Abstract

We briefly outline the work developed in [6], namely the definition of the OWL 2 ontology Ontoceramic for cataloguing ceramics. The analysis of the classification of Ceramics and in order to provide this constraint, in their domains is expressed only the profile OWL 2 SS, and adapted to SSOWL the decision procedure problem for SSOWL is NP-complete.

OWL 2-SS

Ontoceramic is an ontology for classification and cataloguing of ceramics. Currently, classification of ceramics is performed by using traditional methods like hard-copy archives and standard digital techniques like relational databases. The lack of a systematic classification of Ontoceramic brought to light the limits of the nascent knowledge on the use of the profile OWL 2 SS and to not support some of the constructs occurring in Ontoceramic; we defined a logical model of Ontoceramic. Since none of the existing OWL 2 profiles coincide with our model, that is, each existing OWL 2 profile resulted to be much less expressive and to not support some of the constructs occurring in Ontoceramic; we defined a new OWL 2 profile called OWL 2 SS. Our new profile contains all of the features of the logical model of Ontoceramic that include a wide subset of OWL 2 constructs [9]. To assess the computational complexity of the reasoning problems of the OWL 2 SS profile and to define an efficient reasoning algorithm for it, we used the theoretical terms as a fragment of the four-level stratified calculus called 4LQSR (Restricted Four Level Quantified Syllogistic), proved to be decidable in [7].

References

4. D. F. Bantelmann. A semantic web ontology for ceramics cataloguing and set-in-use with archaeological experts as a first step to overcome the problem of efficiently reasoning on the object description, using a “nonNegativeInteger” value in “hasBox” and “hasSheet” data property for the object indicating the number of the box and the number of the sheet of the object form, respectively. To face the problem of identifying every fragment of an object with, respectively, the “hasSample”, “hasSector” and “hasShape” object-property. Every instance of class “Shape” can be unequivocally identified with a triple of properties: “hasFirstShapeDescriptor”, “hasSecondShapeDescriptor”, and “hasThirdShapeDescriptor”, which are sub-properties of “hasShapeDescriptor” data-properties. For each data-properties, can be specified a string value; these values will be keys for the “Shape instances” Ontoceramic can specify for a finding its color using the Munsell Color System through the data-property “hasColor”. This property provides three sub-data-property relations (“hasChroma”, “hasHue”, “hasValue”) for Munsell chroma, hue and value, respectively. In addition one can provide a finding date and a general additional description using, respectively, “hasFindDate” and “hasGeneralDescription” data-properties. As explained above, it is possible to indicate every fragment of an object using the “Type_Of_Fragment” taxonomy and the relative object-property for each fragment one can specify its measurements. In particular, two data-properties are defined to indicate two different fragments. Such data-properties are used for a general fragment. The first one, “hasWallThickness”, is used to indicate the wall thickness of a wall and foot fragment, the second “hasWallThickness”, is used to indicate the bottom thickness of a foot fragment. It is possible to indicate if a fragment can be physically associated with another fragment to compose an unique object. In the next figure, 2-2006. Seattle, WA, USA, August 17-20, 2006. Proceedings, pages 292/297, 2006.