Design and Implementation of Ancient Character Conversion Software Based on Android

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Abstract: At present, there exists no software that truly shows the beauty of wordage in different periods of China. In order to let more people know about the beauty of ancient characters and stir the attention towards Chinese traditional culture, this paper puts forward a design idea of ancient character conversion software based on Android. Led the ancient art into the digital age and integrate into modern Chinese electronic dictionary, which is an innovation point of this software. This software is developed in Java, using the information technology platform to implement word search, word display, voice, interpretation and local storage, among other functions, which not only can let users understand the artistic charm of the Chinese characters in different periods but also can be used as a Chinese electronic dictionary. After a small-scale test, people's interest in ancient Chinese characters has improved significantly.

Keywords: android; conversion of ancient characters; the Chinese character culture

1. Introduction

In line with the government proposals, the Ministry of Education has decided to implement the plan of doing away with the independent college enrollment, which has lasted for many years in China, and replaced it with by the "Qiangji Program" in 2020. In terms of enrollment major, "Qiangji Program" will highlight basic subjects, in addition to mathematics, physics and chemistry, the liberal arts focus on an "unpopular" subject direction and ancient philology. The study of ancient Chinese characters, related to cultural inheritance, is facing the dilemma of insufficient research force and reserve talents. This reform can display the country's determination to strengthen the research force of ancient Chinese characters and to inherit and develop traditional culture.

In order to inherit the traditional culture of ancient Chinese characters and combine the art of ancient Chinese characters with digitization, this paper proposes a design idea of an Android-based ancient Chinese characters conversion software so that people can understand the beauty of Chinese characters in different periods. Then how to integrate the art of ancient Chinese characters into the digital age and modern Chinese electronic dictionary so that every electronic dictionary user can feel the charm of Chinese character culture, which will be an innovation of this software. Basang Zhuoma and Gao Dingguo [1] designed a Tibetan-language electronic dictionary software, whose overall structure consists of a dictionary management module, a query module and a help module. Wang Aixia [2] designed an English electronic dictionary software based on Android, which implemented the functions of word query, addition of new words, modification of new words, entry and browsing of word books, etc. Xu Fenfen [3] designed an English word learning system based on Android, which contains two parts: electronic dictionary and word memory. Wang Songtao [4] designed a Tibetan-Chinese English trilingual dictionary system based on the Android platform, which is characterized by fuzzy query of words. Zha Lima [5] designed a computer query software for English-Chinese Mongolian electronic dictionary, which consists of two modules: instant translation module and instant dictionary. Li Xiao [6] designed an English electronic dictionary system based on Android, which implemented word search module, machine pronunciation module, speech recognition module, personal learning module and user setting module. Guliziya·Abudujili [7] designed a Chinese-kazak bilingual electronic dictionaries that has two ways to search. One is to search the meaning of Chinese and Kazakh words by inputting words through the keyboard. The other is to use screen word extraction technology to let computer programs automatically obtain the referred words and to find and display the meaning of words by judging whether they are Chinese or Kazakh. Maihemuti·Maimaiti, Tuergen·Yibulayin, and Aishan·Wumaier [8] designed an electronic dictionary software for "Turkic Dictionary". It has the function of quickly searching the original word or its meaning in four different languages (Uyghur, Turkish, Chinese, English). Lu Mingyu and Jin Yangyi [9] designed an electronic dictionary software with the function of translating between Korean and Chinese, which also added the learning function. Liu Jian [10] designed an electronic dictionary software for idioms, which mainly implemented several main functional modules, such as query of idioms, easy memorizing of idioms, management of thesaurus and system management.

Huang Yifeng and Yan Qiao [11] designed an English electronic dictionary based on the Android platform, which implemented the functions of English word translation, learning, review, test, notebook, import and delete word base, reciting common sentences and so on. Zhang Jia [12] designed an online translation software based on the Android platform. The basic learning functions are realized by query module, translation module and pronunciation module and auxiliary functions such as thesaurus management, wordbook and user settings are also provided.

Above all, various types of electronic dictionaries have different functions and its own characteristics on the market, but there is no platform that can let people know the beauty of our ancient character in different periods. In order to let more people understand the beauty of ancient character and arouse the attention to Chinese traditional culture and inherit the excellent traditional Chinese culture, this paper proposes a design idea of ancient character conversion software based on Android. With the help of information technology platform, the functions of word search, word display, voice, interpretation and local storage are implemented. Led the ancient art into the digital age and integrate into modern Chinese electronic dictionary, which is an innovation point of this software.

2. Functional Requirements Analysis

In order to be as close to people's real life as possible and convenient for users to operate the system should have the following functions:

2.1. Search Function

It can search words or idioms. The background image should reveal the characteristic functions of the ancient character conversion APP -- big seal character, small seal character, official script, running script, cursive script and traditional Chinese character. As shown in “Figure 1”.

Figure 1. Main interface

2.2. Word Display Function

Users can see the searched words or idioms, and can switch to other fonts to display. Correct pinyin, five-stroke, radicals and stroke numbers should be displayed at the same time. The pronunciation should be read aloud to further check the definition of words. As shown in “Figure 2”.

Figure 2. Font display interface

2.3. Interpretation Function

It can display the interpretation of words and phrases, read aloud and set the speed of reading according to users' needs, which are convenient for users.

2.4. Offline Function

Words and idioms need to be collected locally, which are convenient for the next reading.

2.5. Display Function of Local Database

Users can see the searched words or idioms, and can view the brief of their saved words or idioms. Click the corresponding words to jump to the definition page. Long press the words or idioms to delete it from the local database, as shown in “Figure 3”.

Figure 3. Local data display interface

3. Overall System Design

According to functional requirements, the client module is divided into five parts, including word display module, search module, definition module, offline storage module and local database display module, as shown in “Figure 4”. This system uses SQLite database, which is a lightweight, embedded and relational database. Every Android application can use the SQLite database cause Android runtime integration of SQLite.

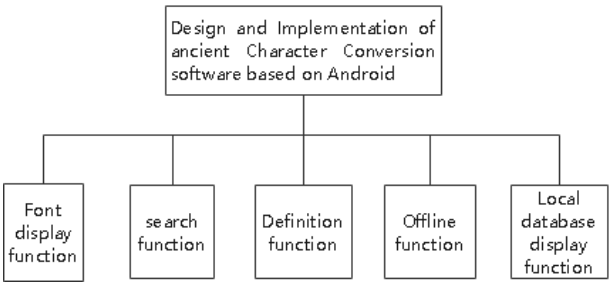

Figure 4. System function diagram

As shown in "Figure 5", the overall design of the system shows that the system often needs to carry out database operations, hence the preference of two classes, DBManager and DBHelper. This is for carrying out specialized database operations according to development requirements. DBHelper class is a class of basic operations on database, because every time the database operation needs to invoke the onCreate method to open or create the database, to obtain SQLite Database instance, and then through the examples of some methods, we can execute SQL statements, the database to add, delete, change, query and other operations. We also need to close the database after the operation. When the program wants to create a table it simply deletes the table by calling the corresponding method in the DBHelper class. When the program wants to query records, insert records, update records and delete records on the database it can directly call the corresponding method in the DBManager class.

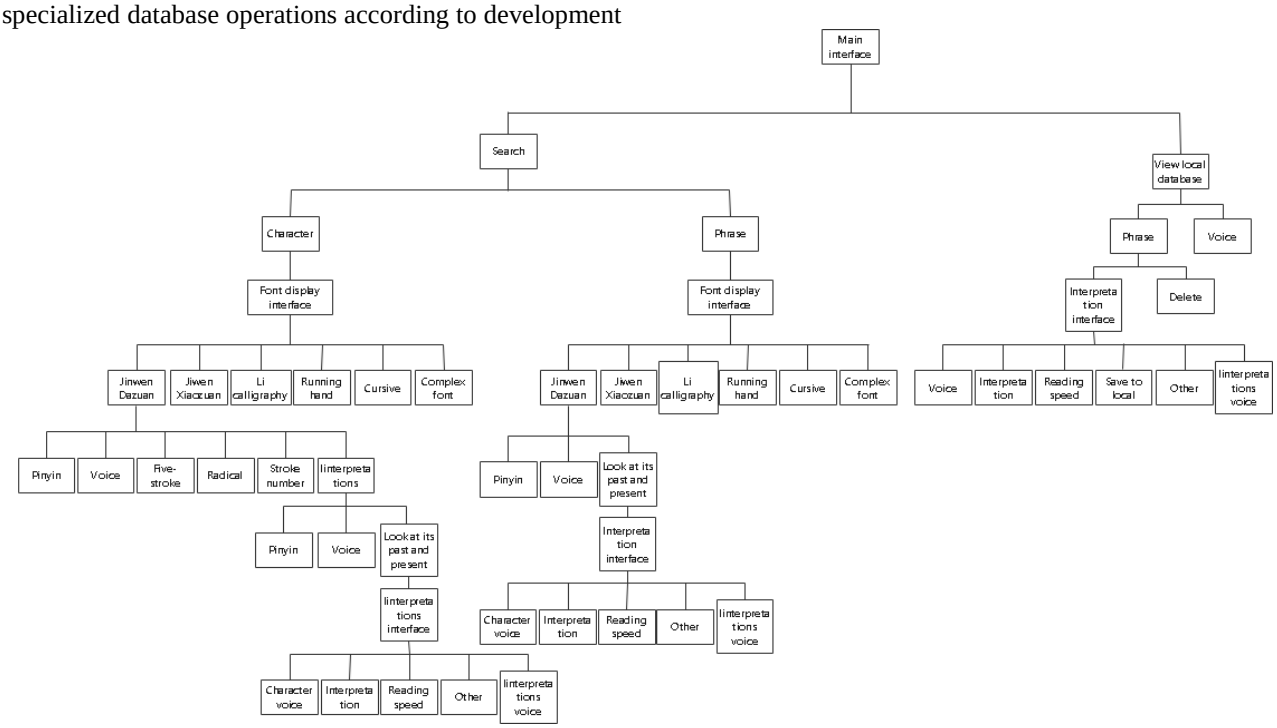

Figure 5. System overall design flow chart

4. The Database Structure Design

Table 1. Word information

Field name	Data type	Field description
_ID	INTEGER	PRIMARY KEY (automatically added)
Word	VARCHAR	idioms
Pinyin	VARCHAR	voice
Duyin	VARCHAR	pronunciation
Wubi	VARCHAR	five-stroke
Bushou	VARCHAR	radical
BhNumber	VARCHAR	stroke number
Xiangjie	TEXT	interpretations

Table 1 is a word information table, which is used to browse the local word database, the pinyin, pronunciation, five-stroke, radical, stroke number, word interpretations and words search. The user's operations on words are all based on this table.

5. System Implementation

The overall implementation idea of the system needs to request the interface of Juhe data, input words or idioms into the interface, then the interface returns json string, APP will parse json string into Java object, according to the layout of the page the object properties will be displayed on the corresponding control.

5.1. Implementation of the Search Module

Simply set the EditText control on the activity's main screen.

5.2. Implementation of Font Display Module

Request the interface of Juhe data, which will return the url of the image corresponding to the ancient word. Download the image into bitmap object according to the url and add several bitmap objects to the List<View>

collection. Set the List<View> collection to the ShowWord (extends PagerAdapter). Set the ShowWord object on the ViewPager. Then the font will be displayed.

5.3. Implementation of the Word Interpretation Module

Click word details on the font display page. Add the click event to TextView object and transfer the text object to the interface of definition details. TextView control is used to display detailed information and SeekBar control is used to adjust the speed of speech. TextToSpeech is a speech object that comes with Android.

5.4. Implementation of Local Database Display Module

Query words or idioms. Find out the qualified text information object WordStory in the database. Set the list to LV_DB_Show (extends BaseAdapter), set the adapter to the ListView control, and then implement TextToSpeech. OnInitListener interface. Add click events to the list. Click on the word can jump to the word display interface. Long press to prompt whether to delete.

6. Conclusion

Chinese electronic dictionaries have been relatively mature for a long time, but the Chinese electronic dictionary with ancient conversion functions has not appeared on the market so far. In order to let more people know about ancient character and draw attention to Chinese traditional culture, inherit the excellent traditional culture of China, understand the beauty of the Chinese words of different culture, this software is developed in Java. with the help of information technology platform, the functions of word search, word display, voice, interpretation and local storage are implemented, which not only can let users understand the artistic charm of the Chinese characters in different periods but also can be used as a Chinese electronic dictionary.

Acknowledgment

This work was supported in part by Premium Funding Project for Academic Human Resources Development in Beijing Union University.

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