

Towards an Interactive Approach for Ontology Recommendation and Reuse

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ABSTRACT: Ontologies are machine-comprehensible and reusable pieces of knowledge designed to explicitly define the semantics of an application domain, using a set of concepts, properties that relate concepts to each other or to literals, and a set of individuals. When deciding to develop an ontology for a new application domain, ontology engineers face the question whether to reuse existing ontologies or to build a new ontology from scratch. In conceptually diverse domains, such as biodiversity, building an ontology from scratch is an expensive and time-consuming process. In such a case, it is a better choice to reuse existing ontologies or parts of them. In general, ontology reuse is defined as the process where existing ontologies, along with possibly other non-ontological resources, are determined and used for building new integrated ontologies as part of a knowledge base. A case study on ontology reuse in different domains, that we conducted, revealed that ontology reuse is either done manually or semi-automatically with IT-support mainly focusing on the retrieval and recommendation of existing ontologies based on their conceptual coverage. This contrasts with the fact that manual ontology engineering and reuse, especially in complex domains, requires great efforts from both ontology engineers and domain experts. Moreover, the ontology reuse process is inherently incremental, as an ontology is developed step-by-step and evolves over time. This aspect is not considered by existing tools that typically make one-shot recommendations. In our talk, we present the concept of a tool which supports interactive ontology recommendation and reuse in order to assist ontology engineers and domain experts in their task to generate an ontological knowledgebase for a specific application domain. The tool will have the following features: a) it allows the user to specify a (potentially empty) seed ontology as a starting point for the new ontology, b) based on a set of candidate ontologies and textual input describing the specified domain, it identifies, extracts and recommends pieces of the candidate ontologies (properties, concepts, textual and formal specifications of concepts) that might be used to extend the seed ontology in an interactive and iterative process, the user selects recommended pieces, which are automatically integrated with the seed ontology. The system makes sure that the resulting ontology is consistent and complies with the domain semantics intended by the user. This will be achieved by the use of logical reasoning and the provisioning of explanations and proper visualizations.

KEYWORDS: Ontology engineering, Interactive Ontology Recommendation, Ontology Reuse

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