A ontology model for investigation Non-Normative behavior in Risky Activities

Jonathan Morris Samara,
Cesar Augusto Tacla

Universidade Tecnológica Federal do Paraná

jonathan_samara@hotmail.com
cesar.tacla@gmail.com

September 5, 2018

Context

- Human activity is related to following, and violation conducts norms. This generates several systemic implications for a society. An example of this involves jobs where professionals are exposed to risks to their respective lives.
- Violation of norms can have many kinds of consequences. These consequences can be slight as well can generate somebody's death. Therefore, we need models that take this behavior int consideration for the purpose of understanding certain types of relationships within the computational context. In this study we will construct a model within the formalism of ontologies.

Problems

- Within the context of multiagent systems, norms are used to define what an agent must do about certain conditions. This allows do develop a model with the purpose of representing behaviors of the human society.
- The representation of non-normative behaviors contributes to the creation of more realistic models. So in this study we intend do present a non-normative model for professional risk activities. With this model we intend to take int consideration how inappropriate choices can generate negative consequences in future stages of the activity.

Goals

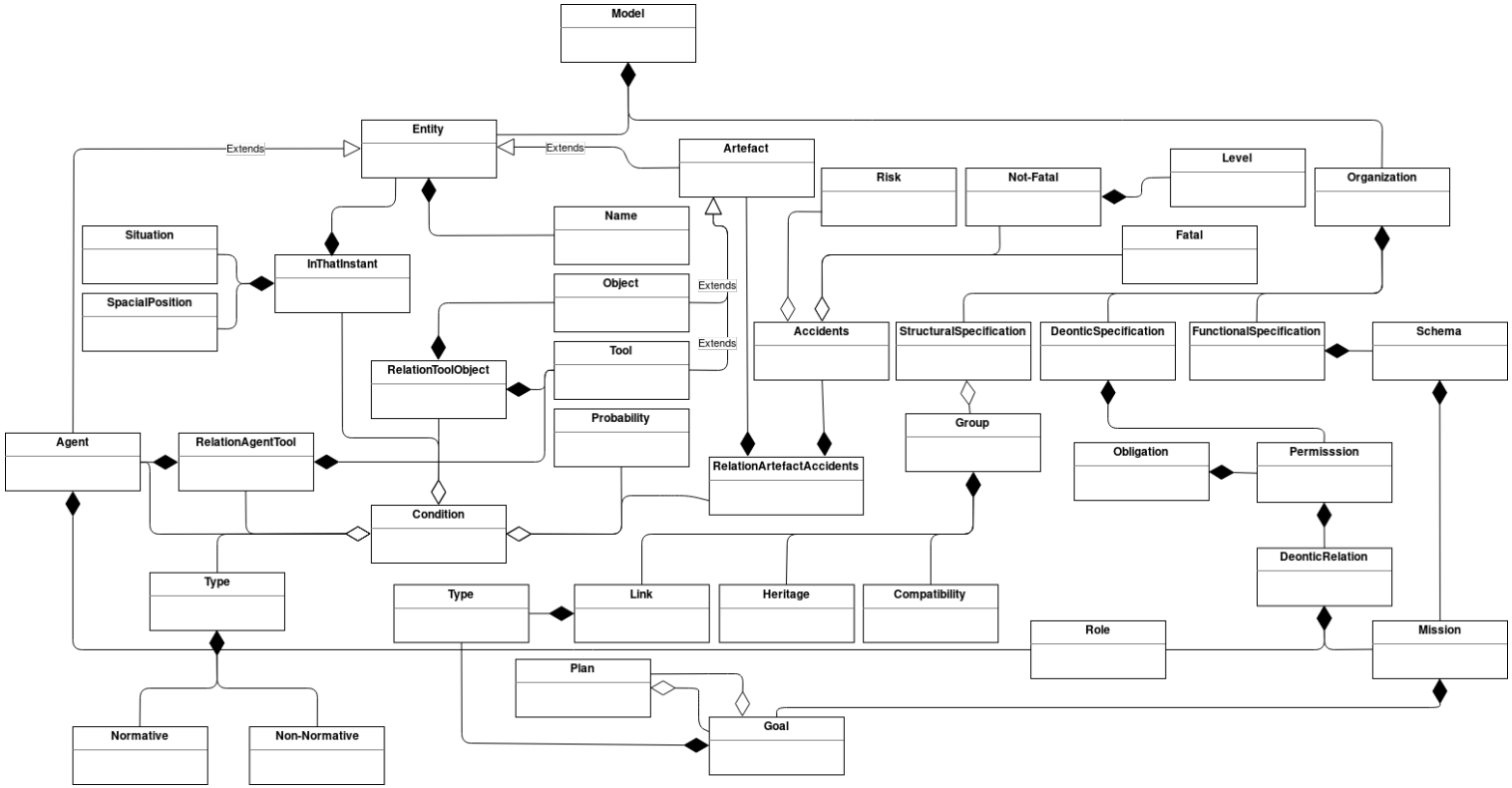
- Identify all aspects relevant to research on a real case study of interest to the scope of this research.
- Investigate all existing models contributes to represent normative and non-normative behaviors.
- Analyze aspects of this case study that are not considered by the current models.
- Construct an ontology that considers aspects that where not considered in previous models.
- Analyze the use of the ontology to represent the case study.

Solution

- The development of the ontology is done using **Methontology** methodology. The steps of this methodology are;
  - Specify (define specifications.)
  - Conceptualize (find patterns that can generalize several entities.)
  - Formalize (to define the concepts whitens a formal language.)
  - Integrate (integrate with existing models.)
  - Implementation the ontology in some computational language and Maintenance (to correct eventual problems arises during the use of the ontology.).
- UML class diagram is used to represent the ontology.
- The implementation of the ontology will be done using SQL relational database.
- We will carry out several types of query in order to evaluate if this representational model meets the needs of the case study.

Results

Figure: Ontology to represent non-normative cases in terms of UML class diagram



Applications

- Develop training systems for risky activities.
- Develop maintenance planning systems.
- Conduct risk analysis
- Analysing of direct and indirect impacts on the violation of norms with respect to the achievement of goals.
- Simulate maintenance practice using multiagent systems.