WEB APPLICATION FOR MANAGING SLOVENIAN POI AND TRANSFER TO A GPS GADGET

David Geršak, Jernej Gračner, PROSPLET d.o.o. Velenje, Slovenia
Peter Peer, Faculty of Computer and Information Science, ULJ, Ljubljana, Slovenia
david@prosplet.com, jernej@prosplet.com, peter.peer@fri.uni-lj.si

Abstract

The goal of our project was to offer to the Slovenian users of GPS gadgets a tool (web application), where they can independently enter Points of Interest (POI), visualize them in Google Maps and upload them to their Global Positioning System (GPS) gadgets completely free of charge. Our targeting group are besides participants in road traffic also cyclists, pedestrians (hikers), tourists, interventional services etc.

We designed and developed a web application SloPOI, which enables users to enter Slovenian POI with help of simple but effective web interface (direct input of location through coordinates), to visualize POI in Google Maps, and to transfer POI database into the GPS gadget (in the first version to Garmin GPS gadgets).

Because of open-source concept and wide usability of the web application our primary result is implementation of a tool for entering Slovenian POI, to establish a unified database of Slovenian POI with simple transfer protocol into GPS gadgets, and linkage with existing solutions in the field of visualization (Google Maps). The project in respect to what we just stated represents an important contribution to localization of e-services and to usability in the navigational field in Slovenia.

With more and more popular GPS gadgets also the inquiry about POI databases is rapidly increasing. And while in Slovenia at the moment we do not have a common database of such points, this was one of the important motivating factors for the project. The implementation also offers the concept of categories of POI, which adds to better segmentation of the data in the database.

With this application we can solve or at least try to solve the problem of dispersed data in eventual existing databases, since the users can define the points on their own and consequently fill only one common database. The application is publicly available at the address http://www.slo-poi.si.

Keywords
Global Positioning System (GPS), Points of Interest (POI), Slovenian POI database, Garmin

INTRODUCTION

The project SloPOI focused on design and development of web application that will enable users to enter and manipulate Slovenian POI [1] in the database and transfer them to GPS gadgets. GPS gadgets are getting more and more popular around the world, but until now we did not have a common database of such points in Slovenia.

Attributes of POI consist of longitude and latitude and can be expanded with a description, a short name, height above sea level or a telephone number. In most cases maps on modern GPS gadgets contain some basic POI in a designated region. There are several foreign web sites with similar functions [2], which can be used to collect and organize POI collections which users can upload to their gadgets and thus replace or expand their existing list of POI. Most of these web sites contain several general categories but some may collect only specific POI e.g. stationary radars.

The second initiative for the project came from the fact that Slovenia installed a large number of stationary radars and there are no complete databases on their whereabouts – Garmin Slovenia [3] stopped updated the list.

USER REQUIREMENTS

Out goal was to develop a web application with which users can enter POI with all required attributes. Basic attributes of POI are longitude, latitude and a name, so those attributes are also required parameters to insert POI in the database.

The editor of the site should have the ability to confirm, reject and edit entries and users should have the ability to enter and download POI collections in a file format which can be used with a Garmin GPS device. This is made possible with Garmin POI Loader application [4] which enables users to transfer POI to their device. A functional diagram which shows inner structure of the task is shown on Figure 1.
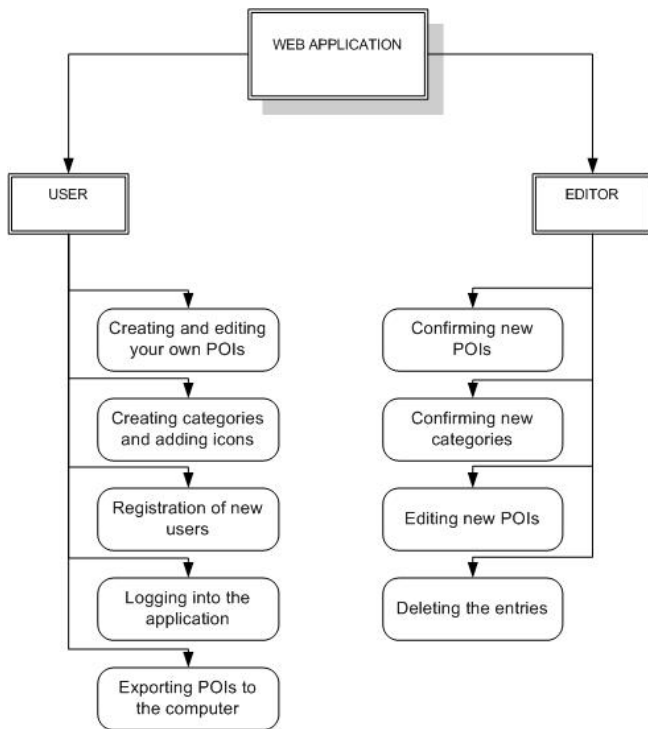
Figure 1: All of the functions which are used to fulfill user requirements. This diagram, which was also further divided into subtasks, was guidance throughout the development of the web application.

USAGE DESCRIPTION

The first step was designing the database. As evident by Figure 2 the database model for this application is straightforward and simple, largely because as of this moment user requirements do not constitute for a larger and more complex model.
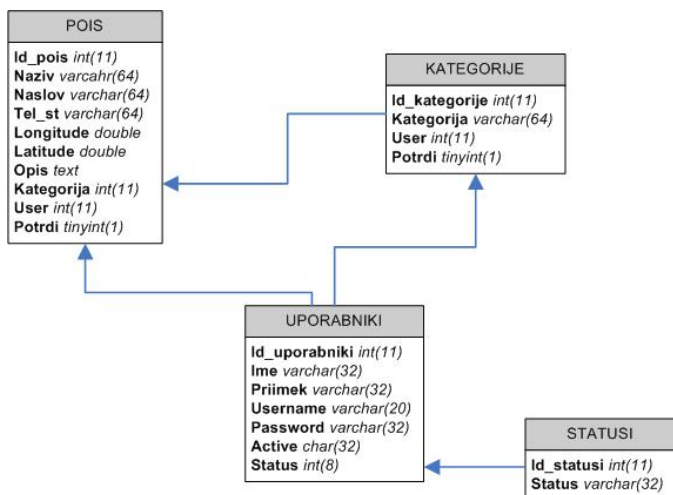

Figure 2: Entity-relationship data model.

The majority of the data resides in a POIS table. This table contains all POI entries with required fields naziv (name),

longitude and latitude. The rest of fields such as NASLOV (address), TEL_st (Phone number) and OPIS (Description) are not required. This table also contains two foreign key fields exist, KATEGORIJE (Category) and user which are linked to id fields in respective tables. Category field serves as a link to a predetermined category, which can be selected from a drop-down menu when entering POI, while the user field stores id of a user who entered the POI. This model is a result of a database normalization which was done at design time and prevents data redundancy. Field POTRDI (Confirm) serves as a flag which states whether an entry is confirmed and thus visible to all users.

Table KATEGORIJE (Categories) consists of four fields. The first is an id which is unique for each record. The second is a category name. The third is a foreign key field user which is linked to id field in table UPORABNIKI (Users) and defines the author of the category. The last field is intended to reflect an editor's choice to confirm or reject a new category entry.

Table UPORABNIKI (Users) contains records of all registered users. Foreign key field Status is linked via an id number to table STATUSI (Status) which stores information on user types. Presently only two types of users are planned: a regular user and an editor. The users table is also linked to tables POIS and KATEGORIJE (Categories) via foreign keys, which enables us to retrieve any information about users and their activities.

Figure 3: Web application basic (intro) page.

Application workflow is simple and straightforward. User who only wishes to download already entered POI does not have to register while anyone who whishes to participate in creating the list by entering their own POI is required to register and log in. A user can reach registration form via main menu or via a sidebar link which is replaced by user menu when the user is logged in (Figure 3). This menu presents the user the following tasks:

- create new points of interest
- edit own points of interest
- create and edit categories
- edit personal information.

If a logged-in user is an editor then a link to editorial section is also listed.

When entering POI a user can fill in several fields, of which only a few are required (Figure 4). In our case required fields are the name of POI and coordinates. Coordinates are used to show location of entered POI in an embedded Google Maps map [5].

Figure 4: POI entry form.

Figure 5: Editorial section on the left side, user menu on the right side of the page.

When entering a new category only two attributes are required: a name and an icon. POI entries as well as category entries are subjected to strict editorial revision prior to publishing. An editor rejects or confirms an entry based on a number of criteria (Figure 5).

Web application also enables users to edit POI, which they have added for themselves. A user can also edit not yet confirmed entries but they are not available for export to other users.

When triggering an exporting of a category the application creates a ZIP archive, which contains POI of the selected category and a matching icon.

CONCLUSION

We have designed in developed a useful and interesting web application which enables users to share points of interest. We have thus established a central database of Slovenian points of interest, which will hopefully do away with current fragmentation and scattered data.

Application also presents a user with a streamlined interface used to quickly and effectively fill the POI database with new entries.

Editorial policy could present a slight synchronization issue with users (as the entered points are not promptly visible) but an editor, which confirms or rejects entries is absolutely necessary. As points and categories entered by one user are also available to others, this policy can help make sure the entered data is sane, valid and up to date.

There are several possible future upgrades of which we would like to bring two to attention, being upgrades of a generated CSV file [6]. The application can be upgraded to allow entering speed limits, which can be then included in the exported file thus removing the necessity of entering limits in Garmin POI Loader. The other option is to replace CSV file with a GPX (GPS eXchange Format) formatted file [7], which is intended to serve as an exchange format between GPS gadgets and respective applications. A GPX is an XML data format.

Another upgrade is possible in the area of POI visualization (displaying points on a map) with Google Maps. Resolution of Slovenian satellite photos in Google Maps is less than stellar, which does not aid the intention of enabling users to visually check and possibly make corrections of a POI location. One of future upgrades could consist of replacing Google Maps with another map provider. A preferred choice would be interactive atlas Geopedia [8]. This open source web application is a product of Slovenian development and contains much higher resolution maps. PROSPLET d.o.o. is in contact with Geopedia team where API development plans are already in motion.

This web application is available under GPL license and thus also developed with open source tools and technologies (PHP and MySQL).

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BIOGRAPHIES

David Geršak, B.Sc., is a Project Manager at PROSPLET d.o.o.

Jernej Gračner is an information science graduate at Higher Professional School Velenje and a PROSPLET d.o.o. contractual co-worker.

Peter Peer, Ph.D., is an assistant professor at the Faculty of Computer and Information Science, University of Ljubljana.