Role of negative properties in knowledge modelling*

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Abstract

An appropriate and effective knowledge domain model is the key element of any intelligent systems. The dominating knowledge models in information technology, like ontology or formal concept analysis (FCA)[2] are strongly related with the current SE modelling tools from the viewpoint of property modelling. These models use positive and mainly binary valued properties. On the field of philosophical ontology, this can be a valid assumption, but IT ontologies are used sometimes for modelling epistemology. The epistemology model is the result of a cognitive process using deductive and inductive methods. In this model, the lack of some property can be an important characteristic of the objects. The paper presents a survey on interpretation of negative property [1] in philosophy and IT ontology. On both fields, very different approaches compete with each other [3]. In the analysis, we argue for the acceptance of negative properties in knowledge modelling. The main benefit of the dual representation of positive and negative properties is a finer description of the support values for facts during an inductive learning process. This extended structure provides more information compared even with the multi-valued logic or fuzzy representation models. The paper demonstrates the construction of knowledge graph using the dual property model.

Keywords: ontology, negative property, knowledge models

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