# Issue 510 55th SIG meeting

The SIG reviewed and accepted MD’s proposal to

* [deprecate I8 Conviction](#_I8_Conviction), resulting in:
	1. the declaration of [I2 Belief](#_NEW) a direct subclass of E2 Temporal Entity,
	2. changing the range class of [J2 concluded](#_NEW_1) that to I2 Belief.
	3. the [deprecation of J11 used manifestation](#_J11_used_manifestation) [D: **I8 Conviction**, R: F3 Manifestation]
	4. the deprecation of [J12 used](#_J12_used_(was) [D: **I8 Conviction**, R: F5 Item]
* [deprecate I9 Provenanced Comprehension](#_I9_Provenanced_Comprehension), resulting in the deprecation of:
	1. [J8 understands (is understood by)](#_J8_understands_(is)
	2. [J9 believes in provenance](#_J9_believes_in)
	3. [J10 reads](#_J10_reads)
* update the modelling [around **I7 Belief Adoption**](#_NEW_2), by means of:
	1. introducing class: Ix4 Adopted Belief
	2. [deprecating J6 adopted](#_J6_adopted_[D:) [D: I7 Belief Adoption, R: I2 Belief]
	3. introducing property: [Jxx5 adopted interpretation](#_Jxx5_adopted_interpretation) [D: I7 Belief Adoption, R: Ix4 Adopted Belief]
	4. introducing property [Jxx2 adopted interpretation of](#_Jxx2_adopted_interpretation) [D: Ix4 Adopted Belief, E73 Information Object]
	5. introducing class: [**Ix2 Intended Meaning Belief**](#_Ix2_Intended_Meaning)
	6. introducing property [Jxx3 assumed meaning](#_Jxx3_assumed_meaning) [D: I7 Belief Adoption, R: Ix2 Intended Meaning Belief]
	7. introducing property [Jxx6 assumed meaning](#_Jxx6_assumed_meaning) [D: Ix2 Intended Meaning Belief, I4 Proposition Set]
	8. introducing property [Jxx7 about](#_Jxx7_about_[D:) [D: Ix2 Intended Meaning, R; E73 Information Object]
	9. introducing class: [**Ix5 Provenance Belief**](#_Ix5_Provenance_Belief)
	10. introducing property [Jxx4 assumed provenance](#_Jxx4_assumed_provenance) [D: I7 Belief Adoption, R: Ix5 Provenance Belief]
	11. introducing property [Jxx8 that](#_Jxx8_that_[D:) [D: Ix5 Provenance Belief, R: I10 Provenance Statement]
	12. redrafting the scope note of [**I10 Provenance Statement**](#_NEW_3)
	13. introducing property [Jxx9 is about the provenance](#_Jxx9_is_about) of [D: I10 Provenance Statement, R: E70 Thing]
	14. introducing class: [**Ix3 Provenance Assessment**](#_Ix3_Provenance_Assessment)
	15. introducing property [Jxx1 concluded provenance](#_Jxx1_concluded_provenance) [D: Ix3 Provenance Assessment, R: Ix5 Provenance Belief]
	16. introducing class: [**Ix1 Meaning Comprehension**](#_Ix1_Meaning_Comprehension)
	17. introducing property [Jxx10 interpreted meaning of](#_Jxx10_interpreted_meaning) [D: Ix1 Meaning Comprehension, E73 Information Object]
	18. introducing property [Jxx11 interpreted meaning as](#_Jxx11_interpreted_meaning) [[D: Ix1 Meaning Comprehension, R: Ix2 Intended Meaning Belief]
	19. and updating all the FOL statements and examples in said class/property definitions.

For details of each definition see below.

**Discussion points**:

* DO to consult with Francesca Bologna on the validity of the examples and the full citation for the example of Jxx4 assumed provenance.
* Examples for Jxx10, Jxx11 could be redrafted if one can come up with suitable, non-fictitious ones (but in a new issue).
* Concerning J11 used manifestation, it seems legit for LRMoo, could possibly find its way there.

**How to move forward**:

1. **HW**: DO to consult with Francesca Bologna on the plausibility of the examples.
2. **HW**: PF & SdS to assign identifiers to the new properties, update the document and issue the new release of CRMinf –which will reference CIDOC CRM v7.1.2
3. **HW**: SdS to check the CRMinf document for misspelled instances of “extant”.
4. **HW**: MD & PR to check whether J11 used manifestation fits LRMoo as is, or if it needs tweaking.
5. Start a new issue about redrafting the introduction of CRMinf, making use of the example of the fire burning down Rome and Nero’s contested whereabouts at the time of the fire.
**HW** assigned to PF, TV.
**HW**: GH could implement this example once the rdf becomes available.
6. Start a new issue to discuss the negation of a belief (**MD, PF** to work on that)
7. Start a new issue to discuss shortcutting knowledge/belief sharing –i.e., without having to go through an infinite number of intermediate steps (**MD, PF** to work on that)
8. Start a new issue about automatically detecting incompatibilities between CRM extensions and CIDOC CRM.
**HW**: PF and ETz to work on that. Consult with VA (LAHRA), because OntoME does exactly that.

***Issue closed***

## Class/property deprecations:

### I8 Conviction

Subclass of: E2 Temporal Entity

Superclass of: I2 Belief

 I9 Provenanced Comprehension

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

Examples:

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

In First Order Logic:

 I8(x) ⊃ E2(x)

### J11 used manifestation [D: **I8 Conviction**, R: F3 Manifestation]

Domain: I8 Conviction

Range: F3 Manifestation

Subproperty of:

Superproperty of:

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

Scope note: This property associates an instance of I8 Conviction with the instance of F3 Manifestation that carried the instance of F2 Expression that contained the instances of E89 Propositional Object that make up the I4 Proposition Set being embraced. It assumes that a non-contentious reading of the instance of F2 Expression has allowed the instances of E89 Propositional Object to be elicited and enumerated.

This property is a shortcut over the long path: I7 Belief adoption:*J6 adopted*:I2 Belief: *J4 that (is subject of):*I4 Proposition Set: *P148 has component* *(is component of):*E89 Propositional Object:*P148i has component (is component of):*F1 Work: *R3 is realised in (realises):*F2 Expression: R4i is *embodied in*:F3 Manifestation

Examples:

* My adoption of the belief that Dragendorff type 29 bowls are from the 1st Century AD (I7) *J11 used manifestation (was manifestation used by)* "Terra sigillata. Ein Beitrag zur Geschichte der griechischen und römischen Keramik", *Bonner* *Jahrbücher* 96 (1895), 18-155 (F3)
* Martin’s citation that Nero was singing in Rome while it was burning *J11 used manifestation (was manifestation used by)* manifestation of De Vita Caesarum by Gaius Suetonius Tranquillus

In First Order Logic:

 J11(x,y) ⊃ I8(x)

 J11(x,y) ⊃ F3(y)

### I9 Provenanced Comprehension

Subclass of: I8 Conviction

Superclass of:

Scope note: This class comprises beliefs in the correct reading or scholarly interpretation of the overt message intended by an instance of E73 Information Object (“source”), in which the interpretation of the source is formulated as a set of formal propositions or regarded to be unambiguously given in the form natural language.

An instance of I9 Provenanced Comprehension implies believing the authenticity of the respective instance of E73 Information Object relative to an explicitly stated provenance, but does not mean believing the respective propositions. Rather, the truth of the cited message is the subject of another scholarly interpretation process. It further does not pertain to arguing about hidden or cryptic meanings of a source, which is the subject of a further scholarly interpretation process.

Properties:

J8 understands (is understood by): E73 Information Object

J9 believes in provenance (provenance is believed by): I10 Provenance Statement

J10 reads as: I4 Proposition Set

Examples:

* My citation and belief that the extant book De Vita Caesarum attributed to Gaius Suetonius Tranquillus stated 121AD that Nero was singing in Rome while it was burning from July 19 in 64 AD.[[1]](#footnote-1)

In First Order Logic:

 I9(x) ⊃ I8(x)

### J8 understands (is understood by)

Domain: I9 Provenanced Comprehension

Range: E73 Information Object

Subproperty of:

Superproperty of:

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

Scope note: This property associates an instance of I9 Provenanced Comprehension with the instance of E73 Information Object it interprets with respect to its intended overt message.

* My citation that Nero was singing in Rome while it was burning *understands* the extant book De Vita Caesarum by Gaius Suetonius Tranquillus

In First Order Logic:

 J8(x,y) ⊃ I7(x)

 J8(x,y) ⊃ E73(y)

### J9 believes in provenance

Domain: I9 Provenanced Comprehension

Range: I10 Provenance Statement

Subproperty of:

Superproperty of:

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

Scope note: This property associates an instance of I9 Provenanced Comprehension with the instance of I10 Provenance Statement that defines the believed provenance of the instance of E73 Information Object referred to in the instance of I9 Provenanced Comprehension.

Examples:

* My citation that Nero was singing in Rome while it was burning *believes in provenance* that the content of the extant book De Vita Caesarum by Gaius Suetonius Tranquillus was published in Rome 121AD

In First Order Logic:

 J9(x,y) ⊃ I9(x)

 J9(x,y) ⊃ I10(y)

### J10 reads

Domain: I9 Provenanced Comprehension

Range: I4 Proposition Set

Subproperty of:

Superproperty of:

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

Scope note: This property associates an instance of I9 Provenanced Comprehension with the instance of I4 Proposition Set that formulates the interpretation.

Examples:

* My citation that Nero was singing in Rome while it was burning *reads as* “Nero, while watching Rome burn, exclaimed how beautiful it was, and sang an epic poem about the sack of Troy while playing the lyre”

In First Order Logic:

 J9(x,y) ⊃ I9(x)

 J9(x,y) ⊃ I4(y)

### J6 adopted [D: I7 Belief Adoption, R: I2 Belief]

Domain: I7 Belief Adoption

Range: I2 Belief

Subproperty of: P17 was motivated by (motivated)

Superproperty of:

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

Scope note: This property associates an instance of I2 Belief with the instance of I7 Belief Adoption that used it as the source of the I6 Belief Value and propositions used in the resulting new I2 Belief.

Examples:

* My adoption of the belief that Dragendorff type 29 bowls are from the 1st Century AD (I7) adopted Dragendorff’s belief that type 29 bowls are from the 1st Century AD (I2)

### J12 used (was used by) [D: I8 Conviction, R:F5 Item]

Domain: I8 Conviction

Range: F5 Item

Subproperty of:

Superproperty of:

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

Scope note: This property associates an instance of I8 Conviction with the particular instance of F5 Item that carried the instance of F2 Expression that contained the instances of E89 Propositional Object that make up the I4 Proposition Set being embraced.

This property is a shortcut over the long path: I7 Belief Adoption:*J6 adopted*: I2 Belief: J2i *was concluded by:* I5/S5 Inference Making: *J1 used as premise (was premise for):* E25 Human-Made Feature: *O16 observed value (value was observed by):* S4 Observation: *O8 observed (was observed by):*F5 Item

Examples:

* My adoption of the belief that Dragendorff type 29 bowls are from the 1st Century AD (I8) *J12 used (was used by)* The Institute of Archaeologies’ copy of "Terra sigillata. Ein Beitrag zur Geschichte der griechischen und römischen Keramik", *Bonner* *Jahrbücher* 96 (1895), 18-155 (F5)
* Martin’s citation that Nero was singing in Rome while it was burning *J12 used (was used by)* Martin’s copy of De Vita Caesarum by Gaius Suetonius Tranquillus

## Newly introduced classes

### Ix4 Adopted Belief

Subclass of: I2 Belief

Superclass of

Scope note: This class comprises the notion that an Actor adopted the meaning of the associated I4 Proposition Set by arguments of trust from a source created by another Actor and holds it as being true or in some way likely to be true. This source can be documented via the property *Jxx5 adopted interpretation of (has adopted interpretation)*. The used interpretation of the meaning of the source may be a belief of the adopting Actor or another one and can be documented as an instance of Ix2 Intended Meaning Belief, if this detail is relevant.

Properties: Jxx2 adopted interpretation of (has adopted interpretation) : E73 Information Object

Examples:

* Francesca Bologna’s belief that Nero was at Antium when the Great Fire broke out and did not return to Rome until the fire approached his house (F. Bologna, 2021)

In First Order Logic:

 Ix4(x) ⇒ I2(x)

### Ix2 Intended Meaning Belief

Subclass of: I2 Belief

Superclass of:

Scope note: This class comprises beliefs of an Actor that a particular instance of I4 Proposition Set formally represents a part or all of the meaning intended by a source created by another Actor, without considering an opinion yet about its truth or trustworthiness. The belief constitutes an interpretation of the source. The respective proposition set and can be documented using the property *Jxx6 assumes meaning (is supposed meaning in)*, whereas the respective source can be documented via the property *Jxx7 about (has interpretation)*. and holds it as being true or in some way likely to be true. The used interpretation of the meaning of the source may be a belief of the adopting Actor or another one and can be documented as an instance of Ix2 Intended Meaning Belief, if this detail is relevant.

Properties: Jxx6 assumed meaning (is supposed meaning in): I4 Proposition Set

 Jxx7 about (has interpretation): E73 Information Object

Examples:

* Francesca Bologna’s belief that Publius Cornelius Tacitus meant that “Nero was at Antium when the Great Fire broke out and did not return to Rome until the fire approached his house” (F. Bologna, 2021)
* Francesca Bologna’s belief that Gaius Suetonius Tranquillus meant that Nero was singing in Rome while it was burning from July 19 in 64 AD.

In First Order Logic:

 Ix2(x) ⇒ I2(x)

### Ix5 Provenance Belief

Subclass of: I2 Belief

Superclass of

Scope note: This class comprises beliefs of an Actor that a particular instance of E70 Thing, in general available to this Actor, is identical to one present in a relevant event or context of reference in the past, such as a text in a book being sufficiently identical to the one in the claimed author’s original manuscript or edition in order to be used by the Actor for citation. Other examples are the provenance of archaeological objects in collections, which may pertain to the claimed excavation spot or to the inferred context of their creation.

The term “in general available” means that the thing is either physically in the hands of the actor or that the actor or an actor of their trust has the principled ability to get access to the thing. In case that only information objects exist describing the proper thing of interest, such as a photo of a lost archaeological object, an instance of Ix5 Provenance Belief should be based on arguments including references to provenance beliefs about descriptions, representations and the described things.

A formal description about the assumed provenance can be documented via the property *Jxx8 that*.Note that, depending on the intended argumentation about the respective instance of E70 Thing, different aspects of provenance may be described about the same instance of E70 Thing.

Properties: Jxx8 that (is subject of): I10 Provenance Statement

Examples:

* Francesca Bologna’s belief about the authenticity of Tacitus, Publius Cornelius. The Annals. Book 15.
* Ernst Pernicka et al. believe that the Nebra Sky Disc dates to the Early Bronze Age (Pernicka et al. 2020)

In First Order Logic:

 Ix5(x) ⇒ I2(x)

### Ix3 Provenance Assessment

Subclass of: I1 Argumentation

Superclass of:

Scope note: This class comprises activities of argumenting and concluding about the likely provenance of instances of E70 Thing existing at the time of this assessment. These activities may further be about the provenance of things referred to or represented by existing information objects, and subsequent references.

Properties: Jxx1 concluded provenance: Ix5 Provenance Belief

Examples:

* The assessment by Ernst Pernicka et al. about the provenance of the Nebra Sky Disc (Pernicka et al. 2020)

In First Order Logic:

 Ix3(x) ⇒ I1(x)

### Ix1 Meaning Comprehension

Subclass of: I1 Argumentation

Superclass of:

Scope note: This class comprises processes of interpreting the intended meaning of parts or the whole of the content of an instance of E73 Information Object as propositions. Such interpretations may include the disambiguation of the meaning of words and expressions, expanding abbreviations, resolving named entities, references and co-references, and complementing missing text parts, without however arguing about the actual truth of the information.

In principle, any use of an information object pertaining to its meaning implies an instance of Ix1 Meaning Comprehension. However, in practical applications, texts in natural language are often clear enough so that no explicit explanation of the interpretation is needed for the user. In such cases, there is no need to create explicit instances of Ix1 Meaning Comprehension, but the adopted belief may directly be linked via *Jxx2 adopted interpretation of (has adopted interpretation),* or the instance of Ix1 Meaning Comprehension may be made implicit to an instance of I7 Belief Adoption by multiple instantiation.

Explicit documentation of instances of Ix1 Meaning Comprehension are useful, if the interpretations are not obvious and if competing arguments about them exist.

Properties: Jxx10 interpreted meaning of: E73 Information Object

 Jxx11 interpreted meaning as: Ix2 Intended Meaning Belief

Examples:

* My understanding of the statements about Emperor Nero’s whereabouts in Rome while it was burning from July 19 in 64 AD [[2]](#footnote-2) in the extant book De Vita Caesarum attributed to Gaius Suetonius Tranquillus.

In First Order Logic:

 Ix1(x) ⇒ I1(x)

## Newly introduced properties

### Jxx5 adopted interpretation [D: I7 Belief Adoption, R: Ix4 Adopted Belief]

**Jxx5 adopted interpretation (was concluded by)**

Domain: I7 Belief Adoption

Range: Ix4 Adopted Belief

Subproperty of: J2 concluded that (was concluded by)

Quantification: many to many, necessary, dependent (1,n:1,n)

Scope Note: This property associates an instance of I7 Belief Adoption with the instance of Ix4 Adopted Belief that was established and possibly selected from the interpretation of the source or sources referred to by the property *Jxx2 adopted interpretation of*. This property implies a relation of trust in the reliability of the sources. The actual believed content, i.e., propositions about some past reality and adopted from the source, should be documented using the property *J4 that*.

Examples:

* Francesca Bologna’s adoption of Tacitus’ belief where Emperor Nero was when the Great Fire started *Jxx5 adopted interpretation* Francesca Bologna’s belief that Nero was at Antium when the Great Fire broke out and did not return to Rome until the fire approached his house (F. Bologna, 2021)

In First Order Logic:

Jxx5(x,y) ⇒ I7(x)

Jxx5(x,y) ⇒ Ix4(y)

Jxx5(x,y) ⇒ J2(x,y)

Jxx5(x,y) ⇐ (∃uvw) [E73(u) ˄ **J7(x,u)** ˄ Ix2(v) ˄ Jxx3(x,v) ˄ I4(w) ˄ J4(y,w) ˄ Jxx7(u,v) ˄ Jxx6(v,w)]

### Jxx2 adopted interpretation of [D: Ix4 Adopted Belief, E73 Information Object]

**Jxx2 adopted interpretation of (has adopted interpretation)**

Domain: Ix4 Adopted Belief

Range: E73 Information Object

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

Scope Note: This property associates an instance of Ix4 Adopted Belief with a source or sources of interpretation from which the belief was established and possibly selected. In some cases of scholarly arguments, multiple sources referring to a common topic may have been interpreted in order to form a particular belief about the topic referred to.

Examples:

* Francesca Bologna’s belief that “Nero was at Antium when the Great Fire broke out and did not return to Rome until the fire approached his house” *Jxx2 adopted interpretation of* Tacitus, Publius Cornelius. The Annals. Book 15 [15.16] (F. Bologna, 2021)

In First Order Logic:

Jxx2(x,y) ⇒ Ix4(x)

Jxx2(x,y) ⇒ E73(y)

### Jxx3 assumed meaning [D:I7 Belief Adoption, R: Ix2 Intended Meaning Belief]

**Jxx3 assumed meaning (was assumed by)**

Domain: I7 Belief Adoption

Range: Ix2 Intended Meaning Belief

Subproperty of: J1 used as premise (was premise for)

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

Scope Note: This property associates an instance of I7 Belief Adoption with an instance of Ix2 Intended Meaning Belief about a meaning believed to be expressed in the source or sources referred to by the property Jxx2 adopted interpretation of.

Examples:

* Francesca Bologna’s adoption of Tacitus’ belief where Emperor Nero was when the Great Fire started *Jxx3 assumed meaning* Francesca Bologna’s belief that Publius Cornelius Tacitus meant that “Nero was at Antium when the Great Fire broke out and did not return to Rome until the fire approached his house” (F. Bologna, 2021)

In First Order Logic:

Jxx3(x,y) ⇒ I7(x)

Jxx3(x,y) ⇒ Ix2(y)

Jxx3(x,y) ⇒ J1(x,y)

### Jxx6 assumed meaning [D: Ix2 Intended Meaning Belief, I4 Proposition Set]

**Jxx6 assumed meaning (is supposed meaning in)**

Domain: Ix2 Intended Meaning Belief

Range: I4 Proposition Set

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

Scope Note: This property associates an instance of Ix2 Intended Meaning Belief with the instance of I4 Proposition Set that represents the meaning assumed by the holder of the belief to have been intended by the respective source. The latter source can be documented with the property *Jxx7 about (has interpretation).*

Examples:

* Francesca Bologna’s belief that Publius Cornelius Tacitus meant that “Nero was at Antium when the Great Fire broke out and did not return to Rome until the fire approached his house” (Ix2) *Jxx6 assumed meaning*

{Nero in July 19, 64 AD (E93 Presence)

 P164 is temporally specified by: July 19, 64 AD (E52 Timespan)

 P195 was a presence of: Nero Claudius Caesar Drusus Germanicus (E21 Person)

 P167 was within Antium in 64 AD, Italy (E53 Place)

 P133 is spatiotemporally separated from: The Great Fire of Rome (E5 Event)

P1 is identified by: incendium magnum Romae (E41 Appellation)

P4 has timespan: July 19-27, 64 AD (E52 Timespan)

P7 took place at : Rome in 64AD, Italy (E53 Place)

} (I4) (F. Bologna, 2021)

* Francesca Bologna’s belief that Gaius Suetonius Tranquillus meant that Nero was singing in Rome while it was burning from July 19 in 64 AD *Jxx6 assumed meaning*

{Nero July 19, 64 AD (E93 Presence)

P164 is temporally specified by: July 19, 64 AD (E52 Timespan)

P195 was a presence of: Nero Claudius Caesar Drusus Germanicus (E21 Person)

P167 was within Rome in 64AD, Italy (E53 Place)

P10 falls within (contains): Nero Singing (E7 Activity)

P2 has type: Singing (E55 Type)

P14 carried out by: Nero Claudius Caesar Drusus Germanicus (E21)

P4 has timespan: July 19, 64 AD (E52 Timespan)

P7 took place at: Rome in 64AD, Italy (E53 Place)

P132 spatiotemporally overlaps with: The Great Fire of Rome (E5 Event)

P1 is identified by: incendium magnum Romae (E41 Appellation)

P4 has timespan: July 19-27, 64 AD (E52 Timespan)

P7 took place at: Rome in 64AD, Italy (E53 Place)

}(I4) (F. Bologna, 2021)

In First Order Logic:

Jxx6(x,y) ⇒ Ix2(x)

Jxx6(x,y) ⇒ I4(y)

### Jxx7 about [D: Ix2 Intended Meaning, R; E73 Information Object]

**Jxx7 about (has interpretation)**

Domain: Ix2 Intended Meaning Belief

Range: E73 Information Object

Subproperty of:

Superproperty of:

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

Scope note: This property associates an instance of Ix2 Intended Meaning Belief with the instance of E73 Information Object that was a source of, or evidence for, the interpretation of its intended meaning. If sources are fragmentary about, or complementary to, a specific topic, more than one source may have been used.

Examples:

* Francesca Bologna’s belief that Gaius Suetonius Tranquillus meant that Nero was singing in Rome while it was burning from July 19 in 64 AD a*bout* the extant book De Vita Caesarum attributed to Gaius Suetonius Tranquillus*.*

In First Order Logic:

Jxx7(x,y) ⇒ Ix2(x)

Jxx7(x,y) ⇒ E73(y)

### Jxx4 assumed provenance [D: I7 Belief Adoption, R: Ix5 Provenance Belief]

**Jxx4 assumed provenance (was assumed by)**

Domain: I7 Belief Adoption

Range: Ix5 Provenance Belief

Subproperty of: J1 used as premise (was premise for)

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

Scope Note: This property associates an instance of I7 Belief Adoption with an instance of Ix5 Provenance Belief about the source or sources referred to by the property Jxx2 adopted interpretation of, which justifies the conviction that the trusted and adopted content of the source, or its copy at hand, is actually identical, or sufficiently close, to the assumed original and its context of creation.

Examples:

* Francesca Bologna’s adoption of Tacitus’ belief where Emperor Nero was when the Great Fire started *Jxx4 assumed provenance* Francesca Bologna’s belief about the authenticity of Tacitus, Publius Cornelius. The Annals. Book 15.

In First Order Logic:

Jxx4(x,y) ⇒ I7(x)

 Jxx4(x,y) ⇒ Ix5(y)

 Jxx4(x,y) ⇒ J1(x,y)

 Jxx4(x,y) ⇐ (∃uv) [E73(u) ˄ J7(x,u) ˄ I10(v) ˄ Jxx9(v,u) ˄ Jxx8(y,v)]

### Jxx8 that [D: Ix5 Provenance Belief, R: I10 Provenance Statement]

**Jxx8 that (is subject of)**

Domain: Ix5 Provenance Belief

Range: I10 Provenance Statement

Subproperty of: I2 Belief. J4 that (is subject of): I4 Proposition Set

Superproperty of:

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

Scope note: This property associates an instance of Ix5 Provenance Belief with the instance of I10 Provenance Statement that holds an opinion about it.

Examples:

* Francesca Bologna’s belief about the authenticity of Tacitus, Publius Cornelius. The Annals. Book 15 *that* the copy of Tacitus, Publius Cornelius. The Annals. Book 15 [15.16] at hands of Francesca Bologna from the British Museum in 2021 represents a text written by the ancient Roman historian Publius Cornelius Tacitus.
* The belief of Ernst Pernicka et al. that the Nebra Sky Disc Dates to the Early Bronze Age *that* “the Nebra Sky Disc dates to the Early Bronze Age” (Pernicka et al. 2020)

In First Order Logic:

Jxx8(x,y) ⇒ Ix5(x)

 Jxx8(x,y) ⇒ I10(y)

 Jxx8(x,y) ⇒ J4(x,y)

### Jxx9 is about the provenance of [D: I10 Provenance Statement, R: E70 Thing]

**Jxx9 is about the provenance of (has provenance claim)**

Domain: I10 Provenance Statement

Range: E70 Thing

Subproperty of: E89 Propositional Object. P129 is about (is subject of): E1 CRM Entity

Superproperty of:

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

Scope note: This property associates an instance of I10 Provenance Statement with an instance of E70 Thing the provenance of which this statement describes.

Examples:

* The statement: “The exemplar of The Merchant of Venice, Quarto 1 (1600) owned by The British Library, shelf number BL C.34.k.22 was published 1600 AD by Thomas Heyes” *is about provenance of* The exemplar of The Merchant of Venice, Quarto 1 (1600) owned by The British Library, shelf number BL C.34.k.22

In First Order Logic:

Jxx9(x,y) ⇒ I10(x)

Jxx9(x,y) ⇒ E70(y)

Jxx9(x,y) ⇒ P129(x,y)

### Jxx1 concluded provenance [D: Ix3 Provenance Assessment, R: Ix5 Provenance Belief]

**Jxx1 concluded provenance (was assessed by)**

Domain: Ix3 Provenance Assessment

Range: Ix5 Provenance Belief

Subproperty of: J2 concluded that (was concluded by)

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

Scope Note: This property associates an instance of Ix3 Provenance Assessment with an instance of Ix5 Provenance Belief that constitutes the conclusion of the assessment. An instance of Ix3 Provenance Assessment may conclude more than one instance of Ix5 Provenance Belief, typically about different objects considered in the same assessment.

Examples:

* The assessment by Ernst Pernicka et al. about the provenance of the Nebra Sky Disc *concluded that* Ernst Pernicka et al. believe that the Nebra Sky Disc dates to the Early Bronze Age (Pernicka et al. 2020)

In First Order Logic:

Jxx1(x,y) ⇒ Ix3(x)

Jxx1(x,y) ⇒ Ix5(y)

Jxx1(x,y) ⇒ J2(x,y)

### Jxx10 interpreted meaning of [D: Ix1 Meaning Comprehension, E73 Information Object]

**Jxx10 interpreted meaning of (was interpreted by)**

Domain: Ix1 Meaning Comprehension

Range: E73 Information Object

Subproperty of: P16 used specific object (was used for)

Superproperty of:

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

Scope note: This property associates an instance of Ix1 Meaning Comprehension with the instance of E73 Information Object that was a source of, or evidence for, the interpretation of its intended meaning. If sources are fragmentary about or complementary to a specific topic, more than one source may have been used.

Examples:

* My understanding of the statements about Emperor Nero’s whereabouts in Rome while it was burning from July 19 in 64 AD *interpreted meaning of* the extant book De Vita Caesarum by Gaius Suetonius Tranquillus.

In First Order Logic:

Jxx10(x,y) ⇒ Ix1(x)

 Jxx10(x,y) ⇒ E73(y)

### Jxx11 interpreted meaning as [[D: Ix1 Meaning Comprehension, R: Ix2 Intended Meaning Belief]

**Jxx11 interpreted meaning as (was interpretation by)**

Domain: Ix1 Meaning Comprehension

Range: Ix2 Intended Meaning Belief

Subproperty of: J2 concluded that (was concluded by)

Superproperty of:

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

Scope note: This property associates an instance of Ix1 Meaning Comprehension with the instance of Ix2 Intended Meaning Belief that was the result of the interpretation of the intended meaning of the analysed source or sources.

Examples:

* My understanding of the statements about Emperor Nero’s whereabouts in Rome while it was burning from July 19 in 64 AD *interpreted meaning as* believing that it meant thatNero was singing in Rome while it was burning from July 19 in 64 AD.

In First Order Logic:

Jxx11(x,y) ⇒ Ix1(x)

 Jxx11(x,y) ⇒ Ix2(y)

## Updating definitions:

### I2 Belief

#### NEW

Subclass of: E2 Temporal Entity

Superclass of

Scope note: This class comprises the notion that the associated I4 Proposition Set is held to have a particular I6 Belief Value by a particular E39 Actor. This can be understood as the period of time that an individual or group holds a particular set of propositions to be true, false or somewhere in between.

Properties: J4 that (is subject of): I4 Proposition Set

 J5 holds to be: I6 Belief Value

Examples:

* Ian Hodder’s belief from 1996 on that Floor B was earlier than wall C of building 1 in the north area of Catalhöyük (Hodder 1999).

#### OLD

Subclass of: I8 Conviction

Superclass of

Scope note: This class comprises the notion that the associated I4 Proposition Set is held to have a particular I6 Belief Value by a particular E39 Actor. This can be understood as the period of time that an individual or group holds a particular set of propositions to be true, false or somewhere in between..

Properties: J4 that (is subject of): I4 Proposition Set

 J5 holds to be: I6 Belief Value

Examples:

* My belief that Dragendorff type 29 bowls are from the 1st Century AD
* Dragendorff’s belief that type 29 bowls are from the 1st Century AD

### I7 Belief Adoption

#### NEW

Subclass of: [I1](https://docs.google.com/document/d/1EywWv4dE2B1bH8NNm8ec0JGa6Af7_GsR/edit#heading=h.gjdgxs) Argumentation

Superclass of:

Scope note: This class comprises the action of an E39 Actor adopting propositions taken from an interpretation of the intended meaning of an instance of E73 Information Object as being true or in some way likely to be true. The adopted propositions constitute the conclusion of the action in the form of a new instance of Ix4 Adopted Belief of the adopting actor.

The basis of I7 Belief Adoption is the justification of trust in the source of the adopted propositions rather than the application of rules for inferring the respective propositions from logical premises.

Typical examples are the citation of academic papers or the reuse of data sets.

Where an instance of I7 Belief Adoption is based on personal communication (marked as pers.comm. in the studied text) this should be represented by using P2 *has type*: “Pers.Comm.” directly from the instance of I7 Belief Adoption.

Properties:

Jxx5 adopted interpretation (was concluded by): Ix4 Adopted Belief

J7 is based on evidence from (was evidence for): E73 Information Object

Jxx3 assumed meaning (was assumed by): Ix2 Intended Meaning Belief

Jxx4 assumed provenance (was assumed by): Ix5 Provenance Belief

Examples:

* Francesca Bologna’s adoption of Tacitus’ belief where Emperor Nero was when the Great Fire started. (F. Bologna, 2021). [Francesca Bologna adopted Tacitus belief, as the only historian who was actually alive at the time of the Great Fire of Rome (although only 8 years old): "Nero at this time was at Antium and did not return to Rome until the fire approached his house" in : Tacitus, Publius Cornelius. The Annals. Book 15 [15.16].]

In First Order Logic:

 I7(x) ⇒ I1(x)

#### OLD

Subclass of: I1 Argumentation

Superclass of:

Scope note: This class comprises the action of an E39 Actor adopting a particular instance of I2 Belief to create a new instance of I2 Belief that shares some of the same propositions in the original I4 Proposition Set and the associated I6 Belief Value.

The basis of I7 Belief Adoption is trust in the source of the instance of I2 Belief rather than the application of the rules in instances of I3 Inference Logic.

Typical examples are the citation of academic papers or the reuse of data sets.

Where an instance of I7 Belief Adoption is based on personal communication (marked as pers.comm. in the studied text) this should be represented by using P2 *has type*: “Pers.Comm.” directly from the instance of I7 Belief Adoption.

Properties: J6 adopted (adopted by): I2 Belief

 J7 is based on evidence (is evidence for): E73 Information Object

J11 used manifestation (was manifestation used by): F3 Manifestation

**J12** used (was used by): F5 Item

Examples:

* My adoption of the belief that Dragendorff type 29 bowls are from the 1st Century AD

### I10 Provenance Statement

#### NEW

Subclass of: I4 Proposition Set

Superclass of:

Scope note: This class comprises statements about the provenance of instances of E70 Thing existing at the time of making the provenance statements. An instance of I10 Provenance Statement must contain propositions contain propositions about the presence of the respective instances of E70 Thing in an event or spatiotemporal context of reference. Characteristically, it may pertain to the writing by a known author at a known or unknown date or place, or to the existence of the text known to some public regardless of the truth of authorship.

In case that only information objects exist describing the proper thing of interest, such as a photo, or photo of a photo of a lost archaeological object, an instance of I10 Provenance Statement should contain or refer to the relevant chain of intermediate events transferring the information from the proper thing of interest up to the extant information objects taken into account.

The property *Jxx9 is about provenance of* can be used to link the instance of I10 Provenance Statement as a whole with the proper thing of interest. It constitutes a constraint to the provenance statement that it must contain the description of the relevant context of reference and, if applicable, to the relevant chain of intermediate events transferring the information.

Properties: Jxx9 is about the provenance of (has provenance claim): E70 Thing

Examples:

* The statement: “The copy of Tacitus, Publius Cornelius. The Annals. Book 15 [15.16] at hands of Francesca Bologna from the British Museum in 2021 represents a text written by the ancient Roman historian Publius Cornelius Tacitus.” [This statement can be represented by a set of CRM compatible propositions]
* The statement: “The Latin content of the extant book De Vita Caesarum attributed to Gaius Suetonius Tranquillus was published in Rome 121AD and not alienated in its propositional content by essential transcription errors until its currently known form.”” [This statement can be represented by a set of CRM compatible propositions]
* The statement: “The exemplar of The Merchant of Venice, Quarto 1 (1600) owned by The British Library, shelf number BL C.34.k.22 was published 1600AD by Thomas Heyes.” [This statement can be represented by a set of CRM compatible propositions]
* The statement: “the Nebra Sky Disc dates to the Early Bronze Age” (Pernicka et al. 2020)

In First Order Logic:

 I10(x) ⇒ I4(x)

#### OLD

Subclass of: I4 Proposition Set

Superclass of:

Scope note: This class comprises statements about the provenance of an instance of E73 Information Object with known content at the time of making the provenance statements. An instance of I10 Provenance Statement must contain propositions about the presence of a carrier of the respective instance of E73 Information Object in an event or spatiotemporal context of reference. Characteristically, it may pertain to the writing by a known author at a known or unknown date or place, or to the existence of the text known to some public regardless the truth of authorship.

Examples:

* The Latin content of the extant book De Vita Caesarum attributed to Gaius Suetonius Tranquillus was published in Rome 121AD and not alienated in its propositional content by essential transcription errors until its currently known form.
* The exemplar of The Merchant of Venice, Quarto 1 (1600) owned by The British Library, shelf number BL C.34.k.22 was published 1600AD by Thomas Heyes.

In First Order Logic:

 I10(x) ⊃ I4(x)

### J2 concluded that [D: I1 Argumentation, R: I2 Belief]

#### NEW

Domain: I1 Argumentation

Range: I2 Belief

Subproperty of:

Superproperty of:

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

Scope note: This property associates an instance of I2 Belief with the instance of I1 Argumentation that concluded it.

Examples:

* Ian Hodder’s reexamination in 1996 of the physical relation of Wall C and floor B of building 1 in the north area of Catalhöyük *concluded that* Ian Hodder’s belief from 1996 on that Floor B was earlier than wall C of building 1 in the north area of Catalhöyük (Hodder 1999)

In First Order Logic:

 J2(x,y) ⊃ I1(y)

 J2(x,y) ⊃ I2(y)

J2(x,y) ⊃ P116(x,y)

#### OLD

Domain: I1 Argumentation

Range: I8 Conviction

Subproperty of: P116 starts (is started by)

Superproperty of:

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

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

Examples:

* My classification and dating of this bowl (I5) concluded that my belief that this bowl is from the 1st Century AD (I2)

In First Order Logic:

 J2(x,y) ⊃ I1(y)

 J2(x,y) ⊃ I8(y)

J2(x,y) ⊃ P116(x,y)

### J7 is based on evidence from [D: I7 Belief Adoption, R: E73 Information Object]

#### NEW

Domain: I7 Belief Adoption

Range: E73 Information Object

Subproperty of: P16 used specific object (was used for)

Superproperty of:

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

Scope note: This property associates an instance of I7 Belief Adoption with the instance of E73 Information Object that was a source of, or evidence for, the I4 Proposition Set that was adopted.

Examples:

* Francesca Bologna’s adoption of Tacitus’ belief where Emperor Nero was when the Great Fire started *J7 is based on evidence from* Tacitus, Publius Cornelius. The Annals. Book 15 [15.16] (F. Bologna, 2021)

In First Order Logic:

J7(x,y) ⇒ I7(x)

 J7(x,y) ⇒ E73(y)

 J7(x,y) ⇒ P16(x,y)

#### OLD

Domain: I7 Belief Adoption

Range: E73 Information Object

Subproperty of: P16 used specific object (was used for)

Superproperty of:

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

Scope note: This property associates an instance of I7 Belief Adoption with the instance of E73 Information Object that was the source of or evidence for the I4 Proposition Set that was adopted.

Examples:

* My adoption of the belief that Dragendorff type 29 bowls are from the 1st Century AD (I7) *is based on evidence from* Hans Dragendorff, "Terra sigillata. Ein Beitrag zur Geschichte der griechischen und römischen Keramik", *Bonner* *Jahrbücher* 96 (1895), 18-155 (E73)

### New example to be used in I4 Proposition Set, J2 that

This example is to be related to an example of I4 Proposition Set:

Francesca Bologna’s belief that Publius Cornelius Tacitus meant that “Nero was at Antium when the Great Fire broke out and did not return to Rome until the fire approached his house” (Ix4) *J2 that*

{Nero in July 19, 64 AD (E93 Presence)

 P164 is temporally specified by: July 19, 64 AD (E52 Timespan)

 P195 was a presence of: Nero Claudius Caesar Drusus Germanicus (E21 Person)

 P167 was within Antium in 64AD, Italy (E53 Place)

 P133 is spatiotemporally separated from: The Great Fire of Rome (E5 Event)

P1 is identified by: incendium magnum Romae (E41 Appellation)

P4 has timespan: July 19-27, 64 AD (E52 Timespan)

P7 took place at : Rome in 64AD, Italy (E53 Place)

 } (F. Bologna, 2021)

} (I4) (F. Bologna, 2021)]

### New example to be used in I4 Proposition Set

Francesca Bologna’s belief that Gaius Suetonius Tranquillus meant that Nero was singing in Rome while it was burning from July 19 in 64 AD *Jxx6 assumed meaning*

{Nero July 19, 64 AD (E93 Presence)

P164 is temporally specified by: July 19, 64 AD (E52 Timespan)

P195 was a presence of: Nero Claudius Caesar Drusus Germanicus (E21 Person)

P167 was within Rome in 64AD, Italy (E53 Place)

P10 falls within (contains): Nero Singing (E7 Activity)

P2 has type: Singing (E55 Type)

P14 carried out by: Nero Claudius Caesar Drusus Germanicus (E21)

P4 has timespan: July 19, 64 AD (E52 Timespan)

P7 took place at: Rome in 64AD, Italy (E53 Place)

P132 spatiotemporally overlaps with: The Great Fire of Rome (E5 Event)

P1 is identified by: incendium magnum Romae (E41 Appellation)

P4 has timespan: July 19-27, 64 AD (E52 Timespan)

P7 took place at: Rome in 64AD, Italy (E53 Place)

}(I4) (F. Bologna, 2021)

### References of examples:

* Bologna, F. (2021) ‘Who was Nero?’, *The British Museum Blog*, 22 April. Available at: <https://www.britishmuseum.org/blog/who-was-nero> (Accessed: 10 April 2023).
* Hodder, I. (1999) The Archaeological Process: An Introduction. Oxford: Blackwell.
* Pernicka, E. et al. (2020) ‘Why the Nebra Sky Disc Dates to the Early Bronze Age. An overview of the Interdisciplinary Results’, Journal on the Archaeology of Europe, 104, pp. 89–122. doi:10.1553/archaeologia104s89.
1. https://en.wikipedia.org/wiki/The\_Twelve\_Caesars [↑](#footnote-ref-1)
2. https://en.wikipedia.org/wiki/The\_Twelve\_Caesars [↑](#footnote-ref-2)