Using background knowledge in ontology matching

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Abstract. This report summarizes the a joint work on the topic of Ontology matching using background knowledge, done by Zharko Aleksovski, Vrije Universiteit Amsterdam, and Marta Sabou, Open University, Milton Keynes. The work was performed during a collaboration visit of Zharko Aleksovski to the Open University. The duration of the visit was four weeks, during which: experiments were conducted and analyzed on a case study from the agricultural domain, and report on the work was writen.

1   Topic

The topic of the visit was Ontology matching using background knowledge. A case study was performed on matching two ontologies from the agricultural domain, while using six others as background knowledge.

The research question posed in the study was: *What are the factors that determine successful outcome of the approach of ontology matching using background knowledge?*

2   Experiments

The method we choose to answer the research question was a case study. We choose two ontologies to be matched from the agricultural domain: NALT and Agrovoc. As a background knowledge we choose six background ontologies:

- Economy
- Mid-level
- Sumo
- TAP
- A.Com
- Surrey

They were extracted using the Watson search engine developed at KMi[1].

The two ontologies were matched through each of the six background ontologies. Then the matchings were analyzied to obtain the factors that determine the success.

3   Lessons learnt

The analysis started from the factors that can be extracted automatically. Such factors include: the depth of the background concepts used in the matching, length of the inference chain in the background knowledge, etc. The only factor that had influence on the quality of the matching result was the length of the inference chain in the background knowledge, the longer the inference, the more likely that wrong match can be obtained.

The further analysis revealed that the factors that determine success are difficult (if possible) to obtain automatically. The causes for wrong matches in the experiments were: wrong relations in the background knowledge, contextual knowledge in the background ontologies, and relations among general concepts (like between *Agent* and *Person*).

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[1] Knowledge Media institute, Milton Keynes, UK