A Mobile Application for Quick Information Retrieval Associated with a Building

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When a man comes to a new building, he feels disoriented and do not know anything about area. The main idea of our project is to ease these unpleasant effects of being in unfamiliar indoor space or its close surrounding. To do so, we offer all important information about critical building and area from different information sources in a form of mobile application. Its key property is to offer the needed information as easy and as quickly as possible using innovative searching methods. Such solution is portable to different types of buildings from different domains e.g. schools, business centers, shopping centers, hospitals and so on.

There are several applications which deal with part of this problem – with indoor navigation but there are not as many complex solutions when it comes to combining this problem with the problem of getting important information really fast. The one system that is very close in ideas to ours is the project called "School of the Future" [1]. Goal of this project is to help students navigate inside campus and school buildings and to get important information with the help of augmented reality in their smartphones. According to the authors of the paper, this system is also suitable for other buildings from different domains just like our application.

To test these ideas, our predecessors decided to develop an application for our faculty – FIIT STU as web page and OS Android version. They named it Virtual FIIT. In faculty, the majority of users are students. According to their needs, the application's main function is to offer a possibility to look up their lessons (time schedule), teachers (contact, office location and schedule) and interactive maps of all floors in the building. Application also consists of a barcode scanner for QR codes, which are located on every room of our faculty. QR codes contain information about the person within the room. The application also contains information about objects in nearby area such as actual food menus of different canteens and bus departures from the nearest bus stops.

We have taken over this ongoing project. It is programmed in JavaScript, HTML5 and CSS3, what makes it also a webpage. When deployed by PhoneGap technology, it is a native application for Android OS, but it can be deployed for other operation systems, too. Application architecture design minimizes time of source code changes in case of reimplementation for other building from other domain. To enrich this multiplatform application we have corrected all of the interactive maps, added the map of the nearby area with bus stops and canteens, remade the whole design of

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the application (see Figure 1), added new feature in a form of RSS stream, implemented other various features and fixed majority of bugs[‡].

The most important features from user's point of view which we had implemented with the highest priority are: periodical storage of data, so the users can access any information without internet access, and complex search function. These two features are of the greatest importance to our users and give our application unique value. Since the quick information searching is leading property of our application, our plan is to empower it even more so it will be able to process requests in natural language by detecting key words and pairing them with answers from our database. This pairing will be calculated from graph with weighted vertices and edges, which represent the weights of keywords and weights of relations between them. This is the main unique feature which will differentiate our application from any other.

The future work in which we see potential is use of Bluetooth chips and Bluetooth Low Energy technology as a tool for indoor navigation. This technology allows smartphones to determine their orientation and distance from the Bluetooth chip transmitter [2]. Another idea for future work is to modify interface of our application to support Google Glass platform.

Figure 1.Virtual FIIT mobile application, main screen (left) and map of the first floor (right).

References

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