Developing a framework for object-semantic mapping

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Abstract

While today more and more applications work with semantic web-based technologies, a broader success still remains unreached. Modern web-based information systems became especially popular for developers with new agile web development frameworks. These frameworks were based on the model-view-controller (MVC) paradigm, object-orientated programming (OOP) and an object-relational mapping (OOM). Programmers were able to use their current OOP-knowledge and avoided recurring SQL-statements in their code, keeping the code smaller and gaining a better overview. Also "convention over configuration" leads to more simplicity, reducing the number of decisions for the programmer.

Using semantic web technologies is still a task for experts because of a lack of frameworks easy to use, requiring a high knowledge to develop applications. By bridging the gap between current object-orientated and semantic web programming, today's developers might be able to adopt semantic web technologies and design new applications, bringing the breakthrough to the semantic web.

Our aim is to develop such a framework which maps ontologies to objects and vice versa. With ActiveRDF, RdfReactor, Elmo and Jastor first object-semantic approaches already exist. But most of them are neither actively developed anymore nor widely used. The reasons for this need to be researched and open issues have to be discovered. In our approach, object-semantic mapping should be as simple as possible while maintaining most of the semantic web features.

Based on current, widespread semantic frameworks like Jena, weaknesses will be discovered and solved towards an agile, object-orientated way of development. For developers it should not be necessary to hand-type SPARQL queries for basic data retrieval.

The following questions can be derived from our goal:
- What is the best approach to object-semantic mapping?
- How do we handle different namespaces easily?
- Is it possible to cast semantic objects automatically?
- Why should developers use object-semantic mapping and what are the advantages?
- How can we traverse a graph in an object-orientated way?

Since we are at the very beginning of our research, a profound investigation of the state-of-the-art will have to follow. As a first step we will focus on the literature on current object-semantic approaches. Afterwards, a comparison with existing widespread semantic frameworks will result in a new conception of an object-semantic framework.