

# LBS 2.0 – Enabling User-Driven Provision and Context-aware Utilisation of Location-based Services

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## Abstract

*This poster presents a novel idea of how to provide users with location-based services. The key issues lie in radically simplifying the provision and the utilisation of services. Therefore we introduce Mobile Geo Widgets. Our objective is to make it possible for non-technicians to compose these via a web toolkit without the need for specialized knowledge, and to enable people to use them on their mobile phones in a context-aware manner without any installation effort.*

## 1. Initial Situation

Nowadays mobile devices with embedded geographic positioning technology have become more and more common. Associated with a faster and cheaper networking layer these could form an adequate technical and economic basis for the realisation and widespread usage of location-based services (LBSs).

However, two fundamental barriers impede a blooming development of numerous and various LBSs:

- The provision of LBSs demands considerable expertise in information technology and requires complex and mostly proprietary development work.
- The utilisation of LBSs demands a daunting effort to find, install and configure the service.

Technical achievements of the Web 2.0 evolution have already reduced the barrier for user generated content on the internet: Content and services can easily be made available (e.g. wikis, blogs, web feeds, podcasts),

and interoperable web applications (e.g. widgets, web services, mashups) simplify the use of such services.

## 2. Idea

Considering this background, the idea to provide even non-technicians with their own LBSs in a way leads to the evolution of LBS 2.0. A corresponding platform could smooth the way for an extensive user-generated repository of LBSs.

A restaurant owner, for example, will then be able to set up a localized service for his restaurant on his own and in an easy and simple way. The menu of the restaurant could be presented to people approaching the restaurant on their mobile devices. Furthermore, one could be able to make a table reservation by a smartphone. Such a new LBS could be coupled to an existing website, where the presentation of the menu and a service for reservation already exist.

## 3. Motivation, research questions, objectives

At present, the demand for mobile information and interaction applications is rapidly increasing. However, it cannot be satisfied due to the large effort of development work required. The complexity that has to be resolved in order to supply and use LBSs is not yet sufficiently covered by higher technology.

Therefore, the following research questions arise:

1. How can the provision of LBSs be made significantly easier and therefore usable also for non-technicians?

2. How can the mobile utilisation of LBSs be simplified radically?

The objectives are a methodology and a platform for the provision and utilisation of LBSs and mobile assistance systems. Our aim is to find a way for providers to bind both existing web-services and their own new services to locations in an uncomplicated and easy way, which does not require any specialized knowledge. Users shall have a context-aware access to all services according to their needs. The resulting necessity of a selection of these services will have to be supported by an automatic filter which grants an easy access to the relevant subset of available services.

#### 4. Solution approaches

The supply chain of LBSs will be generalized from the resources over the provision up to the utilisation of the service by the user.

An ontology for services needs to be founded. In order to approach a simplified provisioning, we have to find a way to make both the service itself and its localisation and semantics describable in a user-driven model.

A web based toolkit for the model-driven development of LBSs will be implemented. User interfaces and the functional logic for new services could easily be constructed from existing building blocks. This ease of use will follow a paradigm, which relies on the mental processes already known from Web 2.0. Compounded services will be deployed on a platform. This will serve as a middleware for the distribution of the services in form of small mobile applications containing UI and simple controller logic (Mobile Geo Widgets). High level functional logic will be executed on a remote server, connected via web services.

Services will be made context-aware, instantly and intuitively accessible for users by a push mechanism. A container for such dynamic mobile applications needs to be developed. The widgets will be described in a lightweight model language (XML-based). Currently there is a prototype implementation of the container in J2ME, and therefore the widgets can already be interpreted on the majority of available mobile devices. A port of the widget container to upcoming operating systems, e.g. Google Android and Apple's iPhone, can easily be done and is therefore planned as future work.

To facilitate the selection of services for the users, a context-aware filtering and a recommender system adapting to each user's interest profile will be implemented within the platform.