### Issue 583 55th SIG meeting

The SIG reviewed MD’s proposal to introduce a modeling construct in CRMsci V2.1 and approved it. The classes/properties concerned immediately follow:

* [Sxx2 Relative Dimension](#_Sxx2_Relative_Dimension) (IsA E54 Dimension), and corresponding property
  + [Oxx6 is relative to (has relative dimension)](#_Oxx6_is_relative_1): S15 Observable Entity [IsA O12 has dimension (is dimension of)]
* [Sxx3 Angle](#_Sxx3_Angle_(IsA) (IsA Sxx2 Relative Dimension), and corresponding property
  + [Oxx7 has vertex](#_Oxx7_has_vertex) (is vertex of): S15 Observable Entity [IsA Oxx6 is relative to (has relative dimension)]

**Discussion points:**

* Property quantifier used in ***Oxx6 is relative to (has relative dimension)*** “many to many, necessary two (2:n,0:n)” has not been properly introduced in any model so far. It has to be defined. Relevant for CRMbase too.
* A historical example of calculations based on a vertex is needed for Oxx7 has vertex (is vertex of) is needed: calculations used by Aristarchus of Samos to infer the distance of the Sun and Moon from the Earth and the measure their circumference.   
  **HW:** for MD & AG formulate the examples and find good citations.

**Decisions**:

* said constructs to be introduced in the model (v2.1).
* AK & TV to take care of assigning them number identifiers in the new release.
* **HW**: MD & AG to formulate missing examples and provide citations for them
* **HW**: MD & CEO to define the missing property quantification “many to many, necessary, two (2:n, 0,n)”.

#### Sxx2 Relative Dimension (isA E54 Dimension)

**Sxx2 Relative Dimension**

Subclass of:

E54 Dimension

Superclass of:

Sxx3 Angle

Scope note:

This class comprises quantifiable properties that can be measured by some calibrated means and were holding between two or more distinct instances of S15 Observable Entity for some time.

Typical examples include relative distances between physical things or temporal distances between events such as athletes arriving at a goal or the time elapsed from production in thermoluninescence dating.

Generally, all kinds of quantifiable properties holding for a single item in isolation can be compared relative to the same of another item. Depending on the methods, such relative dimensions often constitute important primary observational data for calculating absolute values rather than being computational results from absolute values, an example being relative barometric measurements of altitude during expeditions.

Examples:

* the distance of the Moon from Earth [The distance to the Moon can be measured with millimeter precision.] (https://en.wikipedia.org/wiki/Lunar\_Laser\_Ranging\_experiment)

In first-order logic:

Sxx2(x) ⇒ E54(x)

Properties:

Oxx6 is relative to (has relative dimension): S15 Observable Entity

##### Oxx6 is relative to (has relative dimension) (IsA O12 has dimension (is dimension of))

**Oxx6 is relative to (has relative dimension)**

Domain:

[Sxx2](#_heading=h.17dp8vu) Relative Dimension

Range:

S15 Observable Entity

Subproperty of:

E54 Dimension. O12i is dimension of (has dimension): S15 Observable Entity

Quantification:

many to many, necessary (2,n:0,n)

Scope note:

This property associates an instance of Sxx2 Relative Dimension with one of the instances of S15 Observable Entity between which it was holding.

Examples:

* The Moon *is relative to* the distance between the Moon and the Earth [The distance to the Moon can be measured with millimeter precision.] (https://en.wikipedia.org/wiki/Lunar\_Laser\_Ranging\_experiment)
* The Earth *is relative to* the distance between the Moon and the Earth (https://en.wikipedia.org/wiki/Lunar\_Laser\_Ranging\_experiment)

In first-order logic:

Oxx6(x,y) ⇒ E54(x)

Oxx6(x,y) ⇒ S15(y)

Oxx6(x,y) ⇒ O12(x,y)

#### Sxx3 Angle (IsA Sxx2 Relative Dimension)

**Sxx3 Angle**

Subclass of:

Sxx2 Relative Dimension

Scope note:

This class comprises quantifiable angles that can be measured by some calibrated means and held between a spot on some instance of S15 Observable Entity forming the geometric vertex and two directions to the position of some other instances of S15 Observable Entity.

Typical examples include results of measurements with theodolites, sextants or compasses.

Examples:

In first-order logic:

Sxx3(x) ⇒ Sxx2(x)

Properties:

Oxx7 has vertex: S15 Observable Entity

##### Oxx7 has vertex (is vertex of) (IsA Oxx6 is relative to (has relative dimension))

**Oxx7 has vertex (is vertex of)**

Domain:

Sxx3 Angle

Range:

S15 Observable Entity

Subproperty of:

Sxx2 Relative Dimension. Oxx6 is relative to (has relative dimension): S15 Observable Entity

Quantification:

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

Scope note:

This property associates an instance of Sxx3 Angle with the instance of S15 Observable Entity that includes in its extent the vertex of the former.

Typical examples are respective marked spots on Earth or a ship where a theodolite, a sextant or a compass (<https://en.wikipedia.org/wiki/Theodolite>) is positioned during a position measurement.

Examples:

* historical example would be useful

In first-order logic:

Oxx7(x,y) ⇒ Sxx3(x)

Oxx7(x,y) ⇒ S15(y)

Oxx7(x,y) ⇒ Oxx6(x,y)