

## *Retraction*

# **Retracted: Application of Computer Network Technology in Network Music Education System**

### **Mobile Information Systems**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] X. Chao, "Application of Computer Network Technology in Network Music Education System," *Mobile Information Systems*, vol. 2022, Article ID 8754424, 11 pages, 2022.

## Research Article

# Application of Computer Network Technology in Network Music Education System

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In order to explore the application of network music education system, this paper proposes an application of computer network technology in the network music education system. This method explores the application of network music education systems through the key technical problems and solutions of information recommendation based on computer network technology. The research shows that the efficiency of network music education system based on computer network technology is about 30% higher than that of traditional methods. This paper implements the system according to the layered mode and tests the operation of the software system. The test results show that, through the use case test of each functional module of the foreground and background, the system can execute the issued commands smoothly and normally. Finally, it is concluded that the average risk occurrence rate is 2.02 hours/hour, and the probability of high risk is 17.4%. *Conclusion.* After testing, the operation of the software system has achieved the expected goal.

## 1. Introduction

With the development of information science, advanced information technology represented by computer, multimedia, communication, and network has penetrated into all fields of science and social development and has had a far-reaching impact on society, changing people's work, life, learning, and lifestyle, thus putting forward higher requirements for the quality of workers. Education should face modernization, the world, and the future. It will lead to major changes in educational thought, teaching theory, teaching mode, teaching method, and teaching means [1, 2]. This change provides an excellent opportunity for China's basic education to achieve the goal of "Three Orientations." In traditional music teaching, due to the single content and lack of variability in form, the amount of information in the unit class is too narrow, and the information transmission link is not smooth, which greatly restricts students' understanding of more music works and cannot meet students' aesthetic needs for works of different music styles. Therefore, how to use modern teaching methods in music education, change the traditional teaching mode, build a learning

environment conducive to students, give full play to students' main role, effectively improve teaching effectiveness, and promote the comprehensive development of students' quality have become a subject worthy of experiment in our music teaching.

Compared with traditional music education models and teaching methods, multimedia teaching music system has many advantages, such as rich music teaching content, reducing teachers' workload, and making the teaching process more vivid and interesting. The traditional music teaching mode is a teacher-centered way of "teachers teach, students learn," which mainly aims at teachers' imparting knowledge. In today's world, science and technology are booming, education is in the basic position in the formation of comprehensive national strength, and the status of students and teachers has changed greatly [3]. Today, with the rapid development of science and technology, the traditional music teaching mode can no longer adapt to the modern music teaching environment. Music education is also an aesthetic education. Its content is rich and colorful, and its feelings are rich and diverse. Multimedia has entered the classroom one after another, replacing the previous music

teaching, which has achieved twice the result with half the effort and solves the shortcomings of the traditional music teaching mode and teaching methods. And it is conducive to the application of constructivist teaching theory in music teaching.

## 2. Literature Review

Yajima et al. believe that the traditional music classroom teaching method has various disadvantages, such as the stylization of teaching form, the simplification of teaching content, the emphasis of teaching process on teaching rather than exploration, and the emphasis of teaching on results rather than process [4]. However, these drawbacks have been greatly improved after the use of "Internet +." Music teachers should view music education from a developmental perspective, maintain an open and inclusive teaching attitude, and update teaching thinking in the context of "Internet +." "Internet +" music classes will eventually spread across the country and open a new charter for music education. E. Nakamura believes that the use of "Internet +" in primary school music classes has made the originally boring classroom lively [5]. Music teachers should conform to the development of the times and actively explore how to use information technology to skillfully combine with music classroom. We should screen and integrate the teaching resources of the network in order to better stimulate students' interest in music learning and actively use the power of information network to cultivate students' creative ability to wear new clothes. Music teachers should actively explore how to use "Internet +" to better serve students and education with the help of network information technology platform. Isabirye believes that the era of "Internet +" has brought unprecedented opportunities and challenges to high school music education [6]. "Internet +" has a large amount of information, including positive and healthy information and negative and indecent information, so it is a double-edged sword. Music teachers should actively guide students to use "Internet +" to search and learn music works conducive to their healthy growth. In the context of the "Internet +" era, music teachers no longer only act as porters of knowledge but become guides in the process of students' learning, encourage and guide students to use network information technology for autonomous learning, and cultivate students' awareness and ability of autonomous learning. Bayley and Waldron believe that music education should pay attention to three points when taking the "Internet +" bus: (1) hardware is necessary, and technology is the key; (2) "Internet +" is not just about using the Internet; (3) it is not substitution but increase. We should carry out innovation on the basis of adhering to tradition and use "Internet +" to sow the seeds of music in the hearts of young musicians [7]. Fang, in his master's thesis, elaborated on the characteristics of music education under the background of "Internet +" from four aspects, "music education and Internet connection," "optimizing music teaching classroom by Internet means," "music education digitization," and "self-help learning" based on "cloud technology," and believed that it has three development

trends, namely, main service trend, technology trend, and growth trend [8].

When analyzing the system while collecting data, if problems are found in the process of system analysis, we can further collect more relevant data and make further analysis to solve the problems encountered. Analysis is to prepare for the design, take the results of the analysis as the basis of system design, determine the function of the system according to the results of demand analysis, and design the model and data relationship of the system. After completing the analysis and design of the system, the system still stays in the model. The realization of the system is to change the model of the system to a computer-executable system through computer technology so as to realize the function of music distance education system design. Before the music distance education system is put into use, it is necessary to further test the music distance education system, correct the errors and existing problems in the system, and ensure the normal operation of the system.

## 3. Method

*3.1. System Function Model.* The system function model is designed by the system developer to reflect the system model according to the user's needs, the user's business needs, the user's requirements for the system, and the functional requirements. When designing the functional model, we communicate with users through questionnaires, talks, and other methods and convert the user's description of the system and functional requirements into formal documents. Figure 1 shows the overall functional modules of the students.

*3.2. System Data Model.* Through the analysis, we can get the entities of the system and the connections between entities, which are analyzed as follows.

Entity and entity attributes are as follows.

Student: user ID, user name, real name, password, gender, registration date, last login date, and status [9].

Learning record: learning record ID, user ID, course ID, course name, and last learning time.

Assessment record: test record ID, user ID, test paper ID, test paper name, test time, test score, and test answer.

Teacher: teacher ID, user name, real name, password, and level.

Course classification: course classification ID, course class name, and parent class ID.

Course: course ID, course name, classification ID, classification name, author, adding time, video address, introduction, course duration, recommendation level, and status.

News classification: news classification ID, news class name, and parent class ID.

News: News ID, title, classification ID, classification name, author, adding time, introduction, Title Image URL, content, recommendation level, and status.

Test paper: test paper ID, test paper name, parent ID, and status.

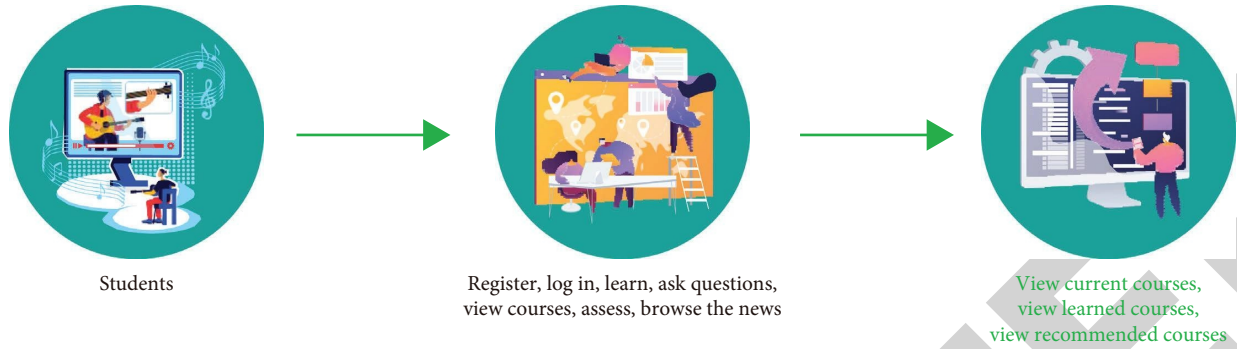


FIGURE 1: Overall function module diagram of trainees.

Test question: test question Id, classification ID, question, question type, question score, and question answer.

Question: question Id, parent ID, questioner ID, questioner user name, respondent ID, respondent user name, question or answer content, status, and type.

The links between entities are as follows:

Teachers and students: a teacher can manage multiple students, and a student can be managed by multiple teachers, so the relationship between teachers and students is many to many.

Teachers and problems: a teacher can manage multiple problems, and the same problem can be managed by multiple teachers, so the relationship between teachers and problems is many to many.

Teachers and news: a teacher can manage multiple news, and the same news can be managed by multiple teachers, so there is a many-to-many relationship between teachers and news.

Teachers and news categories: a teacher can manage multiple news categories, and a news category can be managed by multiple teachers, so there is a many-to-many relationship between teachers and news categories. News and news category: there can be multiple news under a news category, and a news can only belong to one news category, so there is a one-to-many relationship between them.

Teachers and courses: the same teacher can manage several courses, and the same course can be managed by several teachers, so there is a many-to-many relationship between the two.

Teachers and course categories: a teacher can manage multiple course categories, and a course category can be managed by multiple teachers, so there is a many-to-many relationship between them.

Course and course category: the same course can only belong to a certain course category, and a certain course category can correspond to several courses, so there is a one-to-many relationship between them.

Teachers and test papers: a teacher can manage multiple test papers, and the same test paper can be managed by multiple teachers, so there is a many-to-many relationship between them.

Teachers and assessment records: a teacher can view the assessment records of multiple students, and the assessment

records of the same student can be viewed by multiple teachers, so they have a many-to-many relationship.

Test questions and papers: one test question can only belong to one test paper, and one test paper can have multiple test questions, so there is a one-to-many relationship between them.

Students and questions: a student can raise multiple questions, and a question can only be raised by one student, so there is a one-to-many relationship between them.

Students and news: a student can view multiple news, and a news can be viewed by multiple students, so there is a many-to-many relationship between them.

Students and test papers: a student can test multiple test papers, and the same test paper can be tested by multiple students, so there is a many-to-many relationship between them.

Student and assessment record: a student can generate multiple assessment records, and a record can only be generated by a student, so there is a one-to-many relationship between them.

Students and learning records: a student can generate multiple learning records, and a record can only be generated by a student, so there is a one-to-many relationship between them.

Students and courses: a student can learn multiple courses, and a course can be learned by multiple students, so there is a many-to-many relationship between them.

**3.3. System Behavior Model.** The behavior of the system is mainly generated by students and teachers (administrators). The behavior of both students and teachers basically follows these steps: login → issue commands → display operation results → exit the system/continue operation. Therefore, the behavior of students and teachers is simplified into two state diagrams, as shown in Figures 2 and 3, which are the state diagrams of teachers (administrators) and students' operation behavior, respectively.

The operations of the two state diagrams are the behaviors of students or teachers after logging in. They are a high summary of all the behaviors of the system. If they are subdivided, many specific operations can be divided. Because the operations are very similar, we will not describe

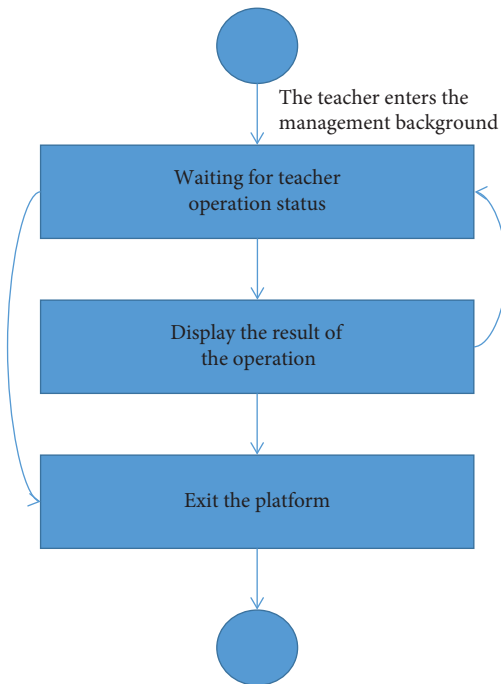


FIGURE 2: State diagram of teachers' operation behavior.

them in detail. Now we will only make a specific state analysis of the login behaviors of students. Figure 4 shows the user login behavior state diagram.

When a user (student) logs in, the system will check the user's login information. If the user information is correct, the user will change from not logged in to logged in. If the user information is wrong, the system will give a second login opportunity. When the second login is successful, the user will change from not logged in to logged in. If it fails, the system will give a third login opportunity. If the third login is successful, the user will change from not logged in to logged in. If the login fails for three consecutive times, the user account will be locked and will no longer be allowed to try to log in [10, 11].

**3.4. System Architecture.** This system is based on the network and belongs to the B/S architecture. B (browser) is a common application software running on the client, which can also be said to unify all clients and put the core functions of the system into the network server. Compared with the traditional c/s mode, it simplifies the development, maintenance, and use of the system. As long as the client installs a browser and enters the system website in the browser address bar, it is convenient to use the system. The architecture diagram of the system network operation is shown in Figure 5.

As can be seen from Figure 5, the system uses a web server and a database server because, considering the scalability of the system and the pressure on the server during multiuser access, they are allowed to undertake different tasks [12].

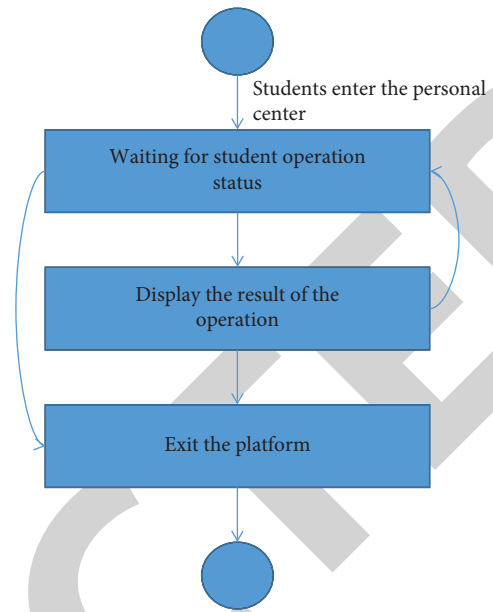


FIGURE 3: Student operation behavior state diagram.

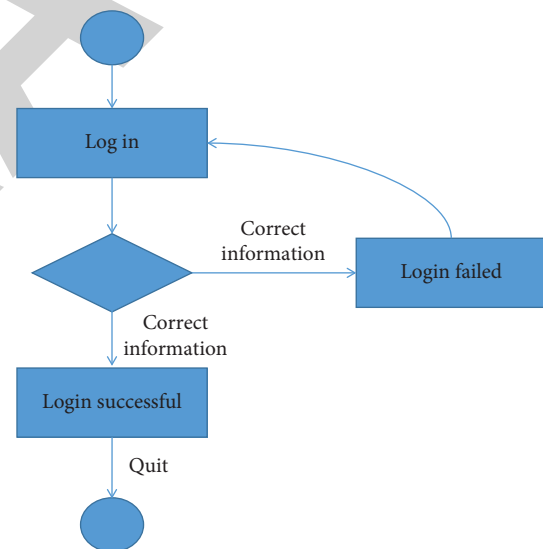


FIGURE 4: User login behavior state diagram.

**3.5. System Architecture Implementation Process.** According to the system architecture diagram designed above, combined with the implementation, the architecture processing flow of the system can be obtained, as shown in Figure 6.

In Figure 6, the presentation layer (web page layer) is written in JSP to show the page to the user and realize the interaction with the user. When the user needs to request data, it is sent out by the JSP page, and then Struts sends the received request to the corresponding class for processing according to the configuration in struts.xml. In the business layer (service), Spring is responsible for providing business model components and DAO components needed in action



FIGURE 5: B/S architecture diagram.

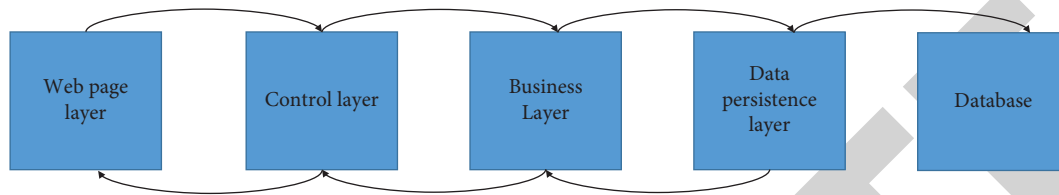


FIGURE 6: Framework business processing flowchart.

to action and providing unified transaction processing, which is equivalent to taking over the transactions of database operations. In the database persistence layer, Hibernate automatically maps the database and JavaBeans through hbm.xml files so that programmers can manipulate Java beans to operate the database and return the results of the operation to the business layer. After the business layer finishes processing, it returns the results to the control layer and finally receives the response through JSP [13, 14].

**3.6. System Database Design.** As the bottom layer of system application, the database provides data storage, modification, deletion, query, and other services for the upper layer, which plays a vital role in system design. A good design will improve the storage, query, and statistical efficiency of data, so the following principles must be considered in database design:

- (1) *Database Security.* The normal operation of the system depends on the data database, and the system generally stores some sensitive information, such as user name and password. If the data is leaked due to the intrusion of illegal users, the system will not operate normally or be maliciously changed, resulting in a series of adverse consequences. Therefore, the authorization problem should be considered in the design of the database.
- (2) *Database Integrity.* The corresponding constraint mechanism and audit mechanism should be designed in the database to prevent data synchronization between two or more tables with relationships and ensure the integrity of the data.
- (3) *Database Scalability.* After the system is officially operated for a period of time, it may be further expanded or transplanted for some reason, so the database design should have good scalability.
- (4) *Database Specification Design.* It is very important to understand 3NF and apply it to the database design of the software system. In addition, unified naming rules must be used for database naming, table naming, and domain name naming to facilitate maintenance and query.

- (5) Ensure the consistency of data in the database. For a certain table, the possibility of concurrency control should be considered to ensure data consistency when updating data [15].

**3.7. System Function Realization.** Music distance education system is an application program running on the Internet, and the B/S (browser/server) mode is selected. Set up an application server on the server to provide services to customers. As long as a browser is installed on the client, it can be accessed and used. The music distance education system is developed based on the SSH framework of Java language. According to the functional modules of the system, the software system is divided into four levels, and each level of the software system corresponds to the corresponding functions of SSH. In terms of server building, the DBMS of MySQL building software is selected for data storage [16]. In terms of application server, Tomcat server is selected. The cooperation between Tomcat server and MySQL has good stability, high security performance, and high execution efficiency. The implementation of music distance education system adopts the popular layered idea in J2EE project at present. The system is divided into interface layer, service layer, and database persistence layer. On this basis, different modules are divided according to different functions. All modules are implemented by “interface-oriented” programming.

The system adopts a three-tier architecture with MVC code separation [17, 18]. After the introduction of the three SSH frameworks, compared with the three-tier architecture in MVC, their division of labor is basically decided: Hibernate acts as the model layer, responsible for generating objects corresponding to data tables and associating the generated objects with tables. Through the manipulation of JavaBeans to achieve the operation of data tables, Struts acts as the control layer, which is responsible for associating the data layer and the view layer (implemented through JSP), receiving the data submitted by users, then processing it (such as verification and encapsulation), and sending and controlling the direction of the operation process of the whole system. Spring is responsible for managing Hibernate and Struts, providing IOC containers, and generating the

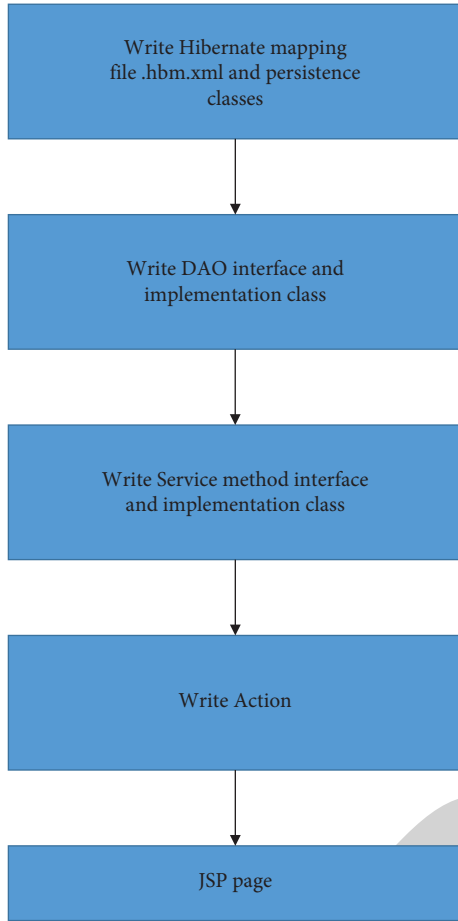


FIGURE 7: System function module compilation architecture diagram a.

required classes for Hibernate and Struts according to the actual situation of the system so that the code is loosely coupled. Based on the above analysis, the implementation of the system function modules is written according to the process in the following figure, as shown in Figures 7 and 8.

In order to overcome the impact of dynamic changes in the network on network transmission, network QoS monitoring technology is introduced, and real-time monitoring lays a good foundation for intelligent transmission control [19, 20]. Add a timestamp at the protocol layer to monitor the network delay, add two fields to each message, and record the last received timestamp (LRT) and the current sent timestamp (CST). After receiving the message, the receiving end calculates the local packet delay according to the LRT and SCT of the message. At the same time, the processing delay of the message in the network can be obtained by subtracting the processing delay of the opposite end according to the last timestamp (LST) saved by the receiving end and the time when the message is currently received.

When end  $B$  replies to  $A$  message,

$$\begin{aligned} LRT &= TB + \Delta t1, \\ CST &= TB + \Delta t1 + \Delta t2. \end{aligned} \quad (1)$$

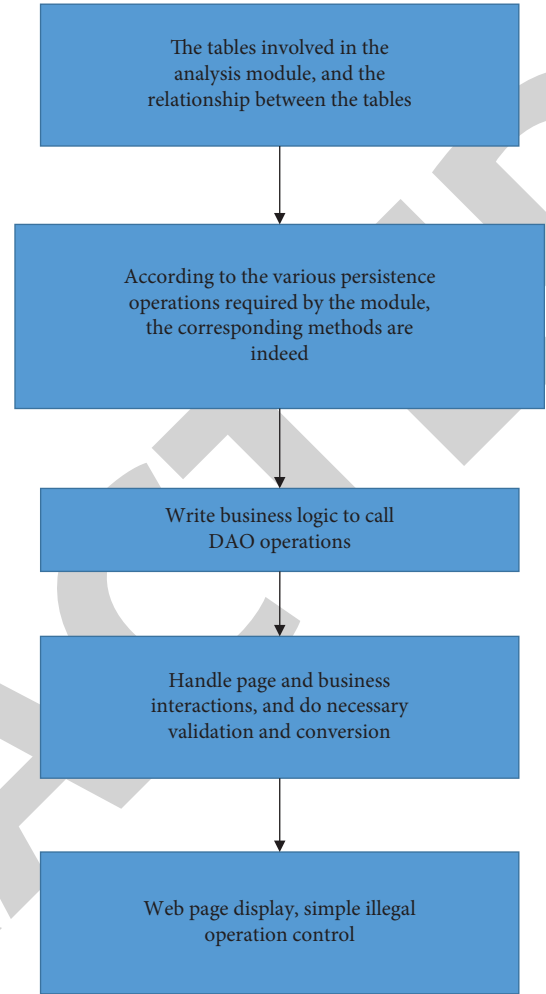


FIGURE 8: System function module compilation architecture b.

When end  $A$  receives the message from end  $B$ , its local LRT is

$$LRT = TA + \Delta t1. \quad (2)$$

And its current time is

$$CT = TA + \Delta t1 + \Delta t2 + \Delta t3. \quad (3)$$

At this time, it can be calculated that the bidirectional delay of message sending is

$$CT - LST - (CST - LRT). \quad (4)$$

#### 4. Results and Analysis

Software testing can also be carried out at different stages of the software implementation process. The software system is a whole, but software testing should not only regard the software system as a whole but also be carried out step by step. In the initial functional design of the software system, it is divided according to the functional modules of the system. When programmers divide the work, they also divide the work and code according to the functional modules. When

TABLE 1: User registration module test table.

Module name	User registration module				Tested by		Foreground user	
Case number	1				Test time	2022.3.2		
Test purpose	Test the effectiveness of user registration function							
Browser	General browsers such as IE11							
Correct data	User name: 4-10 digits; password: 5-15 digits; real name: required							
		Test input			Expected output		Actual output	
Operation steps	User name	Password	Duplicate password	Real name				
1	Guest	12345	12345	Zhang San	Normal registration		Normal registration	
2	Guest	12345	12345	Zhang San	Prompt user name length error		Prompt user name length error	
3	Guest	12345	1234	Zhang San	Prompt that the two passwords are inconsistent		Prompt that the two passwords are inconsistent	
4	Guest888888	12345	12345	Zhang San	Prompt user name length is too long		Prompt user name length is too long	
5	Guest	1234567891011111	1234567891011111	Zhang San	Prompt password length is too long		Prompt password length is too long	
6	Guest	12345	1234	Zhang San	Prompt that the two passwords are inconsistent		Prompt that the two passwords are inconsistent	
7	Guest	12345	123456	Zhang San	Prompt that the two passwords are inconsistent		Prompt that the two passwords are inconsistent	
8	Guest	1234	1234	Zhang San	Prompt password length is too short		Prompt password length is too short	
9	Empty	12345	1234	Zhang San	Prompt user name cannot be empty		Prompt user name cannot be empty	
10	Guest	Empty	1234	Zhang San	Prompt password cannot be empty		Prompt password cannot be empty	
11	Guest	12345	Empty	Zhang San	Prompt duplicate password cannot be empty		Prompt duplicate password cannot be empty	
12	Guest	12345	12345	Empty	Prompt that the real name cannot be empty		Prompt that the real name cannot be empty	
13	Empty	Empty	Empty	Empty	Prompt user name cannot be empty		Prompt user name cannot be empty	

the function of the module is completed, the function module needs to be integrated into the subsystem and finally integrated into a complete system. After the system is put into operation, it is necessary to continue to test the stability of the system. Testing is required in the process of software implementation, so software testing can be divided into the following tests.

**4.1. Module Testing.** Module test is a test conducted by programmers when completing module functions. Module testing requires not only testing whether the module completes the set function from the function but also completing the logic test from the internal code to test whether the process executed inside the module is correct [21, 22].

**4.2. Subsystem Test.** Subsystem test is a test conducted after the integration of functional modules, which needs to test whether the functions of each module are compatible and whether the data exchange between modules meets the design requirements [23, 24].

**4.3. System Test.** System testing is conducted after the completion of system integration. System testing is a systematic process, which includes function testing (using black box testing method) and program logic code testing [25].

**4.4. Acceptance Test.** After the acceptance test software is written, check whether the software meets the required test, create the normal operation environment of the software, and check whether the function of the software meets the design requirements. The acceptance test can verify whether the software system meets the design requirements.

**4.5. Parallel Operation.** Some software system errors will cause immeasurable losses, and these software systems need to be strictly tested before they can be put into operation. After putting into operation, the original system will not be removed immediately but run at the same time with the original system to check whether the new system has problems. When problems are found in the new system, they can be corrected after it is officially put into operation. The music system belongs to the B/S structure, and the roles of



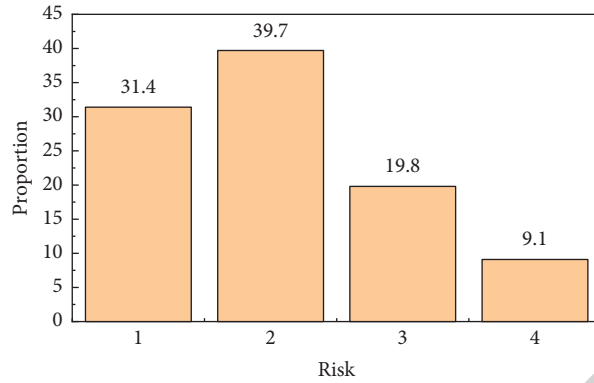


FIGURE 9: Risk classification.

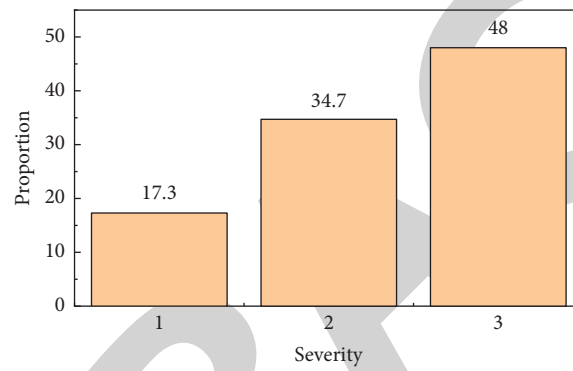


FIGURE 10: Severity.

TABLE 2: User login module test table.

Module name	User login module			Tested by	Foreground user
Case number	2			Test time	2022.3.2
Test purpose	Verify whether the legal and illegal login meet the requirements				
Browser	General browsers such as IE11				
Correct data	User name: chengbao; password: baolei				
	Test input				
Operation steps	User name	Password	Verification code	Expected output	Actual output
1	Chengbao	Empty	Empty	Prompt for password	Prompt for password
2	Empty	Baolei	Empty/error	Prompt for user name	Prompt for user name
3	Chengbao	Baolei	Empty/error	Prompt for verification code	Prompt for verification code
4	Chengbao	Guest	Fill in correctly	Prompt user name/password error	Prompt user name/password error
5	123456	Guest	Fill in correctly	Prompt user name/password error	Prompt user name/password error
6	Empty	Empty	Fill in correctly	Prompt for user name	Prompt for user name
7	Chengbao	Baolei	Fill in correctly	Normal login	Normal login
8	Empty	Empty	Empty	Prompt for user name	Prompt for user name
9	At will	At will	At will	Go back and clear the input box	Go back and clear the input box
10			Click on the verification code image	Replace verification code	Replace verification code

TABLE 3: Background administrator menu test table.

Module name	Background administrator menu		Tested by	Background user
Case number	3		Test time	2022.3.2
Test purpose browser	Check whether the menu switch is correct general browsers such as IE11			
Operation steps	Pedagogical operation	Expected output	Actual output	
1	Click global settings	Display the menu of website settings and registration settings	Display the menu of website settings and registration settings	
2	Click course management	Display the added course and category management menu	Display the menu of adding courses and category management	
3	Click student management	Show add student, student list menu	Show add student, student list menu	
4	Click assessment management	Display the test paper category management and test question management menu	Display the test paper category management and test question management menu	
5	Click news management	Display the menu of adding news, news list, and news classification management	Display the menu of adding news, news list, and news classification management	
6	Click problem management	Show question list menu	Show question list menu	

TABLE 4: Test form of the backstage student management module.

Module name	Backstage student management module		Tested by	Background user
Case number	4		Test time	2022.3.2
Test purpose Browser	Check the functions of the backstage student management module General browsers such as ie11 IE11			
Operation steps	Pedagogical operation	Expected output	Actual output	
1	Click add student menu	Show the add student page	Show the add student page	
2	Click the student list menu	Show student list	Show student list	
3	Click the division menu in the list	Display the prompt whether to delete it really	Display the prompt whether to delete it really	
4	Click the modify menu in the list	Display the modify student page	Display the modify student page	
5	Fill in the information in the add student page	Check whether the data is correct	Correct data verification	
6	Fill in and modify the information in the student page	Check whether the data is correct	Correct data verification	
7	Click the “yes” button to delete the prompt	Delete data	Delete data	
8	Click the “no” button to delete the prompt	There is no change in the data	There is no change in the data	

TABLE 5: Statistical table of software test analysis.

Test software name	Music distance education platform		
Number of use cases	38	Number of risks	121
Test time	60	Average risk discovery rate (person/hour)	2.02

the foreground and background are completely independent, so the test plan will separate the foreground and background. The top and background will be tested, respectively, according to the program function, and the input value will be set with edge value and error value to ensure the normal operation of the program. Some test cases of music system functions are shown in Tables 1–4.

The user registration module test form, user login module test form, background administrator menu test form, and background student management module test form have been displayed in the test case. What is shown

here is only one part of the test. There are other test parts in the music system.

In software testing, we found some problems, such as logic errors in programming, poor reliability caused by some illegal data not being detected, and the output data not reaching the standard. These problems were recorded in the test cases so as to check and correct the errors in the software.

Through the use case test of each functional module of the foreground and background, the system can smoothly and normally execute the commands issued. The final test

analysis statistics are shown in Table 5 and Figures 9 and 10. From Table 5 and Figures 9 and 10, the average risk occurrence rate is 2.02 hours/hour, and the probability of high risk is 17.4%, as shown in Table 5 and Figures 9 and 10.

## 5. Conclusion

From the software system design technology, this paper analyzes and studies the technology needed to design the music remote system, including unified modeling language UML, software system B/S architecture technology, database design technology, and entity relationship data model. Finally, it analyzes the implementation technology of the software system and determines the design tool of the software system according to the needs of the music system. In the design process, considering that the music distance education system is an Internet-based system, we chose the Internet-based development Java language. In order to improve the efficiency of Java, MVC architecture and SSH framework technology are adopted in the software implementation. The application of SSH framework technology in the music remote system can well layer the system, which is conducive to the expansion and transplantation of programs, and enhance the flexibility of the system. The database adopts open source MySQL and uses toad for MySQL visual database operation software to accelerate the development of the database.

Through the test and trial operation of this system, the students' feedback on the system is good. The unified page design style, reasonable layout and structure, simple and clear operation, and smooth running speed give students a good experience. Online learning, online testing, viewing the learning situation of the course, and other functions are practical and easy to use, which makes it convenient for students to freely choose time and place for independent learning. Interactive online Q & A provides a new way for students to communicate with teachers. For teachers, the management of courses, test questions, news, students, and problems can be easily realized in the system, and the continuous increase of teaching resources, information, and students can be freely controlled. Therefore, the system has important practical significance for teaching and learning across time and space.

## Data Availability

The data used to support the findings of this study are included within the article.

## Conflicts of Interest

The author declares that there are no conflicts of interest.

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