Realization of seamless knowledge: connecting distributed RDF and Topic Maps

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Abstract

We attempt to make RDF and topic maps interoperate. We make use of the following:
- RDF to topic maps mapping,
- Published Subjects for identifying subjects (resources), and
- RDF and topic map content spread out on the web.

By connecting them semantically, we try to enable the technologies to make work together more effectively than if each had stood on its own..

1 Introduction

Various applications using RDF or the topic map are appearing. However, as for them, the scale was still relatively small, and they did not cooperate mutually. Therefore, the usefulness is not in sight. The goal of this research is to cooperate with RDF and Topic Maps application which is developed separately and exist dispersedly, and aims at raising the usefulness.

The following are assumed as a technical element for realizing organic cooperation of RDF and Topic Maps.
- RDF and Topic Maps Mapping
- Use of Published Subjects which can identify the subject.
- Cooperation of RDF and Topic Maps which spread out on the web.

We explain these elements individually first. Next, we describe a new challenge. Namely, using these elements, we try to cooperate with existing or new RDF and Topic Maps. And we try to enable it to utilize more effectively rather than using it individually.

2 RDF Topic Maps mapping

RDF model consists of Subject, Predicate (Property), and Object. They are called triples. On the other hand, Topic Maps consists of Topic, Association, Occurrence, and other components.

When we do RDF with Topic Maps mapping, we only need mappings for the RDF properties, not for the subjects and objects of the statements. Once we know how to map the property we know what to do with the object. The subject is always mapped to a topic.

RTM is itself an RDF vocabulary that can be used to describe the mapping of an RDF vocabulary to topic maps in such a way that RDF data using that vocabulary can be converted automatically to topic maps. This allows RDF vocabularies to be used both as RDF vocabularies and as topic map vocabularies.

The vocabulary annotates RDF properties to indicate which topic map construct the property is to be mapped to. The type and scope of the resulting construct can be controlled, and for associations the role played by the subject and the object must be indicated. The RTM mapping declarations can be stored as part of the data to be mapped, or it can be stored externally.
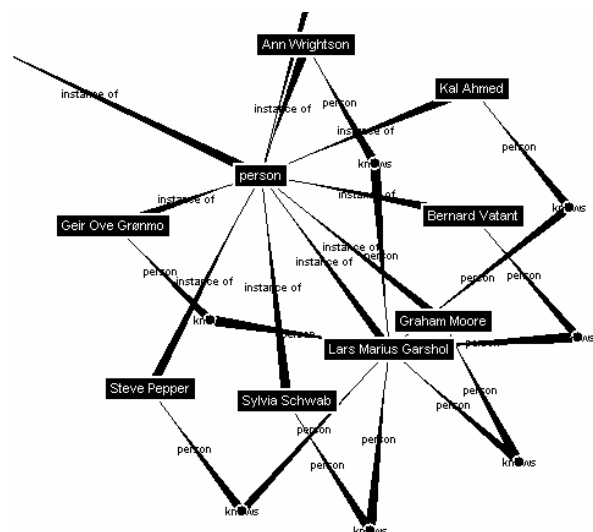

Figure 1. Graphic viewing of an RDF using Topic map browser. First, the RDF is mapped to Topic Maps, and then it is browsing as graph using Topic Maps browser.
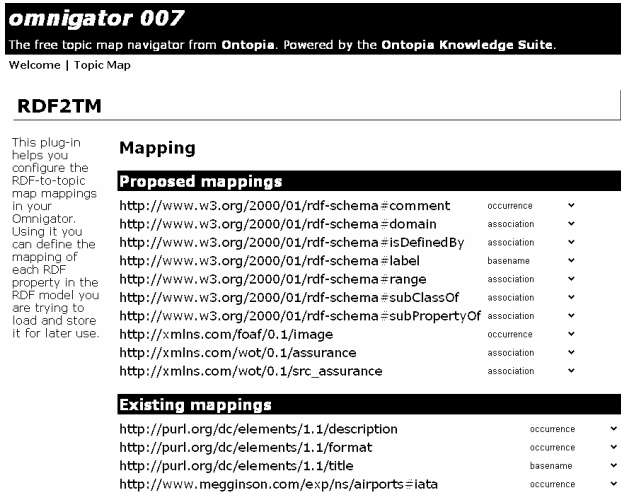
Figure 2. Mapping RDF property to Topic Maps construct. In the Mapping area, the left side row is RDF property and the right side row is Topic Maps constructs. Topic Maps constructs can be selected by manual.

3 Published Subjects

Published Subjects is a mechanism included Topic Maps standard (ISO/IEC 13250). It provides an open, scaleable, URI-based method of identifying subjects of discourse. They cater for the needs of both humans and applications, and they provide mechanisms for ensuring confidence and trust on the part of users.

The use of Published Subjects is expected to promote Topic Maps interoperability. Furthermore it is expected to promote interoperability between Topic Maps and other technologies that make explicit use of abstract representations of subjects, such as the Resource Description Framework (RDF) and the Web Ontology Language (OWL).Published Subjects are also expected to solve the "Web's Identity Crisis."
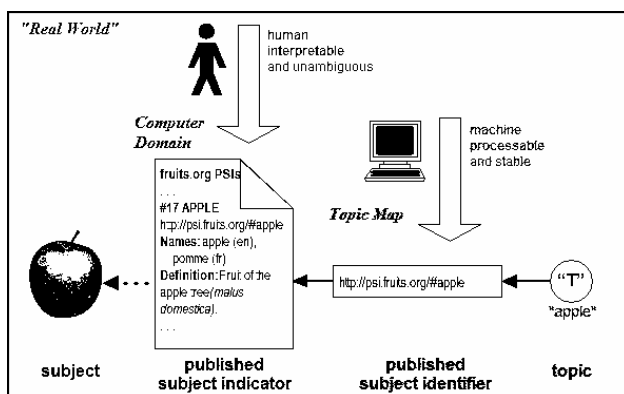

Figure 3. Published Subjects can identify the subjects which are real world things or information resource in computer.

4 Connection and merge of the grain

Topic map has a merge function in itself. In order to cooperate with RDF and Topic Maps, the merge function can be used. RDF has to carry out RDF Topic Maps mapping before merge. In order to merge RDF which exists in the distant place, and Topic Maps, it is necessary to collect them. For that purpose, two kinds of following methods can be considered.

 - Access the candidate for merge to the timing of merge processing, or arbitrary timing.

 - Authors of RDF or Topic Maps register them to the market place.

5 Implementation of RDF and Topic Maps connection

We will try to cooperate with existing or new RDF, and Topic Maps, and verify the results. Use of Published Subjects aims at cooperation by the subject based identification and merge.

For example, by using existing FOAF RDF, the topic map of Scripts and languages (i18n), the country and the language Published Subjects, and creating new topic maps such as people and a native language and the expression of such as greeting and gratitude by each language, we will challenge to develop a system which support communication each other by native language.

References

[Pepper, 2003a] Steve Pepper. *Introduction and Basic Requirements, OASIS Published Subjects Draft Recommendation,* OASIS Topic Maps Published Subjects TC, http://www.ontopia.net/tmp/pubsubj-gentle-intro.htm, 2003

[Pepper, 2003b] Steve Pepper and Sylvia Schwab, Ontopia. *Curing the Web's Identity Crisis: Subject Indicators for RDF,* Proceedings of XML Europe 2003; available from
http://www.ontopia.net/topicmaps/materials/identitycrisis.html

[Garshol 2003] Garshol, Lars Marius. *Living with topic maps and RDF,* Proceedings of XML Europe 2003; available from
http://www.ontopia.net/topicmaps/materials/tmrdf.html