The Travel Agent Of The Next Generation Web

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1 The Travel Agent Scenario

This poster is about ongoing work on a personalized travel agent. This application consequently applies languages and techniques of the Semantic Web combined with knowledge representation methods in order to identify potential shortcomings and research needs. Our aim is to start "the real fun" [Berners-Lee, 2001] by implementing a simple agent showing the added value of Semantic Web techniques within a concrete application scenario of travel arrangements.

Travel planning and booking is the most successful business model on the Web [PhoCusWright, 2001]. However, planning an individual trip on the Web is still a time consuming and complicated venture. Most of the huge number of travel sites provide isolated information about either flights, hotels, rental cars, weather or they relate those information in a very restricted manner. There exists no integrated service for arranging personalized trips to any desired destination, relying on distributed information sources which have to be reasonably combined. Recent approaches build on mediators that turn Web sources into structured data sources. Those mediators are the critical component of the whole system because they have to be build individually and kept up to date.

What is needed is an individual travel agent which is able to arrange journeys to virtually any place using first hand information from a huge set of different Web sources.

2 Arranging a Trip with the Travel Agent

In order to apply Sematic Web techniques within our scenario we assume all involved Web sites encoded with locally relevant knowledge expressed in DAML [DAML, 2001] format.

Imagine, that somebody intends to join a music concert while visiting the corresponding Web page, he or she will start his or her personalized travel agent. This agent will initially read the annotations about location, date, costs etc. form that page. The annotations found there use different vocabularies for time, locations etc. formalized as DAML ontologies on the Web. In order to enable a "wide understanding" of this annotations, the web master will likely refer to generally committed "base ontologies" about temporal or geographical concepts whenever possible. The travel agent may have its own notion of dates, location etc. by referring different ontologies on the Web. The key question is, if the agents is able to interpret the just loaded knowledge by relating them semantically to his own terms. This is done by using inference mechanisms based on the formal semantics of DAML. The key data of train and flight connections, hotel vacancies etc. are interpreted in a likewise manner. Once, this level of understanding is reached planning a trip can be considered as a more or less simple constraint satisfaction problem based on a small set of typical "travel templates".

3 Implementation and Status

The personal travel agent is implemented as an Java applet and can therefore be used from any Java-enabled Web interface. The agent implementation uses the RDF/DAML parser Jena [McBride, 2001] and translates DAML annotations into the format of the Loom description logic reasoner [MacGregor, 1991]. Loom is used as the inference engine for ontology reasoning as well as matching travel templates to concrete journeys (however, Loom expressiveness is not completely congruent to DAML). The resulting travel plan is presented in HTML format through a browser window. The CIA World Fact Book and the Cyc Upper Ontology work as base ontologies in our scenario.

The DAML-to-Loom translation functionality has been finished recently. A set of "virtual" Web sites with annotated knowledge and an initial set of ontologies have been build also. Current work is within the travel planning process and the presentation of travel data. The complete index about relevant Web sources is currently assumed to be held in the agent locally. Future work include using Web services like search engines, booking or reservation.

References

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