

Design of an English Vocabulary Training App Using Google Cloud Messaging Service

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Abstract. In this paper, we design and implement a smartphone app for English vocabulary training using Google Cloud Messaging (GCM) service. The GCM service provided by Google allows data transfer between a smartphone and a server. In the propose app, we present novel functions for the vocabulary learning. First, it receives English words from a database via GCM server and displays on a smartphone screen with notification. Second, it displays an English word and a Korean explanation on the lock screen. In order to unlock the screen, users should drag the explanation and drop to English word. By using such functions, we can expect people study English vocabulary more efficiently.

Keywords: Smartphone, App, English vocabulary Training, GCM service

1 Introduction

Currently, there are a large number of apps related to “English vocabulary” in the Google play [1]. However, these apps should be executed when users play them. Considering this, we design an English vocabulary app that does not need to be executed by user. In the proposed app, we use GCM service [2] for the function. Additionally, we implement a lock screen mode for more efficiency. From those advantages, we expect this app can provide a natural environment to train and study English vocabulary.

2 Related works

2.1 Google Cloud Messaging (GCM) Service

GCM is a free service provided by Google which allows data transfer between a server and android apps. The basic operation of GCM service is shown in Fig. 1. Once users register their phone on GCM service and an individual server, the server can send and alert messages to registered apps. The message can be up to 4KB data.

The important characteristic of GCM is that Android app does not need to be operated to receive messages from the server. Whenever the server sends messages to the Android phone, the app wakes up and immediately receives the messages [2].



Fig. 1. Basic operation of GCM service

2.2 Smartphone apps for English vocabulary training

The ‘Oh my English’ app provides a game for English vocabulary training. In this app, user makes some valid words to gather a star, and when user obtains stars more than one certain level, they can pass to the next level [3].

On the other hand, the ‘word talk’ app provides the variety of functions to train English vocabulary, for example OX quiz, English dictation, list memorization, etc. Additionally, user can select multiple categories of academic words, such as TOFLE, GRE, IELTS and so on [4].

3 English vocabulary training App using GCM service

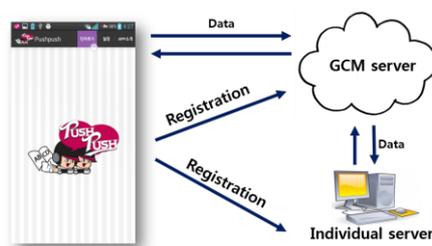


Fig. 2. Structure of the app

The basic structure of the proposed app is presented in Fig. 2. First, in order to use GCM service, the app should be registered on GCM server and an individual server. After the registrations, the app can communicate with an individual server via GCM server.

When users transmit app options or new vocabulary, the data is transmitted to GCM server first and stored on individual server. Also, when the server sends the English vocabulary to the app, GCM server receives the words and broadcasts to the app.

Due to GCM service, the proposed app wakes up when individual server sends English words. In other words, the app does not need to be executed to study English vocabulary.

4 Implementation of the proposed app

4.1 Development environment

In this implementation, we use the Android SDK Platform 4.1.2 "Jelly Bean" on Eclipse as the environment development. We use Sqlite3 database which is built in Android for storing basic words to supply the training functions. The server for implementing REST API uses the Elastic Cloud Compute (EC2) service of Amazon, in Linux Ubuntu12.04 LTS version OS. Finally, the database is developed using Python2.7, Django 1.5.1 and MySQL. For testing, the app is deployed on LG Optimus G, Samsung Galaxy S3, S4 and Note.

4.1 English vocabulary training App

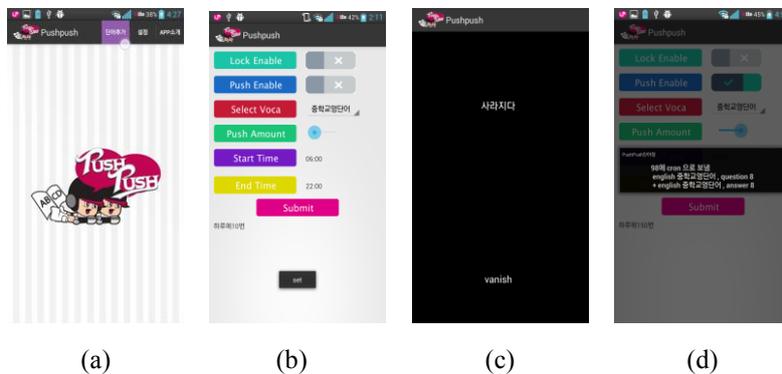


Fig. 3. Application UI

Fig. 3(a) is the main screen of the proposed app. In the main screen, we designed 'Add vocabulary', 'Options' and 'Introduction' tabs. Among them, the 'Add vocabulary' provides a function to add new words to the database. Basically, there is vocabulary for TEPS, TOEFL, TOEIC exams and junior high school student to practice.

The 'Option tab' has the function to manage the operation settings of the app. Option menu is shown in Fig. 3(b). User can switch on the Lock screen function or Push function. Furthermore, there are several options for push service, such as

purpose of studying, amount of words a day, activated time period, etc. The options are stored on the server and the app will be operated by user's setting.

If user switches on the 'Lock Enable', lock screen will be changed like Fig. 3(c). In order to release the lock screen, user should drag the Korean explanation and drop to an English word on the smartphone screen. During the app is activated, English vocabulary are notified to the app at a random moment. Fig. 3(d) shows how English vocabulary are pushed to the app. The word and its meaning is alerted from the server via GCM server.

5 Conclusion

In this paper, we implemented an Android smartphone app for efficient English vocabulary training. Most of existing English vocabulary training apps should be run consciously in order to study English. One of the most important advantages of the proposed app is that it does not need to execute every time user studies due to GCM service. Furthermore, using the lock screen function, we can learn the English vocabulary on the lock screen. Also, new words which are not in the database can be updated by users.

In the presented app, the lock screen function is operated without server part and we provide only Korean version. We plan to use the server for lock screen function and insert the variety of languages version. This remains as the future work.

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