

53rd joint meeting of the CIDOC CRM & ISO/C46/SC4/WG9;

46th FRBR – CIDOC CRM Harmonization meeting

Participants

Christian-Emil Ore (University of Oslo, NOR); **Thanasis Velios** (University of the Arts London, GBR); **Pavlos Fafalios** (FORTH, GRC); **Maliheh Dorkhosh** (University of Tehran – Central library and documentation center, IRN); **Puyu Wang** (Shanghai Normal University, CHN); **Daria Hookk** (The State Hermitage Museum, RUS); **Robert Nasarek** (Germanic National Museum, DEU); **Eleni Tsouloucha** (FORTH, GRC); **Mélanie Roche** (National Library of France, FRA), **Philippe Michon** (Canadian Heritage Information Network, CAN); **Erin Canning** (Linked Infrastructure for Networked Cultural Scholarship, CAN); **Juliane Hamisch** (Germanic National Museum, DEU); **Pat Riva** (Concordia University, CAN); **Chrysoula Bekiari** (FORTH, GRC); **Muriel van Ruymbeke** (University of Liege, BEL); **Mark Fichtner** (Germanic National Museum, DEU); **Maja Žumer** (University of Ljubljana, SVN); **Athina Kritsotaki** (FORTH, GRC); **Elias Tzortzakakis** (FORTH, GRC); **Wolfgang Schmidle** (German Archaeological Institute, DEU); **Lida Harami** (FORTH, GRC); **Gerald Hiebel** (University of Innsbruck, AUT); **Nils Geißler** (University of Cologne/CCeH, DEU); **Øyvind Eide** (University of Cologne, DEU); **Jessica Ye** (Linked Infrastructure for Networked Cultural Scholarship, CAN); **Despoina Pratikaki** (FORTH, GRC); **Trond Aalberg** (OsloMet, NOR); **George Bruseker** (TAKIN.solutions, BGR); **Martin Doerr** (FORTH, GRC); **Stephen Stead** (Paverprime Ltd, GBR).

Contents

53 rd joint meeting of the CIDOC CRM & ISO/C46/SC4/WG9;	1
46 th FRBR – CIDOC CRM Harmonization meeting	1
Participants	1
May 10, 2022	5
Issue 574: Scope note/range clarification for E80 and P112	5
Issue 517: Does the axiom of non-reflexivity from the definition of transitivity?.....	5
[New Issue]: Supplementary documentation section on the CIDOC CRM site	5
Issue 500: Revise examples for E33 Linguistic Object.....	5
Issue 561: Scope note of P139	6
[NEW ISSUE]: define irreflexivity & asymmetry.....	6
Issue 554: Examples for E4 Period	6
Issue 576: About “entity of type”	7
Issue 484: 7.0 preparation - missing examples.....	8
Issue 571: cardinality constraints for typed properties.....	8
Issue 556: Content of the minimal vocabularies for restricting the CIDOC CRM Types	8
Issue 531: Observable Entity.....	9
Issue 583: How to assign dimensions to relative positions/ distances in space-time and other relations between observable entities	9
[NEW ISSUE]: How to specify possible observable situations in the future	10
Issue 388: Reference to the measurements of position of things.....	10
Issue 582: What counts as an instance of E79 Part Addition.....	10
Issue 476: Pxxx represents entity of type	11
Issue 461: Attribute Assignment of .1 properties.....	11
Issue 429: P72 has language	11
Issue 490: How to model a file.....	11
Issue 536: Properties for assigning dimensions to places and temporal entities.....	12
Issue 579: how to model the focus or view of an observation.....	12
Issue 492: Spatiotemporal formalization about the presence of parts.....	13
Issue 541: Small edits checklist	13
Issue 553: Equality and Respect Statement.....	14
Issue 494: Scope note guidelines	14
Issue 493: Example templates	15

Issue 384: Template for family models.....	15
Issue 523: didactic material for the properties of E93 Presence.....	15
May 11, 2022	15
Issue 588: Common policy/method for implementing the .1 properties of base and extensions in rdf	15
Issue 566: other serializations useful to autogenerate	17
Issue 565: Defining rules for automatically generating a JSON-LD context.....	17
[NEW ISSUE]: Editorial Statuses of the CRMbase and family models.....	18
Issue 552: Add URLs to the official documentation.....	18
Issue 585: Example for A7 Embedding.....	19
Issue 447: A7 Embedding as a physical-like entity.....	19
Issue 584: AP32 discarded into –scope note refinement	19
Issue 478: Quantification of AP2 discarded into (was discarded into)	20
Issue 409: CRM archeo generalization of the properties AP12 confines and AP11 has physical relation.....	20
Issue 562: Automatically produce graphs from the XML implementation of CIDOC CRM.....	20
Issue 534: Representing .1 properties of full paths in shortcut properties	21
Issue 526: Named Graph Guidelines.....	21
Issue 564: Tools and formats relevant for the translation work (technical means of the exchange)	21
Issue 552: Add URLs to the official documentation (reprise)	21
Issue 587: Principles for Modelling Ontologies: A Short Reference Guide [introduction and examples for didactic purposes]	22
[NEW ISSUE]: Class/Property labels are not definitions	24
[NEW ISSUE]: publish research questions on the website.....	24
Issue 351: Modelling Principles.....	24
Issue 538: Documenting the changes in the CRM	25
Issue 481: scope notes for socP21 and socP22.....	25
May 12, 2022	25
Historical artefacts as tokens. A case study using blockchain technologies.....	25
Issue 322: Reification of E13, S4 and I1	26
Issue 525: Add graphics to the CRMsci definition	26
[NEW ISSUE]: determine the interface between CRMsci and CRMinf	26
Issue 569: descriptive text for CRMsci diagrams	26
Issue 332: Properties of S10 Material Substantial of CRMsci	27

Issue 527: Modelling provenance of Intangible Heritage	27
Issue 547: CRMdig update	27
Issue 360: LRMoo	27
Issue 590: Review of properties.....	28
Issue 593: E-vote: LRMoo, deprecation of R10 has member (vetoed)	28
Issue 594: semantically replacing Recording Event and Externalization Event	28
Issue 577: Official Namespaces for CRM Extensions	29
May 13, 2022	29
Issue 557: Which family model should classes (i) Provision and (ii) Business Obligation appear under?	29
Issue 586: How to call the model for business transactions?.....	30
CRM Sig meetings in the post-covid era	30
APPENDIX	32
1. List of abbreviated names.....	32
2. Model Changes	33
Issue 583 –HW by MD.....	33
Issue 388 –HW by MD.....	35
Issue 582 –HW by EC.....	36
Issue 490 –Scope note for Pxxx has representative content (HW by MD)	37

May 10, 2022

Issue 574: Scope note/range clarification for E80 and P112

DECISION: The Sig formally closed issue 574, on the grounds of all the points raised in it having been addressed –namely:

- P112 was redrafted to reflect the change in its range to E18
- FOL inference of P112 was changed
- An example involving a physical thing that got diminished as a result of a part removal was added for P112
- E80: the range of the referred property P112 was changed to E18
- E80: an example of part removal involving a natural object (i.e. not E24, but E18 instead) was added
- P110 was updated to reflect the change in its range to E18
- FOL inference for P110 was changed
- An example involving a physical thing that got augmented as a result of a part removal was added for P110
- E79: range of referred property P110 was edited (points to E18)
- E79: an example of part addition involving a natural object (i.e. not E24, but E18 instead) was added
- A new issue started where to revise the definition of E79

All the changes have informed CIDOC CRM v7.1.2 and v7.2.1.

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

DECISION: The Sig formally closed issue 517, on the grounds of it having been resolved by the e-vote that CEO called (full definition of 32 properties that take the same class as domain and range). The CIDOC CRM (v7.1.2, and v7.2.1) has been updated as suggested by the outcome of the evote.

The Sig decided to start a new issue re. where on the site should the table of properties whose domain and range are the same class appear under.

[New Issue]: Supplementary documentation section on the CIDOC CRM site

The Sig has decided to start a new issue re. creating a space on the CIDOC CRM website where to add supplementary documentation for the model –like the table of properties that take the same class as domain and range, the templates for examples, the templates for the definition documents of family models, guidelines for drafting scope-notes, a quick overview of the properties of properties, the small errors checklist etc.

Some place under Resources.

HW: for the FORTH team to implement that.

Issue 500: Revise examples for E33 Linguistic Object

DECISION: The Sig formally closed issue 500, on the grounds of E33 Linguistic Object already having enough examples (including one with recorded dialectal data).

The Sig also edited the last example for E33. The change is incorporated in CIDOC CRM v7.1.2 and v7.2.1.

FROM (old)

the free dialog in the local dialect recorded in 1958, Telemark, Norway stored on tape or.7- 89.s1 (00.15:46-00:34), The Language Collection at the University Library in Bergen, Norway (as by 2020).

TO (new)

the free dialog in the local dialect recorded in 1958, Telemark, Norway stored on tape or.7- 89.s1 (00.15:46-00:34), The Language Collection at the University Library in Bergen, Norway (verified on 2020)

Issue 561: Scope note of P139

Discussion: Irreflexivity and asymmetry are not defined in the document (under terminology). This is a problem, because irreflexivity and non-reflexivity stand for different things, same holds for asymmetry and non-symmetry (no instance of a property is reflexive/symmetric vs. some instances of the property are reflexive/symmetric and some are not).

Proposal: Start a [new issue](#) where to discuss the definitions for irreflexivity and asymmetry that should appear in the terminology section of the definition document. To inform v7.1.2 and v7.2.1 alike. (If we can produce the definitions in time for ISO).

Everyone in agreement.

DECISION: The Sig formally closed issue 561. The scope note and FOL of P139 has alternative form was updated on the definition document for both v7.1.2 and v7.2.1.

Start a new issue where to define irreflexivity and asymmetry.

[NEW ISSUE]: define irreflexivity & asymmetry

Provide definitions for irreflexivity and asymmetry in the definition document for both b7.1.2 and v7.2.1. Position in the document: Terminology table.

HW: CEO

Issue 554: Examples for E4 Period

The Sig went through the examples by DH for E53 Place, reformulated for E4 Period. They had been discussed again during the 51st CIDOC CRM Sig meeting but had not been accepted at the time. The examples in question can be found below:

1. The Capital of Russia (E4) [the capital of Russia in the sense of an administrative unit moved in historical times from Moscow to St Petersburg and then back to Moscow. This exemplifies an administrative unit changing place over time without temporal discontinuity]
2. The settling activity of the community of Helsinki (a.k.a. Helsingfors) (E7) [the original settlement called Helsinki was located in the area of the modern airport. The community moved later to settle on the coast. This exemplifies a continued activity changing place over time without temporal discontinuity]
3. Bronze Age (E4) [Bronze Age, in the sense of technological adoption, spread over disjoint areas including islands such as the British Isles without temporal discontinuity]
4. Japan, the state (E4) [In 2021, the Japanese state as a political unit comprised in 6852 islands extending along the Pacific coast of Asia]

Discussion:

The point of examples is to demonstrate how an instance of E7 Activity or E4 Period can be located in different places over time. No.3 and No.4 succeed in doing that. No.2 is easier to understand. No.1 is harder to understand.

No.4: illustrates how spatial contiguity is not necessary to define an E4 Period – the coherence of the phenomena constituting an instance of E4 Period is critical for defining it.

No.2 demonstrates the relation between an activity and a feature that it transformed and defined (qua place). If no agreement is reached on the usefulness of the examples, then a new issue should be formulated to introduce concepts in the model, by means of which to render that particular relation (f.i., a settling activity vs. the ensuing settlement).

No.1: The objections previously raised were about the phrasing of the example. RS had suggested to reformulate as “the administrative Capital of Russia”, in the sense that the continuity was about the administration, not the place as such”. We can keep it however on the grounds of some functions were specifically executed in Moscow, even though the administration had moved to St. Petersburg (coronation of the Czar). Another example would be Den Haag vs Amsterdam (where the administration is shared between the two cities) but it does not involve moving the administration.

No.3: a reference to the technological innovations relevant for the Bronze Age added to the explanation.

Decision:

The examples were voted in; changes were incorporated in CIDOC CRM v7.1.2 and v7.2.1.

Issue closed.

[Issue 576: About “entity of type”](#)

The Sig discussed the proposal by GB to add properties specifying the real-world thing the proposition is about (be it an event, a place, a person or organization).

Discussion points:

A violation of a principle because it conflates typing the thing that it is about with typing the property. The specializations should be about the type of the range instead.

TV and CM are working towards defining a meta-types model (that refers to negative properties too) in a systematic approach. The generic solution should apply to this particular case as well (particular types of unidentified events).

What GB is suggesting can be implemented in OWL, the solution that TV & CM are working on will allow representing such statements (where one can only express categorical knowledge) in RDF/S too. TV is waiting for the review of the paper to come through, and if the solution provided therein (an RDF/S file that allows this sort of statement to be made with new properties) is considered viable, then the paper can serve as a starting point for a guideline.

MD in favor of treating these cases in an overall way, which would further allow the Sig to deprecate properties rather than continue to add new ones.

Proposal:

Close the issue, because (i) the type of property should not cause ambiguity wrt the type of the range. Also, (ii) we expect a new issue that proposes an algorithmic solution to deal with the derivation of categorical properties and negative properties, rather than creating individual properties in an ad hoc manner.

Nb. The issue can be raised anew if someone produces a more detailed HW. It is more of an issue for the Principles document.

We need to identify the Principle violated

Decision: Proposal accepted.

[Issue 484: 7.0 preparation - missing examples](#)

The Sig revised the examples for **P176 starts before the start of (started after the start of)** (HW by CEO) and accepted them. They have been incorporated in CIDOC CRM v7.1.2 and v7.2.1.

- The reign of King Harold II (E4) *starts before the start of* the Battle of Hastings (E7) (Wikipedia 2022)
- The life of Attila "the Hun" (E4) *starts before the start of* the Battle of the Catalaunian Plains [June 20, 451 AD] (Wikipedia 2022)

The references need to be added to the bibliography list

Bosman (2004), which was previously not cited neither on the 2nd example of P174 starts before the end of (ends after the start of) nor on the Bibliography list at the end, to be added to the definition document.

Issue closed

[Issue 571: cardinality constraints for typed properties](#)

The Sig discussed where on the site to publish the overview of .1 properties. The proposal put forth was to add it to the list of things that will appear under "Supplementary documentation" (within Resources).

Furthermore, the list should be added to the CRM document, in a tabular form, right after the **Table of Properties**. Not in an appendix. It should be visible.

Everyone in agreement. Change implemented in CIDOC CRM v7.1.2 and v7.2.1. Questions re how to structure the table will be dealt by the editorial group.

Issue closed

[Issue 556: Content of the minimal vocabularies for restricting the CIDOC CRM Types](#)

The Sig returned to Issue 556 to establish what the next steps are and assign HW, since 496 has been resolved.

So far:

- TV has proposed a list of classes of the CRM, for which recommending a type would be useful.
- MD has suggested providing recommendations for (a) the types mentioned in properties the range of which is an instance of E55 Type (or a specialization thereof), and by extension all the .1 properties, (b) the types referred to (or implied) in the scope notes of classes and properties.

Proposal:

- a) closely-read the scope notes of CRM classes/properties in order to determine what ontological distinctions can be implemented through the use of types,
- b) go through the deprecated classes to determine whether their content and labels match classifications implemented in other known vocabularies (to check for the next meeting),
- c) identify domain-specific vocabularies and standardized vocabularies that are relevant for the CRM.

Everyone in agreement, **HW assigned to:**

TV: check the classes he has identified for type-recommendations

WS: check types of E4 Period (also settlements qua E7 Activity) and with vocabs from the DAI.

MD: check the deprecated classes

RN: skos vocabularies that they work with at the NFDI

To be discussed again in the next Sig meeting.

[Issue 531: Observable Entity](#)

The Sig closed the issue on the grounds of having enough examples for S4 Observation already having two examples.

[Issue 583: How to assign dimensions to relative positions/ distances in space-time and other relations between observable entities](#)

MD presented his HW (details in the [appendix](#)):

An effort to theorize about dimensions of spatiotemporal distances, understood as distances btw instances of S15 Observable Entity observed through an Observable Situation (the relation can be seen as one of parthood).

What can be observed is: (a) static properties of a Physical Thing or Material Substantial and events; (b) spatiotemporally bounded situations involving observable entities (locations of things present in events during the time of observation); (c) dynamic processes and sub-situations within them.

The parthood can be expressed through P12 occurred in the presence of, the E93 Presence construct (and properties), location etc.

Observable Situation may be described by a Proposition Set, but restrictions need be implemented.

Esp. for observable situations in the future: future constraints can be cast in terms of describing an observable situation as a proposition set, which means that the situation materializes when the condition expressed by the proposition set is met/satisfied.

Proposal:

- (1) parthood of physical things involved in an observation is expressed through: P12 occurred in the presence of, the E93 Presence construct (and properties: P164, P167, P195), location etc.
- (2) introduction of Sxxx Spatial Distance (IsA Sxxx Observable Situation): Properties
 - a. Oxxx is distance between: S15 Observable Entity (cardinality constraint: a relation between at least two instances of S15)

- b. Oxxx has dimension: E54 Dimension
- (3) Observable Situation generalizes over Observations made for a single property. A stepping-stone towards measuring positions and issue 388.
- (4) Continue the HW of identifying properties that

[NEW ISSUE]: [How to specify possible observable situations in the future](#)

Following discussion of issue 583 at the 53rd SIG meeting, it was clarified that Observable Entities as subclass of E93 Presence can only be placed in historical time. A similar construct of defining the constraints of future possible Observable Entities needs to be discussed in a new issue. This will also need to take into account the CRMact model.

[Issue 388: Reference to the measurements of position of things](#)

HW by MD –Introduction of new class Sxxxx Position Measurement (IsA S4 Observation). Proposal for a new property (*Oxx observed situation*) to connect it with Sxxx Observable Situation. In due course O8, O9, O16 would be replaced by the new property *Oxx observed situation*.

Proposed definition of Sxxx Position Measurement in the [appendix](#)

- observation of measurements of angles and distances that define the declarative space that overlaps with the presence of the thing I measured the position of, and this generalizes as observing an observable situation.

Discussion:

The difference of E16 Measurement and Sxxx Position Measurement is that E16 measures only one thing, Sxxx Position Measurement does not measure the property of a single thing, nor the positions of multiple things but distances.

GH has many data in support of this modelling construct. It was not incorporated in CRMgeo because the intention was to have it in CRMsci from the beginning. CRMgeo defines the output of the process, not the process itself.

Decision: The scope note of Sxxx Position Measurement to be paired with a diagram that illustrates how it should be used.

HW: TV, MD & GH to draw a diagram representing that uses this modelling construct to illustrate how the measurement of a position with respect to a reference system can only be adequately described like that, and where CRM fails unless this construct is admitted. F.i. an instance of E54 Dimension measured through an E16 Measurement is one thing, the position is not a dimension to be measured –it is a distance. That will be provided in an example.

[Issue 582: What counts as an instance of E79 Part Addition](#)

EC proposed to reformulate the scope note of E79 Part Addition as follows:

1. Add sentence: “Both the E18 Physical Thing being augmented and the E18 Physical Thing that is being added are treated as separate identifiable wholes prior to the instance of E79 Part Addition.”

This sentence is inserted as the second sentence in the second paragraph, effectively replacing the sentence being removed in edit (2).

2. Remove sentence: “Objects to which parts are added are, by definition, human-made, since the addition of a part implies a human activity.” as well as the words “human-made” from the following sentence.

Decision:

No objections to their proposal, changes accepted and implemented in CIDOC CRM v7.1.2 and v7.2.1.

Details in the [appendix](#).

[Issue 476: Pxxx represents entity of type](#)

The Sig decided to postpone this issue, on the grounds that it may result in infinitely multiplying the typed properties in the CRM. TV and CM are working to achieve that through a systematic solution (also negative properties). The property may end up being deprecated in the end.

There are other typed properties in the CRM that we might need to reconsider after a more general solution has been provided.

[Issue 461: Attribute Assignment of .1 properties](#)

This is an old HW assigned to RS & MD that they need to be reminded of. It is about adding a qualifier to an attribute assignment. Postpone the issue, until HW has been turned in.

HW: MD, RS

[Issue 429: P72 has language](#)

TV walked the Sig through the HW that he, GB, and PR worked on: a definition of a Pxxx has ability property. The discussion had started from documenting someone’s ability to speak/write using a particular language, and then drifted to documenting general abilities particular to individual persons.

Discussion:

- Skill/ability is an opaque concept, we need to decide on what counts as evidence for a particular skill.
- more explanation needed re how these properties differ from typing instances of E21 Person
- some properties central to a person (native language) cannot be documented through events. Others can –attested knowledge of a second language etc.

Decision:

HW: GB, PR, TV, MR: to provide examples for this relevant for CRM (from documentation data). Bibliographic data could be relevant (“which languages could author such-and-such write in?”).

[Issue 490: How to model a file](#)

CEO walked the Sig through the issue:

- The solution to GB’s original question is as follows: The abstract content of a file is an instance of E73 Information Object. The actual content of the file (sequence of symbols) can be represented by an instance of E62 String. The link to the abstract content could be given through a *has semantic encoding* property.

- MD had proposed introducing a property (*Pxxx has representative content*) to connect two instances of E73 Information Object. The scope note was discussed at length during the 52nd Sig meeting, it was not very clear and had not been accepted then.
The property proposed by MD *Pxxx has representative content* (see [appendix](#)) can mark an equivalence relation btw different instances of E73.
This forms an additional solution, not what GB was asking.
- The new property expresses an equivalence relation between instances of E73 Information Object that are also instances of D1 Digital Object in CRMdig.

HW: MD, TV, CEO

- to redraft the text of the scope note & provide examples that are not exclusively European-centric.
- practical issue (question by GB), namely: How do I connect a file with a semantic network. Add something to the rdf guidelines. Distinguish among a file as a physical copy held by a digital library and referring to “my file” by a URI.

Issue 536: Properties for assigning dimensions to places and temporal entities

MD walked the Sig through the issue and proposed to only define a *Pxxx has dimension* [D: E53 Place, R: E54 Dimension] bearing in mind that the instance of E53 Place is an approximation of a real place. The definition must express that the dimension is derived from the mathematical substance of places.

Nb. Distances between features that do not coexist in time, or did not exist at the time of determining the distance, and other geometric “multi-place” properties are mathematical constructs.

Before deciding with *Pxx has dimension* for places, we should see how places and distances btw them are defined in the OGC standards, which should be interfaced by CRMbase and CRMgeo.

Similarly, Spacetime Volumes need a mathematical dimension, not an observable one.

Time-spans do have only one kind of dimension: the duration, which already exists in the model –see properties of E52 Time-Span.

Decision:

Proceed as proposed, GH to check OGC for the definition of places/distances and produce a HW for the next meeting. DH to collaborate.

The STVs can be dealt with after Place has been determined.

HW: GH & DH.

Issue 579: how to model the focus or view of an observation

MD gave some background for the issue: it refers to the event of taking a view-point that should be used to define the position of someone taking a picture or photograph. It adds to the scope of the observation theory discussed in 583, which it depends on.

Issue 492: Spatiotemporal formalization about the presence of parts

MD gave some background for the issue: The theory of mereology developed by the team of N.Guarino, according to which the physical extent of the whole includes the physical extent of its parts, informed the construct of E93 Presence.

Decision: go through the properties identified as having an added spatiotemporal formalization (P8, P12, P110, P111, P112, P113) and formulate axioms of parthood in FOL.

HW: WS, (MD)

Issue 541: Small edits checklist

PM showed the small edits checklist. He explained what the fields on the checklist stand for and how they should be filled in. The spreadsheet in its “current” form –when presented at the 53rd Sig meeting – can be found [here](#).

Nb. Since the spreadsheet is difficult to maintain, EC has created a [google form](#), the answers to which will inform the spreadsheet –users will not need to worry about formatting etc.

EC showed the form that informs the small edits checklist. The “Language” column has been removed, in the sense that the google form could be duplicated for crm translations.

Discussion points:

- some of the fields are repetitive (discouraging to use)
- follow-up email confirmation
- extend the checklist beyond CRMbase. Single form for base and family models or different form per model? Maintaining a separate form per extension can be difficult).
- referenced versions: mainly 7.1.2 (the one to be submitted to ISO) and 7.2.1.
 - Nb. re. family models: only the maintained versions for family will be listed

Proposal: To slightly edit the google form (cover all extensions), keep number of fields at an absolute minimum, explicitly list CRMbase v7.1.2 and 7.2.1 –and “currently” maintained versions of family models – and set up a follow-up email. Discuss where to place it (so people can use it).

The list should be updated in a monthly basis.

Decision:

- Establish a cut-off point beyond which v7.1.2 will no longer be edited (at which point it will be removed from the checklist)
HW: EC & PM to edit the google form as suggested.
- Re. the position of the document on the site (“supplementary material”) –see [new issue](#) started.
HW for the team at FORTH to propose a structure and implement it. The list should be updated in a monthly basis.

Overall discussion re versioning of the CRMbase:

v7.1.2 should start to be translated into the ISO format. In that sense, there is a small margin to further edit it. The decisions made throughout the 53rd Sig meeting should also be included in the version to be submitted to ISO. Once this has been done, typos found in v7.1.2 should be corrected in v7.2.1.

Issue 553: Equality and Respect Statement

MD gave some background on the issue, namely that the CRM is not prescriptive in what counts as a cultural heritage item, but it offers ways to document them.

The text drafted by MD & DO (shared through the relates to the work of the Bias WG: the document was motivated by the discussions within the Bias WG and the intention of producing such a document was to register that the CRM must be kept neutral with respect to various sources of bias (gender, religion, culture, race, etc).

The point of the document is not to describe everything as if it were equal, but that all things (irrespective of origin etc) are equally respected.

Discussion points:

- There has not been enough discourse and debate around this statement to accept it as such.
- The text is practically impossible to disagree with content-wise, however the process by means of which it was produced, did not involve the active participation and engagement of a larger community (that is not centered around Crete or Europe).
- The statement is considered as a quick response to potential criticism (that the model is informed by practices of museums that evoke a colonial past –there is an ongoing discourse at CIDOC with organizations from S.America and Polynesia that the Sig could benefit from).
- Instead of producing a verbose statement, we could simply state that “The CIDOC CRM Sig is open to criticism”, while we continue to look for constructs that project biases in the model with the aim of revising them. Engaging with external organizations might be a place to start with. Worlding Public Cultures, and the Bias WG (see [Issue 530](#)) are such candidates.
- On the other hand, the Sig is as inclusive as it can be –anyone can join, and their point of view is by default considered valid and discussed. Being adopted as an official standard in China, and the ongoing work in Iran means that the user-base of the CRM is expanding and it becomes de facto more inclusive.

Proposal: The discourse in the text by MD & DO should feed into the work of the Bias WG.

Everyone in agreement

Decision: proceed as proposed.

Issue closed

Issue 494: Scope note guidelines

MD read through the scope-note guidelines [document](#). It has been well-received by the Sig.

Proposal: Implement necessary editing (accept edits on suggest mode by EC, TV, PR), add examples of scope notes that are elaborated with this guideline in mind, and revisit the document in the next meeting

Everyone in agreement

Decision: Proceed as proposed. The document to be added to the CIDOC repo (in principle, all documents that are collaboratively edited should be put in the CIDOC repo). Once the document has

been finalized, it will appear in the “Supplementary Material” section (under Resources) of the CRM website.

HW: must be turned in by the end of August -in time for the next Sig meeting.

- EC to proofread (accept changes and make sure that the text reads nice)
- MD & CEO to provide with examples of scope notes adhering to said guidelines (E4 Period, properties that motivated this line of work)
- WS will put the guidelines to the test (use them in producing definitions)

Issue 493: Example templates

The templates have been produced and accepted (e-vote June 2021). What remains to be done is decide where they will be made publicly available –so that people can use them.

Proposal: The documents ([.docx](#), [.odt](#)) to appear in the “Supplementary Material” section (under Resources) of the CRM website. Keep the document in the CIDOC Repo as well.

Decision: proceed as proposed -check in the document on the CIDOC repo.

Issue 384: Template for family models

The document has been accepted by evote (June 2021). What remains to be done is decide where it will appear on the site.

Decision: The [document](#) to appear in the “Supplementary Material” section (under Resources) of the CRM website. Keep the document in the CIDOC Repo as well.

Issue 523: didactic material for the properties of E93 Presence

MD will take up this HW –using the construct of E93 Presence and its properties.

May 11, 2022

Issue 588: Common policy/method for implementing the .1 properties of base and extensions in rdf

PF walked the Sig through the current state of the issue -2 rdfs files generated per published CRMbase model (one for the ontology, one for the Property Classes); plus the following subtopics raised by PM:

1. List the .1 properties of the CRM in the specification document

This particular point has been addressed (and resolved) by [Issue 571](#): a list of all the .1 properties will be added in a tabular form under current table 4 (properties table). Links from that table to the .1 property definition in the document.

Proposal: add scope notes for .1 properties –not for v7.1.2 because there is no time before it is submitted to ISO but for v7.2.1 and on it is definitely something to consider

It is also relevant for [Issue 556](#)

2. Proposal to merge the 2 rdfs files (ontology & pc module); apply this policy in extensions too

Objections to that on the grounds that

- it is trivial to implement the .1 properties in a different file, whereas incorporating them to the ontology file would mean that they need to be used.
- if one wants to extend the PC module for an application, they should not have to extend the core model as well
- there are other ways to implement .1 properties, it doesn't have to be through reification.

Decision: The relation between the CIDOC CRM and the PC module (rdfs implementation of the .1 properties) should be expressed in a comment in the CRMbase file to minimize confusion

HW: PF to write the statement in the ontology file.

3. Provide scope notes for all PC constructs (using 'rdfs:comment')

Proposal: since PCxxx is the same as Pxxx from the point of view of ontology, the scope note of PCxxx could consist of a statement along the lines of "this is the materialization of Pxxx to implement rdf reification. The property means (repeat the scope note of Pxxx)"

HW: PF to prepare a draft statement to be reviewed by the Sig

4. Provide implementation guidelines (generate rdf triples using PCs; run SPARQL queries)

Two options available:

- (a) Always use the property (e.g., 'P14 carried out by') together with its PC class ('PC14_carried_out_by') E.g.:

DATASET EXAMPLE

```
:painting_sistine_chapel a crm:E7_Activity ;
    crm:P14_carried_out_by :Buonaroti .
:Buonaroti a crm:E39_Actor .
:instanceOfPC14 a crm:PC14_carried_out_by ;
    crm:P01_has_domain :painting_sistine_chapel ;
    crm:P02_has_range :Buonaroti ;
    crm:P14.1_in_the_role_of :master_craftsman .
```

QUERY EXAMPLE: Requesting all activities, together with their actors and the role of each actor

```
SELECT ?activity ?actor ?role WHERE {
    ?activity a crm:E7_Activity ;
        crm:P14_carried_out_by ?actor .
    OPTIONAL {
        ?x a crm:PC14_carried_out_by ;
            crm:P01_has_domain ?activity ;
            crm:P02_has_range ?actor ;
            crm:P14.1_in_the_role_of ?role } }
```

- (b) Use the PC class without using the property

DATASET EXAMPLE

```
:painting_sistine_chapel a crm:E7_Activity .
    crm:P14_carried_out_by :Buonaroti .
:Buonaroti a crm:E39_Actor .
```



```

:instanceOfPC14 a crm:PC14_carried_out_by ;
    crm:P01_has_domain :painting_sistine_chapel ;
    crm:P02_has_range :Buonaroti ;
    crm:P14.1_in_the_role_of :master_craftsman .

```

QUERY EXAMPLE: Requesting all activities, together with their actors and the role of each actor

```

SELECT ?activity ?actor ?role WHERE {
  ?x a crm:PC14_carried_out_by ;
    crm:P01_has_domain ?activity ;
    crm:P02_has_range ?actor .
  OPTIONAL {
    ?x crm:P14.1_in_the_role_of ?role } }
// the query makes no use of 'crm:P14_carried_out_by'

```

Discussion:

- (b) problematic, in the sense that neither the dataset nor the query make use of P14, so one cannot exploit sub/super property information, make reasoning, etc
- (a) unmanageable, in the sense that it requires users to double the effort. It should fall on the users to query for both P01-PCxxx-P02 and Pxx.
- Union SPARQL query (E39 Actor in the range of P14 displayed along with the E39 Actor in the range of P02 has range) as a **3rd scenario** (to be included in the statement)
- Given comments above: resolve this by drafting a recommendation document that lays out the two approaches –namely: if data generation process allows case (a) then go for it, if not, the recommendation is to use case (b) but query for both Pxxx and PCxxx. Also include 3rd scenario in the statement.

HW: PF detailed descriptions (and draft a query for case 3).

The other issues addressed in PMs response are to be discussed at a later stage.

Another point raised was the directionality of PC properties (forward going vs. inverse form).

Issue 566: [other serializations useful to autogenerate](#)

PF presented the Trig file that he and ETz created (available under Versions of the [CIDOC-CRM](#), under [more](#) (for published versions), and [other encodings](#)).

Proposal to formally close the issue. Everyone in agreement.

Issue closed.

Issue 565: [Defining rules for automatically generating a JSON-LD context](#)

PF showed the JSON-LD file for [v7.1.1](#) and where it can be accessed from (separate file per published version). There is an unversioned URI pointing to the [last published community version](#).

Discussion points:

- The labels on the versions should be reconsidered, the unversioned URIs point to the last published community version (for now v7.1.1). V7.2 is also a published version; however, it does not serve as “community standard”, and as such versionless URIs do not point to it (it doesn’t have an rdfs implementation or other encodings at the moment). It comes however with some

errors, that have also transferred to v7.2.1 (and have been inherited from version 7.1, so they are also found in v7.1.1 & 7.1.2)

- Despite E4 Period being a subclass of E92 Spacetime Volume:
 - P161 has spatial projection (is spatial projection) [D:E92 Spacetime Volume, R: E53 Place] had been listed as a subproperty of P7 took place at (witnessed) [D:E4 Period, R: E53 Place]
 - P7 took place at (witnessed) [D:E4 Period, R: E53 Place] had been listed as a superproperty of P161 has spatial projection (is spatial projection) [D:E92 Spacetime Volume, R: E53 Place]
- This is a typo and needs to be edited (v7.1.2 and v7.2.1)

Decision: Close the issue, edit the super- vs. sub-property relation btw P7 & P161 in both currently maintained versions, start a new issue re the labels for version-status.

[NEW ISSUE]: Editorial Statuses of the CRMbase and family models

Background: The labels for Document Type and Editorial Status are far from self-explanatory. GB had made a proposal to simplify them for Issue 310. The categories proposed and the guideline he had proposed made sense and were supposed to be put to an e-vote following some minor editing. Subsequently, the Sig decided to merge the issue with 354 (which dealt with the overall workflow in proposing alterations to the model and/or implementation) –October 2020. Since then, no progress has been made, if anything the editorial status component of the issue got completely out of scope.

What motivated addressing the issue again was the fact that v7.2 appears as a Published Version, but does not come with an rdfls file or any other encoding.

- V7.2 is superseded by v7.1.2 and v7.2.1 (as indicated by the announcement date).
- “Official versions” are the finalized versions that are submitted to ISO, “Published versions” are stable versions that can be used for implementations.
- The “Editorial Status” label is redundant and the overall statuses need to be reexamined.
 - **Proposal:** Official, Published (verified), Published (in verification), Current (i.e., currently maintained), Draft (mainly for proposed models <new extensions that have not been admitted as CRM compatible extensions yet> and for non-stable versions of the CRM.
 - **Published (in verification):** applies to v7.2 and above at the time of the meeting
 - Consider issues [310](#), [354](#) for drafting commonsensical labels.
HW: team at FORTH to propose something, and correct the rdfls for v7.1.1 (relation btw P7 and P161)

Issue 552: Add URLs to the official documentation

Hotlinks from the .pdf to the supported online representations, verify official URIs

Discussion points:

Arguments in favor

- a URI is an official name for the thing it describes, it shouldn't change in principle –if it is placed in the specification document (not as a hotlink, but as a separate section in the definitions), then it would be easy to edit/delete them if they change

- URIs could be added to the supplementary files, not the specification document. If the URI policy changes, it would entail having to update just the supplementary material, NOT the entire specification document –but on the other hand, the rdfs serialization is where the URIs get published
- it is possible to use versioned URIs for all versions of the standard, that redirect to the html page of that version. There are no implementation issues there (f.i., E59 Primitive Value is represented therein).

Arguments against

- adding URIs to the specification document might not be such a good idea –they are part of a particular technological solution that is currently available. The standard need not point to that particular implementation.
- having versionless URIs in the pdf versions of the specification document means that the thing they point to is to the “current” –i.e., last published –version (in all likelihood not the one that the .pdf stands for). No use to that.
- historical versions of the specification document could have links to the URIs that were relevant at the time of their implementation. Maybe add a comment pointing to the current (updated) version of the implementation.

Return to the [issue](#) later on.

[Issue 585: Example for A7 Embedding](#)

Discuss the example “The calcified layers of fine ash covering body x during the eruption of Mount Vesuvius in AD79. (tentative)” that raised some objections in the 52nd sig meeting.

CEO claimed that the example is interesting in the sense that the body that was enclosed in the ash layer disintegrated and calcified in time. It still is embedded –the embedding consists of the geometrical feature around the find. AF & GH in agreement that the example should make it into CRMarchaeo.

Decision: add the example to the list.

Issue closed

[Issue 447: A7 Embedding as a physical-like entity](#)

Decision: The Sig decided to formally close the issue on the grounds of there being nothing left to do (A7 Embedding and its properties were updated to reflect its feature-like nature).

Issue closed

[Issue 584: AP32 discarded into –scope note refinement¹](#)

CEO walked the Sig through the current state of the issue:

- AP29 discarded into: that identifier is already taken –next available number is AP32.
- considerations re. its quantification that is set to “many-to-many”. The reasoning is as follows:

¹ The issue was formerly called AP29 discarded into, referencing the ID of the property. However, the property had been given an existing numeric identifier by mistake.

- **FIRST PART:** the same instance of A1 Excavation Processing Unit may discard matter into multiple heaps, unless there is a clearly establishing criterion of close correspondence between each A1 and the heap in which the material extracted from it is discarded. However, this criterion is not always followed, therefore we opt for the broader case.
- **SECOND PART:** the material produced during an A1 Excavation Processing Unit can be discarded into any heap, but also simply thrown away without any order or exported to be deposited elsewhere, thereby breaking any close correspondence between the excavation and the deposit.
- Wrt. the necessity of adding a clause in the scope note to explain the quantification: is it necessary only for this case or should there be similar explanations for all property quantifications?

Decision:

- change the numeric ID of the property to AP32 discarded into (was discarded by)
- no objections to the quantification of the property
- draft a statement for this particular instance –whether explanations are offered for something in a scope note is solely dependent it being self-explanatory or not.
HW: CEO, AF, GH to update the scope note based on the text expressing the reasoning that supports setting the quantification to “many-to-many”.
- call an evote for the updated scope note.

Issue 478: [Quantification of AP2 discarded into \(was discarded into\)](#)

The Sig decided to formally close the issue, on the grounds of there being nothing left to do:

- a new property (AP32 discarded into) has been introduced to CRMarchaeo
- AP2 has been renamed “discarded” to mark the heap removed in the course of an excavation process unit
- the quantification of both properties have been determined (for AP2 in this issue, for AP32 in issue [584](#))

Issue 409: [CRMarcheo generalization of the properties AP12 confines and AP11 has physical relation](#)

CEO informed the Sig that the votes to close this issue were 5 (2 through the Sig list, the others through personal communication). There was no veto.

Issue closed

Issue 562: [Automatically produce graphs from the XML implementation of CIDOC CRM](#)

ETz reported that he needs concrete guidelines re. what the graph should look like –for the moment all he has to work with is that the graph should have a left-to-right orientation instead of assuming a top-down representation. Otherwise, he considers the issue resolved (in the sense that it is now possible to automatically generate graphs from the xml version of the CRM: see [here](#). Their orientation is suboptimal, but it can change easily).

More info is needed in terms of what parts of the model need to be represented. To be dealt internally by FORTH.

Decision: Compare the output with the graphs from Telos (HW FORTH).

Postpone the issue for the moment –until there are more concrete specifications.

Issue 534: Representing .1 properties of full paths in shortcut properties

For each long path that involves a property that has a .1, is it the case that the corresponding shortcut should also come with a .1 property?

The way to go about it is either

- (1) recommend that implementers only use the full path if they want to deploy the .1 property
- (2) or, for each long path –shortcut pair, in which the long path involves a .1 property, establish whether it is needed for the shortcut too. If yes, what does it amount to?

Decision:

- Check the pairs of long paths and corresponding shortcut properties, to determine which ones make use of a .1 property.
 - See if there is a list of full vs shortcuts available –check issue [357](#) for CEOs HW & feedback by MF (posts from 21 October 2021 and on).
 - also discuss the hierarchy of properties that have .1 properties and whether these are inherited by their subproperties (and what the relation btw the respective .1 properties)
 - **HW:** CEO

Issue 526: Named Graph Guidelines

- HW by MD specifications have not been shared with the Sig
- HW on use cases has not been turned in either –NC was the only one to submit HW and it does not strictly speaking form a use-case, it's more about a method.

Decision: Postpone the issue until HW has been turned in –send reminders.

Possibly return to RDF+ later on in the Sig.

Issue 564: Tools and formats relevant for the translation work (technical means of the exchange)

Way to proceed: ETz needs to arrange a meeting with the Translation WG (PM, MD). Possibly come back to this issue later on in the Sig.

Issue 552: Add URLs to the official documentation (reprise)

Summary of previous discussions –separate approaches:

- (1) insert the URIs for the web descriptions of classes and properties in the specification document –to facilitate representing the content in online tools
- (2) to refrain from doing that, because older versions would ultimately end up pointing to whatever counts as the “current” version of the online documentation.
- (3) alternatively, use versioned URIs pointing to the corresponding online documentation –add a statement that “this does not correspond to the latest version” –but this practice would complicate the editorial work beyond necessity.

Discussion:

Deprecated classes/properties point to a table with migration guidelines in the html version and to a statement that this construct has been deprecated in the rdfls version. The versioned URIs do not pose the same problem. But this means that there is yet another step to implement before closing a version (updating the URIs).

If case in point is to always get to the “current” version, then it might be better to generate a supplemental document listing all “current” URIs for E&P definitions than adding the URIs to the documentation. It all boils down to what the purpose of having the URI link in the document is: (a) link to the current version, or (b) some other functionality?

Re (a): having the URIs pointing to the official documentation from some particular web-application makes sense, but from the official documentation to the current version of the documentation online, not so much.

Since (b) is not very clear, we need a use case to make an informed decision about whether or not to introduce them.

- The overall case seems to be that when one is using different applications (that most likely run on different versions of the CRM) –it is good for version control and for tracking the history of changes implemented in the model.
- However, this has already been implemented in the .html version (with links to all versions and comments re the last time they were edited).
Accessed through: Resources/ (respective CIDOC CRM version)/Classes & Properties Translations & Versioning

Decision: Use case needed by the end of June to make an informed decision [HW: GB and anyone else interested]. Otherwise, we close the issue.

Issue 587: Principles for Modelling Ontologies: A Short Reference Guide [introduction and examples for didactic purposes]

The Sig discussed the proposal for a [reference guide](#) concerning Modelling Ontologies (HW by MD & DO) –a guideline into the steps one must follow to propose a modelling construct, namely: (1) a “how to model” question, (2) the development of a modelling construct that extends or modifies CRM (base and family models), (3) introducing a new construct into the CRM.

Additionally, there is a proposal on how to ground the need for a completely new extension and what the steps towards its definition should be.

Discussion/comments:

- The point of this issue was to provide examples that showcase how the principles should be used when one is creating a modelling construct. There are none throughout the document. The example would be like “How to model *Observable Situations*?”
 - This proposal is part of answering the issue, but also proposes what the overall process should be.
 - **HW –FORTH:** Provide examples from the SeaLit project.

- The “How to model such and such?” is mainly what the Sig list is all about. It is more important to define what the characteristics of useful examples of individuals (vs. categorical ones).
 - Change the content of the cell *Example: “how to model the modification of an art object by an artful contribution, possibly by a different artist?”* into *Example: “how to model the modification of the engraving plate x by engraver y, possibly by a different engraver z?”*
 - For properties, the examples must showcase both the domain and the range class.
 - Analysis of Scientific Questions in Archaeology (link: https://isl.ics.forth.gr/archaeological_questions/) that were generated from abstracts of papers for Archaeology.
- In relation to [Issue 538](#) that raises the question how to document changes implemented in the model: keeping track of the questions a proposed model answers should be the general practice.
- Pg.1: the document needs a general introduction for the two parts of the document, namely:
 - New Modelling Construct Proposal Checklist and Procedure
 - New Extension Proposal Checklist and Procedure
- re. modelling extensions to the CRM: trying to avoid overlap btw two models does not amount to keeping their scopes disjoint but trying to avoid a situation in which it is open to debate what model a given class or property should appear under.
- re. different kinds of research questions –not all questions raised in the course of a modelling project are helpful or relevant to guide the modelling process. Some are at a macro-level, some others at a micro-level. The micro-level questions is easier to address.
 - if the research questions that guided modelling decisions in SeaLit can be shared (no restrictions), then they should be published on the CRM website.
 - theory on micro-macro level questions: i.e., which ones are more crucial to create a conceptual model? In practice, the micro-level questions were more useful to derive modelling constructs (micro-structures taken together can completely answer a macro-level question)
 - e.g.: “What are the living standards of sailors?” translates into variables (a) salary and overall income, (b) sailors having shares in the ship or not, etc.
 - needs to be further expanded.

Decisions:

- accept the document in principle (in the sense that it addresses important issues and it needs to be further developed).
- **HW** to AK & PF to offer a selection of the research questions used for the SeaLit Project that are to be shared through the website.
- **HW** to AF & FM to provide examples and research questions for CRMtex
- **HW**: DO to write the overall introduction; SdS to proofread it; EC to review it from a newcomer’s perspective.
- **HW**: TV to reference the document with the Principles for Modelling Ontologies

- **WS:** to test the workflow (follow it in producing an ontology that he's working on and send feedback).
- The document has implications for [issue 538](#) as well. Extract from the guideline the processes that need to be documented, and inform 538 with them.
- Start a [new issue](#) re. where to publish research questions on the website.

[NEW ISSUE]: [Class/Property labels are not definitions](#)

Add a clause in the Introduction of the CRM stating that the labels of classes and properties of the CRMbase and family models do not stand in lieu of their definition. They only form mnemonic devices that allow one to refer to any given class/property.

[NEW ISSUE]: [publish research questions on the website](#)

Make a proposal re where to publish the following sources that analyze research questions, in a way that leaves no room for ambiguity re what counts as a research question.

- 1) the [Analysis of Scientific Questions in Archaeology](#) somewhere on the CIDOC CRM website
- 2) the research questions that the modelling in [SeaLit](#) provides an answer to
- 3) The CRM Requirements Analysis (described in the [deliverable](#) for the Chios Project) –and the document where the questions are listed.
- 4) the PhD Dissertation by Stephen Hennieke (the research questions he used).

HW: FORTH to make a proposal (PF, ETs, AS, CB) –*Important theories* that now sits empty, or *Use cases*, or Scope (under “About & Info”) or something else (new)?

Issue 351: [Modelling Principles](#)

There are currently two different entries on the website for the Principles for Modelling Ontologies under Technical Papers. [Principles for Modelling Ontologies: A Short Reference Guide](#) contains two documents: ([v.0.1.2](#), i.e., the last known updated version of the document and [v.0.1.2-comments by EC](#), i.e., the same document with comments by EC). [CM Principles Word v.0.1.2 \[Introduction text\]](#) contains the [introductory text](#) that needs to be revised and supplemented with examples ([Issue 587](#)).

There is yet another version ([v.0.1.3](#)) that had not been made publicly available, but was circulated among members of the Sig after the meeting in Lyon (May 2018). It featured comments and updates by CEO and MD that have not been incorporated in the last [known updated version](#) of the document – hence EC has not considered them upon reviewing the document.

Discussion:

Insofar as the version by CEO provides examples and use-cases for how to apply the principles to model an ontology that are commonsensical enough and explain the case in point, then the text is ready to be published as a guideline. If not, not so much.

CEO had only gone through the first 50 pg of the document back in 2018, so there is still a substantial part of the document he has not updated. In that sense, his version should not be granted “guideline” status either.

[v.0.1.2](#) has issues identified by EC during the review of the text and they have not been properly addressed yet.

Decision:

Everyone share their version to the CRM Sig list and CEO and ETs. CEO will run a diff on the various documents and collate them. Inform Issue 587 with the final version of the document –especially the part of the introduction that is to be supplemented with examples from SeaLiT and CRMtex.

HW: CEO to share with EC, MD & ETs his last edited version (May 2018).

HW: EC, CEO to collate the two versions.

- Once we end up with only one document, it should be managed through the CIDOC repository

[Issue 538: Documenting the changes in the CRM](#)

Discussion:

The issue to be informed by any decisions reached in Issue 587 (the parts referring to how one should proceed with creating modelling constructs).

List the elements of the [HW](#) by MD & DO would be helpful to document arguments in the sig, namely: (i) “how to model” questions, (ii) research questions that one needs to answer, (iii) how the proposed modelling constructs help to answer questions posed, (iv) examples.

TV proposed to postpone the issue until the examples for Issue 587 are decided upon.

If the goal is to point to the argumentation that resulted in each class/property of the model (a retrospective documentation project as it were), then we could start a wiki for each class/property where people can post questions etc. Despite such efforts not having been felicitous in the past, it’s worth considering.

Decision:

Postpone the issue until the examples for Issue 587 are decided upon.

HW: FORTH to propose a way to automatically index posts on the CRM archive. In a way that it gives a quick overview of the discussions therein. PF to discuss with YTz and YM and people from the lab that engage in NLP.

[Issue 481: scope notes for socP21 and socP22](#)

No HW delivered, the issue is postponed until the meeting in Rome.

- socP21 specifies place --> isA P89 falls within [D: E53, R: E53]
- socP22 specifies time --> isA P86 falls within [D: E52, R: E52]

HW: MD & TV to redraft the scope notes. Need the draft of the CRMact.

[May 12, 2022](#)

[Historical artefacts as tokens. A case study using blockchain technologies](#)
Presentation by Slavina Stoyanova. Link to presentation [here](#).

Issue 322: Reification of E13, S4 and I1

CEO gave a brief summary of the state of the issue. He personally thinks that connecting the reification construct of E13 Attribute Assignment and S4 Observation with the named graph construction of I1 Argumentation should not be dealt with in SO Logic. Could be done in other logical systems. He will turn in this HW in time for the meeting in Rome.

HW: CEO

Issue 525: Add graphics to the CRMsci definition

AK presented HW: graphics for CRMsci (featuring S24 Sample Splitting, S5 Inference Making that had not been included in the previous version).

Discussion:

Slide No 7 represents classes and properties that are not completely understood or agreed upon. However, it will be added to the definition document seeing as the diagrams should reflect its current state. If the model changes, the graphs will be updated too.

Slide No 8. New slide for S5 Inference making and its properties. It forms a very small subpart of the model that needs to be expanded on. Start a [new issue](#) to define the interface between CRMsci and CRMInf. There is a substantial overlap btw the two models.

Decision:

Admit the diagrams in the definition document

[NEW ISSUE]: [determine the interface between CRMsci and CRMInf](#)

Starting by S5 Inference Making and I5 Inference Making, there seems to be a substantial overlap between the two models. We need to determine how they are interfaced. And what is the best fit for Inference Making.

To determine whether S5 is kept in CRMsci until CRMInf is stable

HW: CRMsci (MD, TV, AK) and CRMInf (SdS) maintainers.

Issue 569: descriptive text for CRMsci diagrams

TV presented his HW (descriptive texts for CRMsci diagrams in [CRMsci](#)). Some minor editing took place

Discussion-Comments:

- Figure 3: Link Sampling with the Encounter Event.
- Figure 6: Alterations
 - O13 triggers connects a triggering event that forms the very final part in a series of events leading up to the triggered event, and a triggered event, the beginning of which is synchronous to the triggering event. The temporal proximity allows the association of the two events. It doesn't involve an overall causality. It caused some reformulation.
 - The timespan of the triggering event must include the start of the triggered event. Start an issue on that
 - examples of Landslide documentation demonstrate the events conceived as a cause or trigger for the landslide.

- The last sentence (“The CIDOC CRM avoids providing constructs ... or historical events”) does not strictly concern alterations, to be revisited at a later stage:

Proposal:

- admit the descriptive texts in the definition document –fix the typos on S15 Observable Entity and edit the class hierarchy list accordingly
- Assign a new version number once the changes have been implemented (v1.7) –the changes in S15 Observable Entity, and the measurements and dimensions justify a new number.
- Once the Position Measurement construct have been accepted, we will implement a new major update (2.0) –also produce graphs for Position Measurement.

Everyone in agreement

Decision: Proceed as proposed

Re the RDF: The document needs to be reformatted according to the template, in order to automatically generate the rdfs file prior to the next meeting.

- produce an rdf for the current version (for v1.7) and once Position Measurements etc are handled, produce yet another one.
- **HW:** TV to share the last updated version of the definition document with ETz, who will try to generate an rdfs file from, despite it not adhering to the new template. He will try to have it ready by the next meeting.

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

Issue closed

[Issue 527: Modelling provenance of Intangible Heritage](#)

The construct that the issue set to describe cannot be defined through the CRM at this point (how to describe categorical information). Should be kept open, carry on the discussions among MD, MN, DH, OE until they reach a concrete proposal.

HW: MD, MN, DH, OE

[Issue 547: CRMdig update](#)

Look at CRMdig, determine what parts of the model need to be kept in CRMdig vs the things that echo the project they were built to describe. Discuss the overlap with PEM. Inform the Sig in the next meeting maybe.

Proposal: Break the model in small subtasks (review properties, Digital Objects etc)

HW: GB to coordinate the group of people involved in this task, CEO, (MD), and confer with ML and GH.

[Issue 360: LRMoo](#)

In the 53rd CIDOC CRM & 46th FRBRoo SIG meeting, the SIG went through Issue 360.

Present state of the issue: the results of the e-votes have been incorporated in the current version of the LRMoo. Of these, 3 were recorded as specific issues: **589, 591, 592** –they are formally closed.

Subtopics discussed:

- Review of properties –see issue [590](#), below.
- Proposal to deprecate R10 has member vetoed –see issue [593](#), below.
- Proposal to introduce a property Rnn included memory of, connecting an instance of F28 to an instance of E7 –see issue 594, [below](#).
- Review of the WEMI examples.

Review of the WEMI examples for LRMoo.

The review of the [examples](#) for LRMoo is still ongoing, Sig members can advise on them.

Issue 590: Review of properties

the Sig went through the revised the table of quantifications, fol axioms, (.1) properties, and declaration of new sub/superproperties for the set of LRMoo properties (**HW** by PR & MZ) and edited some of them. The updated list can be found [here](#).

Decisions:

- label for the quantification (1,n:1,n): many to many, necessary, dependent. To be added to the list of possible quantifications in LRMoo.
- Re. transitivity, symmetry and reflexivity: the **non**-symmetric/reflexive attributes mean to say that some instances of the property can be symmetric/reflexive, whereas some others can be asymmetric/irreflexive. For properties with the same domain and range, a statement must be offered wrt. their transitivity (+, -, neither).

However:

If a property is known to be **reflexive/symmetric for all its instances**, then it should be marked as such. The same applies to properties known to be **irreflexive/asymmetric** for all their instances.

Conversely, if a property is neither symmetric/reflexive nor asymmetric/irreflexive, it must not be given a characterization regarding these attributes. **Non-x statements should be avoided.**

- Re the .1 properties: deprecate the *R33.1 has encoding* property, it can inherit the one from P3.1 has note.
- Re. declaring new sub/super properties:
 - *R2 is derivative of* *IsA R68 is inspired by*, on the grounds of it being much more specific.
 - *R2 is derivative of* not declared a subproperty of *P130 shows features of*, as *R68* (its direct superproperty) is listed as a subproperty of *P130*.

Issue 593: E-vote: LRMoo, deprecation of R10 has member (vetoed)

MD went through the reasons that motivated his veto to the proposal to deprecate R10 (see issue description). The Sig decided to keep it in LRMoo.

Issue closed

Issue 594: semantically replacing Recording Event and Externalization Event

The Sig discussed MD's proposal to introduce a property F28 Expression Creation. Rnn included memory of: E7 Activity to replace R20 recorded.

There were objections raised wrt to whether the property falls in scope with the LRM. The use of the memory of a particular activity in an instance of F28 Expression creation can be dealt with in LRMoo through the subject relation that covers both aboutness and depiction. And could extend to a particular performance. It could be useful for CRMbase.

However, it seems that the memory is not by default observable. It should be defined as such, otherwise the construct would be a bit obscure.

To add it to CRMbase it would mean that we would have to define an Expression Creation class in CRMbase, which is far from ideal.

Instead, to discuss it again in the next meeting (with a scope note and everything that goes with it).

Decision: HW MD to produce scope note in time for the Sig in Rome.

Issue 577: Official Namespaces for CRM Extensions

According to the head of Lidatech committee of IFLA there is no technical contradiction with having an IFLA standard under a different namespace, provided that they can push it from one namespace to another. In terms of policies, MR has not received a proper response, so she will double check with the committee on standards.

- FRBRoo should be left under an IFLA namespace
- LRMoo does not have an IFLA namespace, and to create a namespace and maintain it would require some effort (from a financial point of view too). If the CRM can provide and support a namespace for LRMoo that pushes to IFLA, it would probably be OK.

Decision: Inform the Committee on Standards (IFLA) that the intention is to maintain a link btw the IFLA website and the CRM namespace. If there are objections, report back to the Sig. If not, proceed.

May 13, 2022

Issue 557: Which family model should classes (i) Provision and (ii) Business Obligation appear under?

The Sig had appointed MD & SdS to turn the bullet-points in the list below into a practical scope for the business model (a reference to everything else it covers, aside business transactions).

- material provision of things (labor, services, money, goods)
- social exchanges for material gain
- incorporate constructs from SeaLit (and other projects –f.i. Spectrum, documentation of Nazi theft, BM project for illicit trading) to draft the practical scope of the document (discuss with RS, SdS)
- museum transactions for object acquisition/exchange etc

Discussion:

The HW has not been turned in, and SdS wants out of it (does not have the time to engage). No access to documentation re. the Nazi theft. However, there is ample data from SeaLiT (access to sources such as account books).

New twist on the HW:

- reference the publicly accessible archival material from [SeaLit](#) (HW: AK, PF)
- [Spectrum data model](#): what are the fields that Spectrum uses to document museum transactions? Consult the [minutes](#) of the 32nd CDOC CRM Sig meeting and their [mapping](#) to CIDOC CRM (HW: AK)
- The outcomes of the discussion in [Issue 273](#) Business Transactions can also feed into the scope of the model.
- MD to combine the collected info in the scope of the model,
- SdS to proofread

[Issue 586: How to call the model for business transactions?](#)

It's not a model that is strictly about business transactions, more like private law, and contracts.

The draft document of this extension is not available right now. It is needed to produce a scope and then decide on how to call it.

Decision:

- Use the template for the family models and add classes/properties and examples for them (format them accordingly)
- for the examples we need to go through archival material (Turkish archives, that contain transactions, contracts), but they would have to be transformed to data structures
- draft the practical scope
- then decide on the label for the model.

Issue 557 takes precedence over this issue.

[CRM Sig meetings in the post-covid era.](#)

Two planned meetings so far

- Physical meeting in Rome (it has been planned already).
 - [A tentative agenda](#) has been circulated through the list,
 - discounted accommodation was secured
 - wrt participation, no updates
 - the organizers will probably enable virtual participation, but they had obtained a grant to hold a physical meeting, which means that they need to secure physical participation.
- Physical meeting in Luxembourg (not Liège), because MvR has changed affiliation. The Sig must be informed of this (CEO to share the information with the mailing list)

For the future:

- We should organize at least one (mostly) physical meeting per year, and plan for other online meetings. Could be combined with a workshop.
- Four meetings a year (even if it's only online) is way too optimistic in any case.
- Zoom meetings are easier and more manageable, in the sense that they are smaller (half meetings) and more concentrated.

- The Sig's work needs to be more goal-oriented, to encourage participation. Newcomers are scarce. There is much documentation available. The topics of interest mainly revolve around applications using the model.

Especially for Rome: The meeting must be attractive in terms of content. **HW** needs to be turned in in time for the meeting. Ask participants for ideas for the meeting (topics of interest). The editors to email the Sig list asking for contributions. Areas of interest identified, to be shared with the list.

- business model
- model for provenance
- reification, rdf-star
- research dissemination (key person: Oyvind)
- Extensions (they facilitate the application of the CRM to diverse scientific domains, they serve different purposes)
 - CRMinf
 - CRMarchaeo
 - CRMba
 - ARIADNEplus models, other models that have been created as part of ongoing/past projects
- NLP methods to automatically extract CRM-compatible data annotations from free text.
- WS is particularly interested in the documentation of modelling classes and new ontology/extensions –if there is online participation in the Rome meeting, he can report on having used it.
- GH is up for online participation on Thursday (for Rome), he is interested in work on CRMinf and CRMsci (he's been using them quite a bit lately)

We need to appoint task groups and work on areas of interest.

HW: CEO to send out the email to the Sig-list.

APPENDICES

1. List of abbreviated names

AF	Achille Felicetti
AK	Athina Kritsotaki
CB	Chrysoula Bekiari
CEO	Christian-Emil Ore
CM	Carlo Meghini
DH	Daria Hookk
DO	Dominic Oldmann
EC	Erin Canning
ETs	Eleni Tsouloucha
ETz	Elias Tzortzakakis
GB	George Bruseker
GH	Gerald Hiebel
MN	Massoomeh Niknia
MD	Martin Doerr
MF	Mark Fichtner
ML	Matteo Lorenzini
MR	Mélanie Roche
MZ	Maja Žumer
NC	Nicola Carboni
OE	Øyvind Eide
PF	Pavlos Fafalios
PM	Philippe Michon
PR	Pat Riva
RN	Robert Nasarek
SdS	Stephen Stead
TV	Thanasis Velios
WS	Wolfgang Schmidle
YM.	Yannis Marketakis
YTz	Yannis Tzitzikas

2. Model Changes

Issue 583 –HW by MD

S4 Observation

Subclass of: E13 Attribute Assignment

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 between them.

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 that certain propositions held at a time within the time-span of the 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.

Examples:

The excavation of unit XI by the Archaeological Institute of Crete in 2004.

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).

In First Order Logic:

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

Properties:

O8 observed (was observed by): S15 Observable Entity

O9 observed property type (property type was observed by): S9 Property Type

O16 observed value (value was observed by): E1 CRM Entity

O? observed: Situation?

Observable Situation

Scope note:

An Observable Situation can be perceived as the focus of an observer, by human senses or enhanced or mediated by technical instruments, on a constellation, an interaction or a dynamic behavior of instances of S15 Observable Entity or sections of these instances within a particular time-span and spatial extent in the past. The observer may themselves be directly involved, or be receiving respective signals from these instances. The focus of the observer determines the model they overlay on the observed reality in order to describe it in terms of distinct properties and value ranges of parameters. The latter selection and projection from reality constitutes the content of a particular observable situation. Multiple observers may select different models, details and value systems to the same spatiotemporal area (i.e., views they pay attention to). Consequently, the observed situations may differ, but should, in principle, be compatible with a common reality in their overlaps

(categorical) Examples:

- Sun rising over the horizon at a particular spot.
- A car passing by another car.
- A lightning bolt.
- An air temperature and wind speed at a certain point and time.
- People being in a city, a house.
- Someone showing symptoms of sickness.
- A vegetation cover of a field.
- Someone eating.
- Two mountains being at a certain distance.
- Cars in a starting position for a race.
- The direction a compass needle shows at a particular spot.

All **parthood** of physical things for an uninterrupted period of observation is an observable situation.

P12 occurred in the presence of (was present at) is observable.

E93 Presence of physical things for an uninterrupted period of observation is an observable situation.

The location of things present and events happening are observable with respect to physical features or objects unmoved.

The presence **of two** physical things for an uninterrupted period of observation each within a given space, or the presence of one thing and an event or two events within an uninterrupted period of observation allow for observing a spatial distance in this “situation”.

- P164 is temporally specified by (temporally specifies): E52 Time Span
- P167 was within (includes): E53 Place
- P195 was a presence of (had presence): E18 Physical Thing

I propose:

Sxxx Spatial Distance

Subclass of Sxxx Observable Situation

properties:

Oxxx is distance between: Observable Entity (cardinality 2!

Oxxx has dimension:

as an observed situation, it could per default inherit the temporal bounds of the observation/measurement. As a result of evaluation, it could exceed any limitations of single observation..

We can define a **temporal distance** of events as another observable situation.

Open questions: how to define a situation of passing by a feature (“destination mark”).

Generally,

one can observe

- A. static properties of a Physical Thing or Material Substantial and events.
- B. Situations when affairs involving observable entities stay within some boundaries for some time, such as presence, parthood, P12 was present at, location
- C. Dynamic processes involving sub-situations of things going from A to B etc, such as runners in a competition. We have no construct of following a road in the CRM, but we can specify an observable situation in a more general sense, within which the Marathon runner had first a presence at Marathon, if not explicitly a “starting event”, and then at various road mark, and then in Athens (“dying”).

Question, can these all be subsumed under “observable situation”, or is this overstretching the concept?

Observable Situation clearly needs a **parthood property**.

Observable Situation may be described by a Proposition Set, but it “commits” to the statements themselves; it is **not** just an **information object**. **Specializations** of Observable Situation may **restrict** possible propositions appearing in the Situation, **NOT add** new ones.

[Issue 388 –HW by MD](#)

Sxxx Position Measurement

Subclass of: S4 Observation

Scope note: This class comprises activities of measuring positions in space and time. The measured position is intended to approximate a part or all of the extent of the presence (instance of E93 Presence) of an instance of E18 Physical Thing or E4 Period of interest, such as the outer walls of an excavated settlement, the position of a ship sailing or the start and end of athlete’s run in a competition. Characteristically, a theodolite or GPS device may be positioned on some persistent feature. Measuring the position of the device will yield an approximation of the position of the feature of interest. Alternatively, some material item may be observed moving through a measured position at a given time.

A position measurement is an evaluation of a combination of measurement of multiple associated distances and/or angles (instances of E54 Dimension) from a particular spot to certain reference points of previously known position in the same reference space. A particular role is played by the Earth's magnetic field and rotational axis as reference for an angle or direction. Often, the observed constituting dimensions are not documented, or hidden in an electronic device software. The measured position is given as an E94 Space Primitive corresponding to a declarative place. Together with the measured time-span covering the time-critical observations it forms a spacetime volume, which should normally overlap with the spatiotemporal extent of the thing or phenomenon of interest.

Properties:

- Oxx1 determined position (was determined by): E94 Space Primitive
- Oxx2 has validity time-span (is position validity for): E52 Time-Span
- We may now formulate the approximation to the things of interest, e.g.
- Oxx3 overlaps with presence: E93 Presence.

position measurement consists of triangulation, either with two more things, or one thing and a direction from it. GPS is multiple triangulation with Greenwich and the rotational axis of earth as ref frame. Normally, directions are defined by two things present.

So, position measurement is multiple measurements of an observable situation and implicit evaluation of the coordinates relative to the ref frame.

Basically, the position measurement makes sense as a declarative place within the presence of a thing or event at the time of measurement, or covering it. "overlaps" may be precise enough.

Issue 582 –HW by EC

Reformulation of the scope note for E79 Part Addition

Old

E79 Part Addition

This class comprises activities that result in an instance of E18 Physical Thing being increased, enlarged or augmented by the addition of a part.

Typical scenarios include the attachment of an accessory, the integration of a component, the addition of an element to an aggregate object, or the accessioning of an object into a curated instance of E78 Curated Holding. Objects to which parts are added are, by definition, human-made, since the addition of a part implies a human activity. Following the addition of parts, the resulting human-made assemblages are treated objectively as single identifiable wholes, made up of constituent or component parts bound together either physically (for example the engine becoming a part of the car), or by sharing a common purpose (such as the 32 chess pieces that make up a chess set). This class of activities forms a basis for reasoning about the history and continuity of identity of objects that are integrated into other objects over time, such as precious gemstones being repeatedly incorporated into different items of jewellery, or cultural artifacts being added to different museum instances of E78 Curated Holding over their lifespan.

New

E79 Part Addition

This class comprises activities that result in an instance of E18 Physical Thing being increased, enlarged or augmented by the addition of a part.

Typical scenarios include the attachment of an accessory, the integration of a component, the addition of an element to an aggregate object, or the accessioning of an object into a curated instance of E78 Curated Holding. Both the E18 Physical Thing being augmented and the E18 Physical Thing that is being added are treated as separate identifiable wholes prior to the instance of E79 Part Addition. Following the addition of parts, the resulting assemblages are treated objectively as single identifiable wholes, made up of constituent or component parts bound together either physically (for example the engine becoming a part of the car), or by sharing a common purpose (such as the 32 chess pieces that make up a chess set). This class of activities forms a basis for reasoning about the history and continuity of identity of objects that are integrated into other objects over time, such as precious gemstones being repeatedly incorporated into different items of jewellery, or cultural artefacts being added to different museum instances of E78 Curated Holding over their lifespan.

Issue 490 –Scope note for Pxxx has representative content (HW by MD)

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.