Advances in Engineering Research (AER), volume 116
International Conference on Communication and Electronic Information Engineering (CEIE 2016)

Perfection of the programming design for medical college internship files with the utilization of android mobile phone client

Xiao-Meng Liu[1,a], Chang-Guo Xu[1,b], Ju Wang[1,c], Xiao-Lin Hu[1,d], and Seng Li[2,e*]
[1]*Shandong Medical College, Jinan Shandong China*
[2]*Ji'nan Dongxin file Technology Services Ltd, Jinan Shandong China*
Emai: [a]landy3330@163.com, [b]xuchg@sdmc.net.cn, [c]wangj@sdmc.net.cn, [d]huxlin@sdmc.net.cn, [e]lisen674@163.com
**Corresponding author*

This paper describes the design of the medical intern students' file program, which utilizes the universal application of Android mobile clients to solve the hard problems from the collection of the students' files after they enter the internship places, mainly including the three aspects: the program overview, the technology and the function.

Keywords: Android Mobile Clients; Medical Students Internship; Students Program Design.

1. Introduction

Students of medical colleges will go to hospitals or other medical and health institutions for probation and internship of one year or two, After they fulfill the study of basic theoretical knowledge and skills. During this period, because the students are distributed to different internship places in different areas, it is quite difficult to conduct the internship management. The collection of students' internship situations and the construction of files cannot be completely done in time, either. In order to strengthen the intern management and file construction, based on the currently extensive application of Android mobile phone client among teachers and students, Android mobile phone internship file management system has been developed to improve the management of medical college students on interns, thereby helping to collect the internship information and perfect students' files.

2. Overview of Program

The design of the program aims to collect the information of the students in the internship places during the internship and send the real-time feedback to the school server as well as link the information with students' file management

system so as to perfect the management of students' files. The paper mainly introduces how the computer design of Android mobile phone client system receiving the information is connected with the school students' file management system. No more details will be described here as different schools use different file management systems.

Generally, when the medical college students practice in a hospital or any other internship places, the institution will respectively require the staff of the departments, where the students will serve, to take charge of the management of the internship. In this paper, the staff in charge of the internship management in the internship places such as hospital will be called as Hospital Tutors. The medical schools will appoint several teachers to manage the internship students. By areas, each teacher will usually take care of the students from several internship institutions. In this paper, the medical school teachers in charge of the internship students will be called as School Tutors.

We intend to utilize Apache+mysql+php pattern to establish the system, which includes two parts of client and server. To be specific, it includes the client construction, server construction, data sheet setting and the function design, which contains the part of students, part of Hospital Tutors and the part of School Tutors.

3. Technology

3.1. G*eneralization of the software design*

3.1.1. *Foundation of realization*

i. Realization of Android mobile phone network communication

Android sdk has lots of practical units which can realize the interaction with web server. As to *TCP* protocol, it has Socket which can apply set Entity to submit the data of client to the server. Regarding *HttpResponse*, it can use *Execute* way to obtain the data returned by web server.

ii. Realization of *Servlet* and *jdbc* technologies

Servlet is a class of *java* programming language. Web server enlarges the application program through *servlet*, in which doGet and doPost are used to receive the request of users and response to the client.

The main function of Servlet is to realize control. It can promptly send response message to the client, to realize the C of MVC pattern.

Jdbc refers to *java* database connection. It provides the unified access standard for various relational database. By using it, there are many methods for getting access to the database. Considering the practicability and the convenience, the paper utilizes the *thin* pattern to accomplish the database

access. Meanwhile, *Class for Name* is applied to load the driver. Next, the *Connection* object and *Statement* object are established. Also, these objects are used to implement *SQL sentence* with *excuteUpdate* method or *executeQuery* method. Finally, it uses *ResultSet* object to get the information sent back from the database, as shown in the following figure.

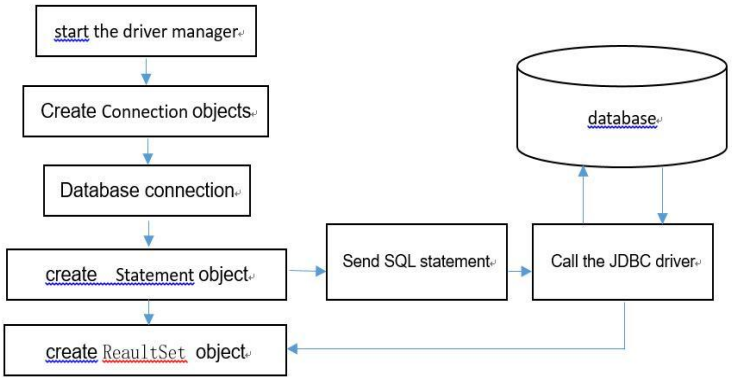

Fig. 1 Implementation process of Servlet and JDBC Technology

3.1.2. *Realization of mobile phone client*

i. Overview

It is realized by using *eclipse* and *java* language with the relevant plug-in. The interface display is accomplished by *activity*. It is responsible for receiving various operations conducted by users on the mobile phone. Because the realization process is not the key point of this paper, it will not be much described.

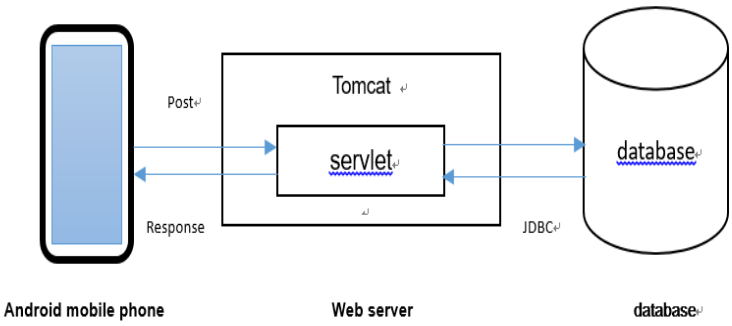

Fig. 2 Program design architecture

ii. Realization of modules

The *HttpPost* object is applied to realize the data receiving and delivering, during which the encapsulation of the data delivered and the separation of the data received are completed with this object. It shields the hypertext transfer protocol. Hence, *List<NameValuePair>* is utilized for the data encapsulation and the data submission to the server. Finally, through the way of *execute* of *HttpResponse*, the data is received.

3.1.3. *Realization of Web server*

i. Overview

Web server uses *tomcat6.0* as the *servlet* vessel. It is realized through the use of *myeclipse* and the establishment of *Servlet* through *java* language. The initial module mainly accomplish the deployment of Web application program and intercept the request of the mobile phone client. In the case of normal running, as long as the web server starts working, it can be realized.

ii. Query module

The query module is used to inquire data of all aspects of the internship software. After the query is submitted, the background will make up *sql sentence* according to the query condition. The execution module checks the database in accordance with *sql* and then feedbacks the information which can be shown to users in the tabular form. The data can be printed.

iii. Adding or editting module

The module is utilized to add the information of students, teachers and internship.

iiii. Statistics module

The module can establish different query modes according to various statistical patterns. It can also use *sql sentence* execution module to graphically present the data returned, which can help to conducts the statistical analysis on various internship situations.

iiiii. *Sql sentence* execution module

The *createStatement* of *Connection* is applied to establish *Statement*. And then it uses *executeQuery* to inquire statements.

3.2. Database Design

The database stores a variety of data and information of the software, including forms for the students, forms for the Hospital Tutors , forms for the School Tutors, the internship information forms and the internship situation forms.

Tab.1students

Field name	Description	Field type
Id	Student table primary key	Numerical model
Sid	Student ID	Character
Name	Full Name	Character
department	Department	Character
Professional	Major	Character
Sex	Sex	Character
Age	Age	Numerical model
Grade	Grade	Numerical model
Unit	Practice Institution	Character
City	City of the Institution	Character
Pid	Practice ID	Numerical model

Tab.2 Hospital Tutor

Field name	Description	Field type
Id	Hospital Tutor Table primary key ID	Numerical model
Name	Full name	Character
Unit	Working Institution	Character
Department	Department	Character
Sex	Sex	Character
Post	Post	Character
Age	Age	Numerical model

Tab.3School Tutor

Field name	Description	Field type
Id	School Tutor table primary key ID	Numerical model
Tid	Teacher ID	Character
Name	Full name	Character
department	Department	Character
Sex	Sex	Character
Post	Post	Character
Age	Age	Character

Tab.4 Internship Information

Field name	Description	Field type
Id	Internship information table primary key ID	Numerical model
Pid	Practice ID	Character
Name	Practice name	Character
Stid	Association of School Tutor Table	Character
Utid	Association of Hospital Tutor Table	Character
Unit	Practice Institution	Character
City	City of the internship	Character
Begin	starting time of Internship	Character
End	End time of Internship	Character

Tab.5 Internship situation

Field name	Description	Field type
Id	Internship information table primary key ID	Numerical model
Note	Description of practice	Character
Note_time	submission time of Internship	Character
Note_person	Name of Submitter	Character

4. Function

4.1. *Students end*

The students end is quite simple. It only needs to reflect the problems of internship. The students information is not registered by students themselves. It is added through the computer end.

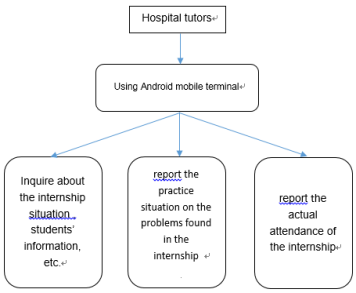

Fig. 3 Operation Process of Student End

4.2. *Hospital Tutors end*

The hospital tutors can use the mobile phone to inquire the internship situation and regularly, according to the regulation of the school, report the internship situation and attendance situation.

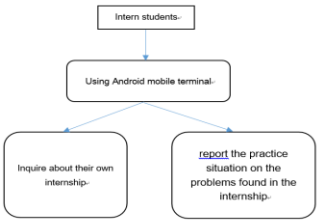

Fig. 4 Operation Process of Hospital Teacher

4.3. *School Tutors end*

The school tutors can check multiple internship information of students, whom they are responsible for, and further can carefully refer to the information of each student and regular attendance situation as well as the problems revealed.

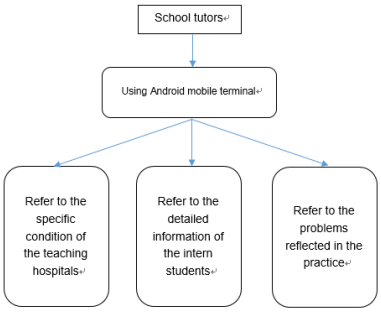

Fig. 5 Operation Process of School Teacher

4.4. *Computer end*

The function of the computer end includes the addition and management of basic information, statistics of internship situation and output of internship data.

a) The contents added and managed contain students' information, hospital and school tutors' information and internship information.

b) Statistics function. Aiming at the different query conditions, it makes the statistics on query results, such as the internship situation of some department in one year, or the statistics of internship situation under the guide of a certain internship tutor.

Summary

With the design given above, we can help the medical colleges and universities to make the interns' information in the internship institutions better collected, to strengthen management, and to improve the internship files, so that the original intension of the program will be basically achieved.

References

1. Fanping Deng, In-depth understanding of Android(Vol.1),Machinery Industry Press,China, 2011.
2. Yafeng Wu, Typical examples and project development of Android programming,Publishing House of Electronics Industry, China, 2011.
3. Chao Han, Development of Android classic application program, Publishing House of Electronics Industry, 2012.
4. Ning Li, Authoritative guide to Android Development, People's Posts and Telecommunications Press, 2011.