Integration of Similar Location Based Services Proposed by Several Providers

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Abstract. Due to the fact that mobile devices are in widespread use, many applications including Location Based Services (LBS) had been involved to deliver relevant information to customers anywhere at any time and thus based on their profile and geographical position. However, with the increasing number of geographical data and distributed geospatial applications with heterogeneous databases, many problems may arise related to 1) the interoperability of geographical databases, 2) the integration of geospatial data / metadata of services and 3) the development of user friendly visual portals on mobiles. As many LB standards like OGC and applications were demonstrating the feasibility of portals from a unique provider, the objective of this paper is to pursue further in the approach of generating visual portals by allowing many providers to commercialize their services overlaid on a unique base-map. Furthermore, we have implemented this approach via our prototype MPLoM (Multi-Providers LBS on Mobile Devices).

Keywords: GIS, LBS, Cartography Graphic Semiology, Ontology, OWL, GML, XQuery, GUI on PDA, WMS, WFS, Web Services, Integration.

1 Introduction

The field of LBS, which emerged a few years ago, presents many challenges in terms of research and industrial concerns. We mean by Location-based services (LBS), a particular type of web services used via web browsers, but those LBS’s are efficiently used in applications integrating services data/metadata based on the user’s location(spatial coordinates LLA: Longitude, Latitude, Altitude).

Examples of such applications include: tracking (device oriented) or information entertainment /navigation and many others (person oriented). [1]

Let us take the application to look at the nearest restaurant in your area with the navigation instructions to get there:

First of all, we might encounter the answer of an Italian restaurant listed by two different providers, not exactly located at the same place (50 meters of difference)
due to the inaccurate precision from Satellite or Radio Mobile positioning systems. The same Italian restaurant is named “Carlo’s Pizzeria” in the first one and “Da Carlo trattoria” in the second one, visualized by different cartographic symbols. The goal is to consider them as the same object.

Many techniques should be studied to solve these issues and ensure the integration of homologous objects among all the heterogeneous ones overlaid on the same map.

This paper will discuss in Section 1, the state of the art related to our subject. Section 2 will be dedicated for the service location integration and the adopted techniques, Section 3 will discuss the cartographic symbol integration and the mapping output, Section 4 will detail the architecture and the functionality of our developed platform MPLoM and finally, we will conclude and present our future work in Section 5.

2 Related Work

Currently, we can find visual portals (background map and geographic object) that can be textual, iconic or cartographic maps. Fake screenshots are given below as examples to explain the scenario we are considering:

Another visual representation is based on a 3D perspective Street view. Facing the problem of place names’ overlap in 3D and cognitive difficulties, the usage of icons instead of place names could have more accurate impact.

Based on what was proposed in the history of portals as described above and their problems [3], visualizing a unique map whose components will come from various LBS providers, becomes a real challenge.