

Recommendation for the representation of the primitive value classes of the CRM as data types in RDF/OWL implementations

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Introduction

The CIDOC CRM definition states: "It is recommended that the primitive value system from the implementation platform be used to substitute for this class and its subclasses" (p. 25). Therefore we recommend modeling E59 Primitive Value and its subclasses as primitive data types. Properties having one of these classes as range (currently P3, P57, P79, P80, P81, P82, P90) are modeled as data type properties.

RDF and OWL recommend using the data type system of the XML Schema Definition (XSD). As the hierarchy of the Primitive Value Classes is not supported by the hierarchy of XSD data types in RDF / OWL, it cannot be implemented as defined by the CRM. Furthermore, XSD data types do not meet the requirements derived from the scope notes and examples of E60 Number (restricted representation of numbers, no vectors, etc.) and E61 Time Primitive (no representation of arbitrary time spans).

Recommendation

As a consequence we recommend to leave the range of these data type properties undefined, i.e., not to impose any restriction on possible data types. If data type restrictions are necessary in a certain implementation, we recommend introducing typed sub properties, such as "P57a has number of parts [XSD integer]" or "P57b has number of parts [XSD unsigned byte]" as sub properties of "P57 has number of parts".

Furthermore, some CRM classes do not presuppose the attachment of values which are used in implementations (e.g., the concrete representation of an E42 Appellation or E34 Inscription). RDF and OWL do not support the expression of values inside classes. Therefore an implementation has to use suitable properties for this task. The only data type property available for these classes is "P3 has note". The scope note of P3 states "This property is a container for all informal descriptions about an object that have not been expressed in terms of CRM constructs." We recommend using "P3 has note" to attach such values (concrete representations of instances of the class "E90 Symbolic Object" and its subclasses) to the respective classes. We also recommend that an RDF and OWL implementation introduces sub properties of P3 to further determine the type of a representation, e.g. "P3a has string representation [XSD String]".¹

Additional Note

Although the property "P3 has note" is the only available property to represent the "content" of an instance of "E90 Symbolic Object" and its subclasses, it is not perfect. The scope note says that it is a "container for all informal descriptions *about* an object", and not a container for a *representation* of an object. Furthermore, its range "E62 String" prevents the representation of an object, as, e.g., a spoken word or a gesture. Therefore we suggest adding a new property to the CRM "[E1 CRM Entity] P149 has representation" with range [E59 Primitive Value], or maybe even [any] resp. no/open range. For example, this would allow statements like "'myE82ActorAppellation' P149 has representation (a binary sound file)" or "'myE34Inscription' P149 has representation 'SPQR'".

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¹ The current implementation (110224) of the Erlangen CRM / OWL (<http://erlangen-crm.org>) follows this recommendation.