Dewey Decimal Classification number in the English language 23rd edition.]

Properties: R56.1 has type: [E55](#) Type

332: Properties of S10 Material Substantial (CRMsci)

[S24 Sample Splitting](#)

Subclass of: S2 Sample Taking

Scope note: This class comprises the activity of dividing an instance of S13 Sample into new instances of S13 Sample. This activity describes cases of sub-sampling where the resulting instance maintains the characteristic qualities of the original instance. Any observations of these qualities made on the new instance also apply to the original one. This class should be used to model cases of splitting a homogenous sample into multiple ones.

Examples:

- the activity of removing a part from the sample, which was originally taken from the tusk fragment GT993 by Godfrey et al. in 2000, in order to analyse it through ICP-AES analysis to reveal the composition of the original sample
[A sample from a section of the tusk fragment GT993 which was originally found in the ship-wreck of Vergulde Draeck in Western Australia was taken. This sample was homogenous (ground to fine powder). Part of the sample was then removed for elemental analysis using inductively coupled plasma

atomic emission spectrometry (ICP-AES). Another part was removed for carbon/nitrogen analysis using a LECO analyser.] (Godfrey et al., 2002)

In First Order Logic:

$$S24(x) \Rightarrow S2(x)$$

Properties:

O27 split (was source for): S13 Sample

O29 removed sub-sample (was sub-sample removed by): S13 Sample

O27 split (was source for)

The definition changed

FROM (old):

O27 split (was split by)

Domain: S24 Sample Splitting

Range: S13 Sample

Subproperty of: S2 Sample Taking: O5 removed (was removed by): S13 Sample

Quantification:

Scope note: This property associates an instance of S2 Sample Taking with an instance of S13 Sample that was removed during this activity. The resulting S13 Sample maintains the characteristic qualities of the instance of S10 Material Substantial that the sample was taken from. This supports reasoning that this sample retains/preserves the characteristic qualities of the original sample. This property should be used to model cases when a homogenous sample is split into multiple ones.

Examples:

TO (new):

O27 split (was source for)

Domain: S24 Sample Splitting

Range: S13 Sample

Subproperty of: S2 Sample Taking: O3 sampled from (was sample by): S10 Material Substantial

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

Scope note: This property associates an instance of S24 Sample Splitting with the instance of S13 Sample which is the original sample being split.

Examples:

- The subsampling activity by Godfrey et al. in 2000 (S24) *split* the homogenous sample (S13). [Part of the finely ground sample from fragment GT993 was taken to be used in ICP-AES analysis.] (Godfrey et al., 2002)

In First Order Logic:

$$O27(x,y) \Rightarrow S24(x)$$

$$O27(x,y) \Rightarrow S13(y)$$

New property: O29 removed sub-sample (was sub-sample removed by)

Domain: S24 Sample Splitting

Range: S13 Sample

Subproperty of: S2 Sample Taking. O5 removed (was removed by): S13 Sample

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

Scope note: This property associates an instance of S24 Sample Splitting with the resulting instance of S13 Sample that has been removed from the original sample. The new sample (i.e. the sub-sample) maintains the characteristic qualities of the original.

Examples:

- The subsampling activity by Godfrey et al. in 2000 (S24) *removed sub-sample* the ICP-AES sub-sample (S13). [This sub-sample was used for elemental analysis using inductively coupled plasma atomic emission spectrometry (ICP-AES) to reveal the composition of the original sample.] (Godfrey et al., 2002)

In First Order Logic:

$$O29(x,y) \Rightarrow S24(x)$$

$$O29(x,y) \Rightarrow S13(y)$$

537: How does reducing the range of P39 measured affect CRMsci?

S21 Measurement

The definition changed

FROM (old)

S21 Measurement

Subclass of: [S4](#) Observation

[E16](#) Measurement

Superclass of: [S3](#) Measurement by Sampling

Scope note: This class comprises actions measuring instances of E2 Temporal Entity or E77 Persistent Items, properties of physical things, or phenomena, states and interactions or events, that can be

determined by a systematic procedure. Primary data from measurement devices are regarded to be results of an observation process.

In First Order Logic:

$$S21(x) \supset S4(x)$$

$$S21(x) \supset E16(x)$$

Properties:

[O24](#) measured (was measured by): [S15](#) Observable Entity

[TO](#) (new)

S21 Measurement

Subclass of: [S4](#) Observation

Superclass of: [S3](#) Measurement by Sampling

[E16](#) Measurement

Scope note: This class comprises actions measuring instances of [S15](#) Observable Entity, properties of physical things, or phenomena, states and interactions or events, that can be determined by a systematic procedure. Primary data from measurement devices are regarded to be results of an observation process.

Examples:

- The magnitude measurement of the earthquake of Mexico city in 2017. (S21) [It had the magnitude 6.2 Richter] (Mindock, 2017) (<http://www.independent.co.uk/news/world/americas/mexico-earthquake-today-latest-mexico-city-magnitude-6-tremor-damage-a7963211.html>).
- The sensor measurement by IGME in 1999 which measured the landslide displacement in the area of Parnitha, Greece. (S21) (InGeoCloudS - INspiredGEOdata CLOUD Services D2.2 2012;D2.3 2013)

In First Order Logic:

$$S21(x) \supset S4(x)$$

Properties:

[O24](#) measured (was measured by): [S15](#) Observable Entity

[O16](#) observed value (value was observed by)

The definition changed

FROM (old):

O16 observed value (value was observed by)

Domain: [S4](#) Observation

Range: [E1](#) CRM Entity

Subproperty of: [E13](#) Attribute Assignment. [P141](#) assigned (was assigned by): [E1](#) CRM Entity

Superproperty of: [E16](#) Measurement. [P40](#) observed dimension (was observed in): [E54](#) Dimension (inconsistent with E21 Measurement as long as Observable Entity is not moved to CRM.)

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

Scope note: This property associates a value assigned to an entity observed by S4 Observation.

Examples:

- The surface survey at the bronze age site of Mitrou in east Lokris carried out by Cornell University in 1989 *observed value* 600 (of sherds.) (Kramer-Hajos and O'Neill , 2008).

In First Order Logic:

$$O16(x,y) \supset S4(x)$$
$$O16(x,y) \supset E1(y)$$
$$O16(x,y) \supset P141(x,y)$$

TO (new):

O16 observed value (value was observed by)

Domain: [S4](#) Observation

Range: [E1](#) CRM Entity

Subproperty of: [E13](#) Attribute Assignment. [P141](#) assigned (was assigned by): [E1](#) CRM Entity

Superproperty of: [E16](#) Measurement. [P40](#) observed dimension (was observed in): [E54](#) Dimension

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

Scope note: This property associates a value assigned to an entity observed by S4 Observation.

Examples:

- The surface survey at the bronze age site of Mitrou in east Lokris carried out by Cornell University in 1989 *observed value* 600 (of sherds.) (Kramer-Hajos and O'Neill , 2008).

In First Order Logic:

$$O16(x,y) \supset S4(x)$$
$$O16(x,y) \supset E1(y)$$
$$O16(x,y) \supset P141(x,y)$$

O24 measured (was measured by)

The definition changed

FROM (old):

O24 measured (was measured by)

Domain: [S21](#) Measurement

Range: [S15](#) Observable Entity

Subproperty of: [S4](#) Observation. [O8](#) observed (was observed by): [S15](#) Observable Entity

[E16](#) Measurement. [P39](#) measured (was measured by): [E1](#) CRM Entity

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

Scope note: This property associates an instance of S21 Measurement with the instance of S15 Observable Entity to which it applied. An instance of S15 Observable Entity may be measured more than once. Material and immaterial things and processes may be measured, e.g. the number of words in a text, or the duration of an event.

Examples:

- The sensor measurement by IGME in 1999 (S21) *measured* the landslide displacement (S15) in the area of Parnitha.(InGeoCloudS - INspiredGEOdata CLOUD Services D2.2 2012;D2.3 2013)

In First Order Logic:

$O24(x,y) \supset S21(x)$

$O24(x,y) \supset S15(y)$

$O24(x,y) \supset O8(x,y)$

$O24(x,y) \supset P39(x,y)$

TO (new):

O24 measured (was measured by)

Domain: [S21](#) Measurement

Range: [S15](#) Observable Entity

Subproperty of: [S4](#) Observation. [O8](#) observed (was observed by): [S15](#) Observable Entity

Superproperty of:[E16](#) Measurement. [P39](#) measured (was measured by): E18 Physical Thing

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

Scope note: This property associates an instance of S21 Measurement with the instance of S15 Observable Entity to which it applied. An instance of S15 Observable Entity may be measured more than once. Material and immaterial things and processes may be measured, e.g. the number of words in a text, or the duration of an event.

Examples:

- The sensor measurement by IGME in 1999 (S21) *measured* the landslide displacement (S15) in the area of Parnitha.(InGeoCloudS - INspiredGEOdata CLOUD Services D2.2 2012;D2.3 2013)

In First Order Logic:

$$O24(x,y) \supset S21(x)$$
$$O24(x,y) \supset S15(y)$$
$$O24(x,y) \supset O8(x,y)$$

O12 has dimension (is dimension of)

The definition changed

FROM (old):

O12 has dimension (is dimension of)

Domain: [S15](#) Observable Entity

Range: [E54](#) Dimension

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

Scope note: This property associates an instance of S15 Observable Entity with an instance of E54 Dimension that the observable entity has.

It offers no information about how and when an E54 Dimension was established.

Examples:

- The earthquake of Mexico city in 2017 *had dimension* magnitude 6.2 Richter (Mindock, 2017, <http://www.independent.co.uk/news/world/americas/mexico-earthquake-today-latest-mexico-city-magnitude-6-tremor-damage-a7963211.html>).
- The landslide that was activated in Parnitha in 1999 after the earthquake, *had dimension* crest length > 70 (InGeoCloudS - INspiredGEOdata CLOUD Services D2.2 2012;D2.3 2013)

In First Order Logic:

$O12(x,y) \supset S15(x)$

$O12(x,y) \supset E54(y)$

TO (new):

O12 has dimension (is dimension of)

Domain: [S15](#) Observable Entity

Range: [E54](#) Dimension

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

Scope note: This property associates an instance of S15 Observable Entity with an instance of E54 Dimension that the observable entity has.

It offers no information about how and when an E54 Dimension was established.

Examples:

- The earthquake of Mexico city in 2017 *had dimension* magnitude 6.2 Richter (Mindock, 2017, <http://www.independent.co.uk/news/world/americas/mexico-earthquake-today-latest-mexico-city-magnitude-6-tremor-damage-a7963211.html>).
- The landslide that was activated in Parnitha in 1999 after the earthquake, *had dimension* crest length > 70 (InGeoCloudS - INspiredGEOdata CLOUD Services D2.2 2012;D2.3 2013)

In First Order Logic:

$O12(x,y) \supset S15(x)$

$O12(x,y) \supset E54(y)$

$[O12(x,y) \wedge E18(x)] \Rightarrow P43(x,y)$

$[P43(x,y) \wedge E18(x)] \Rightarrow O12(x,y)$

O9 observed property type (property type was observed by)

The definition changed

FROM (old):

O9 observed property type (property type was observed by)

Domain: [S4](#) Observation

Range: [S9](#) Property Type

Subproperty of: [E1](#) CRM Entity. P2 has type: [E55](#) Type

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

Scope note: This property associates an instance of S4 Observation with the instance of S9 Property Type for which the observation provides a value or evidence, such as “concentration of nitrate” observed in the water from a particular borehole. Encoding the observed property by type, observed entity and value (properties O9, O10, O16) is a method to circumscribe the reification of the observed property by the respective instance of S4 Observation.

In an RDFS encoding, this circumscription can be transformed into an explicit representation of the observed property in terms of a formal ontology either by use of a reification construct or by the use of a Named Graph containing the observed property. The latter representation allows for more formal reasoning with the model, the former is more flexible about the kinds of observations.

Examples:

- The seismic hazard analysis and recording by EPPO in 1990 (S4), in the area of Attiki *observed* and recorded *property type* share wave velocity (S9) (InGeoCloudS - INspiredGEOdata CLOUD Services D2.2 2012;D2.3 2013)
- The Gas Chromatography analysis (S4) of the sample “mid-blue paint from the sky” *observed property type* retention time (S9). (Foister, S. 2015)

TO (new):

O9 observed property type (property type was observed by)

Domain: [S4](#) Observation

Range: [S9](#) Property Type

Subproperty of: E13 Attribute Assignment. P177 assigned property type: E55 Type

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

Scope note: This property associates an instance of S4 Observation with the instance of S9 Property Type for which the observation provides a value or evidence, such as “concentration of nitrate” observed in the water from a particular borehole. Encoding the observed property by type, observed entity and value (properties O9, O10, O16) is a method to circumscribe the reification of the observed property by the respective instance of S4 Observation.

In an RDFS encoding, this circumscription can be transformed into an explicit representation of the observed property in terms of a formal ontology either by use of a reification construct or by the use of a Named Graph containing the observed property. The latter representation allows for more formal reasoning with the model, the former is more flexible about the kinds of observations.

Examples:

- The seismic hazard analysis and recording by EPPO in 1990 (S4), in the area of Attiki *observed* and recorded *property type* share wave velocity (S9) (InGeoCloudS - INspiredGEOdata CLOUD Services D2.2 2012;D2.3 2013)
- The Gas Chromatography analysis (S4) of the sample “mid-blue paint from the sky” *observed property type* retention time (S9). (Foister, S. 2015)

In First Order Logic:

$$O9(x,y) \supset S4(x)$$
$$O9(x,y) \supset S9(y)$$
$$O9(x,y) \supset P177(x,y)$$

531: Observable Entity

Proposed definition for S4 Observation

S4 Observation

Subclass of:

Superclass of: [S21](#) Measurement

[S19](#) Encounter Event

Scope note: This class comprises the activity of gaining scientific knowledge about particular states of physical reality through empirical evidence, experiments and measurements.

We define observation in the sense of natural sciences, as a kind of human activity: at some place and within some time-span, certain physical things and their behavior and interactions are observed by human sensory impression, and often enhanced by tools and measurement devices.

Observed situations or dimensions may pertain to properties confined to a single instance of S15 Observable Entity or pertain to constellations of multiple instances and relations between them, in particular distances.

The output of the internal processes of measurement devices that do not require additional human interaction are in general regarded as part of the observation and not as additional inference.

Primary data from measurement devices are regarded in this model to be results of observation and can be interpreted as propositions believed to be true within the (known) tolerances and degree of reliability of the device.

Measurements and witnessing of events are special cases of observations. Observations result in a belief about certain propositions to hold at a time within the time-span of observation. In this model, the degree of confidence in the observed properties is regarded to be “true” by default, but could be described differently by adding a property *P3 has note* to an instance of S4 Observation.

Observations represent the transition between reality and propositions in the form of instances of a formal ontology, and can be subject to data evaluation from this point on. For instance, detecting an archaeological site on satellite images is not regarded as an instance of S4 Observation, but as an instance of S6 Data Evaluation. Rather, only the production of the images is regarded as an instance of S4 Observation.

Examples:

- The observation (S4) of the density (S9) of the X-Ray image of cupid's head from the painting “Cupid complaining to Venus” (S15) as “high density” (E1), on the 19th of March 1963 (Cranach Digital Archive, http://lucascranach.org/UK_NGL_6344).
- The observation (S4) of visible light absorption (S9) of the painting “Cupid complaining to Venus” (S15) as “having red pigment”, in 2015 (Foister, S., 2015).
- Oxxx observed situation (was observed by): Observable Situation

In First Order Logic:

$$S4(x) \supset E13(x)$$

Properties:

[O8](#) observed entity (was observed by): [S15](#) Observable Entity

Proposed definition for S15 Observable Entity

S15 Observable Entity

Subclass of: [E1](#) CRM Entity

Superclass of: [E5](#) Event

O10 Material Substantial

Scope note:

This class comprises instances of E5 Event and O10 Material Substantial, i.e. items or phenomena, such as physical things, their behavior, current state and interactions or events that can be observed by human sensory impression as well as enhanced by using tools and measurement or detection devices.

In order to be observable, instances of E5 Event must consist of some interaction or action of material substance. In some cases, the confinement of the event itself, such as a flash, a car stopping etc. marks the observation. In other cases, such as the situation of a car passing by a certain object, the event of observing itself, i.e. noticing the sight of it, a light emission, marks a situation in course taken by the car.

Examples:

- The domestic goose from Guangdong/1/1996 (H5N1) (S15) that was identified in 1996 in farmed geese in southern China as circulating highly pathogenic H5N1 (Wan, 2012) .
- The crow flight he observed over the waters of Minamkeak Lake during the summer of 2015
- The eruption of Krakatoa volcano at Indonesia in 1883 (F.A.R., Archibald and Whipple, 1888).
- The density of the cupid head area in the X-Ray of the painting “Cupid complaining to Venus” (http://lucascranach.org/UK_NGL_6344).

In First Order Logic:

$$S15(x) \supset E1(x)$$

Properties:

[O12](#) has dimension (is dimension of): [E54](#) Dimension