Design of Traditional Chinese Medicine Health Cultivation Application Based on Android Platform

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Abstract. With the popularity of health cultivation in traditional Chinese medicine (TCM), to meet pursuit of TCM health cultivation, we have developed an Android-based Chinese medicine health cultivation application. The software realizes the functions of identification of TCM constitution, suggestion of TCM constitution health preservation, exercise health preservation and electronic mall of health cultivation products. The whole process of TCM health cultivation was completed. Achieve the goal of health cultivation at home.

Introduction

With the improvement of the living standard of society, people are more and more concerned about personal health.\textsuperscript{[1]} However, the development of the medical market is lagging behind and the allocation of medical resources is unbalanced, which makes it difficult for medical services to keep up with the increasing needs of users. As a result, "expensive and difficult to see a doctor" has become a hot topic in the current society, leaving aside the factors of the social environment, investigate the individual reasons, because residents do not understand their own physical condition, fail to prevent the occurrence of disease, disease prevention.

The State Council promulgated the Outline of the National Medium-and Long-Term Science and Technology Development Plan (2006-2020). It mentioned that "the focus of disease prevention and control should be moved forward", "prevention should be given priority" and "health promotion should be combined with disease prevention" in order to emphasize the importance of "disease prevention". That is, when the body is in sub-health state,\textsuperscript{[3]} countermeasures should be sought. Many people in sub-health state neglect their precursors. This part of the sub-health population does not have disease itself, so it is not necessary to go to the hospital for treatment, only to carry out health intervention, so as to make it less sick or not sick, so as to reduce personal health risks and disease incidence, and reduce medical expenditure. It is of great practical value to give full play to the advantages of “Following the Prognosis of a Disease” and to improve the quality of human health.

In recent years, people are concerned about personal health status, and pay more and more attention to health cultivation.\textsuperscript{[4]} They have become increasingly interested in the traditional health cultivation of TCM. How to integrate TCM health preservation and mobile interconnection technology and develop TCM health cultivation software based on the theory of “Following the Prognosis of a Disease " is of great significance.

The application of health preservation of TCM at home enables users to quickly grasp their constitution of TCM at anytime, anywhere, and according to individual constitution types of TCM, formulate personality conditioning programs, from diet, living, spiritual and sports lifestyle to health cultivation, to achieve the role of disease prevention. It also provides the functions of health information providing, sports health cultivation program and electronic shopping mall of health cultivation products.
About Android Architecture

Android is a mobile operating system which is launched by Google. It is available on a wide range of different devices, to provide good experiences for users in different market segments. It is based on Linux kernel and the platform architecture consists of five layers, Linux kernel, libraries and Android runtime, application framework and applications. [5] The Android architecture is shown in Figure 1.

**Figure 1. Android architecture.**

**Linux Kernel.** It helps to manage security, memory management, process management, network stack and other important issues.

**Libraries.** There are a set of native libraries written in C/C++, which are responsible for stable performance of various components.

**Android Runtime.** The main component Dalvik virtual machine was designed specifically for Android running in limited environment, where the limited battery, CPU, memory and data storage are the main issues. The core libraries are written in Java language and contains of the collection classes, the utilities, IO and other tools. [6]

**Application Framework.** It is a toolkit that all applications use, ones which come with mobile device like contacts or SMS box, or applications written by Google and any Android developer.
Applications. At the top of Android Architecture we have all the applications, which are used by the final user. By installing different applications, the user can turn his mobile phone into the unique, optimized and smart mobile phone.

Requirements Analysis
The system interrelated users contain the mass user, TCM doctor, e-mall administrator and system administrator. Mass users’ operations mainly consist of six modular s such as questionnaire of constitutions, performance of TCM constitutions, e-Mall, Health cultivation advice, health cultivation with exercises and user information. TCM doctor manages health cultivation information, such as Health cultivation advice and Health cultivation with exercises. E-mall administrator manages products of e-Mall, marketing campaign and order of e-mall. System administrators manage data of system such as information of users and records of TCM constitutions. The use case diagram shows in Figure 2.

The Process Customization of TCM Health Cultivation
The mobile terminal software realizes the health cultivation function of TCM constitution, and its work flow is as follows: Fill in the questionnaire survey of TCM constitution, its content is sixty questions about the representation of body condition, answer each question in turn, submit the questionnaire, and give each score of nine kinds of constitution systematically. To determine whether the user's physique is peaceful or one or more biased, the questionnaire answers and the results of physique determination are stored in the database. Users can check their Health cultivation advice according to their physical condition, including diet, living life, spirit, exercise and drug recuperation, which has reached the role of health cultivation. Users can also view health books and the real-time updated information in the public health network, in order to better understand the knowledge of TCM. The process customization of TCM health cultivation is shown in Figure 3.
Conclusions

With the continuous development of modern mobile communication technology, the application of health preservation in TCM can identify constitutions at anytime and anywhere, grasp individual constitutions of TCM, and give full play to the advantages of "Following the Prognosis of a Disease" according to individual conditions. This paper elaborates on the overall structure and design objectives, and analyses the application requirements. The functions are mainly divided into five modules: constitutions identification, Health cultivation advice, spirit recuperation, TCM culture and e-mall of health cultivation products. Through the whole process of TCM health cultivation, achieve the goal of health cultivation at home.

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