

Rapid Ontology Development Model Based on Rule Management Approach in Business Applications

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Thesis Summary

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In this paper rapid ontology development with emphasis on facilitating development with constant evaluation of steps in the process of ontology development is presented. The review of related work pointed out that existing methodologies for ontology development are complex and high level of technical knowledge is required. Business users and developers usually don't pose such knowledge therefore ontology completeness indicator was introduced in this approach. The role of this indicator is to guide developer throughout the development process and constantly aid user with recommendations to progress to next step and improve the quality of ontology. While evaluating the ontology, several aspects are considered; from description, partition, consistency, redundancy and to anomaly. The approach was verified on Financial Instruments and Trading Strategies (FITS) ontology and compared to other approaches.

Povzetek: V članku je predstavljen hiter razvoj ontologij.

1 Introduction

The Semantic Web vision is the idea of having data on the Web defined and linked in a way that it can be used by machines not just for display purposes (e.g. user), but for automation, integration and reuse of data across various applications. Next generation of the Web is expected to provide automated services based on machine processable semantics of data, reasoning techniques and heuristics that make use of these data. The applications of ontologies are mainly restricted to academia while successful employment in business environments is rare.

The simplicity of using approaches for ontology construction and accompanying tool support is an important issue which needs a lot of attention and further work.

2 Related work

Current approaches [1-3] in ontology development are technically very demanding and require long learning curve and are therefore inappropriate for business users. In majority of existing approaches an additional role of knowledge engineer is required for mediation between actual knowledge that business users possess and ontology engineers who encode knowledge in one of selected formalisms. Introduction of several abstraction layers as suggested in systems for business rules manipulation and MDA approach has turned out to be very effective in development of ontologies and using it

in business applications [4]. Besides simplifying the process of ontology construction we also have to focus on very important aspect of ontology completeness. Several researches [5],[6] have discussed error free ontologies and identified frequent errors and anomalies in ontology development, which is advised to be included in the development process and therefore aiding users at prevention and elimination of repeated design errors.

3 Rapid Ontology Development

The main purpose of this thesis was to define innovative model for rapid ontology development (ROD) that is suitable for users without extensive technical knowledge and knowledge of ontology design [7]. The proposed process includes pre-development, development and post-development activities, from business vocabulary acquisition to employment of developed ontology as a functional component in information system (see Figure 1).

ROD process also includes a constant evaluation of developed ontologies which is conducted at every step of the process and gives user recommendations on how to improve the quality of developing ontology. This functionality is implemented using ontology completeness indicator (OC) that is used for following the steps of ROD process in simplified manner (see Figure 2).

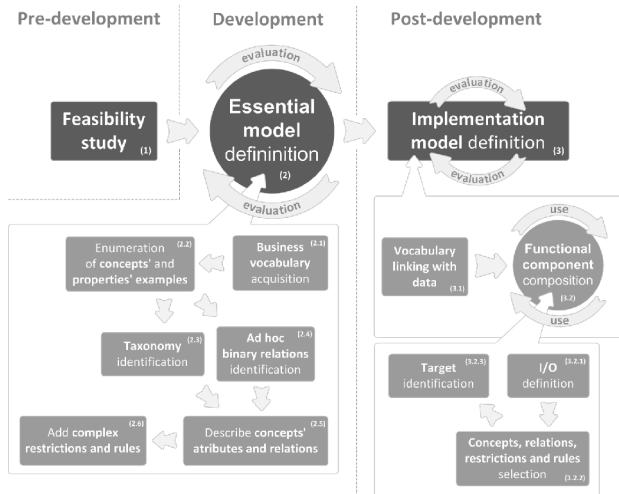


Figure 1: Process of Rapid Ontology Development.

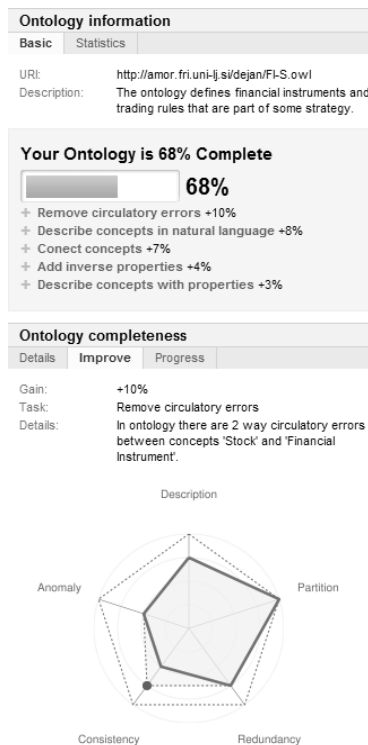


Figure 2: Display of ontology completeness results and improvement recommendations.

Constant evaluation of developing ontology is also performed with dynamic adaption of weights in calculation which in turn aids user with recommendations on how to improve ontology. Along with the development of ROD model several possibilities of using ontology as a functional component was investigated. Ontology can be used as whole or just partly by using only schematic part. To improve integration with existing data sources, interfaces for direct linking of semi-structured data in ontology were developed. This was accomplished with a generic approach of regular expressions that enables us to

connect to any semi-structured source of data, e.g. document, web page, data base, CSV file etc. For the evaluation purposes of proposed approach FITS ontology for trading with financial instruments was developed. Its generic design enables users very straightforward reuse. In this experiment ROD approach turned out to be very effective. Less iterations were required to develop a working version of ontology and the required confirmation level of ontology quality was also achieved earlier.

4 Conclusions

The thesis represents integral model for rapid ontology development that enables users without extensive technical knowledge development of ontology. By doing this they have an ability to employ the advantages of semantic web in building semantically enabled application that can very intuitively reuse data from several (also semi-structured) data sources.

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