Individualized Travel Planning through the Integration of different Information Sources, including a POI Ontology

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ABSTRACT

Based on ongoing project work that concerns the individualization of a web-based travel planning tool, the focus of this paper is on a specific part of the project, the development and integration of a POI ontology. Within the project, a travel planning system (http://www.geotoolsharz.de/) is optimized aimed at enabling users to integrate individual requirements and personal wishes into the planning procedure. The system relies, among other information sources, on a points-of-interest-database (POIDB).

The optimization process is aimed at a qualitatively better support of travel planning. *Qualitatively better* does mean that individual requirements and personal wishes of users should be considered dynamically when planning a day- or weekend trip. An increasingly upcoming user requirement for route- and travel planning is that different information sources are considered in a more *comprehensive* way, aiming at providing a travel plan that takes into account the *individual needs and wishes* of users. There are various attempts toward more individualized route planning systems, which have been taken into account into the concepts that are developed in the project mentioned above (e. g. Czifersky & Winter 2002; Garbers et al. 2006).

One aim of the project is to produce a complete travel plan in dependence of various information sources and such individual requirements. This plan can be produced in advance of the trip by using the existing Web- tool. The plan, however, can be modified whenever and wherever the user wants due to the parallel development of a mobile component of the system, running on Smartphones.

Because of this two-sided approach (webbased system on the one, mobile component on the other hand) and the resulting complexity of the project in general, the focus of this paper is foremost on the underlying POIDB. During project work it became obvious that a “simple” POIDB is not enough to support the goals mentioned before. Due to individual user requirements that might occur, the POIDB must be enriched with information that enables *the system* to interpret, to a certain extent, the descriptions, definitions, and models that underlie each POI. Such an enrichment process leads to a POI ontology, instead of a “simple” database. This is shown based on the example of planning a *hike*.

The identification of individual user needs is important for planning the *optimal hike* and therefore considering individual information *comprehensively*. Such an optimal hike can only exist in the *context* of a specific user (Pundt 2008). A challenging question within such a framework is, for instance, what *interesting POI* means from the perspective of a user. POIs that are interesting for one person can be boring for another. These considerations led to the idea to enrich the POIDB semantically and transform it toward a POI ontology. To do this adequately, a class-subclass-structure with a clear and user-driven definition of terms is required. The classes, subclasses and the

relationships between them have to be described *clearly* and defined in a *unique way*, considering *specific contexts* in which these terms are used.

An attempt to approach a conceptualization of "POI" as it would be represented in a POI ontology is shown in figure 1. It should be taken into account, that the terms in the ovals are not simple attributes, but complex descriptions of *contextual* and other information. For the implementation, such descriptions must be provided in machine-readable language, XML/RDF or OWL, respectively (Antoniou & van Harmelen, 2003; OGC 2009; W3C 2009).

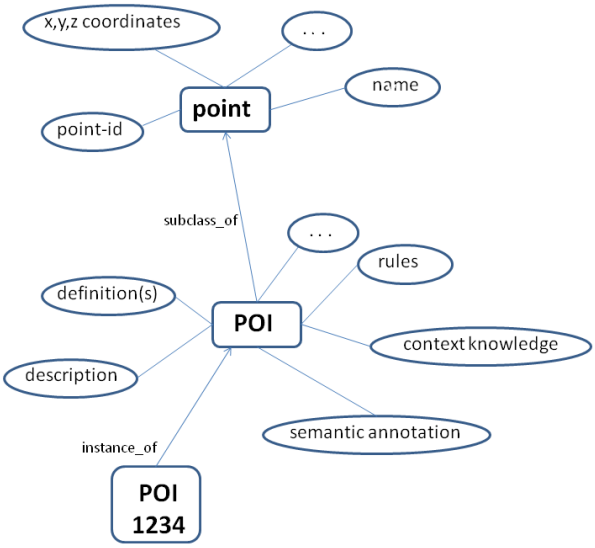

Figure 1: An ontological approach toward a POI

During the presentation at "Geoinformatik 2010", the basic approach and the current developments will be explained. Furthermore, some insights into the system components as they exist until recently will be given as basis for a fruitful discussion of the concepts.

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