

## SmartLiving – LBS and Social Media for Comprehensive Democratic Positions in Urban Development

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### Extended Abstract

#### Introduction

Location-based services (LBS) in general allow information processing with respect to three dimensions: space, time and semantics/content. Social media allows using people's social network for information processing. The wide use of both techniques motivates to merge them into new application domains. In this paper we present our first experiences with the design and development of a mobile application for comprehensive democratic positions in urban development. Our application enables users to mark, track and comment interesting locations. It is used in a concrete urban development project where stakeholders (in our case young people and children) go into the development area with their mobile devices and give suggestions about "objects" they would like to have there. The combination of LBS with social media allows integrating stakeholders like young people and children in the urban development process which normally do not participate in the traditional process.



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## Scenario

The “communicative turn” which gained increasing influence in the planning disciplines since the 1990s framed a new understanding towards urban development tasks. Today an informal participation process belongs to urban design projects in nearly every municipality. However, criticism spread even though the participation readiness of the municipalities is high and the instruments are various. Classical procedures like forums, round tables and meetings reach only few and require a high level of intellectual ability. Especially children and young people belong to the excluded social groups.

With the usage of our mobile application within the urban development project we demonstrate how new and direct forms of an urban development dialogue appropriate for youths and children arise. Our application offers a systematic insight in democratic processes by combining a user’s actual position (dimension space) with his or her preferences/needs (dimension theme) in that specific situation (dimension time). Research questions include the action radius of young people in the neighbourhood, a social area analysis based on qualitative comments or a stakeholder oriented information service (e.g. where is the next meeting point of the group I belong to?)

## Architecture

In the area of LBS there are several challenges that need to be addressed. One is that the in-built location sensors of smartphones provide a limited accuracy. For the application in use this was not a problem because the users would use the provided in-built location to approximately place their objects of interest or locate their commentaries on the map.

From a technical point of view one challenge is the necessity of native developments because of the variety of operation systems. To avoid this obstacle the application was designed as a HTML5 application with CSS3 (hybrid approach).

Figure 1 shows the technical architecture of the application that was implemented by the Institute of Geomatics Engineering in a first version.

Instead of programming new services from scratch we combined and enriched existing services. To ensure the location aspect of LBS, we used the built-in sensors of smartphones in this scenario that can be accessed via the HTML5 approach while we used the functionality of Yammer<sup>1</sup> for the social

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<sup>1</sup> <https://about.yammer.com/>

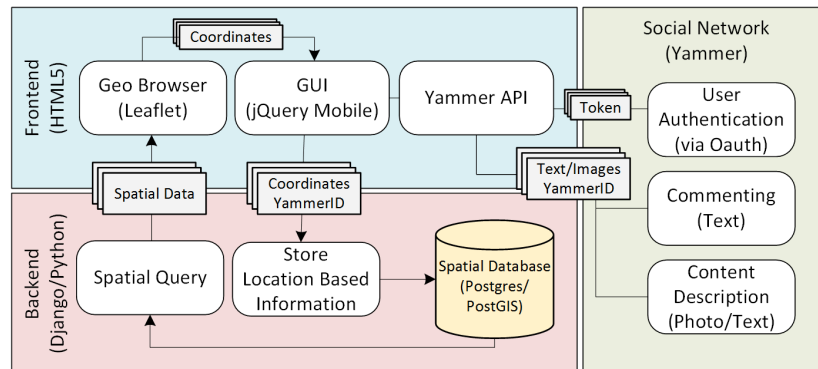


Fig 1: Technical Architecture of the mobile application

media functionalities. Integrating a social network via a suitable application programming interface (API) allows direct interaction with a social media platform and provides the possibility to link its data directly onto the map.

In the backend a component that supports spatial queries was chosen. Relational databases such as PostgreSQL can be enhanced using the spatial extension PostGIS, which fully supports spatial data.

Data management for location-based services requires rather large datasets to be inserted, updated and removed. The handling of such datasets can be done by employing a streamlined framework. In this case Django was used.

### Lessons learnt so far

Using hybrid mobile apps as described above offers wide possibilities for different users to interact with the same user interface that is independent of both browser and underlying (mobile) operating system.

The HTML5-based application facilitates easy integration into a mobile environment using the local browser of a mobile device or even into a hybrid framework such as Cordova<sup>2</sup>.

The application must also be easy to use and require as little user interaction as possible. In a first version a problem occurred with this aspect because the social media component (Yammer) did not operate smoothly with the mapping framework and thus as a consequence implied an annoying registering process in the social media part for the user. In a second version this obstacle was removed by replacing the social media component.

<sup>2</sup> <http://cordova.apache.org/>