

# Point Out a Location in Mobile Services – The POIServer for Using and Managing Personal Points of Interest

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## German Abstract

In den letzten Jahren haben sich Location-based Services (LBS) und Navigationsanwendungen für mobile Endgeräte im Markt etabliert. Hierbei handelt es sich vor allem um Systeme, die Fragen zur aktuellen Position oder den Weg zu einem bestimmten Ort beantworten. Ein immer stärkerer Fokus in der Unterscheidung der Systeme liegt in der Verfügbarkeit von so genannten Points of Interest (PoI), welche für den Anwender interessante Objekte wie Hotels oder Restaurants mit Zusatzinformationen wiedergeben. Das Augenmerk in der Nutzung der PoIs liegt aber meist nur in der möglichst flächendeckenden Verfügbarkeit und einer detaillierten Klassifizierung. Des Weiteren werden meist nur textuelle Informationen und Attribute zu dem entsprechenden PoIs abgelegt. Der POIServer des Fraunhofer IGD erweitert das Spektrum in der Verwendung von Location-based Services hin zu einem multimedial geführten Reiseplaner, bei dem die Wissensvermittlung und der Unterhaltungswert im Vordergrund stehen. Auch ist es mit dem POIServer möglich, personalisierte PoIs individuell zu verwalten und situationsabhängige Informationsergebnisse anzubieten.

## Introduction

Location-based services (LBS) offer new possibilities to provide the pedestrian with navigation functionality and information especially adapted to his needs in a mobile environment. The special purpose of such a service is to offer, in addition to the services known from car navigation systems, further comprehensive personalized information according to the respective position of the user and his user profile. While a car driver mainly needs support in navigation, the pedestrian is situated in a slower mobile environment and expects further services in addition to this basic function.

In the last few years, the importance of interesting locations in such services, known as Points of Interest (POI), has been increasing strongly. Nowadays, the provisioning of well addressed and well-sorted POIs is considered a distinctive feature in location-based services. While there is a general aim of personalization of mobile services, the use of POIs is still mostly limited to static POIs with generic interest, like hotels, restaura-

rants or tourist features, without considering the current user-context. The enhancement of current POI concepts with personalization approaches leads to a new paradigm for using POIs: If the user has the possibility to generate and manage POIs personally, the use of LBSs can be extended to a part of a personal information manager (PIM) offering functionalities to integrate and organize personal locations.

Based on the growing support of the multimedia capabilities of mobile devices and services, the expectations of the users increase in the utilization of these functionalities if they are looking for more or detailed information provided by an LBS. Therefore, it is not only sufficient to provide the user with static information about a hotel or a sight but also with pre-processed multimedia-based information of different types, like video or audio.

Based on this idea, the »POIServer« was developed by the Fraunhofer IGD. This system realizes a concept for managing different kinds of POIs and individual locations including the possibility to provide dynamically multimedia-based information.



Figure 1: »Providing of different multimedia-based content in LoVEUS using POIServer«.

## POIServer

The Graphic Information Systems department of Fraunhofer IGD has started to develop the POIServer system during several research projects in the area of LBS-providing on cell phones due to the increasing requirement of a flexible handling of POIs and related content. The POIServer is uncoupled from an LBS or mapping server which generally provides POIs. The capabilities focus completely on the managing and providing of POIs and related multimedia-based information. The concept of the server is designed to support web-based services generally known from the Internet but with the main focus to provide its service on complicated conditions as mobile service due to the differentiation of the mobile devices in case of their limited hardware and supported functionalities.

The POIServer is based upon the following two main concepts in using POIs:

1. Points of Interest can differ on their characteristic and their current relevance.
2. Every POI can be associated with varying representations and information.

The architecture of the system is based on a modular design. Therefore, the system can be easily extended by functionalities as well as by interfaces for its provided service and to accessed data sources like databases or external web services.

The main modules POIModule and RepresentationModule realize the basic concepts mentioned above of handling the different Points of Interest and organizing the multimedia-based information. Related to these main components, some basic modules are required in order to support the system with different functionalities. One basic module is responsible for the control of the location of the POIs. The module handles, for example, coordinate transformations or transforms addresses into geographical coordinates. Another basic module manages and provides symbols used as visualizations in maps.

A further set of modules is called controller modules and, for example, control the behavior of the server and



Figure 2: Architecture of the POIServer.

the content provisioning. These modules are required especially in the case of using the POIServer in a location-based service. In mobile services, the individual and technical context has to be considered, because the usage of the service varies depending on the situation of the user and the capabilities of the mobile device. In order to provide a stable and usable service, the available content has to be controlled as well as pre-processed, so that it is only provided to mobile phones supporting, for example, the used file format and file size.

Actually, the POIServer is extended by a more flexible managing of multimedia-based information in case of a free authoring and arranging of available content by an administrator of a tourist office without technical knowledge but with cultural background.

### Application of the POIServer

The development of the POIServer was started during the EU-project »LoVEUS« in which a multimedia location-based service for Athens was realized. Here, the user was provided

with a system allowing him to get background knowledge about sights by means of multimedia presentations. The POIServer was also used in the governmentally-funded research project »servingo« with its focus on developing a service platform for personal logistics and infotainment in mobile environments. At this, the server builds the base for creating personal Points of Interest using localization techniques and the built-in camera of the cell phone to bookmark these Personal POIs at the servingo portal.

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