Ontology of Ontology Patterns as Linked Data Integration Tool

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Abstract. The paper present preview of ontology of ontology design patterns and transformation patterns being developed as support tool for emerging ontology design techniques and methodologies.

The Linked Data initiative was started by Tim Berners-Lee as an architectural vision for the Semantic Web. It explores the idea of Semantic Web as puting emphasis on making links so both people and machines can explore the interconnected web of data [1].
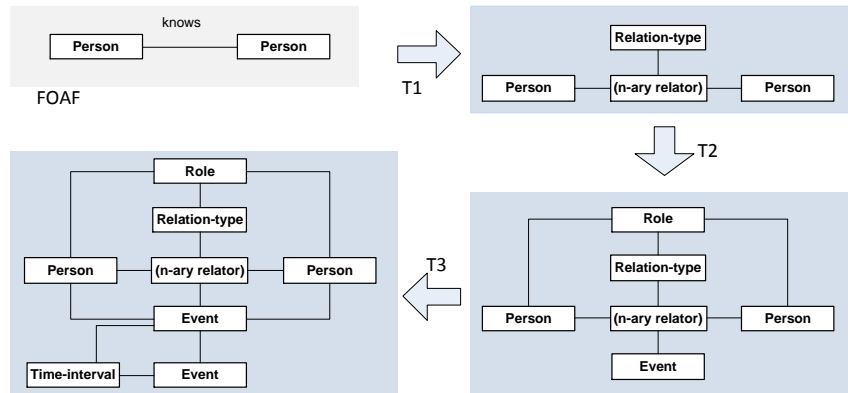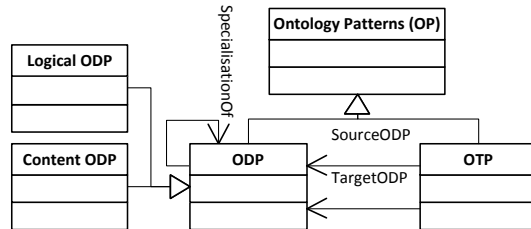

Fig. 1. FOAF Transformations

As an use-case we choose the FOAF project and it's 'knows' relation. Since 2004 there was more than 1 million FOAF documents and 79% of them utilized the knows property [2]. The typical needs of ontology engineer working on top of some Linked Data source comprises of transformation or aligning data to some more complex ontology either newly designed or already existing. This is also case of knows relation that in its FOAF implementation is very simple and doesn't allow expressing more complex relations among individuals.

In the case of newly designed ontology use of ontology design patterns (ODPs) proved the most effective and the least time consuming way of doing it. In context of our use-case we can think of several iterations of ODPs that represent more or less complex or expanded view on 'knows' relation as is depicted on Fig. 1. These ODPs can be connected together using predefined transformation patterns (OPPL), It seems to us that having library of such predefined pattern transformations at hand could make such design tasks easier and much faster. Our ongoing work proposes development of such library on top of existing portal `OntologyDesignPatterns.org`, but 1) in form of ontology, 2) with explicitly stated relations, 3) that are formally defined and 4) with appropriate transformations (OPPL) between related patterns, that enable automatic transformation from one pattern to another. We also focus on providing more fine-grained analysis of relations (like specialization/generalization) between ontology ODPs.

Fig. 2. Design Patterns Transformations Ontology

Such a library would could be easily integrated with methodologies like *Extreme Design* (XD) [3] and respective development tools like NeON or Protegé. This extended abstracts presents early preview of architecture of ontology being developed on Fig. 2. For additional information see `http://keg.vse.cz`.

References

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