

Retraction

Retracted: A College Music Teaching System Designed Based on Android Platform

Scientific Programming

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

- [1] S. Sun, "A College Music Teaching System Designed Based on Android Platform," *Scientific Programming*, vol. 2021, Article ID 7460924, 16 pages, 2021.

Research Article

A College Music Teaching System Designed Based on Android Platform

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Today's rapid evolution in information and communication technologies affects all sectors, including education, and has a positive impact. As a result, teachers need to use technology effectively and keep up with innovation to meet the needs of the next generation. The college music educational system was always an important part of higher education in China, and the corresponding music curriculum system has gradually been established. This curriculum system has been instrumental in the systematization and standardization of China's music industry, and it has produced a large number of outstanding musical talents for the country. The goal of this research is to discover advanced and dependable teaching methods. With the growing popularity of mobile intelligent terminal devices and the expanding application of the Android platform, using a mobile intelligent terminal for university courses' learning has become a more powerful technical feature. Through the development of an intelligent learning application using the Android intelligent platform, students can practice exercises and evaluate themselves, allowing them to analyze their weak points based on their evaluation value, whether in class or after class, and then facilitate their learning. In this paper, I present my original perspectives and proposals on music education in colleges and universities, based on literature, analysis, and study, as well as my years of practical experience. To assure stability of the suggested framework, scalability, and sustainability, I have used the Model View Controller (MVC) architecture. This framework is based on the mobile client of Android that teaches and queries college music remotely and controls smart music. According to the experimental data, online music teaching has a greater learning effect on music skills and enhances traditional music performance by 25%. In terms of increasing interest in musical courses, this online college teaching information platform has the ability to raise 74% of students' awareness.

1. Introduction

Information technologies have gained significance in education during the previous century and have attained a lot of attention [1]. Continuous technological advancements have created resources that can be used in educational settings. They have also compelled changes in the teacher profile and role, as well as teaching methods. With the advancement of information technology, the teacher's role has evolved to facilitate learning [2]. As a result, teachers need to use technology effectively and keep up with innovation to meet the needs of the next generation. The theory of online learning was first proposed in the United Kingdom among European and American countries. David Seward proposed the concept of an online learning assistance system in the

1970s, and it has had a far-reaching impact to this day. In response to this idea, foreign education institutions and software vendors have created a range of network learning systems in the past few years, but their basic design patterns are based on utilizing computer multimedia technology, such as video, audio, and other forms of multimedia for learners to impart knowledge, usually through desktop systems and data CDs. In the early 2000s, with the rise of Internet streaming media technology, the online learning system attained unprecedented development through streaming. Here, the learners do not need to complete the download courseware and learning materials, but only need to complete the online learning resources under the limited bandwidth of real-time playback. The learners can choose a section of learning content, which greatly improved the

maneuverability and convenience of learning. Nowadays, playing network learning resources are no longer a problem in the context of bandwidth, and there is usually no playing lag. Hence, learning courseware is progressing towards high definition and high quality at this level.

With the rapid advancement of computer technology, the information network has emerged as a critical component of social progress. The goals of current educators are to realize knowledge transfer quickly, efficiently, and conveniently using the network as the link and to promote teaching reform through modern means and transform traditional classroom teaching into classroom, computer, network classroom, Internet, and other learning methods [3]. With its roots in the network teaching environment of modern distance learning, network education is the advanced technological technology applied in the production of a new educational form. The implementation of network education is the key to creating a network environment that can promote learners' active learning.

The development of China's online education support platform has mainly experienced five stages which can be explained in Figure 1.

Although China's research on a network local education platform began late, with the maturation of the concept of network teaching, the construction of network teaching platforms has gradually improved. Network teaching platforms are an effective solution to the contradiction between China's educational needs and resources, and they will become an important direction of China's future educational development. On the contrary, there are still a lot of flaws. For example, research has revealed that the current level of network teaching platforms is unequal and that certain teaching websites contain some unsatisfactory areas. Some even make teaching errors; others have technical issues, and so on. Second, some teaching websites do not pay attention to student communication, which means that educational information cannot be provided on time.

The People's Republic of China's Ministry of Education proposed the goal of creating a web-based distant education platform in 1999 [4]. Domestic educational institutions and colleges have invested a significant amount of hardware and software resources in network education for this purpose. The fact that most domestic colleges have built a distance education system [5, 6] is a significant move. They offer online students with complete degree schools. Users will take classes online, complete required exams offline, and finish the course. Finally, the institution will award a learning certificate or certificate to the student. At the same time, some educational and training institutions charge for online learning [7], and by purchasing learning resources and paying for them indefinitely, teacher enlightenment has become a useful supplement to campus education, allowing more off-campus learners to obtain professional knowledge and training. On the contrary, these online learning systems are typically based on the replay of courseware and place a high value on knowledge acquisition, but they lack associated tasks. In most cases, learners merely need to create an online account to access on-demand learning resources and complete learning assignments [8, 9].

The study of curriculum learning in foreign countries is relatively early. After searching the keywords such as microlesson and collecting and reading a large number of relevant literatures, it is found that the meaning of the course learning represented by these keywords is more or less different. Even if the same term is the same, it will have different connotations with the different research fields or times [10]. Since the end of the 90s, network technology has been developed by leaps and bounds; people's thirst for knowledge is more and more urgent, and network distance education then arises at the historic moment. With its unique receiving mode and focus on individuality, network distance education, as a new type of education, has revolutionized the old way of education typified by "face to face" teaching and has sparked a global education revolution [8].

If education is to spread through the network, it must eventually use the network as a medium. In distance learning, the customer support system is an important carrier of network distance education. This is because it provides all of the learning support services required by distance education and offers great convenience to distance learners in the network, including learning resources such as learning content, learning processes, and learning methods. However, there are numerous issues to be resolved. Examples include the difficulty of transitioning from traditional education to modern education. In general, the lack of perfection in the construction of the learning customer support system severely restricts the use and development of the system. Learners can complete tasks based on their performance [11], which coincides with the remote support service's activity objectives.

Because of this, I should fully utilize performance learning theory and software design technology to lay a solid foundation for a learning platform system based on performance concepts, according to Jones [12], to change the current research situation that emphasizes technology. The research and development of having to learn system design method and application mode based on the concept of performance innovation, which provides more convenient, comprehensive, and efficient functions for distance learning, as well as continuously improve the distance learning support service system and support development, has significant theoretical and practical application value.

The following are the technological structure and functional elements of online learning systems in general, whether at home and abroad: ordinary online learning system, based on BSS structure, is characterized by strong system expansion [13]; there is no need to install any client, strong user expansion, and new learners can continue to join in; since the emergence of HTML5, the client functions have gradually enriched, which is more suitable for online learning. Because the online education system usually realizes data communication with other systems, such as the courseware management system on campus, the layout and function design can be completed on the browser just like the traditional window system, and because the online learning system usually realizes data communication with other systems such as the courseware management system on campus, it needs to realize data sharing of multiple

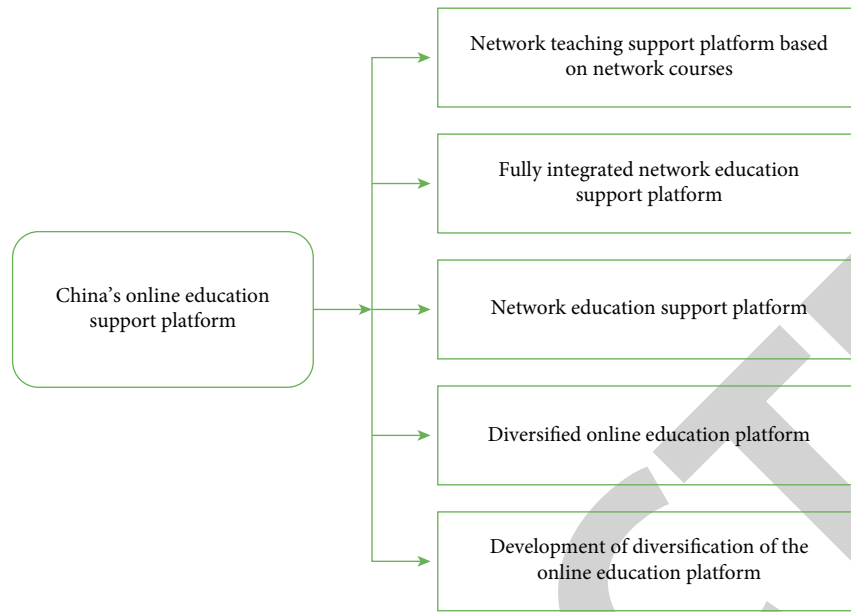


FIGURE 1: China's online education support platform.

systems through web services. In terms of functionality, most online learning systems rely on on-demand courseware and background data maintenance. Databases typically make use of huge commercial databases such as SQL Server and Oracle, although some also make use of the free MySQL database. A student-oriented front-end learning system is responsible for maintaining course materials resources, while system administrators or teachers are in charge of the system's overall function. Front-end code controls the playback of courseware resources, while server-side data is read. As a general rule, the background system handles the updating and maintenance of the learning resources and can import teaching materials in batches [14].

This article proposes an Android-based college music teaching system built on previous excellent efforts. This technology is portable, cheap, and simple to use, allowing for considerably greater flexibility in the distribution of musical course content. The program presented here is based on the JAVA EE framework, and it not only shows how to analyze musical teaching but it also covers a wide variety of subjects related to music teaching processing. In addition, AEPS is meant to create a genuine and creative learning environment through a simple Android user interface (UI), enabling students to experience augmented reality, encouraging students to participate in musical activities, and increase knowledge and understanding of information [3]. Besides, the music teaching system investigated in this paper is based on a thorough examination of the characteristics of traditional online learning systems. This investigation is also based on the application of current mobile Internet technology to complete the Android-based music teaching system as well as a system for learners and teachers to achieve a centralized learning and communication platform.

- (i) First, I have briefly explained the related technology of music teaching system based on Android

- (ii) Then, the model is divided into two kinds of music homework: one is the music homework of the independent learning type, and the other is the resource of the performance learning type
- (iii) The proposed model performs queries, add, save, and delete music homework
- (iv) After that, the throughput of the model has been checked by performing several experiments
- (v) Finally, this method has the potential to improve student's musical awareness and comprehension

The following is a breakdown of the paper's structure. In Section 2, I offer a brief overview of relevant technologies for music teaching systems based on Android, and in Section 3, I discuss my suggested architecture for college music instruction. Section 4 then goes over the experimental works and their evaluations. Finally, Section 5 brings the paper to a close.

2. The Related Technology of Music Teaching System Based on Android

2.1. Java EE. JAVA EE is one of the current enterprise-level application system development frameworks because it is implemented in JAVA. In the current application system development, Java EE is the preferred platform, so in this research work, I use the JAVA EE framework. On the base of the work of [15, 16], the main features of the JAVA EE framework can be explained in Figure 2.

- (i) *Strong Compatibility of Operating System.* Because Java is a cross-platform language, the Java EE application framework may support cross-platform redeployment, reducing enterprise investment costs. There are numerous enterprise information

and data integration options available in today's enterprise application system. Each of them with its own set of benefits. Java EE applications may easily be distributed across operating platforms without affecting system settings or business logic.

- (ii) *Rich Development Framework*. SSH framework, EJB, MVC model, and other development frameworks and modes are available in Java EE. Developers can swiftly change the application system to meet business demands using these frameworks. MVC mode, in particular, realizes the relative independence of data, business, and interface, as well as a fast and efficient data access interface. The design of business logic takes up more time and effort for system designers and developers.
- (iii) *Good Load Balancing Regulation Mechanism*. When the application system has more than a particular number of concurrent users, a larger application server access, the system framework is automatically assigned which adjusts services' pressure and accomplishes the task scheduling system with the Java EE integration platform.

- (iv) *High Application System Development Efficiency*. Without developers from the basis of creation, Java EE can flexibly use third-party released or produced programs, saving development time and improving development efficiency.

2.2. *Model View Controller (MVC)*. MVC is a common development framework that uses the modular design concept to achieve the goal of application system maintainability by dividing the system into several layers. The structure diagram of MVC is illustrated in Figure 3. Its key characteristic is to organize the code of the application in a way that isolates the business logic from data and output presentation [17].

The following are the relevant descriptions of each part.

- (i) *Struts' Presentation Layer*. This layer uses the MVC design pattern, allowing for the realization of data, logic, and view of phase separation. This layer is responsible for expressing that data is in its final form when it comes to the system's final data. This layer acts as a bridge for communication between the system and the users of the system:

$$\begin{aligned}
 P(X_1|Z_{1,t}) &= kP(Z_t|X_t)P(X_1|Z_{1,r-1}), \\
 P(X_1|Z_{1,t}) &= kP(Z_t|X_t) \int_{xr-1}^N P(Xt|Xr-1)P(Xr-1|Z1;r-1), \\
 P(X_1|Z_{1,t}) &\approx kP(Z_t|X_t) \sum_i^N wr-1P(Xt|Xt-1).
 \end{aligned} \tag{1}$$

- (ii) *Data Persistence Layer (Hibernate)*. This layer is a data persistence framework completed on the server side. Its function is to convert database tables into objects. Some operations on tables can be completed by calling corresponding methods of these objects, and it also realizes some optimized access operations of databases so that developers do not need to care about complex and changeable database operations. It improves the development efficiency of the application system:

$$q(X_t) = \sum_i^N wr-1P(Xt|Xt-1). \tag{2}$$

Then, priority can be expressed as

$$w_t = P(Z_t|X_t). \tag{3}$$

2.3. *The Android Technology*. The system's mobile terminal runs on the Android operating system because Android is a popular mobile operating system developed by Google, and its kernel is Linux. The majority of mobile terminal producers appreciate its openness and free features, and it has

quickly become the operating system for smartphones, smart appliances, and other terminals in just a few years. It has now surpassed Android as the most popular smartphone operating system. Because of Android's open-source nature, major mobile phone manufacturers in the United States and elsewhere are working on Android secondary development and customization, which is tailored to the manufacturer's mobile phone operating system [18]. Android is divided into four layers when it comes to architecture: application service layer, basic framework layer, component and container layer, and operational kernel layer. In this section, I discuss these layers in much detail as below:

- (i) *Basic Framework Layer (Application Layer)*. This layer is also called application layer, which provides secondary development interfaces to finish the development of a specific function. Application system developers can complete the development of some functional features by using such positioning as mobile phone SMS records, rather than focusing on specific functional application interfaces and only by using interface calls.
- (ii) *Component and Container Layer*. This is the second layer of the Android framework that includes core components and a component operating

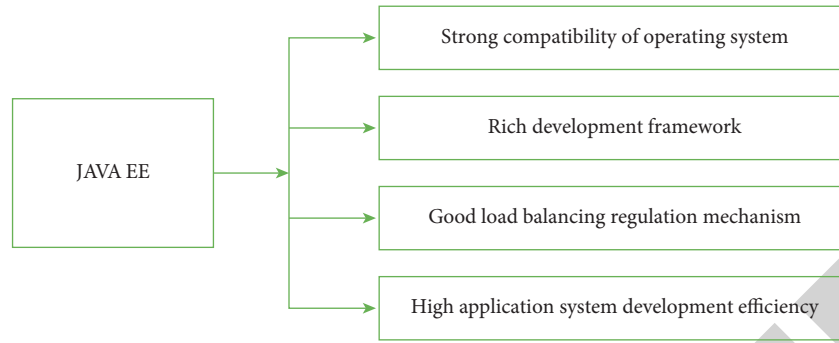


FIGURE 2: Features of the JAVA EE framework.

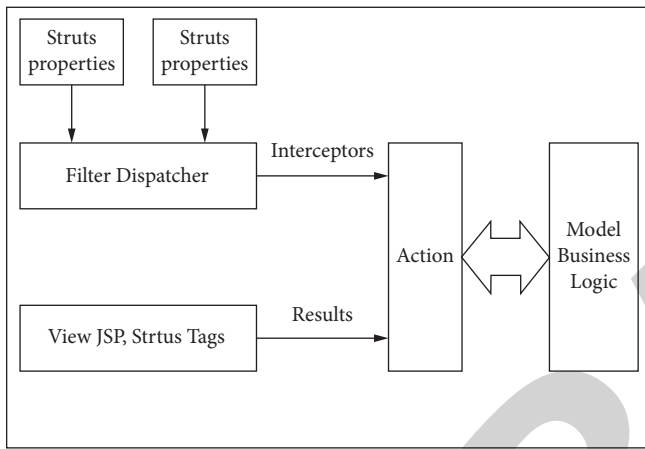


FIGURE 3: The structure diagram of MVC.

Students' registration information will be valid only when the examination has been approved, and they will be able to log in through the client. Figure 4 depicts the essential information about user management. Student management, teacher management, and manager management are the information management functions of my suggested model for users (such as students, teachers, and managers). Students may access multiple modules such as registration, check, change, delete, and load via the student management module which connects them to instructor management. The teacher administration is linked to the student administration as well as the manager administration. Teachers may access many modules such as registering, checking, modifying, deleting, and loading with the aid of teacher management. The managers, linked to the teacher management, may also have access to the same modules as teacher management and student management.

environment for Android's basic framework layer. The operational functions of Android are carried out by a set of components that are exposed and hidden via function calls such as a PC application system, which requires a specialized operating environment. These running environments, such as the .NET framework and the JAVA operating environment, constitute the cornerstone of the entire system's configuration and functioning.

- (iii) *Operating Kernel Layer.* This is the third layer of Android framework, which executes related hardware operations through some of the core Linux integrated code, and it offers the underlying operation at the operating system level.

Using the above Android-related technologies, it is possible to complete the creation of necessary functions in the Android system as well as the Android data communication and operations of the database.

2.4. System Function Analysis

2.4.1. Basic Information Management Functional Model. According to demand analysis, end-users such as students, instructors, and administrators are typically beginning music courses that need comprehensive registration on the platform, which is done through a mobile operator.

2.4.2. Student Music Homework Management Function Model. The music homework management feature of my suggested approach is discussed in this section. For a learning system, students must first gain information through music work; music work is the foundation of students' learning, and teachers educate; thus, the system must complete the music operation management job of maintenance. Because most online learning systems employ linked material such as video and audio, I used the same type of online learning system in this system. As a result, music homework takes the form of text descriptions and file attachments. Figure 5 shows how teachers may keep track of their music homework, post it, and remove it. Students can browse, query, and download music homework when the teacher has uploaded it to the system.

The usage of music homework is one of the markers of students' performance evaluation in my system. There are two types of music homework: autonomous learning music homework and performance learning resource music homework. Teachers submit music homework in the form of file attachments based on student needs. Music assignment, publisher, release date, and storage path are all examples of learning information.

2.4.3. Music Practice Management Function Model. Music practice is utilized to do musical practice on mobile telephones in pupils. The issues of practice are solved by mobile

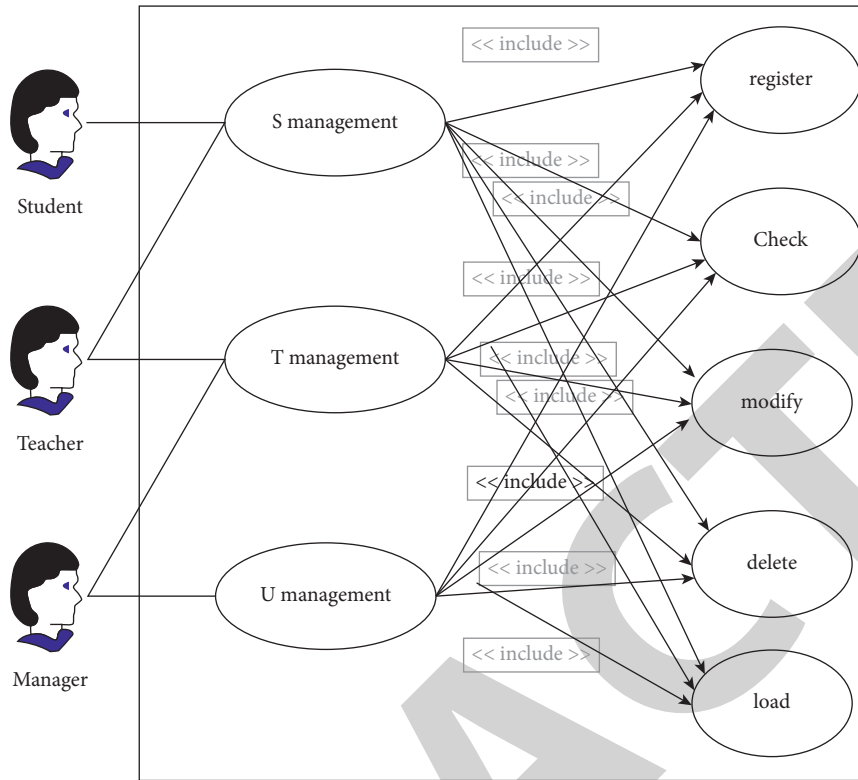


FIGURE 4: Basic information management use case diagram.

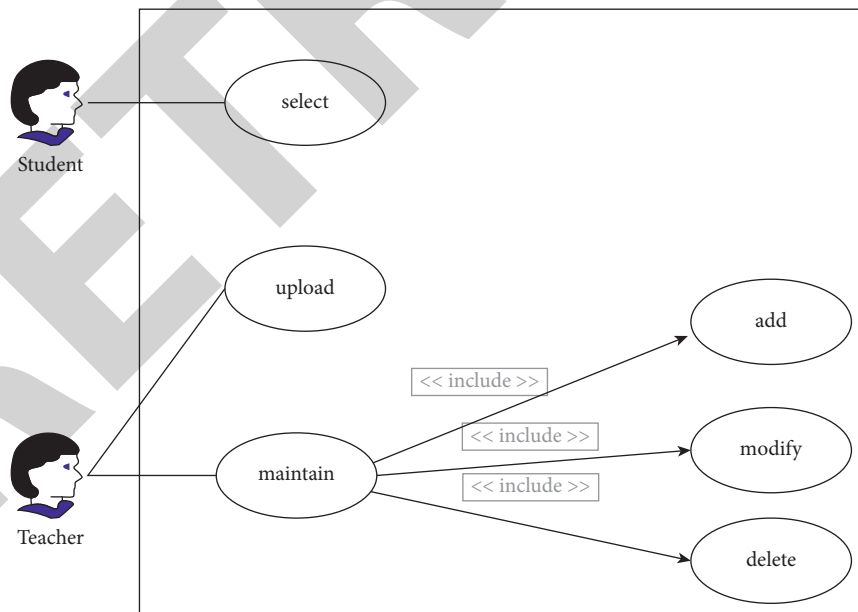


FIGURE 5: Music job management use case diagram.

telephones, including accompanying practices, testing practices, and works by prominent artists. Figure 6 shows the use case diagram. Besides pupils who complete accompanying exercises, tests, and works by great artists, teachers perform question banks and data maintenance works by renowned artists [19].

Classroom learning is a key component of the system since it needs students to broadcast on-demand online learning resources, keep learning logs, and post all types of learning questions online at any moment during the learning process. Teachers can use this platform to accomplish the

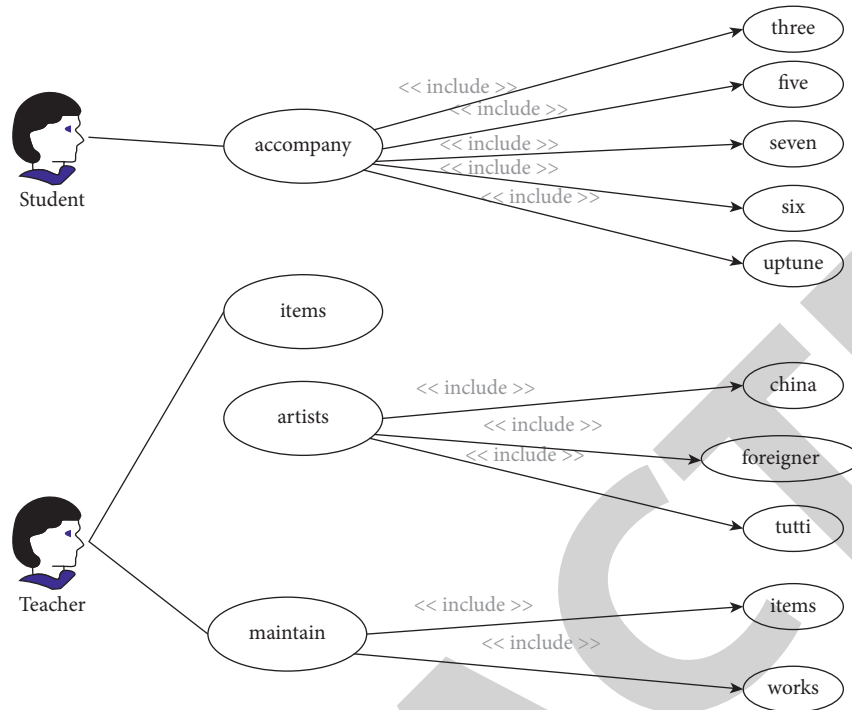


FIGURE 6: Music practice management use case diagram.

dynamic release of teaching information and notification for each student in the music teaching system.

2.5. Nonfunctional Requirements of the System. In this part, I outline my proposed system’s nonfunctional needs. Non-functional requirements are the qualities that a software product should have in addition to functional criteria to fulfill the user’s business needs. Nonfunctional needs of the music teaching system include system responsiveness, pressure resistance, security, and integrity. Figure 7 shows one example of this.

- (i) *Performance Requirements.* As the system is designed to provide to multiple users, the number of participants may not be too high at the same time. This means that the system needs to meet 2000 user requirements during online work so that each student clicks learning resources online, and the system responds within 3 seconds. The system must also ensure that the student receives a maximum of 2 million people.
- (ii) *Security Requirements.* System security needs are also an important indicator if the data are stolen maliciously; some individuals might have some influence on society; therefore, the safety requirements of the system are increased, and security requirements are not only met through the processing of user password encryption on the database platform but also by protecting unlawful intruders from a browser or a link to the client database by accessing the database. To make sure that as well as the relevant data and business associations can be

viewed inside the system, other methods such as access to file information through file viewing mode can be seen in the ciphertext operation saving modes at all levels of the system. Furthermore, a security audit is necessary at all system levels. The system also offers an optimal system user permission and management method to ensure approved user management. This prevents unauthorized individuals from gaining access to the system as well as database security flaws and illegal injections.

- (iii) *Normative Requirements for Development.* This article is considered from the point of view of the subsequent upgrade of the system because the business logic of the system is often changed by requirements, so the system development needs to be standardized to ensure the continuity of subsequent developers. The system design should conform to the software engineering development standard and the system architecture selection specification, and the database design should follow the paradigm standard.
- (iv) *Operate Usability Requirements.* The system’s friendly interface enables the operation efficiency and user comfort, and smooth operations to be improved, making it possible to lay down the system requirements page in line with business practice.
- (v) *Stability Requirements.* A user-friendly interface can help improve efficiency by making operations more convenient and smooth for the user. As a result, the system requires a page layout that is in line with business operation habits, has clear and simple messages, and minimizes operator input while providing selective operation.

- (vi) *Maintainability Requirement*. When a business needs change, developers may maintain and upgrade the system's business logic without altering the system's general structure, with little or no impact on the system's everyday use. The interface definition between the various levels of the system is necessary for addition to the layered and modular architecture of the system.

3. Design of Music Teaching System Based on Android

3.1. *System Outline Design*. The system architecture is separated into three components based on the system requirement analysis: the system data layer, the business logic layer, and the user interface layer. Figure 8 depicts the software structure of the system.

- (i) *Data Layer*. The fundamental purpose of the system data is data storage. This layer generally carries out data storage, data queries, and data maintenance. In particular, the system database contains a music database of assignments, a student information database, and a learning database. This layer supports fundamental data and system business query interface. The fundamental purpose of data storage is to store basic data. This layer not only stores data but also provides a statistical interface and data inquiry. In this layer, all necessary system database activities are performed.
- (ii) *Business Logic Layer*. This layer includes business rule definitions, business process settings, and user role rules. The business rules define the functional rules used to deal with music teaching systematically. User role rules are used to define student and teacher system role assignment and role authorization.
- (iii) *User Interaction Layer*. This layer is used to implement the input and output operations of the system. This acts as a bridge between the user and system.

The physical structure of the system is described in terms of the connection of the system physical network, server deployment, and user terminal. Figure 9 is the physical structure diagram of the system.

3.2. *Detailed System Design*. User management is the management of users, such as students and teachers, according to the demand analysis so that the system function design comprises the class of users and the pupils. In addition to entering fundamental information, the data import operation must be completed using documents and the class of data import and class of file operation defined. The detailed class diagram for user management is shown in Figure 10.

Due to the complexity of the class, a typical operation is selected to describe the timing relationship. Figure 11 is the timing diagram of the review operation of student user registration information.

The architecture of the music homework management class is shown in Figure 12. This module creates the Resources class and the Resource file classes, which are used to perform queries, add, save, and delete music homework. Audio, video, and document materials, as well as other relevant resources, are included in music homework. Because different types of resource files require different ways to open the page, the system uses the ShowFile class to complete the file display; the UploadFile class is used to upload the resource file.

Music practice is utilized to do musical practice on mobile telephones in pupils. The issues of practice are solved by mobile telephones, including accompanying practices, testing practices, and works by prominent artists. I have thus developed the fundamental operating class of the students, the students' practice class, the score management class, and the score importing class. Figure 13 shows the complete diagram of student information.

With the analysis of the system and system design, the system's function to achieve a detailed understanding of the system is to support a system through a database, so the system database design needs to be complete in this section, using the system database conceptual model and the physical design of the system database. As I know, there are three elements in the design of databases. In this portion, the conceptual model diagram of the database describes the system's conceptual design and logical design, while the core table structure describes the physical structure of the database.

4. The Realization and Test of Music Teaching System Based on Android

There are two kinds of music homework: one is the music homework of the independent learning type, and the other is the resource of the performance learning type, in which the independent learning type does not count and is uploaded and maintained by system administrators and teachers, while the performance type is included in the assessment score and can only be uploaded and maintained by teachers [20]. According to the learning module, the teacher uploads the music homework, which exists in the form of a file attachment. The learning information includes the music homework, publisher, release time, and storage path. The system distinguishes between two types of music homework: autonomous studying music homework and performance learning materials. The autonomous learning type is not included in the assessment score and must be uploaded and maintained by teachers, but the performance type is included in the assessment score and can only be posted and maintained by instructors. According to the learning module, the teacher submits the music assignment, which is in the form of a file attachment. The music assignment, publisher, release date, storage path, and other learning information are all included in the learning information. Learners can locate their desired courses via course classification or by searching directly for resources. The user may utilize the

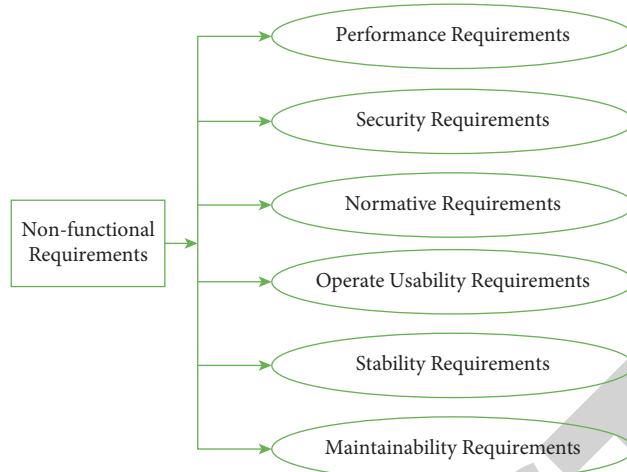


FIGURE 7: Nonfunctional requirements.

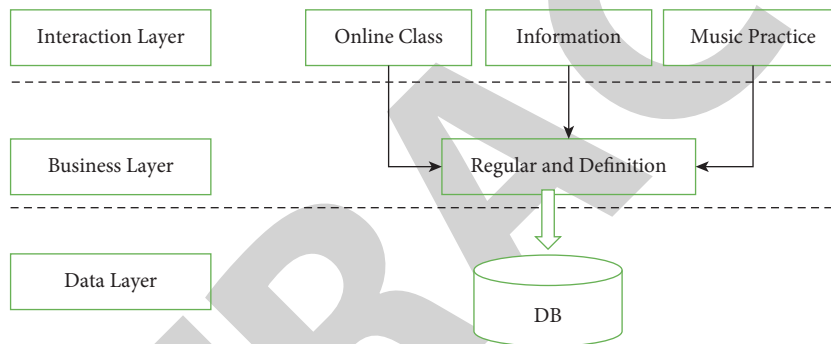


FIGURE 8: System and software architecture.

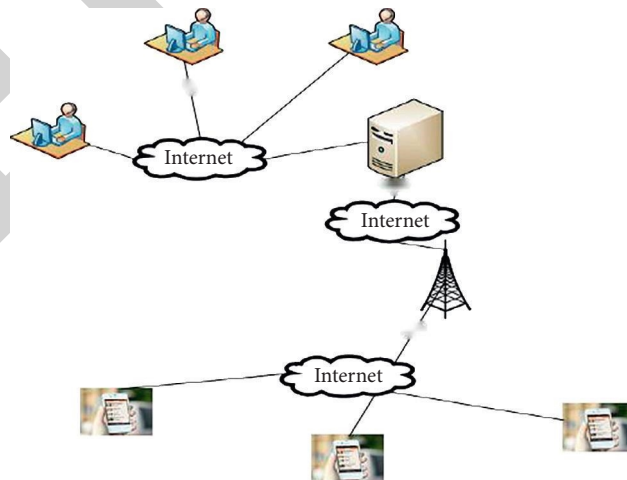


FIGURE 9: The physical structure diagram of the system.

management tool to modify the course design and the learning tool to complete the learning job. Figure 14 shows the system home page.

This part implements the following functions: a system database uses an SQL server, a database interface is created

through a unique database access interface, and a class is used to link the database. The execution object of the data commands, data set object, and associated methods for database operation, such as data query and database update, are specified in this class.

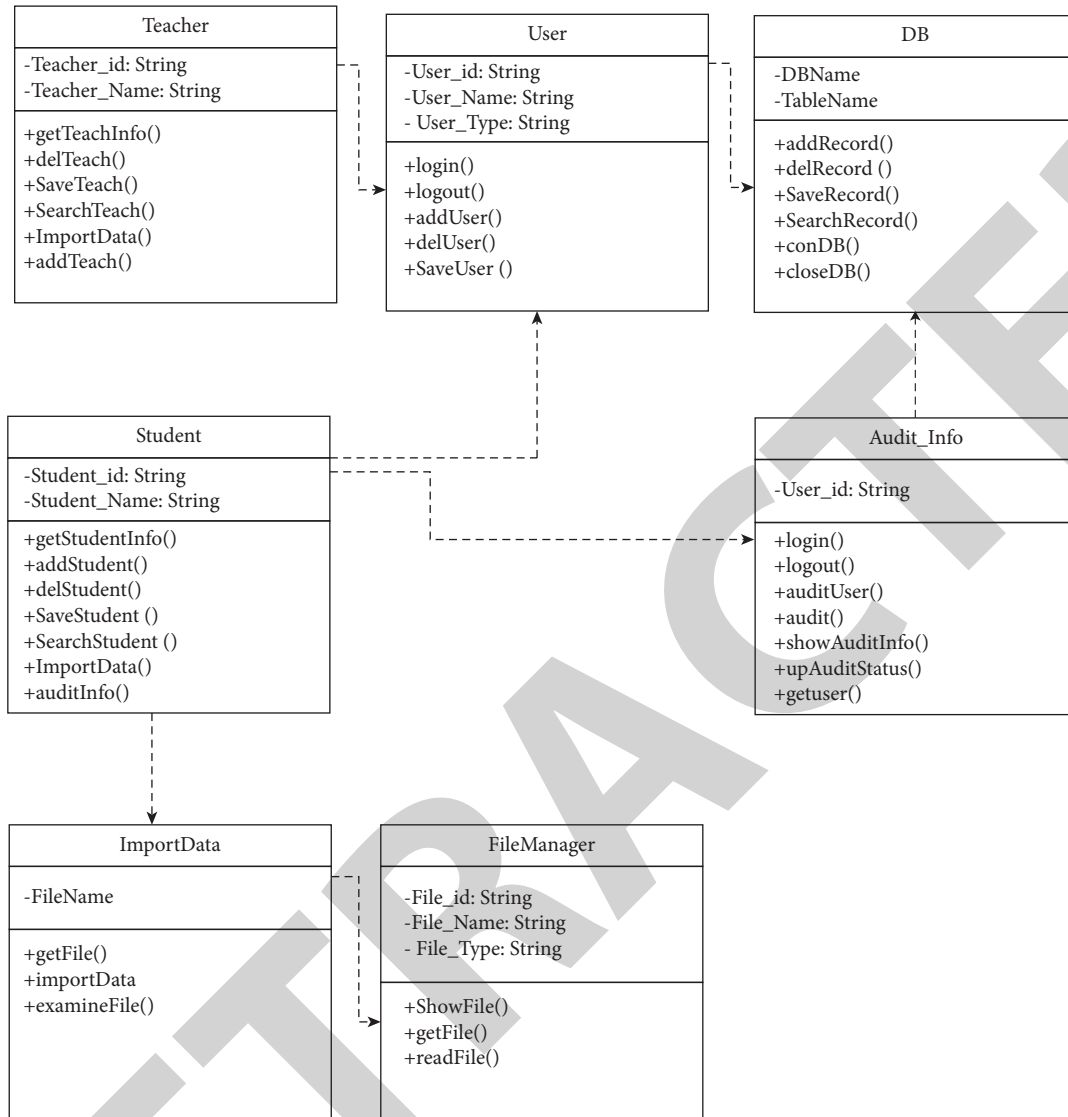


FIGURE 10: User management detail class diagram.

The masterwork list is acquired in the JSON form, and a first picture of the masterworks on the customer's side shows the masterworks. You need to click to reach the detailed view if you are looking for detailed masterworks. These thumbnails are generated using the image via the server code, and no need for the client to download the entire image. Thumbnail processing is through the third party class to complete, with no programming implementation. When these thumbnails are sent to the mobile phone terminal, the mobile phone terminal takes the picture form as the folder

(directory) of the works of famous artists. In the topic of basic information and masterworks maintenance operation, the operation is based on the database operation to achieve, so in the server through a Java class to complete the corresponding database operation and through the call to different methods to complete the data operation.

The online classroom is that learners can arrange to log in to the system for learning detection at any time after setting relevant goals and performance. You can utilize the learning tools in this module to capture notes, impressions,

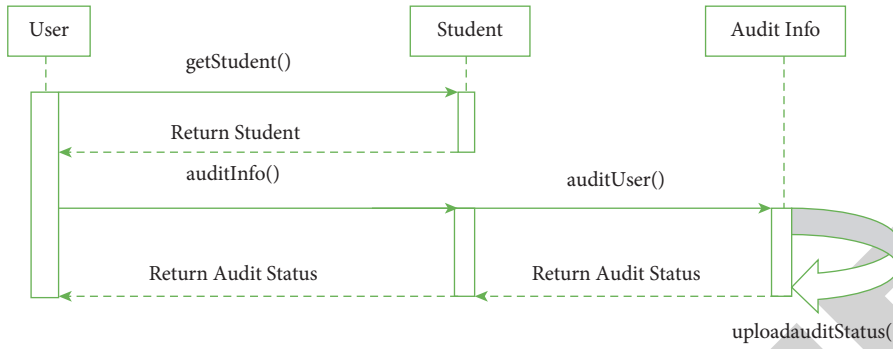


FIGURE 11: Time sequence diagram of the student information review.

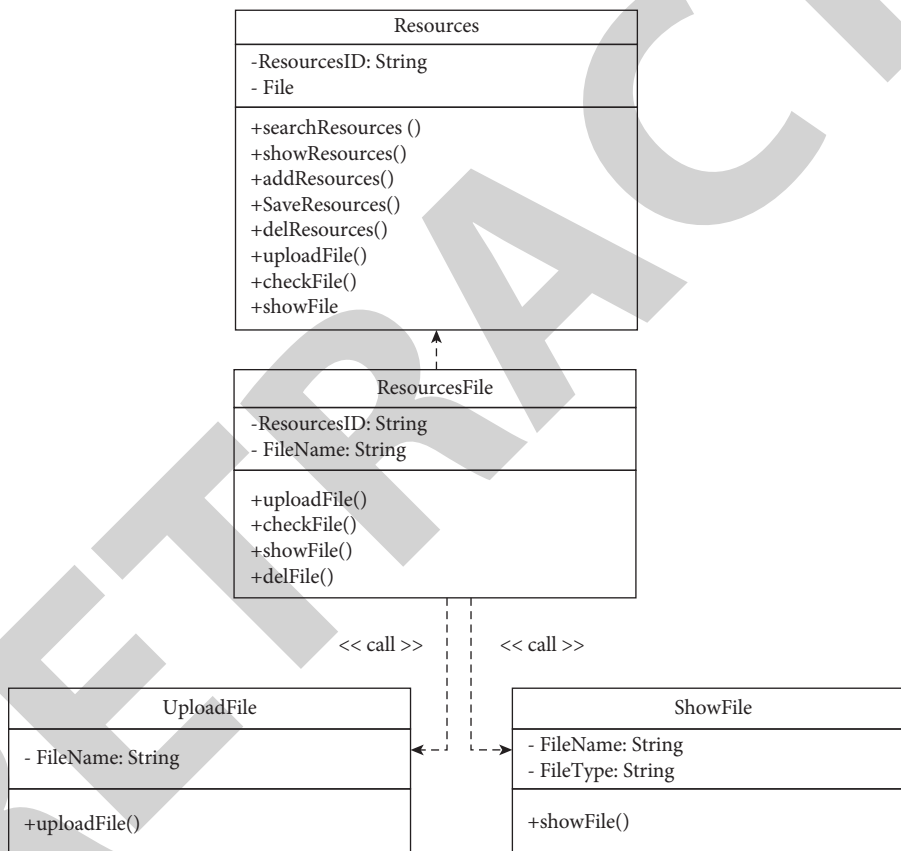


FIGURE 12: Music homework management class design.

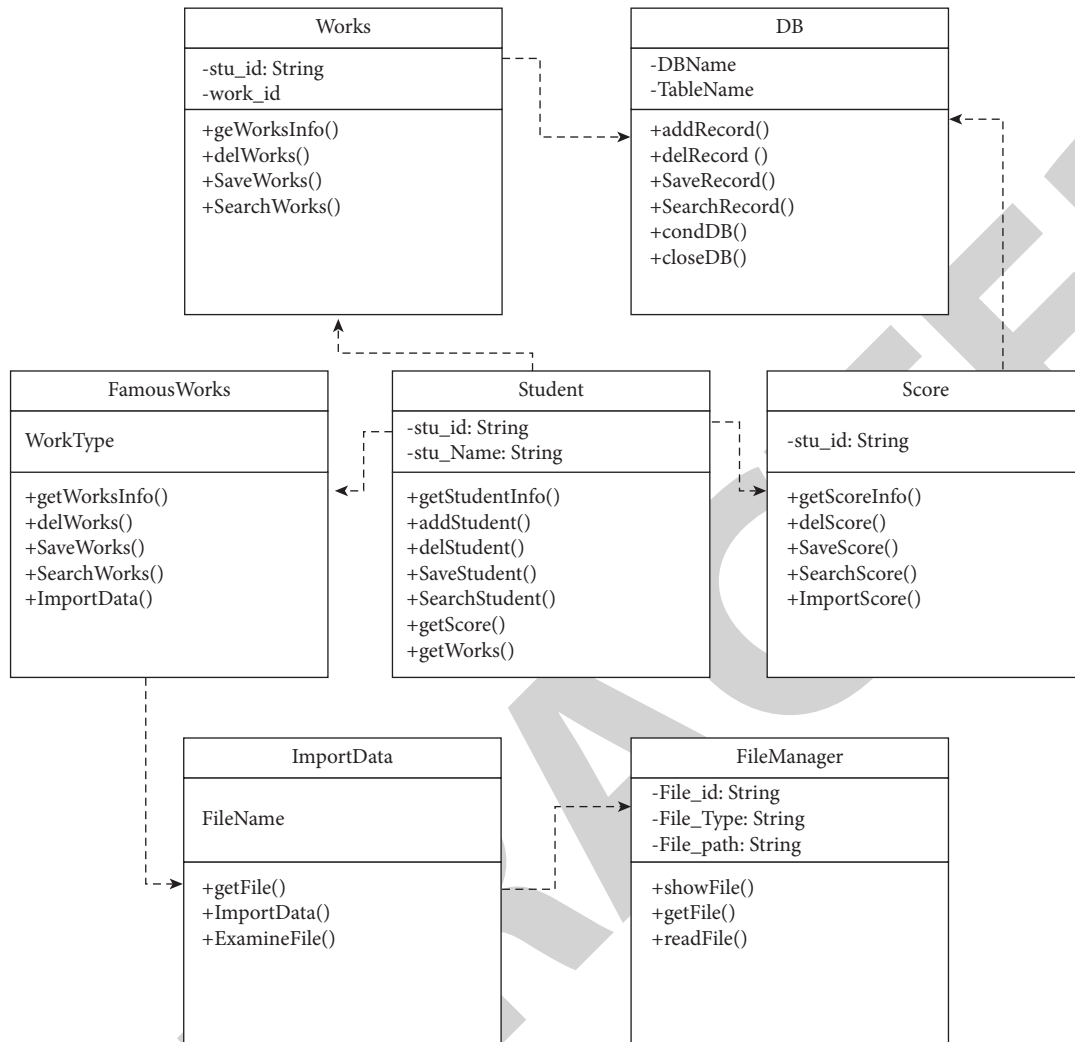


FIGURE 13: Detailed class diagram for music practice.

and issues throughout the online session for future reference. Online class includes classroom study, study log, study reflection, online questioning, and resource browsing:

(i) Classroom learning is used to select and play learning resources online, and the system will automatically record the starting time of learning

(ii) Learning log is used by the system to record learners' selection of various resources in the learning process and to play the daily catalog

(iii) Learning reflection is used to record the summary and reflection of related problems of learners in the learning process

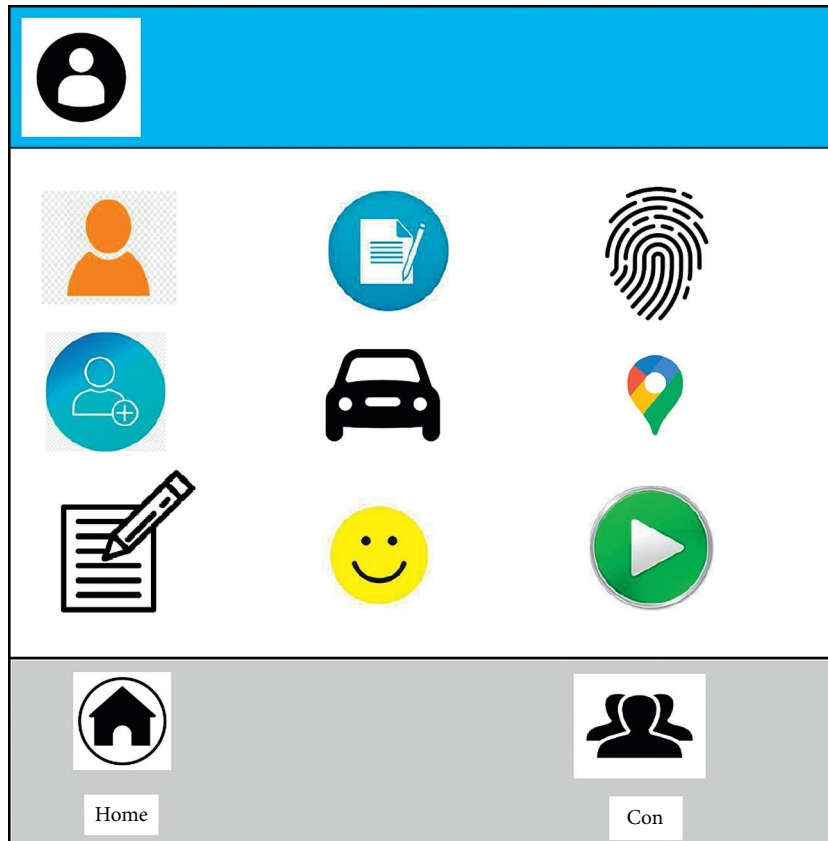


FIGURE 14: Homepage of the system.

- (iv) Online questioning means that learners put forward questions related to learning online, and the answers are answered by teachers
- (v) Resource browsing is to query learning resources by entering keywords

Functional testing entails executing test cases and executing tests by selecting a function from a menu and inputting appropriate data and circumstances. It is possible to test the data maintenance feature to check if it can be saved normally by entering data.

Figure 15 depicts the system throughput test results. Under the condition of 200 concurrent users, the system's average throughput is 18213.363 bytes/second, the maximum throughput is 20073.653 bytes/second, and the minimum throughput is 6726 bytes/second.

According to the system response time test results shown in Figure 16, when 200 concurrent users access the system, the average response time is 0.358 seconds. In general, when 200 concurrent users access the system, 10 seconds can meet the expected design goal; however, when some client hardware configurations are taken into account, within 1 second can meet

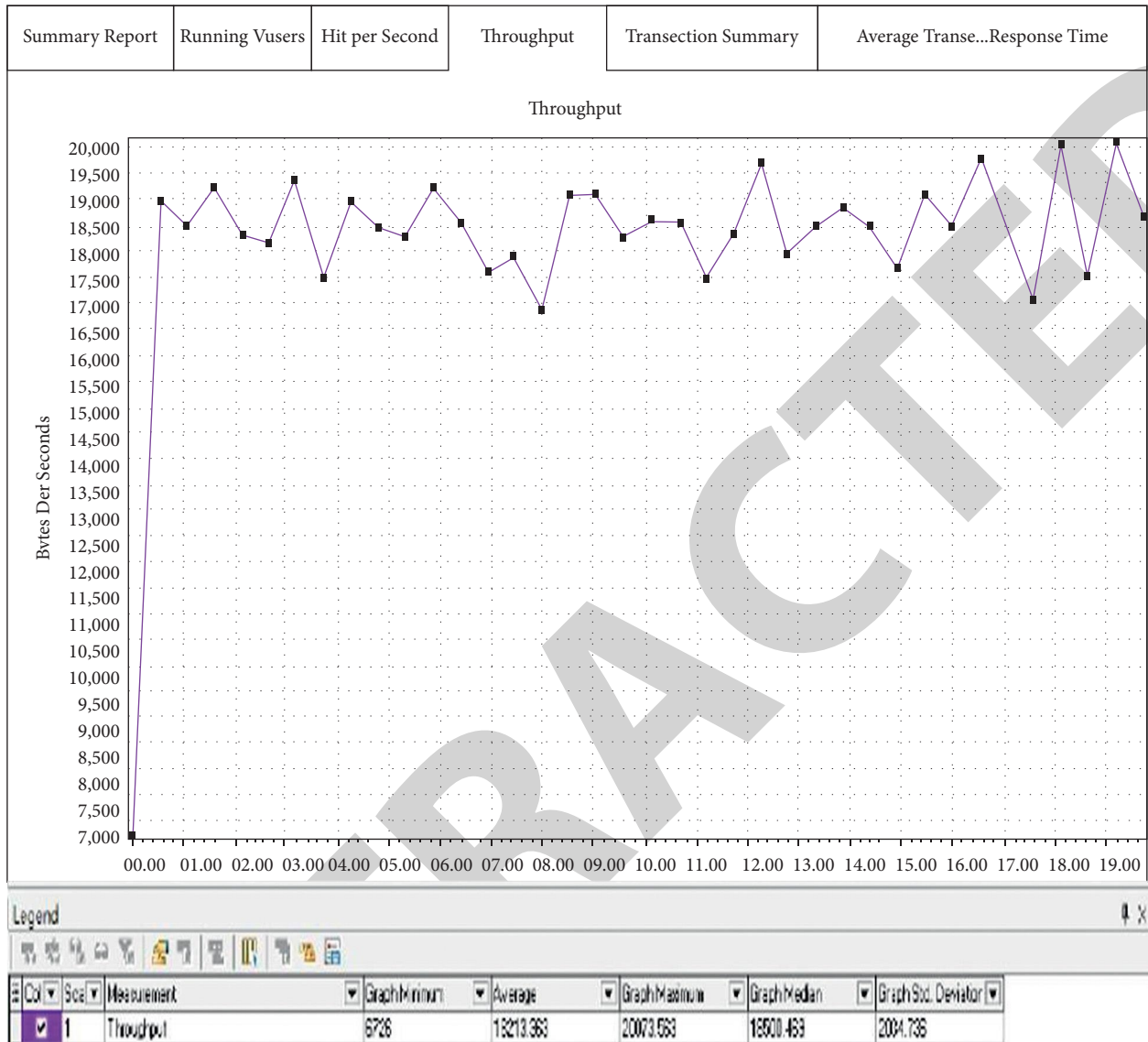


FIGURE 15: System throughput test results.

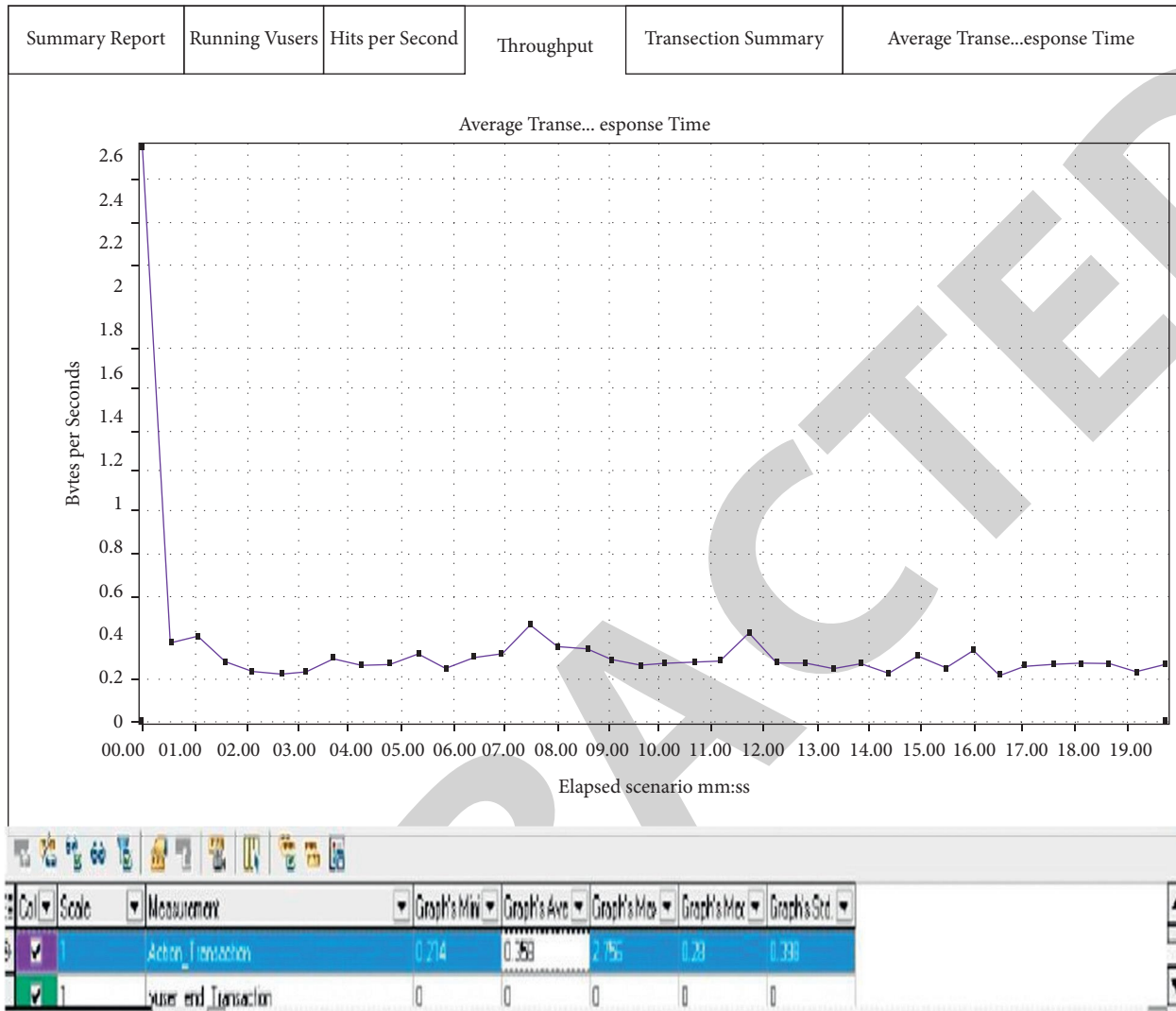


FIGURE 16: System response time test results.

the performance requirements of the actual operation. In conclusion, the system function and performance tests have been conducted by the test strategy. The test results demonstrate that the system satisfies the system's criteria.

5. Conclusion

The music education system is distinct from that of other subjects. The requirement to recognize sounds through notes is a significant professional aspect of music instruction. This article offers a music education system based on the Android platform to get a better music teaching impact. The system makes extensive use of multimedia technologies on the Android platform, and the teaching system has a basic interface design that reflects the peculiarities of the music profession. Learners may make full use of their spare time to complete learning and exercises by taking use of the ease and speed of today's mobile Internet. This improves their learning efficiency. At the same time, this paper's study is based on server data release and mobile front-end functional views to create a framework for music education system

design. The first two layers offer data support for the system's front end, while the entire structure provides a solution for the system's data processing, service, and function presentation. The system function and performance tests have been conducted by the test strategy. The test results demonstrate that the system satisfies the system's criteria.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

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