

Towards Open Ontology Engineering

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1 Motivation

Ontologies are widely regarded as the backbone of the Semantic Web and the research is very active. However, when searching the Web, only few useful ontologies can be found. The reasons for this phenomenon are manifold; [1] identifies four bottlenecks: first, many relevant domains of discourse, such as in e-commerce, comprise a high degree of conceptual dynamics. Second, the benefit of building and using ontologies is often adumbrated by the cost, especially in rapidly changing domains. Third, a prerequisite for using an ontology and thus committing to its view of the world is to exactly understand the meaning of concepts and relations. This is hampered by the fact that most ontologies are built by a group of engineers and the user community does not have control over the evolution of the ontology due to the lack of efficient tool support for a broad audience with only limited ontology engineering skills. Forth, existing standards specifications and all kinds of controlled vocabularies are subject to intellectual property rights.

A community-oriented approach has several advantages towards an isolated, engineering-oriented approach: (1) A community can keep up with the pace of conceptual dynamics in a domain more easily. (2) It is cheaper for a community to collaboratively work on a specification of an ontology than for a group of ontology engineers. (3) A community-agreed specification of a conceptualization will more likely be used and further developed. The idea of wikis is to allow a wide range of users to contribute without requiring more than basic Web editing skills. The enormous success of the online encyclopedia Wikipedia¹ has proven the efficiency of wiki infrastructure. In my thesis, I investigate the use of wiki technology for a collaborative and open ontology building environment and thereby tackle the problems described above with a focus on the first three bottlenecks [1]: conceptual dynamics, cost vs. benefit, and perspicuity. The resulting ontologies will be rather lightweight, yet useful: [2] show that lightweight ontologies have a bigger user community than highly axiomatized models.

2 Related Work

The related work can be divided into the following areas:

Collaborative ontology engineering: [3] describes Tadzebao and WebOnto. [4] describe the DILIGENT knowledge process where ontology evolution and collaborative concept mapping are applied to deal with conceptual dynamics of domains. The ontology editor Protégé² is also available in a Web version [5].

Semantic Wikis: [6] describe Makna, a Wiki engine that was extended with generic ontology-driven components that allow collaborative authoring, querying, and browsing

¹ <http://wikipedia.org/>

² <http://protege.stanford.edu/>

Semantic Web information. IkeWiki [7] allows annotating links, typing of pages, and context dependent content adaptation. Platypus Wiki [8] aims at augmenting a wiki with semantics.

The approach described in this paper differs from all these approaches, as most of them aim at augmenting existing wiki content with semantics. The goal of my approach is to *use* wiki technology to collaboratively build ontologies.

3 Methodology and Contribution

In my thesis, on which I have been working for five months now, I commit to the following research methodology: (1) State-of-the-art overview of collaborative ontology engineering, representation formalisms, change management, visualization, user interface techniques, and achieving community consensus in sociology, linguistics as well as management science. (2) Definition of a suitable meta-model. (3) Description of processes allowing basic ontology editing tasks, community-driven ontology change management, categorization of content, and integration of Web resources. (4) Definition of user roles. (5) Application of various techniques for visualization of ontologies and user interfaces to foster comprehensibility. (6) Evaluation of the prototype in different use cases conducted with industrial partners in the project myOntology³.

4 Expected Impact

The approach towards ontology building described in this paper is supposed to enable more users to participate in creating and maintaining ontologies. Though these ontologies might not be highly axiomatized, they will be very useful to describe domains that can benefit from deploying ontologies, such as e-commerce.

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³ <http://myontology.org/>