

ИНФОРМАЦИОННЫЕ СИСТЕМЫ И ТЕХНОЛОГИИ

SOFTWARE COMPLEX «REMEMBER ME»

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The article describes the importance of time management and effective planning in modern society and is devoted to an Android OS application development. It points out the main features of a mobile application such as cross-platform capability and synchronization. Much attention is given to the software architecture as well as user data protection via password hashing methods.

Key words: time management, application, development, security, hashing, password

Introduction

Time management is one the basic concepts which allows the modern man to achieve efficiency and productivity of their actions. Anyone who can be considered successful spends quite some time on planning process. Everyday planning is necessary for performance improvement and effective time management.

In modern society every other person owns a smartphone, which can run organizer-type applications. These programs allow comfortable, fast and most important – mobile planning. Unfortunately, not all of them have full functionality that users require.

Actuality of software complex

Therefore it is relevant to develop a multi-functional, cross-platform software complex, which will allow administering directly from a mobile device and from a PC. During the development process it is important to take a lot of elements into account, the crucial being users personal data safety.

Objectives of development

The main objective of this study is the development of a software complex “remember me” used for schedule control and event planning. This complex allows administrating directly from the mobile device or a PC, synchronizing all the data between them. The software complex consists of a mobile application run under Android OS, web-application, web-service and also administrator-app.

Analog applications review

In order to define main functions of our software complex we have to analyze the market of similar software and look into strong and weak points of other products, how they differ from “Remember me”, study future competitiveness of our complex and user requirements.

After completing the market research of notepad- and organizer-apps we picked 3 basic most popular products with similar functions:

- 1) «BossNote» combines a notepad, calendar and an easy datebook for planning and saving notes. «BossNote» has a synchronization feature between devices, allows attachment of photos, sound, geo-posts and pictures. [1].
- 2) «Jorte» application is made maximally similar to paper organizer. It has many interesting features such as event reminder, pasting pictures into certain log: monthly, weekly and daily event browsing, past events review. [2].

3) “Pomnit vse” can make notes with a reminding feature at a certain time using standard keyboard for input or via voice typing. This application is capable of browsing through all reminders active or passed. This program is available only for Android OS [3].

These programs altogether have functions such as: creating\seeing events with reminders, event map coordinates identification, synchronization between devices, event calendar browsing, imaging format settings, stamps for completed tasks/passed events, records changing.

Competitive ability

After reviewing the analogs we concluded the following:

1. There are similar popular software products on the market;
2. High number of apps are pay-ware or have built in buying options;
3. Although the market is filled with numerous products, all of them have their own customer share, due to the fact, that different people have very different tastes, when it comes to mobile apps.

With that said we can make a fair assumption that developing our own software complex is justified, because it will take its own niche on the market.

Also after reviewing similar products we made a decision to create some unique functions of our software complex, which can put it in favor amongst competitors:

1. Creating both Android and web-based application with synchronization feature;
2. Friend search and browsing through shared schedule;
3. Adding geo-data to schedule entries.

Functions of software complex

Based on analysis of applications-analogs our software complex functions were determined. In order to access data both from PC and mobile device synchronization function is needed. The user can set event reminders; point the location of created event on a map, also every event has its privacy level. To access the system under registered profile log in via username and password.

If it's the first app run then you have to complete registration process. After registration the user has options to choose friends from the users list and also check each other's schedule or planned events if they have set certain privacy level – “for everyone”, or “just for friends”. Also user can synchronize shared events (with open privacy level) with his friends.

Software complex architecture

Based on the declared above functions, the architecture of the software complex should be flexible and resilient and must guarantee simple and fast client-server interaction together with GoogleMap services.

The complex design is shown on figure 1. To accomplish the ability to use this software on any device two client applications (mobile for Android OS and web-application for browser) have to be developed. In order to have an option of system administering in emergency situations an administrator web-application is required. To provide synchronization function all information must be stored in a data-base on a server and present a cloud storage. For secure communications between client parts and Database all client requests are sent indirectly using web-service.

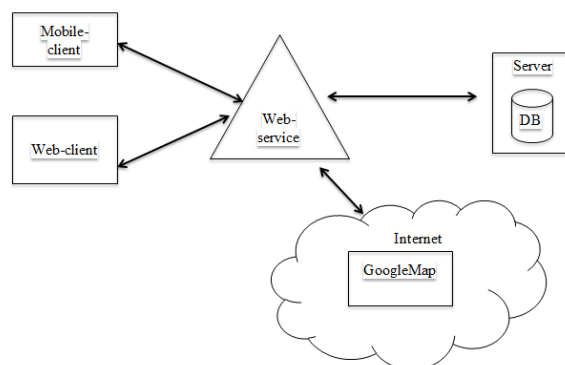


Figure 1 – «Remember Me» architecture.

Development tools

Due to selected design and functions selection of our product we chose following development tools:

1. Android Studio, Java – for mobile client design;
2. MySQL-(web-server), SQLite (mobile application) –database;
3. PHP- web-service design;
4. PHP- web-client development, HTML.

Implementation

Based on chosen architecture and software complex functions, concept and physical designs were created. During the Database development process you must be taking into account not only the field of its application but also following 3 normal forms.

Because the Database is required for Android device and a web-service application, it has to be developed in a way that allows successful data processing on both of these systems, given that we use SQLite for Android, and MySQL for web-application design. These Database management systems have some differences, which have to be taken into consideration.

After Database design web-service methods are developed such as Database connection, authentication, registration, friend search and adding etc. When developing web-service methods, reliable level of security must be provided.

The most important part in data security is password hashing, this operation is a must in developing application, that require users passwords. Without hashing, passwords can be stolen from the Database and users can lose their profiles [4].

Many developers hash passwords using popular functions like *md5()* и *sha1()*. Hashing algorithms such as MD5, SHA1 и SHA256 are very fast and effective. But with modern technology and hardware it became quite simple to find out the result of these algorithms. Because of the speed modern computers can reverse those hashing algorithms, many data security specialists strongly advise not using them for password hashing.

Most widely-spread vulnerabilities in data bases are SQL-injections. SQL -injections is a type of flaw, that allows to replace SQL -request with foreign data. Securing from it can be done using several methods and the simplest of them are : first – not embedding the user-input variable directly into SQL -request, running it through such functions as *mysql_real_escape_string()*, which screens special symbols in the string[4], second- using built-in PHP functions of SQL-requests processing, for example *mysqli_prepare()* prepares SQL-request and returns index on that phrase, which can be used in further operations with it, in case the request contains an error, this function returns the value *false* [5].

Literature

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FEATURES MICROCONTROLLER IMPLEMENTATIONS RECYCLING SYSTEMS USE WASTE

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This article discusses the problem of recycling of secondary material resources. We analyzed various methods to solve this problem. On the basis of the study offers a solution by sorting waste into classes based on the dielectric constant of the medium performance. Hardware and software implementation of the waste management system.

Key words: arduino, a microcontroller, the dielectric constant, sorting of MSW (municipal solid waste).

MSW incineration is technically very difficult, environmentally dangerous and economically inefficient, and sorting the population and utilities practically not carried out. To solve the problem of urgent measures required to ensure effective use of secondary material resources and environmental protection [1].

One way to solve the problem - the use of mobile screening plants, differ from stationary business capacity and dimensions, and the following tasks:

- Extraction of valuable components of solid waste, recyclable;
- Reduction of waste;
- Packaging waste compacted in plastic wrap.

The modern world offers us a variety of solutions for the automation of various processes of human activity and most progressive - a microcontroller system. The microcontroller - chip for controlling electronic devices [2]. When designing the microcontroller has to be a balance between the size and cost on one hand and flexibility and productivity on the other. For different applications, the optimal ratio of these and other parameters may vary greatly. Therefore, there are many microcontrollers types differing architecture processor module size and internal memory type, a set of peripheral devices, the type of housing, and so on. D. Unlike conventional computer microprocessors in microcontrollers often used Harvard memory architecture, that is, separate storage and command in the RAM and ROM respectively.

A typical microcontroller combines the functions of the processor and peripheral devices, contains RAM or PZU- Figure 1. In fact, this single-chip computer capable of performing simple tasks. This microcontroller is the most inexpensive computing means, which has a long service life and low energy consumption, which contributes to its popularity.