Design and Implementation of English Intelligent Electronic Dictionary System based on Android Platform

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ABSTRACT: *With the continuous development of science and technology, mobile intelligent devices have been widely used in homes, and have become a very important part of people's lives. At present, the smart phone application services have a very large value. English, as a language widely used in the world, has not faded away from the English learning craze in China. The use of intelligent electronic dictionary system to learn English, with the use of more distributed time, because of its portable and easy to use and more functional, users achieve more learning needs. Through the Android system design of intelligent electronic dictionary, all the functions for learning are realized.*

Keywords: Android, Electronic dictionary, English

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1. Introduction

As the world's most widely used language, English is the official language of the United States and Europe and many African countries, and the world wide use of English has been increasing. The widespread use of English, in the United Kingdom and the United States for two centuries, and the world economy, culture, military, political, scientific and other areas have tremendous impact. Now, for most of the international social activities, English is used as the main language of international communication. At the same time, most programming languages are realized through English, with the continuous development of computer technology and Internet technology, where the use of English is now more popular. In China, learning English is one of the main subjects for students. With the changing of people's learning style, people are no longer confined to the English Dictionary of the paper version, but the computerized electronic dictionary is widely used. Because, the English dictionary has more functional requirements, electronic dictionaries meet complete thesaurus requirements, and they are lightweight, easy to carry, simple, intelligent and so on[1]. And the birth of the Android mobile operating system, makes the electronic dictionary to achieve these functions. By virtue of its strong advantages in resources and the business service pluralistic integration, it has enhanced user's mobile operating system, and its market share rate has exceeded 50%. It is also the case that the design of the

intelligent electronic dictionary system based on Android system is of great significance to the study of English.

2. State of the Art

2.1 Android operating system

Android system within the scope of the world set off a storm of intelligent systems as the release still without any signs of slowing a variety of industries of electronic, manpower cost thrift is transformed into many entrepreneurs and managers [2]. Free and open source operating system based on Android, the Linux system is mainly used in mobile devices, including smart phones and tablet PCs [3]. The entire Android system consists of the following parts. The upper layer is the application software, directly connected to the user. The second layer is the developer which can call for the interface display component and the third layer is the middleware, which shields the underlying operating system. The entire system has a complete API and open source, and its ultimate goal is to fully integrate the mobile functionality of the product [4]. The Android applications are rely on the Java language to write, so development of application program and its core applications is the same level based on API to build. It not only can freely use the device hardware advantages, but also for the background services, where the use is very powerful[5]. Android developers have four major components: activities (Activity)- Used to represent the function. Services- Running in the background and does not provide interface presentation. Broadcast receiver - For receiving broadcast. Content providers (Content Provider)- support for multiple applications to store and retrieve data which is the equivalent of a database. The Android is the root of all procedures, processes and all programs are being run in the Activity, Activity can be regarded as the most frequently encountered by the developer, which is also one of the Android basic modules. If the phone is compared to a browser, then the Activity is equivalent to a web page. Activity can see the concept and the concept is quite similar to the page. Usually an Android application is composed of a plurality of Activity.

Figure 1. Android interface

Android applications can jump each other; for example, pressing a button may lead to jump to another Activity. And the page jumps is slightly different as it is possible to jump from the Activity between the return value, for example, to jump from Activity A to Activity B, then when Activity B is at the end of the run, it is possible to give Activity A, a return value. Doing it so many cases is quite convenient. When we open a new screen, a screen will be set before the suspended state, and pressed into the history stack (See figure 1). Users can roll back the operation returns to the previously opened screen. We can selectively remove some and there is no need to keep the screen because Android will start each application to the current screen which is saved in each stack. The Service is the android system in an assembly, and it is with almost Activity level. It cannot run by itself, and can only run in the background, which would interact with other components. Service is no longer a lifecycle interface code. Service is a program that can run for a long time, but it has no user interface. That is a bit boring, and look at an example. Open a music player program, and this time if you want to access, and then open the Android browser. This time the browser has entered the program, however, did not stop playing the song, but then continue in the background of the first playback. In fact, this player is playing music from the Service control. Of course, this music can also stop the Service, for example, when a playlist

of songs inside the end, or if the user pressed the Stop the music player shortcut keys and the like. Service can be multi-occasion use in applications, such as playing multimedia when a user starts the other activity. This time the program which the users want to continue to play in the background, such as changes detected on the SD card file, and then, record change geographic information on the location in the background, and so on in short service, which are always hidden behind.

Content Provider is a third-party application data access solutions provided by Android. In Android, the data protection is very strict, as in addition to the data on the SD card, the application content and some databases, files and other holdings are not allowed direct access. Andorid courses do not really put each application to make an island; it is ready for all the applications in a window, and this is the Content Provider. Applications want to provide external data and can be derived by Content Provider, and a package is put into a Content Provider. In the Content Provider, each *uri* is used as a separate identity shaped like content. Everything looked like REST look, but in reality, it is more flexible than REST. REST and similar, *uri* can have two types, one is with the id, and the other is a list, but the implementation does not need to follow this model to do to the id *uri* and can also return a list of types of data, as long as caller understand, anyway, without demanding so-called REST (See figure 2).

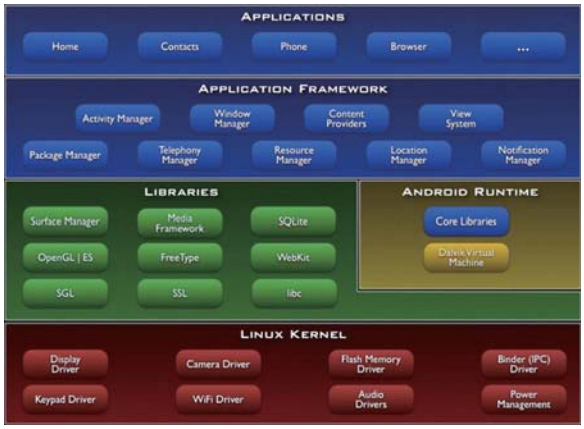

Figure 2. Android operating system

2.2 Demand analysis of electronic dictionary

The main function of the electronic dictionary is to carry out the query, to meet the user's need for the retrieval of the content. Hence, first of all carry out the realization of the function of the word query to execute the operation. Include the English pronunciation, idioms, Chinese content, Chinese and English interpretation and other content, where the content is available in the Internet to obtain relevant information [6]. And in order to better serve the user, allow the user to obtain the execution function. Therefore, it is necessary to provide the function, the users will need to focus on learning and use the memory of the words. Word pronunciation is required to provide the voice of the teacher, in order to achieve the correct pronunciation of the word. In addition to some of the necessary functional requirements, the electronic dictionary should also meet some of the non-functional requirements [7]. First, security should be guaranteed, no matter what kind of information users should have adequate confidentiality, and to ensure the correctness and completeness of dictionary content library.

3. Methodology

The Android mobile phone application system, has a whole system which is divided into logic layer and data layer, which is the part of the MVC three layer structure [8]. The specific structure of the system is shown below in the figure 3.

Among them, the view layer uses the XML document to carry on the description of the interface, where the use of the time can be more convenient to introduce. The operation of the database and the operation of the network should be processed in Model, and the operation of the business calculation must be the model layer, that is, the application of the binary data [9]. Data binding in SDK Android, is the use of a similar approach with the MVC framework to display data. In the control layer, the data can be directly displayed on the view model in accordance with the requirements of the view model, which can realize the data binding.

According to the functional requirements of the system, the Android electronic dictionary system can be divided into five

modules: the local dictionary, the network dictionary, the individual learning, the voice module and the setting module (See figure 4).

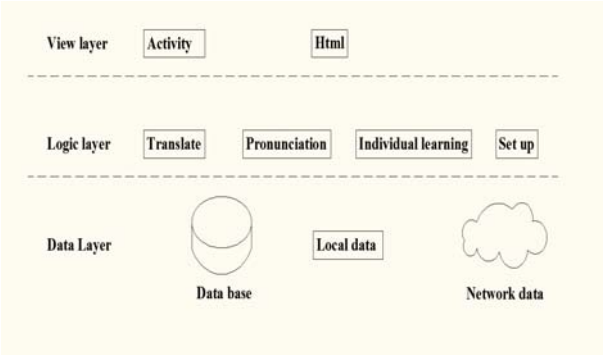

Figure 3. System architecture diagram

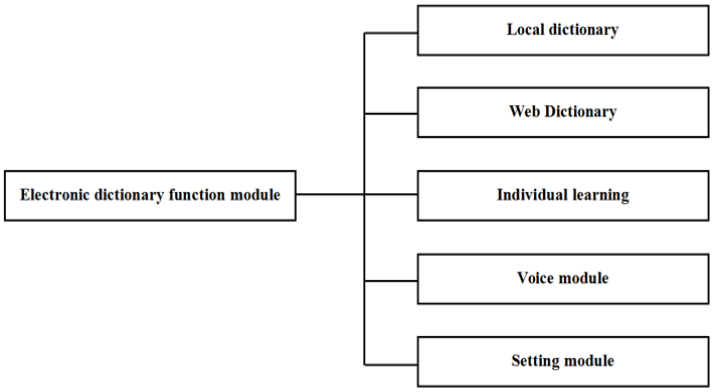

Figure 4. System function module division

The local dictionary can be input to be word query, and users in the input box type the query words and phrases, to get clear results. When the input of two or more letters on the word smart *Lenovo* is carried, it saves users time. The network dictionary can also be displayed in the case of a local dictionary. Individual learning can add some high-frequency words to the word, the speech module can be speech recognition, and the results of the word query to read aloud [10]. The Setup module includes the management of the function, the network cache cleaning, etc.

The Database design mainly use database to store data for individual learning module in the words. The word data in this table is used for storing the add words, the attribute information, including words ID, new words, new words level, add time. The word table structure is as follows:

Field name	Data type	Remarks
Word_Id	Integer	New words ID
Word	Text	New words
Level	Integer	New word level
Time	Long	Add time of new words
Meaning	Text	New words

Table 1. Word list data structure

The local word search function design does not require a network connection, thus require only the local thesaurus files to provide the corresponding data and the local word database is stored in the eclipse Android project res\raw directory, because the directory in the file will not be compressed. Therefore, one can directly extract the files.

4. Results, analysis and discussion

In order to be able to test the whole system, the trials run in both the simulated environment and real environment. Will gather first with the USB connection to the computer, and then select the portal and tools. It will appear in the computer of a virtual storage, automatically install the program, the driver and a mobile phone connection program. Through this program, the open mobile phone portal program automatically go through the USB connection. According to the client's module division, the entire client function for user interface testing, functional testing and integration testing are integrated with two rounds of testing.

Modular	Condition	Operation	Expected result	Actual result
Local word search	This lexicon	Query word	Return to interpretation	Adopt
	The lexicon	Query word	Return "no this word" prompt	Adopt
	There is no word in the word	Add word	Successfully added	Adopt
New words to add	Word already exists in the word	Add word	Returns the word 'already exists'.	Adopt
Dictionary setting			Set the availability of local Dictionaries	Adopt
Empty words		Click to clear the word of this button	Empty words	Adopt
Pronunciation setting			Choose whether or not you need to recite words	Adopt
		Click the Home button to exit	Can close application	Adopt
	Operating procedures			
Library client		Direct end process	Can quit, the program does not go wrong	Adopt
	Enter the program page	Click exit key	Eject exit prompt box	Adopt

Table 2. Test of each module

5. Conclusions

In this paper through the Android phone application, the development and testing of electronic dictionary, is carried out to achieve the main functions that include local search words, network check words, English pronunciation, new words and words and the memory mode. The user set the function in the design and development process, to scientific management thoughts of software engineering as a guide to facilitate the follow-up project function to add. Through the back of the functional test it is possible to visualize the development of all the modules are successfully implemented, and hence, the design of the electronic dictionary system is more successful.

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