

# The Design and Implementation of a Cross-Platform Teaching System

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**Abstract.** With the development of computer technology and network technology, the traditional test mode is not able to fully meet digital, standardized test requirements. Traditional exam modes include artificial test paper, artificial marking, several processes statistics and performance analysis papers, results statistics, papers analysis etc., The whole process is cumbersome and inefficient. Moreover, with the change of examination techniques and carrier landmark, we can say the traditional examination method is no longer suitable for today's exam. Now appears online examination system is an extension of the traditional examination and change, with its own efficient and convenient, flexible benefits, widespread concern various institutions. On the other hand, with the rapid development of mobile communication technology and intelligent portable device innovation, appearing more and more sophisticated intelligence products, marking the arrival of the mobile Internet era. As a smart phone operating system, Android platform by virtue of its open source, openness and stability, it has become the current most users, the fastest growing mobile smartphone operating system.

In summary, The campus of the previous examination system is applied to the mobile client, not only can make full use of space, anytime, anywhere to exam, not too much limited by time and space. And greatly simplifies the examination process, reducing the onerous test management work, which is a mobile Internet application development model better.

In order to make the examination system to have flexible scalability and cross-platform portability, At the same time convenient for each subsystem integration, based Android platform and application software technology Web application server communication, combined with the actual traditional examination process, design the overall structure and function of the system to achieve the main module, in order to develop versatility, flexibility, ease of maintenance of the mobile phone side of the school examination system. The system includes system settings, test status, clear examination, re-examination, the online exam, the student information maintenance and queries, bank maintenance, query results, review papers, exit multiple module systems, it can enter their own questions and its related the freedom to create and delete, save students answer timely information, the system uses a manual marking and automatic scoring combination to provide a more objective reference points.

The system uses Android as an operating system, using J2EE as a development framework, JAVA as the system development language, using the B/S structure of the network architecture model, applying SQL Server2005 database management system to store student information and questions as to

achieve different people, from different locations (such as LAN, WAN, Internet/Intranet), with different access methods to access and manipulate a common database. It can effectively protect data platform and access management, as well as its own security server database, to better improve the overall security of the system.

In this paper, based on the Android platform school examinations system design, development and related technology is described and discussed. First of all, the analysis shows that schools in the past exam mode, so as to define the overall layout of the system and its related processes. Secondly, using the JAVA language for the completion of the layout of the main module for development, implementation steps are discussed in detail. Finally, the system is optimized and the relevant contents are summarized. After the completion of the system development, the function of each function should be checked to ensure that the system can achieve the expected purpose, better guarantee the availability and safety of the system.

The realization of the Android platform of school examination system, not only to meet the school standardized tests of functional requirements, and well solves the shortcoming of lack of portability of the original system. It is able to improve the flexibility and practicality of the system, teachers and students can use and search examination system related information anytime and anywhere, to a greater extent save time and space occupancy. In the implementation of the Android examination system, there are still many problems, but also need to continue planning and design. But the whole process of its development, this is a familiar and the process of exploration, and it is proved that this is an effective research and development process, at the same time, it has important guidance and reference for the future development of a more excellent and more efficient system.

**Keywords:** JAVA · Examinations · System · Android

## 1 Introduction

### 1.1 Research Background

With the development of mobile Internet technology, not only changing our way of life, but also changing the traditional test pattern. In the forefront of mobile Internet wave Android mobile intelligent operating system, more and more widely be applied to today's test model.

Past the traditional examination mode after artificial group volume, manual marking, score statistics and papers and tests, analysis process, often need to spend a lot of manpower and material resources and financial resources, the whole process cumbersome and inefficient. So the traditional examination way has not fully meet the needs of education informatization construction and modern teaching [1]. Now college students for mobile Internet cognitive degree is self-evident, the traditional exam mode and the combination of mobile networking, developed an Android based smartphone operating system under the test program, can reduce the test cost, easing the burden on teachers, greatly improve the work efficiency, ensure the quality of the exam. At the same time, based on the test pattern under the Android mobile intelligent operating

system, has become a trend of assessment of students' academic level of higher education, the examination is the original way of development and innovation, conform to the requirements for the development of the information age [2], will also was welcomed by college students.

## 1.2 The Development of Mobile Internet

Today is the era of Internet, the Internet has become the essential element in life, in almost every corner around us. Especially in recent years, the popularity of cell phones and other portable devices, especially the rapid development of mobile smart phones, mobile Internet concept of thorough popular feeling, is bound to lead a new wave of technology.

From the user perspective, the so-called Mobile Internet refers to the way the application of mobile, portable tablet PCs and other mobile devices to access the Internet over a wireless connection, although it seems that only the access equipment has changed, and in fact has prompted the Internet occurred a lot of fundamental change. Acceleration in the pace of life, people today need to be more precise and more direct service, "small and light" and "Communication and convenient" determined by the characteristics of the mobile Internet and PC Internet fundamentally different place, and trends associated with the Department.

First of all, the mobile Internet, its biggest feature is the characteristics of easy to carry, compared to the massive PC or laptop, mobile phone and tablets and weight are more appropriate people carry in the body. Especially mobile phones, today's mainstream contact tools, mobile phone is almost 24 h a day with people around you. Mobile phones as a tool of mobile Internet access, to search information resources required for people at any time, make full use of the fragmented time in the life, work, accept and deal with all kinds of Internet information.

Second, different from the PC model of human-computer interaction process, the mobile Internet in the unique way of human-computer interaction, since mobile portable devices have small screens, and no keyboard input devices such as external, shown to result in the user's information or controls are relatively few. While the terminal capabilities by the terminal size, processing power, battery capacity and other limitations. This requires that mobile Internet devices will be needed to refine the content as much as possible, to reduce the user's input operation. However, in general, for a large number of formal jobs, people will still choose PC. Therefore, mobile communications equipment to provide users with more entertainment and communication. So when making interactive users prefer the multi-touch and gestures, body feeling.

Finally, because of the mobile Internet business has received the network and terminal capacity constraints, therefore, its content and form also needs to be suitable for a particular network technical specifications and terminal type, therefore, when using mobile Internet business, the use of content and services more intimate, especially in mobile phone as the client access to the Internet, including users mobile phone number, real information and user directories contain user information at any time are likely to leak, social relations, therefore, mobile Internet users for its information security requirement is extremely high, generally do not reveal information risks install new applications.

### 1.3 The Android Platform Development

Android is an Open source mobile devices operating system based on Linux, mainly used for smart phones and tablets and other mobile devices, set up by Google's Open Handset Alliance (smaller companies, Open Handset Alliance) continued leadership and development.

Android was originally founded by Andy Rubin, originally developed the purpose of this system is to create a digital camera's advanced operating system; But it was found that the market demand is not big enough, and the fast-growing smartphone market, so the Android was transformed into an operating system for smartphones. In August 2005 to be bought by Google technology businesses in the United States. In November 2007, Google and 84 manufacturers, developers and telecom operators set up the Open Handset Alliance to jointly develop improved Android system, then Google to Apache free open source license authorization way, released the source code, Android allows producers running Android smartphone, then gradually expand to tablets and other fields.

On the one hand, the development of the Android system in the country mainly for secondary development on the Android system, based on the Android source code, and the depth of the customized version of the operating system.

Second, the openness of the Android platform allows any mobile terminal manufacturers to join the Android alliance, significant openness can make its have more developers, with users and applications is growing, more and more get the welcome of the masses, the Android platform.

### 1.4 JAVA EE Platform

Java EE (Java Platform, Enterprise Edition) is the sun's Enterprise application version. This version is formerly known as J2EE, can help us develop and deploy a portable, robust, scalable and secure Java application server.

Along with the rapid development of science and technology, Java EE has evolved into the current enterprise development is actually one of the standard platform, Java EE application because of its high degree of development, stable performance, high safety etc., by the enterprise spirit domain relevant personage, the more the more enterprises to choose the Java EE as a development platform.

The advantages of Java EE platform is more outstanding, such as: JUnit and TestNG to test code (including unit, integration and function test) write created conditions; The implementation of continuous integration can rely on the continuous integration server, and so on. Now existing Java EE technology is very mature, the vendor containers tend to be more homogeneous, so the Java EE is the mainstream of development enterprise Web application frameworks technology, in today's enterprise project development and Microsoft's MS.NET together form the two core framework technology.

### 1.5 Study the Significance of School Examinations System Design Based on the Android System

Because previous test mode after artificial group general volume, manual marking, score statistics and papers and tests, analysis process, the whole process is complicated

and inefficient, already can not fully meet the demand of digital and standardized test. Not only that, as the school examination technology and carrier of epoch-making change, to say the traditional way of examination is no longer suitable for today's exam.

And now with the rapid development of mobile communication technology and intelligent portable device of continuous innovation, the emergence of more and more intelligent and advanced products, marks the arrival of the era of mobile Internet. As a smartphone operating system, Android platform, with its open source, openness and stability, has become the current user, most of the fastest growing mobile smartphone operating system.

So to school examinations system based on the Android system design of the related research and implementation, not just to satisfy the functional requirement of standardized tests in school, and very good solve the disadvantage of the lack of portability of original system, to improve the flexibility and practicability of the system, the teachers and students can use anytime and anywhere, processing, search relevant information in the test system, more save the time and space.

## **2 System Builds Related Technologies**

### **2.1 JAVA**

Java is a simple, cross-platform, object-oriented, distributed, explains, the robust security, the structure of the neutral, portable, performance is very excellent multi-threaded, dynamic languages. Suitable for large enterprise applications and Internet applications, especially application system based on B/S agency.

### **2.2 B/S Structure Mode**

Structure B/S (Browser/Server), is one of the Web after the rise of the network structure model, a Web Browser is one of the main client application software, the model unified the client, will be the core of the system function realization part focus on the Server, simplify the development, maintenance and use of the system. Client only need to install a browser and Server installation, such as SQL Server database, the browser can interact through the Web Server and database data.

B/S mode is divided into three levels [3]: the first layer is the client browser, for the presentation layer. The second layer is a Web server, it is the business logic layer. The third is the database server, this layer is the data access layer.

### **2.3 The Database**

Database designer performance evaluation, the basis of information management information system implementation to do try to use the least amount of data table, the optimization to realize the function of demand, and the retrieval database to be simple and colleges and universities. The test system based on Android system under

application of the database is SQL Server2005. The database is easy to use, good scalability, high and related software integration degree, etc.

### 3 System Overall Design

According to the requirements in the test, the system needs to be done function module mainly includes:

**Test information.** After the examinee input information in school, to the system, the query to participate in the test project, choose to take an examination after entering the examination. Exam questions from the backstage database according to the format of the list, and prompt the exam time. Candidates can submit after finish the test paper, if the test time, test paper automatically submit.

**Course maintenance.** The examinee exam content according to the courses for the progress and questions from the backstage database and maintenance related.

**Query.** Examination after landing, can query before the test information, through this function, the examinee can query the corresponding standard answer questions.

**Test condition.** The examinee when log in problem solving, according to the length of the examinee answer the time required for each question and problem of simple and easy degree, corresponding to the examinee state judge, for students in terms of which type of class, to make a more objective basis.

**Re-exam.** Test for examination, unqualified candidates system will give the chance of the second test, students can login, you can test.

**Paper review.** The examinee answer all the questions, under the condition of the test time allowed, can choose paper review. According to test yourself to answer to determine degree, choose the check part of the paper.

**Teachers' information management.** Management teacher after login, can undertake maintenance of examinee's information, including adding information, query, modify the examinee information candidates on the history of the exam and reply to the original information and password.

Demand analysis of the test, can design the overall structure of this system include two aspects: the examination system at the front desk and the background system.

Examination system at the front desk includes: login, examinee examination, the exit examination, scores query, information query. Exam system background include: the examinee information management, test management and test question management.

In short, the system of separating performance and the database, the examinee users through the Android client input and query information, from all walks of life to get the data in the database.

## 4 Summarizes

Due to the limitation of research time and ability, the system is the basis of the examination system module, the design of the other modules such as question bank is not very standard, and automatic marking function in volume and stay in the most basic level, the examination process confidentiality also need to be better improved. To sum up, this system still has many problems, its need to improve, need to accumulate experience in practice, in turn, strengthen perfect, I hope one day, can truly implement such a system, provide convenience for future examination.

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