

ONE SOLUTION OF INTERACTION WEB APPLICATION FOR USERS INTERCONNECTION

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Abstract: *In this paper, one solution for the user application which is intended for interactive graphical display of user location is presented. Given the increasing mobility of users, their interactivity and the need for communication, this application offers the ability to find users and visualize its location. An application can only be used if two or more users want to communicate with each other and share their locations. Particular attention is paid to the significance of personal data so the application can only be used if the user approves it for each individual use. According to its purpose, the application is available on mobile devices as well as on computers.*

Key words: *Geo location, interconnection, find people, web application*

1. INTRODUCTION

One of the key characteristics of the modern age is the intensive development of technology, its use in everyday life and the impact on the everyday activities of users. The intensive development of the telecommunication network, then the mobile networks and mobile devices, is rapidly changing the way people communicate [1]. The high level of availability of mobile carrier services, the ever more affordable price of services and the high degree of coverage of the mobile network slowly shift the focus of end-users from computers to mobile devices [1], [2].

Young generations and new generations of digital service users and devices already imply that communication in the digital world is the default form of communication [2]. For this reason, an increasing number of service users require constant changes and improvements to existing services and services that are available online using mobile applications and services [1]. Intensive communication and user mobility requires ever more advanced services that, in addition to their content, have a visual presentation. This becomes especially important when you need to find someone or find some object easier in an unknown environment [3].

There are a large number of professional papers and applications that solve the problem of finding the desired restaurant, museum or some facility easier [2], [3].

In line with all of the above, this paper presents one solution for a web application intended for mutual finding and tracking the users' location. This is of great importance in situations where an increasing number of users have increased mobility, especially situations where users are in

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an unknown environment. This is why the application can be especially useful to tourists, or parents who want to know the location of their children [3]. The primary goal of the application is to graphically visualize the geographical location of one or more users, provided that they want to share that location with another user or users, whereby the privacy of users is maximally respected and cannot be misused in any way.

The work is organized through four chapters: After the introduction, the second chapter defines the reasons for the development of this application as well as the technical requirements for the same and used technology. The third chapter presents the results and possibilities of the implemented application. In the end, a conclusion is given and further guidelines for future research.

2. APPLICATION FUNCTIONALITY AND TECHNOLOGIES

Starting from the primary purpose of the application and the need to be easily accessible to end users, one of the first goals is the proposed solution should be implemented as a web application. On that way it can be used both on mobile devices and desktop computers, without any restrictions. Additionally, the application is supported on Android and iOS operating systems for mobile platforms, as well as Windows and Linux for desktop devices [4].

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Since the goal of the application is to visualize the location of two or more users, and how this information cannot be seen by other users, the application should work on the principle of logical channels that contain those users who want to share their locations among themselves [5]. A channel is a logical structure that defines which users can interact with each other and see the locations of other users belonging to the same channel. In this way, one user can communicate with different users in different channels, while users outside the channel cannot see each other. While using the application, it is desirable to enable geo-location in order to display the user's location to other users within the same channel, but this is not necessary. This way, a user can use the app to see the locations of all users who have enabled geo-location, even though they have not shared their own location. This gives the user possibility to use the application on a PC, or to preserve their privacy [6].

The app is implemented as a standalone application, but it can also be used as part of another web site. A part of the web page would be reserved for the graphics of this application and it would be displayed independently in that space. Then it can be run in parallel with other graphic and functional elements of the original web page [5], [6].

In order to ensure a fast response of the system to every user request, the server application is written in the PHP programming language with the MySQL database [9]. The development of

object-oriented PHP code was realized using the MVC Pattern. This pattern is a Model-View-Controller organization. This division of code into three parts ensures quick processing of user requests, optimal code writing, lower level of application complexity, and better system performance [4], [6]. For this purpose, PHP framework CodeIgniter 3.1.0 was used [7], [10].

Codeigniter is an open source framework for PHP language. It uses the MVC architecture (Model-View-Controller) that brings separation between the logical layer and the layer of presentation. In practice, this allows web pages to contain a minimum code script because php scripting is separate from the presentation:

- The model represents the data structures. A typical model contains functions that enable retrieval and data entry into the database;
- Controller serves as an agent between the model and view, processes HTTP requests and generates web pages;
- View serves to present data to the user. View is a classic web page, but in Codeigniter can be a fragment, like a header or a footer, an RSS page, or any other web page.

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Codeigniter has a fairly free interpretation of MVC because models are not required. Thus, unnecessary code complexity can be avoided. Codeigniter helps us to program in the PHP programming language better and simpler. Adds modularity and code becomes more readable and simpler for updates and changes.

The advantage of this framework with respect to others is that Codeigniter:

- Free;
- It is very easy to install and configure;
- Thoroughly documented;
- It has excellent community support through a large number of forums;
- It contains a large number of libraries and functions that are useful for application development;
- Fast and easy - basically contains a small number of libraries, others are loaded as needed;
- Generate clean and 'Search engine friendly' URLs that help when listing in search engines.

As already mentioned, the primary objective of the application is to provide easy visual communication for users who want to share their location with other users in the channel, making it simple for the user to see their own and locations of others that show up on real maps, with clearly outlined locations of other users, and labels on which user is in which place. As the application is interactive, the position of each user is immediately refreshed in the application as they move, allowing the other users to find, meet, or monitor the position of the person they want. This requires that the application has access to the included geolocation services on the user's device and that it can work with the precision level that the user has with his geolocation [8]. The accuracy of the displayed locations is based on the precision of the geolocation that is

taken from the user's phone and the mistake is usually smaller than 5 meters, which is sufficient for finding people or objects.

3. REALIZATION AND USE OF THE APPLICATION

Starting from all the defined requirements, the proposed solution is programmatically implemented, and customized to be displayed in browsers and mobile devices. How device resolutions in users viewing the application in a browser can be a very different application implemented in accordance with the principles of responsive design, which involves automatically changing the resolution and size of the display of individual application elements with the goal of adjusting the overall display to the current dimension of the user device.



Figure 1: Initial appearance of the application

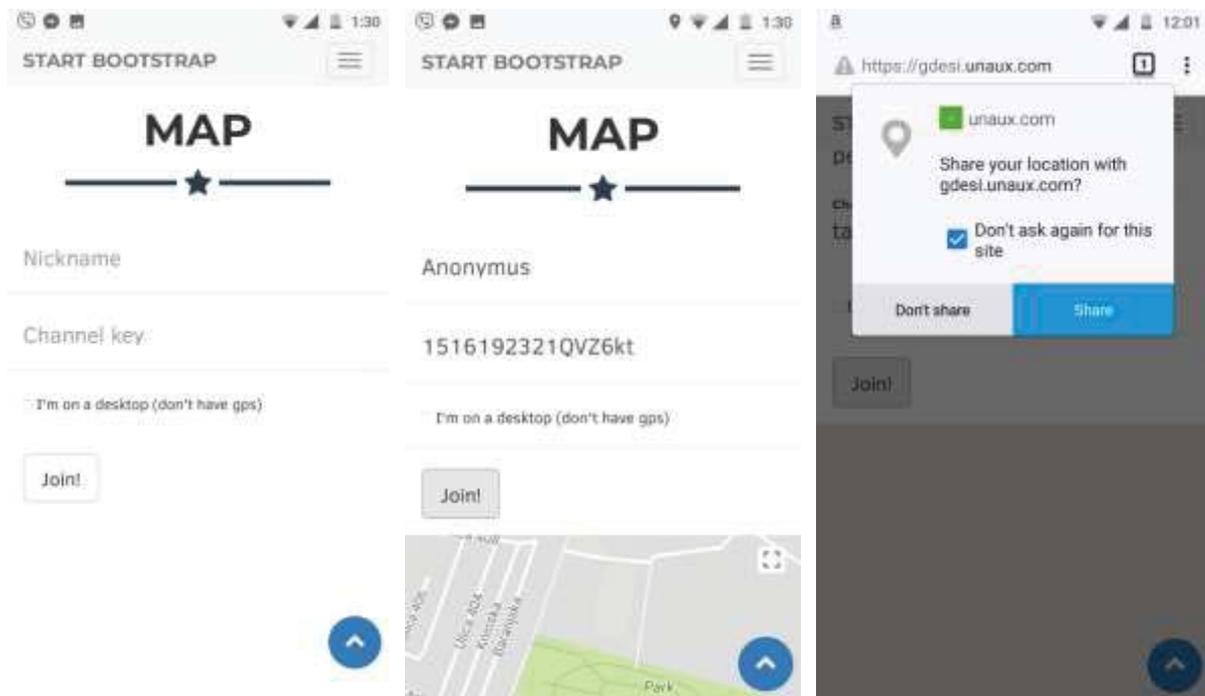


Figure 2: a) Initial display of the application on the mobile device b) Generating a channel key c) Searching for a permission to activate a geolocation

The Fig. 1 i Fig. 2a show the initial appearance of an application when it is loaded in a browser or on a mobile device. The user does not have to enter real name, if he / she does not want it, and it is enough to define nickname so that the users can differ from one another. The application does not require the authorization and authentication of users, and the application can thus be used without the fear of identity theft of users.

In order to prevent the unwanted sharing of your location with unknown users, the user gets his channel key during the initial use of the application. With this number, he can send a request to any other user with whom he wants to share his location, or accept a request from another user to participate in his channel. In this way, one line can share its location with multiple users in one channel, while in another channel it can do with a completely different group of users. The Fig. 2b shows the generation of a channel key which provides protection of personal data from unwanted users.

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Figure 3: Displaying the user's markers within the real map of the place where it is located

After defining a nick name and receiving a channel key, the application checks if the user has a geolocation included on his device. If not, the user is notified that the geolocation is off, and that if he wants to share his location he should turn it on, Fig. 2c. The user has the right to choose whether he wants to do it or not. If the user allows the use of a geolocation, the user automatically loads the location map where it is located with the automatic setting of a signal marker that points to itself, Fig. 3. Clicking the marker displays the nick name of that user. If there are multiple users in the channel, a marker is displayed for each of them and each defines the current location of that user and his nick name, Fig 4.



Figure 4: Display a map with two users in the same channel, which was initialized by the user Pera.

If we assume that a user with a nick name Mika is logged in to the application, after his access to the application, this user will see the screen as in Fig. 5. If a user with nick name Pera joins the same channel, then he will see his marker as well as the Mika user's marker. This would be repeated for every new user in the channel.



Figure 5: View the folder for the user who defined the nickname as Mika.

A special addition to the application is the automatic calculation of user interaction. This distance is calculated in relation to the airspace. This is displayed in the lower left corner of the window, just below the map. Fig. 5. Thus, the user who sees himself sees the distance to himself as 0m, while as a distance to another user sees the distance between two points in a two-dimensional space.

4. CONCLUSION

In this paper we present one solution of web oriented applications with the aim of graphically visualizing the locations of users sharing the same virtual communication channel. The application has the goals to help users find, track or feel more quickly and easily in new and unknown geographic locations. The application is adapted to work on different devices, operating systems and resolutions and has a simple user interface. In addition to interactive visual map view with user locations, the application also shows their mutual distance. Future research will focus on extending functionality in terms of recommendations for the shortest

distance based on realistic environmental constraints and the initial display of objects that may be of interest.

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