

## Design of Mobile Teaching Platform Based on Android

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**Abstract.** Nowadays in campus, the mobile terminals (smart phones, tablet PCs, etc.) are becoming increasingly popular. In order to make students to know teaching information timely and share study materials whenever and wherever, a mobile teaching platform based on Android is designed in this paper. The platform includes releasing teaching information, uploading or downloading teaching material, integration of students and teachers microblog. The platform is installed on Android devices in Android applications. Teachers and students can teach and learn by mobile terminal without geographical and time constraints.

### Introduction

At present most of the teaching platforms are B/S structures and based on Windows operating system. Students browse information by Browser, confined by the computer terminal and the network cable. With the development of smart mobile technology, the number of students with mobile devices (smart phones, tablet PCs) are more and more. How to get teaching information and share study materials effectively by mobile devices is a problem worthy of study [1].

This paper describes mobile teaching platform based on Android. It makes teachers and students can teach and learn by mobile terminal. Students can browse and query teaching information, download study materials, consult the matter in study conveniently through the platform. The teacher can conveniently release teaching information, upload the teaching resources, online answer etc. [2].

### Android platform architecture

Android is a Linux-based open source operating system, mainly used in portable devices. According to the February 2012 statistics, Android holds the global smart phone / the Tablet PC operating system market of 59% and Chinese market share of 68.4%. Android is a true sense of the openness of mobile devices and integrated platform, which includes the operating system, middleware and some key platform application. Android biggest feature is that it is an open architecture, with a very good development and debugging environment, but also supports a variety of scalable user experience. The openness of the Android platform reduces development costs. Its openness is suitable for the teaching platform development[3].

The Android platform architecture consists of a five-story structure, they are application layer, application framework and the component layer and libraries layer, the Android runtime environment layer and Linux kernel layer [4,5,6].

Android applications are written in the Java programming language. All the code in a single .apk file is considered to be one application and is the file that Android-powered devices use to install the application.

Application components are the essential building blocks of an Android application. Each component is a different point through which the system can enter your application. Generally, there are five different types of application components in an application. They are Activity, Service, Broadcast Receiver, Content Provider and Intent [5].

Data storage is the most frequently used in developing. Android provides several options for you to save application data. They are Shared Preferences, File, SQLite Databases, ContentProvider, Network Connection.

### Requirement analysis of teaching platform based on Android

The persons who use the platform are teachers and students participating in the course, their requirements are as follows:

Students need through the teaching platform query information about classes, exams and other related courses, download teaching materials, interact with students or teachers, upload work etc. Specific use case diagram is as fig. 1.

Teachers need through teaching platform release teaching information, upload teaching material, answer students' question, manage students' work etc. Specific use case diagram is as fig. 2.

Administrator need through the platform manage user's information and assign user rights. Specific use case diagram is as fig. 3.

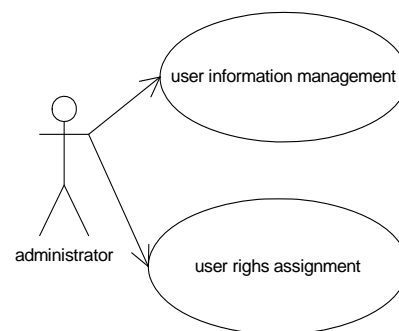
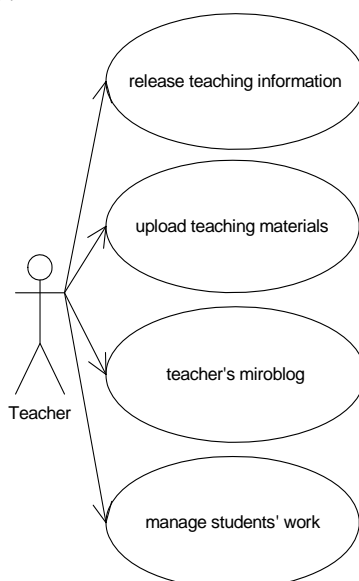
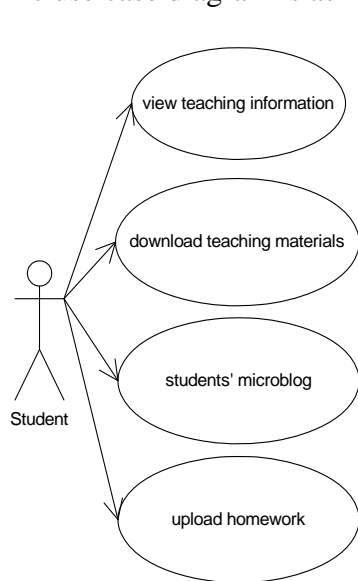


Fig.1 Student use case diagram

Fig.2 Teacher use case diagram

Fig.3 Administrator use case diagram

### Overall architecture design of the teaching platform based on Android

**Functional model design of teaching platform.** According to System requirements, the Android-based teaching platform implements the following functions:

- Teaching information management: Releasing meeting notice, exam and class information through the platform in order to students know teaching dynamic timely.
- Sharing of teaching material: Teacher can release teaching information through the platform. Students can download learning materials via the Android smart phones and tablet PCs in order to study at any time and any place.
- Integration of teachers' and students' microblog: Integrate multi-platform or multi microblog accounts, in order to Students and teachers communicate more easily.
- User information management: Manage user information and rights.

Functional model of the system is as fig.4.

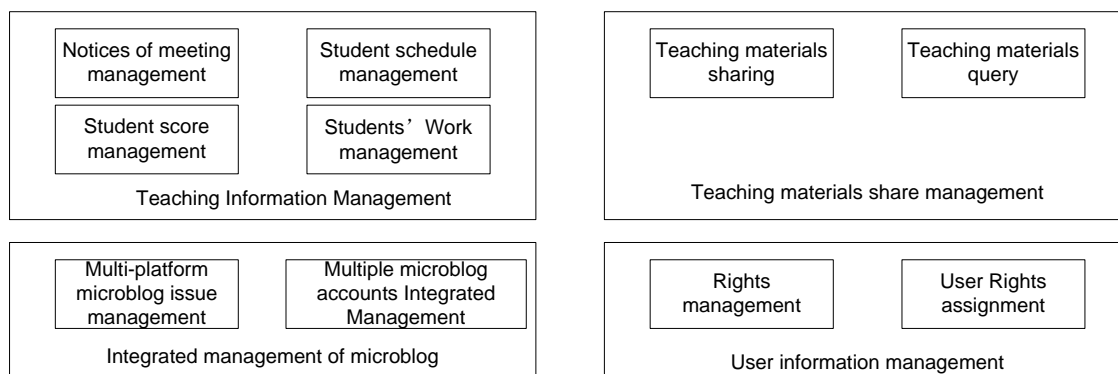


Fig.4. Functional model of teaching platform based on Andriod

**Architecture design of teaching platform.** Architecture design of teaching platform includes overall architecture design, platform component development, platform activity development and data high level design. The following are details of various design parts.

- Overall architecture design of teaching platform

The overall architecture design idea of the teaching platform is modular and components. The platform has teaching information management module, teaching material sharing management module, microblog integrated management module and user information management module. Components are developed by calling basic application components of Android platform and complete the function.

Teaching information management module includes management of meeting notices, students schedule, student score, students' work. Teaching sharing management module includes teaching materials sharing and teaching materials query. Microblog integrated management module includes multi-platform posting microblog management and multiple microblog accounts integrated management. User information management module includes rights management and user information management. Overall architecture design of teaching platform is as fig.5.

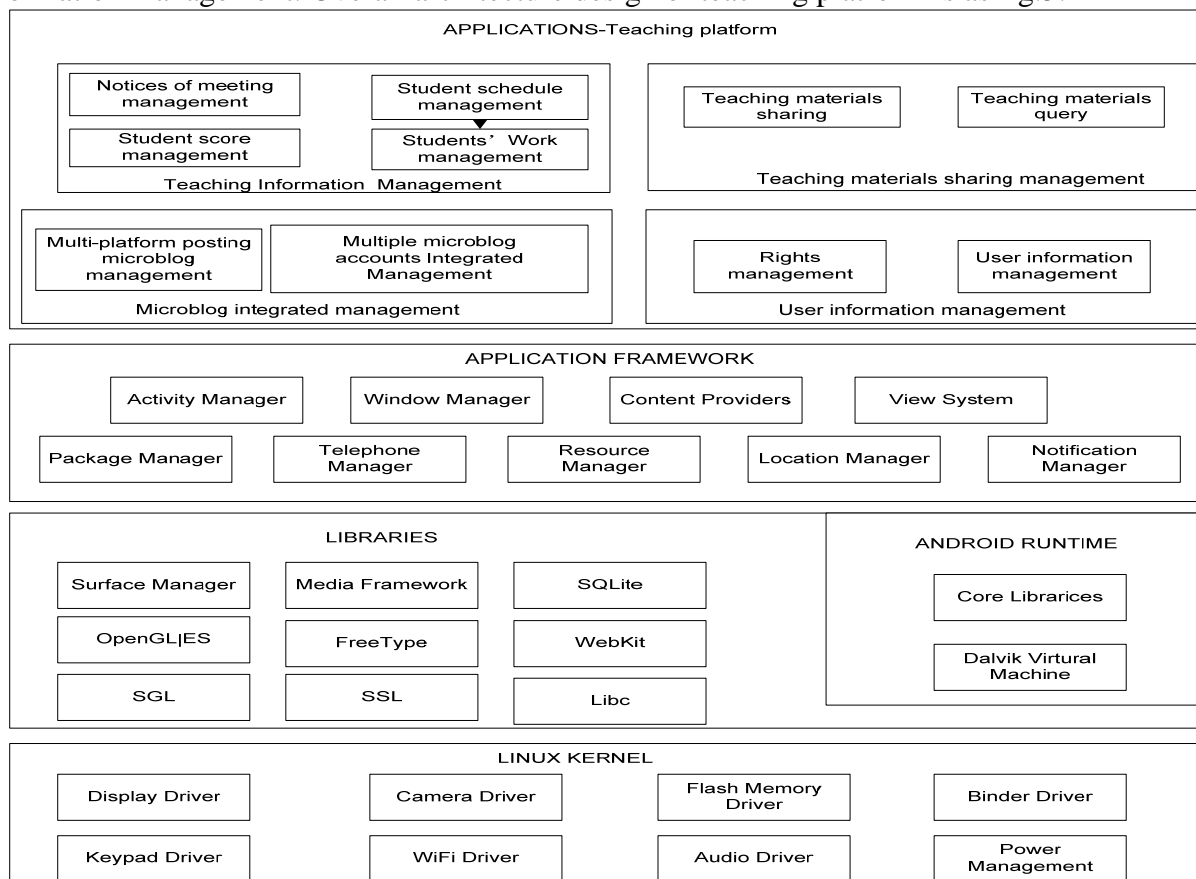


Fig. 5 Overall architecture design of teaching platform

- Components developing design of teaching platform

The components of the module of teaching platform use activities, services, broadcast receivers, content providers and Intent to complete their functions. Take an example of issuing meeting notice. Issuing meeting notice activity, service and content provider interact with context application by Intent. Thus it can complete issuing meeting notice and storing meeting data. Students view meeting notice by view meeting notice activity, service and content provider. Specific developing design of components is as Fig.6.

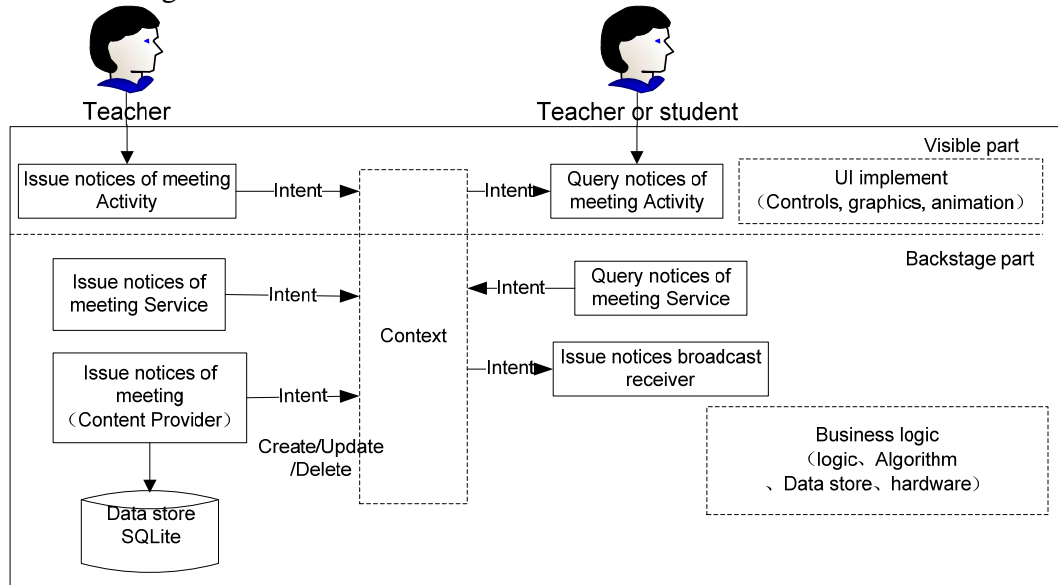


Fig.6 Design of developing components diagram

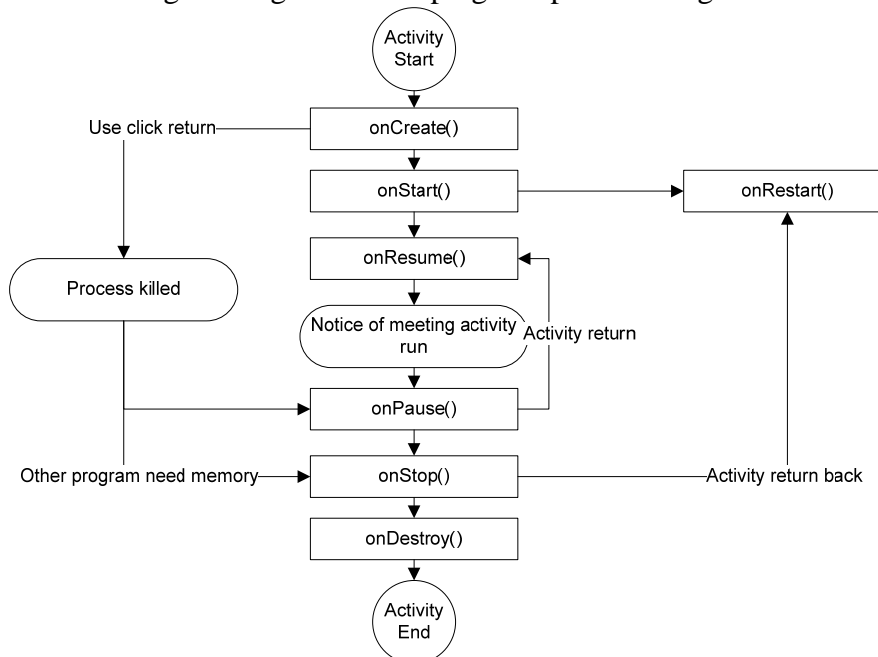


Fig.7 Activities transfer design

#### ● Design of developing activity of teaching platform

Taking an example of issuing meeting notice activity explains the design of activities. An activity is implemented as a subclass of Activity and implement a few protected() methods of Activity .

Protected void onCreate(Bundle savedInstanceState) //be called when it is being created

Protected void onStart() // be called when it is being initialized

Protected void onResume() // be called when it is being recovered

Protected void onPause() // be called when it is being paused

Protected void onStop() // be called when it is being stopped

Protected void onRestart() // be called when it is being restarted

Protected void onDestroy() // be called when it is being destroyed

The methods beginning with Syllable word “on” represent behavior which happens when active state machine is transferring. These methods will be called at different stages of the life cycle of an activity run[8]. The activities transfer design is as fig.7.

### Data high level design of teaching platform

The data storage of teaching platform uses SQLite. The data table of teaching platform has two types. One is business table including notice information table and teaching material table. The other is code table including user table, common code table etc. Specific data high level model is as Fig.8.

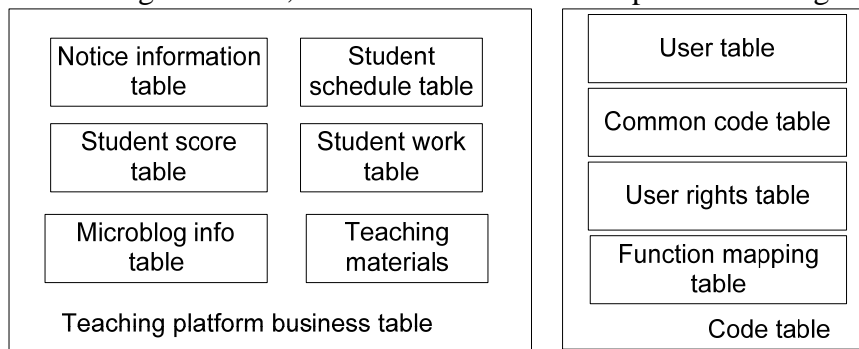


Fig.8 Data high level model

### Conclusions

The teaching platform is based on Android and installed on mobile terminals. It further expands the communication means between teachers and students. It makes students to access to teaching information more conveniently. In addition, Students can also further develop on this platform so as to enrich platform function.

### Acknowledgment

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