A requirements analysis of a method for harmonizing the conceptual modeling language, the ontology and the model setting

Michaël Verdonck, Frederik Gailly

Introduction

- 'If very different models can be developed of the same system, how can a modeler determine which model to use?' – S. Robinson

- Ontology driven conceptual modeling has not yet demonstrated the results we had hoped for

- No argumentation for a chosen ontology

Michaël Verdonck, Frederik Gailly

My Research

Model Setting

Conceptual Model

Ontology

Conceptual Modeling Language

Michaël Verdonck, Frederik Gailly
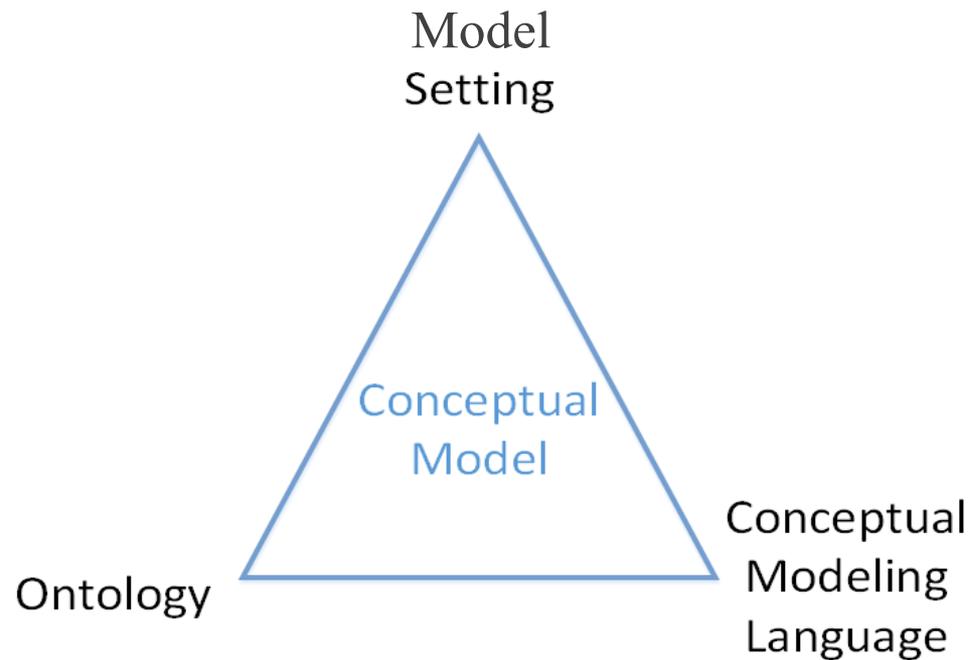
Model Requirements

- Translating model setting into model requirements

- Much research has yet been done on modelling requirements
  - Pritsker (1986), Nance (1994), Willemain (1994), van der Zee and van der Vorst(2005), Robinson (2008)

- Development of a classification of model settings into model requirements

Michaël Verdonck, Frederik Gailly

Method to-be

1. Provide pre-defined user guidance based on the relation between the model requirements and the ontology.

2. Provide pre-defined user guidance based on the relation between the model requirements and the conceptual modeling language (CML).

3. Integrate the user-requested CML with the user-requested ontology.

Michaël Verdonck, Frederik Gailly

Method to-be

1. Literature review on the usage of ontologies

2. Comparative study

3. Selection of ontologies to implement in the method

4. Create a list of criteria to assess an ontology

5. Based on these criteria, produce an algorithm in order to assist the user in the choice of an ontology

Michaël Verdonck, Frederik Gailly

Undecided & Unresolved

- Incorporating domain ontologies or not?

- Linking ontologies with a specific set of requirements

- Linking conceptual modeling languages with a specific set of requirements

Michaël Verdonck, Frederik Gailly

Questions/Feedback?

Michaël Verdonck, Frederik Gailly

Do differences in ontologies matter for conceptual modelling? (1)

- UFO has Quality (the ontological version of an attribute) as a subclass of Moment, and a Quality Universal as subclass of Moment Universal. GFO's Property is similar in idea, but is a subclass of Individual, and is unrelated to moments.

Michaël Verdonck, Frederik Gailly

Do differences in ontologies matter for conceptual modelling? (2)

- GFO's Amount of substrate (like water, gold) and DOLCE's Amount of Matter, which convey a similar notion as Guizzardi's "stuff universal" for which was proposed a stereotype 'quantity' that is a sortal that is a universal in [12], but UFO—used in another extension [3]—does not consider amounts of matter, and nor does BFO, i.e., stuff does not exist according to UFO and BFO, so we cannot identify and model it.

- This results in a situation where aligning EER or UML to DOLCE or GFO would permit us to create a stereotype to denote such entities and relate them with subQuantityOf, but not with UFO or BFO.

Michaël Verdonck, Frederik Gailly