

Issue Topic

Adjust scope notes of properties of E16 after harmonizing the quantification of P43 with O12 has dimension

Consider the latest definition of E16 and P39:

E16 Measurement

Subclass of:

E13 Attribute Assignment

Scope note:

This class comprises actions measuring quantitative physical properties and other values that can be determined by a systematic, objective procedure of direct observation of particular states of physical reality.

An instance of E16 Measurement may use simple counting or tools, such as yardsticks or radiation detection devices. The interest is in the method and care applied, so that the reliability of the result may be judged at a later stage, or research continued on the associated documents. The date of the event is important for dimensions, which may change value over time, such as the length of an object subject to shrinkage. Methods and devices employed should be associated with instances of E16 Measurement by properties such as *P33 used specific technique*: E29 Design or Procedure, *P125 used object of type*: E55 Type, *P16 used specific object (was used for)*: E70 Thing, whereas basic techniques such as "carbon-14 dating" should be encoded using *P2 has type (is type of)*: E55 Type. Details of methods and devices reused or reusable in other instances of E16 Measurement should be documented for these entities rather than the measurements themselves, whereas details of particular execution may be documented by free text or by instantiating adequate sub-activities, if the detail may be of interest for an overarching query.

Regardless whether a measurement is made by an instrument or by human senses, it represents the initial transition from physical reality to information without any other documented information object in between within the reasoning chain that would represent the result of the interaction of the observer or device with reality. Therefore, determining properties of an instance of E90 Symbolic Object is regarded as an instance of E13 Attribute Assignment, which may be inferred from observing and measuring representative carriers. In the case that the carrier can be named, the property *P16 used specific object (was used for)* should be used to indicate the instance(s) of E18 Physical Thing that was used as the empirical basis for the attribute assignment. For instance, inferring properties of depicted items using image material, such as satellite images, is not regarded as an instance of E16 Measurement, but as a subsequent instance of E13 Attribute Assignment. Rather, only the production of the images, understood as arrays of radiation intensities, is regarded as an instance of E16 Measurement. The same reasoning holds for other sensor data.

Examples:

- measurement of the height of silver cup 232 on the 31st August 1997 (fictitious)
- the carbon 14 dating of the "Schoeninger Speer II" in 1996 [The carbon 14 dating of an approximately 400.000 year old complete Old Palaeolithic wooden spear found in Schoeningen, Niedersachsen, Germany, in 1995.] (Kouwenhoven, 1997)

In first-order logic:

$$E16(x) \Rightarrow E13(x)$$

Properties:

P39 measured (was measured by): E18 Physical Thing

P40 observed dimension (was observed in): E54 Dimension

P39 measured (was measured by)

Domain:

E16 Measurement

Range:

E18 Physical Thing

Subproperty of:

E13 Attribute Assignment. P140 assigned attribute to (was attributed by): E1 CRM Entity

Quantification:

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

Scope note:

This property associates an instance of E16 Measurement with the instance of E18 Physical Thing upon which it acted. The instance of E16 Measurement is specific to the measured object. An instance of E18 Physical Thing may be measured more than once with different results, constituting different instances of E16 Measurement.

Examples:

- The measurement of the height of silver cup 232 on 31st August 1997 (E16) *measured* silver cup 232 (E22). (fictitious)
- The carbon 14 dating of the “Schoeninger Speer II” in 1996 (E16) *measured* the “Schoeninger Speer II” (E22). [The carbon 14 dating of an approximately 400.000 year old complete Old Palaeolithic wooden spear found in Schoeningen, Niedersachsen, Germany, in 1995. See also, E16 Measurement.] (Kouwenhoven, 1997)

In first-order logic:

$$P39(x,y) \Rightarrow E16(x)$$

$$P39(x,y) \Rightarrow E18(y)$$

$$P39(x,y) \Rightarrow P140(x,y)$$

In contrast, the scope notes of P43 and P40 have not been adjusted to the new interpretation of E16. Therefore I propose the following

OLD

P43 has dimension (is dimension of)

Domain:

E70 Thing

Range:

E54 Dimension

Quantification:

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

Scope note:

This property records an instance of E54 Dimension of some instance of E70 Thing.

In the case that the recorded property is a result of a measurement of an instance of E18 Physical Thing, this property is a shortcut of the more fully developed path from E18 Physical Thing through *P39i was measured by (measured)*, E16 Measurement, *P40 observed dimension (was observed in)* to E54 Dimension.

It offers no information about how and when an E54 Dimension was established, nor by whom. Knowledge about an instance of E54 Dimension need not be the result of a measurement; it may be the result of evaluating data or other information, which should be documented as an instance of E13 Attribute Assignment.

An instance of E54 Dimension is specific to an instance of E70 Thing.

Full path:

E18 Physical Thing. P39i was measured by (measured): E16 Measurement. P80 observed dimension (was observed in): E54 Dimension

Examples:

- Silver cup 232 (E22) *has dimension* height of silver cup 232 (E54). [which *has unit (P91)* mm (E58), *has value (P90)* 224 (E60)] (fictitious)

In first-order logic:

$P43(x,y) \Rightarrow E70(x)$

$P43(x,y) \Rightarrow E54(y)$

$P43(x,y) \Leftarrow (\exists z) [E16(z) \wedge P39i(x,z) \wedge P40(z,y)]$

NEW

P43 has dimension (is dimension of)

Domain:

E70 Thing

Range:

E54 Dimension

Quantification:

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

Scope note:

This property records an instance of E54 Dimension of some instance of E70 Thing.

In the case that the recorded property is a result of a measurement of an instance of E18 Physical Thing, this property is a shortcut of the more fully developed path from E18 Physical Thing through *P39i was measured by*, E16 Measurement, *P40 observed dimension* to E54 Dimension.

It offers no information about how and when an E54 Dimension was established, nor by whom. Knowledge about an instance of E54 Dimension need not be the result of a measurement; it may be the result of evaluating data or other information, which should be documented as an instance of E13 Attribute Assignment.

An instance of E54 Dimension that is referred to by this property is specific to an instance of E70 Thing.

Examples:

- Silver cup 232 (E22) *has dimension* height of silver cup 232 (E54). [which *has unit* (P91) mm (E58), *has value* (P90) 224 (E60)] (fictitious)
- The “Schoeninger Speer II” (E60) *has dimension* the carbon 14 based temporal distance from 1996 to the growth of the wood of the “Schoeninger Speer II” (E54). [The carbon 14 dating of the “Schoeninger Speer II” in 1996 of an old complete Old Palaeolithic wooden spear found in Schoeningen, Niederachsen, Germany, in 1995 resulted in approximately 400.000 years. See also: E16 Measurement.] (Kouwenhoven, 1997)

In first-order logic:

$P43(x,y) \Rightarrow E70(x)$

$P43(x,y) \Rightarrow E54(y)$

$P43(x,y) \Leftarrow (\exists z) [E16(z) \wedge P39(z,x) \wedge P40(z,y)]$

Exclusion statements to go under P43, CRMbase:

$P43(z,y) \Rightarrow \neg(\exists z) [E54(z) \wedge 191(x,z)]$

$P43(z,y) \Rightarrow \neg(\exists z) [E54(z) \wedge 179(x,z)]$

By deduction, $P40(x,y) \Rightarrow P39(x,z) \Rightarrow P43(z,y) \Rightarrow \neg(\exists z) [E54(z) \wedge 191(x,z)]$

OLD

P40 observed dimension (was observed in)

Domain:

E16 Measurement

Range:

E54 Dimension

Subproperty of:

E13 Attribute Assignment. P141 assigned (was assigned by): E1 CRM Entity

Quantification:

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

Scope note:

This property records the dimension that was observed in an E16 Measurement Event.

E54 Dimension can be any quantifiable aspect of E70 Thing. Weight, image colour depth and monetary value are dimensions in this sense. One measurement activity may determine more than one dimension of one object.

Dimensions may be determined either by direct observation or using recorded evidence. In the latter case the measured Thing does not need to be present or extant.

Even though knowledge of the value of a dimension requires measurement, the dimension may be an object of discourse prior to, or even without, any measurement being made.

Examples:

- The measurement of the height of silver cup 232 on 31st August 1997 (E16) *observed dimension* silver cup 232 height (E54). [which *has unit* mm (E58), *has value* 224 (E60)] (fictitious)
- The carbon 14 dating of the “Schoeningen Speer II” in 1996 (E16) *observed dimension* the carbon 14 based temporal distance from 1996 to the growth of the wood of the “Schoeningen Speer II” (E60). [The carbon 14 dating of an approximately 400.000 year old complete Old Palaeolithic wooden spear found in Schoeningen, Niedersachsen, Germany, in 1995. See also: E16 Measurement.] (Kouwenhoven, 1997)

In first-order logic:

$P40(x,y) \Rightarrow E16(x)$

$P40(x,y) \Rightarrow E54(y)$

$P40(x,y) \Rightarrow P141(x,y)$

NEW

P40 observed dimension (was observed in)

Domain:

[E16](#) Measurement

Range:

[E54](#) Dimension

Subproperty of:

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

Quantification:

one to one, necessary (1,1:0,1)

Scope note:

This property records the dimension of an instance of E18 Physical Thing that was observed in an E16 Measurement Event. The observed item should be documented using the property P39 measured (was measured by).

One measurement activity may determine only one dimension of an instance of E18 Physical Thing. Such dimension can be any quantifiable aspect of E70 Thing. Weight, length, chemical content are dimensions in this sense.

Dimensions of an instance of E18 Physical Thing may be determined either by direct observation or using recorded evidence. However, determination by measuring requires the presence of the measured item. Other methods may constitute instances of E13 Attribute Assignment.

Even though knowledge of the value of a dimension requires measurement, the dimension may be an object of discourse prior to, or even without, any measurement being made.

This property is part of the fully developed path from E18 Physical Thing through *P39i was measured by*, E16 Measurement, *P40 observed dimension* to E54 Dimension, which is shortcut by *P43 has dimension (is dimension of)*.

Examples:

- The measurement of the height of silver cup 232 on 31st of August 1997 (E16) *observed dimension* silver cup 232 height (E54). [which *has unit* mm (E58), *has value* 224 (E60)] (fictitious)
- The carbon 14 dating of the “Schoeninger Speer II” in 1996 (E16) *observed dimension* the carbon 14 based temporal distance from 1996 to the growth of the wood of the “Schoeninger Speer II” (E54). [The carbon 14 dating of an approximately 400.000 year old complete Old Palaeolithic wooden spear found in Schoeningen, Niederachsen, Germany, in 1995. See also: E16 Measurement.] (Kouwenhoven, 1997)

In First Order Logic:

$P40(x,y) \Rightarrow E16(x)$

$P40(x,y) \Rightarrow E54(y)$

$P40(x,y) \Rightarrow P141(x,y)$

By deduction, $P40(x,y) \Rightarrow P39(x,z) \Rightarrow P43(z,y) \Rightarrow \neg(\exists z) [E54(z) \wedge P191(x,z)]$

NEW

P39 measured (was measured by)

Domain:

E16 Measurement

Range:

E18 Physical Thing

Subproperty of:

E13 Attribute Assignment. P140 assigned attribute to (was attributed by): E1 CRM Entity

Quantification:

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

Scope note:

This property associates an instance of E16 Measurement with the instance of E18 Physical Thing upon which it acted. The instance of E16 Measurement is specific to the measured object. An instance of E18 Physical Thing may be measured more than once with different results, constituting different instances of E16 Measurement.

This property is part of the fully developed path from E18 Physical Thing through *P39i was measured by*, E16 Measurement, *P40 observed dimension* to E54 Dimension, which is shortcut by *P43 has dimension (is dimension of)*.

Examples:

- The measurement of the height of silver cup 232 on 31st August 1997 (E16) *measured* silver cup 232 (E22). (fictitious)
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In first-order logic:

$P39(x,y) \Rightarrow E16(x)$

$P39(x,y) \Rightarrow E18(y)$

$P39(x,y) \Rightarrow P140(x,y)$