OpenPOI – Developing a Web-based Portal with High School Students to Collaboratively Collect and Share Points-of-Interest Data

Stefanie ANDRAE, Christoph ERLACHER, Gernot PAULUS, Gerald GRUBER, Helga GSCHLIESSER, Peter MOSER, Karl SABITZER & Günther KIECHLE

Abstract

Web-based and mobile location-based applications are becoming increasingly popular to a broad range of users. In particular young people like to explore the latest technological innovations in the context of mobile devices, and are interested in hardware or software. Points of Interest (POI) are an essential data source for location-based applications. Having emerged from classic in-car navigation systems, POI are often linked to a postal address and relate to businesses or common sense information. A collection of POI that reflects the needs and interests of young people is currently not available. In this paper we present a project for developing a web-based portal for POI in cooperation with high school teachers and students. This paper introduces the methods of collaboration and the expected results from the scientific and educational point of view.

1 Motivation

Points-of-Interest (POI) provide an essential data source for a wide range of location-based applications. Having emerged from in-car navigation systems the classic POI are often linked to an address and relate to businesses such as petrol stations, garages, shopping centers, or common sense information, such as the church, police station or hospital in a city. Today POI data is collected as authoritive data with means of traditional data acquisition procedures and as free and open data using crowd sourcing paradigms. Only a few sources offer free access to POI data; they often do not cover the needed domain, are cost intensive or difficult to access.

In general, POI can be defined as spatial information being of interest for a specific user community. POI either comprise spatial information of wider interest e.g. major touristic sites, petrol stations, restaurants and "insider" POI or they comprise very specific information in terms of spatial location and domain. Due to this wide and vast range of meaning and the lack of satisfying definitions and standards (2005, HAID et al.), POI represent an interesting research topic, especially in the context of raising spatial awareness among young people. As digital natives they use this kind of information in their daily communication in social networks and mobile communication but do not have a clear understanding of the relevance, quality and structure of this type of spatial information.

In this project a web-based portal for the collection and sharing of POI will be developed collaboratively with teachers and studends of a highschool. Major goals are a better understanding of POI in terms of their spatial, temporal and semantic nature and how they

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are used by young people, providing an easy to use web-based tool for their collection and analysing spatial and temporal patterns related with these data.

2 Project Outline

The School of Geoinformation at Carinthia University of Applied Sciences has cooperated with high schools in Carinthia and Styria over the past years by jointly working on A-level projects, high school theses and workshops for school classes (ANDERS et al. 2009, PAULUS et al. 2007).

A commercial college, the HAK1-International Klagenfurt is the School partner in this project. The HAK1-International offers a special branch, called Digital Business. This branch has a special focus on sound commercial education with intensive Information Technology (IT) training, which comprises approximately 30 percent of the total lessons per week. The IT training covers subjects such as 'Applied Programming', 'Software Development', 'Operating Systems and Network Technologies', 'Internet and Multimedia' as well as 'Business Information Technology'.

This project is funded as a research-focused geoinformation project by the Sparkling Science research program of the Austrian Federal Ministry of Science and Research (BMWF). During the next 1.5 years a strong collaboration between students, teachers and researcher is planned for the following three phases:

In the first phase 26 students of the third form of the Digital Business branch are involved in the conceptual modeling of POI and the design of a database model for POI. During this school year, the main focus for the students is on database development. In the subject 'Applied Programming' the students focus on database connections. Consequently, this project's contents can easily be integrated into the lessons. Based on the result a web-based portal will be set up for the collection of POI data.

In the second phase young people from other forms or schools will be encouraged to collect POI using their local spatial knowledge and discus their perception with teachers and students involved in the project. The dissemination of results in the respective communities, e.g. papers/posters at scientific conferences, a 'Road Show' at schools, is the main aim of this phase.

In the third and final phase the project will be concluded by another group of students developing web- or mobile based applications utilizing the collected data via standardized interfaces. Students of the fifth form carry out this phase as part of their A-level projects. The aim is to demonstrate the importance of interoperability by creating applications that are based on the POI data created in the first two phases.

3 Methods of Collaboration

The collaboration between HAK1-International and the School of Geoinformation is based on know-how-transfers between teachers – scientists, teachers – students as well as students – teachers – scientists and problem-based learning techniques. To a major extent, collaboration is taking place within the lessons of the third and fifth form. Furthermore, internships

at the School of Geoinformation are offered to motivated high school students with deeper interest in the project domain. Finally, a 'Road Show' will be organized to disseminate the results at other schools in Austria. Here, peer-to-peer learning will happen between high school students while presenting the projects concept and results in collaboration with researchers of the School of Geoinformation.

4 Preliminary Results

At this point in the project, first results are available from the first phase of collaboration focusing on the conceptual modeling of POI. In order to foster collaboration, the following workshops have been conducted:

- Kick-off workshop at the School of Geoinformation, consisting of an overview about the project, an introductory lecture on the key principles of Geoinformation as well as a practical hands-on lab with GPS devices and location-based smart-phone applications.
- 'An innovation workshop' at the school considering the different aspects of the project and using creativity methods such as brainstorming to elaborate on the question 'What are POIs for you'?
- Structuring the topic, in form of exercises in class and homework by drafting a questionnaire to find out which POIs are used by young people between 14 and 18 as well as designing an input mask for the OpenPOI web-based portal.

First conclusions can be drawn from these activities: Being part of a 'real' project, high school students had the feeling that they were doing something 'meaningful' for the first time. They learned that only a constructive attitude towards work can lead them to their goal.

409 questionnaires were filled in by students of the following secondary schools in Carinthia: HAK 1-Klagenfurt, Wimo Klagenfurt, BRG Viktring, HBLA St. Veit and BRG St. Veit. When analyzing the questionnaires, students realized themselves that inaccurate filled out questionnaires and insignificant aspects with no usable application to the project are unsatisfactory. The analysis of the questionnaires showed that the POI of young people do not differ a lot from the usual POI. However, the willingness to use this platform and also to add information voluntarily was surprisingly high. Currently these results are analyzed in detail in order to identify significant patterns.

5 Outlook

The final result of this project will be a web-based portal for POI focusing on the interests and requirements of young people between 14 and 18 years. Through a map-based graphical user interface users will have the possibility to create a new POI and to share it with the 'OpenPOI' community. For that purpose, these interests and requirements are currently investigated, analyzed and categorized in order to implement an adaptive POI spatial data model. Preferences of young people in respect to POI and their characteristics have been identified in a first data acquisition phase by the questionnaire mentioned above and will serve as a guideline for the conceptualization and implementation of the data model.

Special emphasis will be given on the temporal aspects of POI. Additional categories of POI must be considered in terms of time. For example, a POI can be linked to an event that occurs only once, twice or monthly during a specified period of the year and has a limited duration. In this context spatial-temporal data models and queries have to be integrated (ERLACHER 2006).

The next step will be the launch of the OpenPOI web-based portal in summer 2011. At the beginning of autumn 2011 web- or mobile based applications to capture, edit, visualize and query POI will be developed by students of the HAK1-International during their A-level projects. Finally, the dissemination of the project to other interested groups (e.g. students from other schools) will be done as a 'Road Show'.

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