Consensus Making on the Semantic Web: Personalization and Community Support

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Abstract. We propose a framework for ontology-based consensus making, which is grounded on personalization and community support. Corresponding software is designed to be naturally deployed in community Web environments.

1 Introduction and Related Work

For facilitation of information delivery and application interoperation, the Semantic Web extends the current Web with machine-processable, commonly understood and shared evolving data and metadata, i.e., ontologies. Specification and support of processes leading to ontology sharing are the problems to resolve for making the Semantic Web approach practically applicable.

Collaboration Tool Support Many existing ontology editing tools provide collaborative ontology construction facilities to ontology engineers. Among the examples of such tools are Protégé, OntoEdit, KAON, Ontolingua, Tadzebao and APEKS.

Distributed Construction of Consensual Knowledge Many ontology building methodologies do not explicitly address the problem of consensus making. The methodologies addressing consensus making problem (e.g., CO4 and DILIGENT) mainly introduce editors/moderators responsible for specific ontology parts and collecting inputs from the community.

Ontology Views Similar to database views that provide a specific visualization of part of the database instances, the ontology view approaches (e.g., in KAON and Protégé) exploit the idea of views in ontologies. Users can reach easier an agreement about the structure and instances of an ontology, as views facilitate visualization of the data to each particular need.

Here modeling of a consensus framework is performed with a personalization and community support perspective, adhering to the requirements of dynamicity, heterogeneity and the original ontology bases integrity maintenance. Current consensus-making solutions often ignore these principles and normally incur additional costs specifically for consensus making.

2 Consensus Framework

2.1 Consensus Process

As for the current Web, numerous contributors are expected to be involved in creation and evolution of the Semantic Web. Therefore, users/contributors, communities and

distributed online content provide the ground for consensus making. We specify the consensus process via actions of individual users and interactions across communities and platforms.

We model ***consensus*** as a result of a reiterating process with the following steps:

1) Creation or creation with reuse of an ontology or data item(s) that are estimated as highly relevant by an individual.

2) Discovery of relevance of created or created with reuse items to other individuals The discovery process consists of the following steps:

a. Ranging communities and individuals as more and less relevant to an individual, e.g., depending on presentation of external ontology items in the individual and community profiles, dynamics and tendency in the evolution of individual and community profiles.

b. Reception of information on individual and community actions, e.g., as a summary starting from more relevant communities and individuals to less relevant communities and individuals. Information on similar actions (e.g., efforts that can bring benefit via making alignment) and complementing actions (which can influence or be influenced by actions of an individual) is of special importance for estimating relevance.

3) Returning to step (1) with estimation of relevance renewed by a discovery process.

2.2   Implementation

The consensus framework is implemented in the People's portal, a community Semantic Web portal infrastructure providing ontology management facilities to the community members [4]. The infrastructure is built as a Java application, employing Jena 2 [2] and Ontology alignment API [3]. The People's portal is applied to the DERI intranet [5] and a Semantic Web community associated with the KnowledgeWeb NoE [1].

3   Conclusions

Involvement of a broad stratum of Web users and enabling communities to regulate their own ontology evolution processes are advantages of the proposed consensus making solution. We are interested in further employment of the developed consensus framework and its tool support in real-life scenarios on community Web portals.

References

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