Possible entry for transitivity in the term list on pp vii – xiii. A suggestion is to insert the first paragraph as an entry in the term list and then add all three in the section “Modelling principles”

|  |  |
| --- | --- |
| transitivity | Transitivity is defined in the standard way found in mathematics or logic: A property P is transitive if the domain and range is the same class and for all instances x, y, z of this class the following is the case: If x is related by P to y and y is related byP to z, then x is related by P to z. The intention of a property as described in the scope note will decide whether a property is transitive. For example overlap in time or in space are not transitive, while occurs before is transitive. Transitivity is especially useful when CRM is implemented in a system with deduction.  CRM is formulated as a class system with inheritance. A property P with domain A and range B will also be a property between possible subclasses of A and B. In many cases there will be a common subclass C of A and B. In these cases when the property restricted to C, that is, with C as domain and range, the restricted property could be transitive. In the current version of CRM, there is only one case where a property restricted to a common subclass of its domain and range is transitive. An information object can be incorporated in a symbolic object and thus an information object can be incorporated in another information object.  In the definition of CRM the transitive properties are explicitly marked as such in the scope notes. All unmarked properties should be considered as intransitive. |

In my notes there is one scope note that is marked as not well formulated, P150 defines typical parts of (defines typical wholes of). I have reread the scope note and find it ok. However, to avoid confusions and discussion, the scope note should state that the property is intransitive.

### P150 defines typical parts of (defines typical wholes for)

Domain: E55 Type

Range: E55 Type

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

Scope note: This property associates an instance of E55 Type “A” with an instance of E55 Type “B”, when items of type “A” typically form part of items of type “B”, such as “car motors” and “cars”. The property is in general not transitive.

It allows types to be organised into hierarchies based on one type describing a typical part of another. This property is equivalent to "broader term partitive (BTP)" as defined in ISO 2788 and “broaderPartitive” in SKOS.

Examples:

Car motors (E55) *defines typical parts of* cars (E55)

In First Order Logic:

P150(x,y) ⊃ (E55 Type)

P150(x,y) ⊃ E55(y)

I have added a sentence to the scope note of P165 which is the only property which is transitive when restricted:

### P165 incorporates (is incorporated in)

Domain: [E73](#_E73_Information_Object) Information Object

Range: [E90](#_E90_Symbolic_Object_1) Symbolic Object

Subproperty of: [E90](#_E90_Symbolic_Object_1) Symbolic Object. [P106](#_P106_is_composed_) is composed of (forms part of): [E90](#_E90_Symbolic_Object_1) Symbolic Object

Quantification: (0,n :0,n)

Scope note: This property associates an instance of E73 Information Object with an instance of E90 Symbolic Object (or any of its subclasses) that was included in it.

This property makes it possible to recognise the autonomous status of the incorporated signs, which were created in a distinct context, and can be incorporated in many distinct self-contained expressions, and to highlight the difference between structural and accidental whole-part relationships between conceptual entities.

It accounts for many cultural facts that are quite frequent and significant: the inclusion of a poem in an anthology, the re-use of an operatic aria in a new opera, the use of a reproduction of a painting for a book cover or a CD booklet, the integration of textual quotations, the presence of lyrics in a song that sets those lyrics to music, the presence of the text of a play in a movie based on that play, etc.

In particular, this property allows for modelling relationships of different levels of symbolic specificity, such as the natural language words making up a particular text, the characters making up the words and punctuation, the choice of fonts and page layout for the characters.

When restricted to information objects, that is, seen as a property with E73 Information Object as domain and range the property is transitive.

A digital photograph of a manuscript page incorporates the text of the manuscript page

Examples:

* The content of Charles-Moïse Briquet’s ‘Les Filigranes: dictionnaire historique des marques du papier’ (E32) P165 incorporates the visual aspect of the watermark used around 1358-61 by some Spanish papermaker(s) and identified as ‘Briquet 4019’ (E37)
* The visual content of Jacopo Amigoni’s painting known as ‘The Singer Farinelli and friends’ (E38) *P165 incorporates* the musical notation of Farinelli’s musical work entitled ‘La Partenza’ (E73)
* The visual content of Nicolas Poussin’s painting entitled ‘Les Bergers d’Arcadie’ (E38) *P165 incorporates* the Latin phrase ‘Et in Arcadia ego’ (E33)

In First Order Logic:

P165(x,y) ⊃ E73(x)

P165(x,y) ⊃ E90(y)

P165(x,y) ⊃ P106(x,y)