

Design and Implementation of a Campus Sports Meet Management System

Hengli Nie

Mining Safety College, North China Institute of Science and Technology, Langfang, Hebei, 065201, China

Abstract: In response to challenges in traditional sports meet management such as managing numerous participants, difficulty in track allocation, complex match statistics, untimely announcements, and information bottlenecks, we have designed an efficient, intelligent, and practical management system for university sports meets. This system facilitates administrators in viewing and modifying information, compiling statistics, entering match results, and managing both competitions and equipment. Users can modify personal information, view match schedules, register for events, view results, and check sports equipment and announcements. This complete system integrates seamlessly with university information service platforms and is highly practical.

Keywords: Sports Meet Management System; Java; MySQL; SpringMvc; Mybatis.

1. Introduction

The campus sports meeting is an important activity to unite the class, strengthen the body, show the spirit of courage and cohesion, which can enhance the sports quality of students and teachers to start from the sports power. However, in recent years, the management of the sports meeting, whether it is the registration statistics of the sports meeting, the announcement information of the sports meeting, the information of the competition items and the entry and statistics of the results, is completed manually, processing a large number of data according to various complicated documents and office software. Moreover, the manual management efficiency is low, the statistical speed is slow, the work report statistics are prone to error, the timely publication of many information of the sports meeting is difficult to do, and the management and viewing of student information competition results is also very complicated, which is unfavorable to the development of a university, so the design and development of an intelligent, efficient and comprehensive sports meeting management system is a top priority. In foreign countries, the Ministry of Education of colleges and universities has also proposed to strengthen the construction of "campus intelligence" and support efficient management and learning. For example, Norwegian University of Science and Technology, Stanford University and Massachusetts Institute of Technology have complete intelligent information management platforms to ensure that every student and teacher can repeat and reasonably use the teaching platform to support the school's teaching and research and various tasks with the highest efficiency, such as NBA events or recent sports meetings, with good system technology support. It can fully meet management requirements. And many domestic campus platform services are gradually intelligent, such as Magpie and Xuexitong and many other learning platforms are widely used, which brings great convenience to the teaching and research management of universities. However, most universities are still based on manual report operations, or based on some office software to operate data, once the amount of data increases, the workload will become a lot, the overall work will become very cumbersome and complex. The system based on Java and B/S design pattern has good security, robustness and portability. Because the Web is

independent of the platform, the system has good portability and scalability. Java security framework technology is used to encrypt user passwords, and Mysql database is used to store various data, which protects user accounts and a series of data, reduces risks, and avoids losses caused by illegal account theft[1].

2. Demand Analysis

2.1. System Interface Requirements

Campus sports meeting management system requires beautiful interface, clean and tidy, simple to use, page response time is short, high efficiency, high accuracy; Add corresponding prompts for modifying, deleting, and adding functions to prevent data loss and damage caused by misoperations.

2.2. System Performance Requirement

The software is based on Windows platform, adopts B/S structure development, uses MySQL for data storage, and adopts Spring+SpringMvc+Mybatis system framework. Page display using Html, Css, JavaScript, JQueryUi and Bootstrap plug-in technology to develop a campus sports management system[2]. the development of the system should meet the following standards[3].

(1) Processing capacity: The system should be able to process multiple user requests at the same time within a specified time.

(2) Security and stability: The system requires user login to use, the database password is encrypted, and there are strict permission restrictions and attack prevention mechanisms. At the same time, the system is based on a stable architecture pattern, which can effectively handle and recover errors.

(3) Scalability and maintainability: The system can increase the load capacity or function by adding hardware or software components, and it is easy to change, debug, optimize, replace and restructure the code.

(4) Operability: The system function is perfect, to meet the explicit and implicit needs, the user interface is simple, the operation is simple.

(5) Data indicators: Ensure the correctness, effectiveness, accuracy and integrity of data, and ensure the consistency and readability of data storage methods and formats.

2.3. System Functional Requirement

Based on the experience in the campus and the query of relevant information, the users of the sports meeting management system are set as administrators, students and teachers. The campus sports meeting management system realizes the dynamic management of the website, combines the dynamic web page with the database, and processes the sports meeting information through various functions, which makes the management of information more timely and efficient and improves the work efficiency. Finally, administrators, students and teachers can jointly manage the system.

3. System Design

3.1. Overall System Design

The design and development process of the system refers to the life cycle of software engineering development to achieve modular design, reduce coupling degree, improve cohesion, reduce complexity and redundancy between modules, develop from top to bottom, and finally carry out unit testing, integration testing and performance testing, debug and improve the system according to the test results, and debug and improve the system according to the test results. Thus, the workload of registration groups and scores entry and other operations is reduced, so that users can timely obtain the status of the games and related information of various events, providing users with a more convenient experience[4].

3.2. System Functional Design

The sports management system authenticates users and

administrators through the login module, and gives different permissions to users and administrators after login[5].

Administrator's rights include information management module, sports management module, sports equipment management module. The information management module is mainly used by administrators to view and modify their own information, modify passwords, add, delete, modify and check the information of students, students' teachers and students' classes, so that administrators can manage information efficiently; The sports meeting management module is mainly to publish and modify the sports meeting announcement information, add, delete, modify and check the information of competition events, project name, time, place, gender restrictions and rules, as well as the entry of competition results, the grouping of participants and the viewing of the results of participants; Sports equipment management module is mainly to view and manage equipment information, check the name of the equipment, place, total number and loan amount of information, manage the loan and return of equipment, as well as the addition and deletion of equipment operations.

In the user's authority there are information module, competition information module, sports information module. The information module is mainly to check the student information, student class information and student college information and modify the password and other operations; Competition information module is mainly to view the participated and not yet participated in the competition, provide registration and withdrawal operations, to ensure that users can easily manage the competition information; Sports Event information module view the sports event information, sports event announcement, sports event details, etc. The system function design is shown in Figure 1.

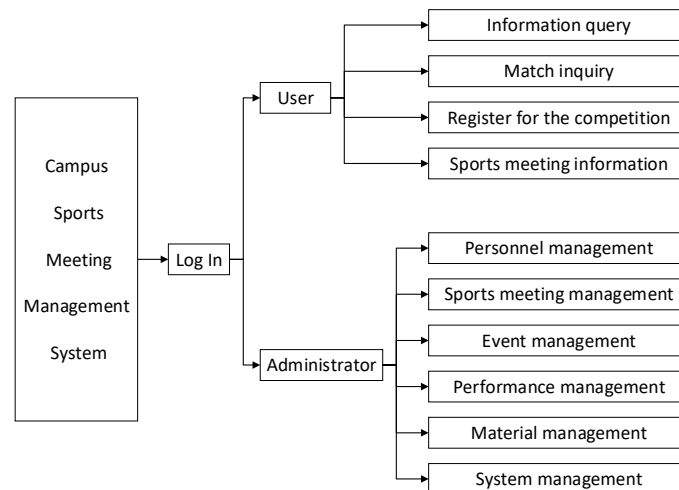


Figure 1. System function structure diagram

4. System Implementation

4.1. Login Module

The main design goal of the login module is to distinguish the identity of the administrator and the user. The identity determination is realized by searching the login account in the user and permission table of the database. Use SpringSecurity for password encryption and requires a series of login jump and decryption functions to be set up in the configuration file. The main process is that the user or administrator enters the account and password at the front end and submits the form,

and the back-end server receives the information and finds the corresponding account and password, and then decrypts and compares. According to the permission table, the system determines whether the login account is an administrator or a user.

4.2. Participant Information Module

The user participation information module can view the events that can participate and the events that have already participated, and can register for and withdraw from the competition. Click to enter a contest in the Sign Up dropdown list in the navigation bar, that is, to send a request to the

server, the EventController layer receives the request and invokes EventService. EventService calls EventMapper to query the list of projects in the database according to the entry restrictions, such as gender restrictions and time limits, and

returns the EventList variable, which is the list of projects that can participate, to the Eventlist.jsp page and renders it, including the project name, location, date and other information. As shown in Figure 2.

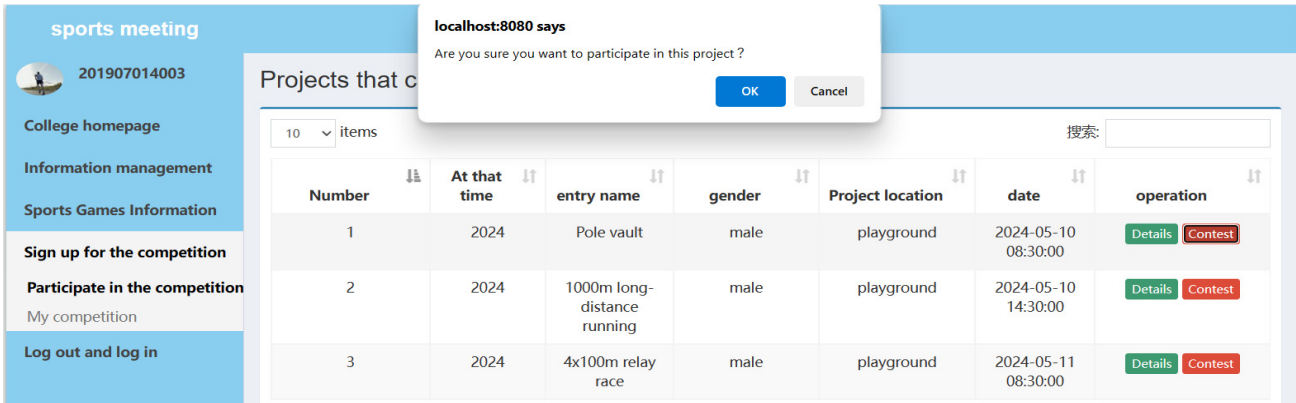


Figure 2. Eligible event

You can also withdraw from a race you have already participated in. As shown in Figure 3.

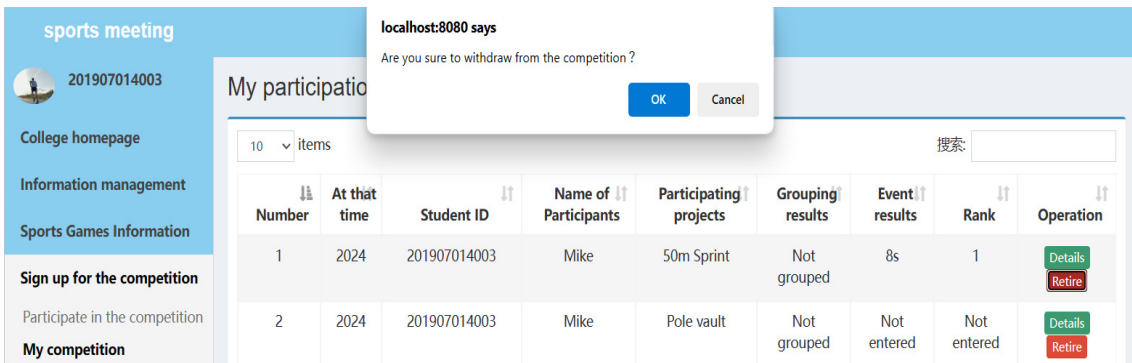


Figure 3. Withdraw

4.3. Results Management Module

The competition results management module implements results entry, grouping of participants, and viewing of results of participating members. First, the participants are divided into groups, and after the group competition, the competition results are entered. Grouping and score entry should be done on a project-by-project basis. After the scores are entered, they can be viewed or modified in the score list. The grouping

of participants and the entry of scores are implemented by initiating a request to the back-end server. MatchesController initiates a request and calls MatchesService. MatchesService calls MatchesMapper and EventMapper to implement connection query, and returns the projects whose scores have not yet been entered and the corresponding score list to the MathesInput.jsp page. and render. Group personnel and record records in this interface, as shown in Figure 4.

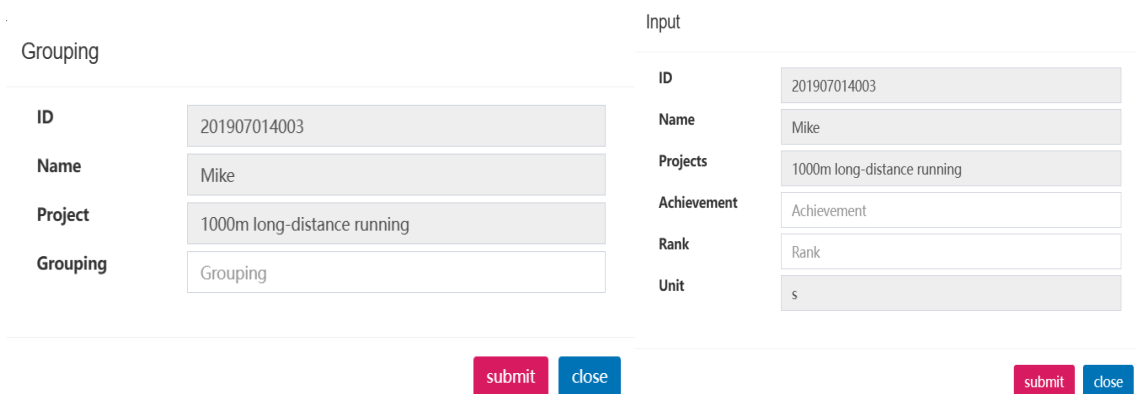


Figure 4. Grouping and score entry

After the entry is completed, you can view the score information. Click the sports meeting score list in the navigation bar to initiate a request to the back-end server. MatchesController accepts the request and processes it, returns the MatchesList variable to MatchesList.jsp and

renders the page. In the score information list, you can Add, modify, delete and view details of grades. The grade information list is shown in Figure 5.

serial number	At that time	The name of the project	Participant ID	name	grouping	grades	ranking	operation
7	2024	1000m long-distance running	201908024003	Si Qing	2	50s	1	detail revise Delete
8	2024	1000m long-distance running	201908024004	Wang Anlun	2	1s	2	detail revise Delete
9	2024	4x100m relay race	201909014001	Jack	1	Not entered	Not ranked	detail revise Delete
10	2024	4x100m relay race	201909014002	Fu Chenqing	1	Not entered	Not ranked	detail revise Delete

Figure 5. Grade information list

4.4. Equipment Management Module

The administrator can view and manage the device information, such as the name, place, total number and loaned

quantity of the device, to realize the loan and return of the device, and to add and delete the device information, as shown in Figure 4.26. Click the Lend button in the operation to lend the equipment, as shown in Figure 6.

ID	name	place	total	loaned	Procurement time	operation
1	basketball	grammar school	100	10	2024-05-08 16:49:10	revise Delete Borrowing
2	ping pong	grammar school	100	0	2024-05-08 16:49:10	revise Delete Borrowing
3	Table tennis rackets	grammar school	100	0	2024-05-08 16:49:10	revise Delete Borrowing
4	badminton	grammar school	100	0	2024-05-08 16:49:10	revise Delete Borrowing
5	Badminton rackets	grammar school	100	0	2024-05-08 16:49:10	revise Delete Borrowing
6	Roller skates	grammar school	100	0	2024-05-08 16:49:10	revise Delete Borrowing

Figure 6. Device management information

Click on the loan and return information in the navigation bar to view the overall loan and return information of the equipment, such as who borrowed, lent equipment, lent time

and whether to return information. The equipment loan and return information is shown in Figure 7.

Borrower ID	Borrower	Name of equipment	Quantity	Lending Time	Return time	Status
201907014003	Mike	basketball	10	2024-05-16 17:02:28	2024-05-25 11:54:12	already repaid
201907014003	Mike	basketball	10	2024-05-16 17:31:01	2024-05-25 11:09:06	already repaid
201907014003	Mike	basketball	10	2024-05-25 11:53:01	Not yet repaid	Not yet repaid
201907014003	Mike	basketball	10	2024-05-26 16:08:37	2024-05-26 16:25:24	already repaid
201907014004	Olivia	basketball	10	2024-05-26 16:14:36	2024-06-09 11:20:16	already repaid

Figure 7. Equipment is available for loan

Click the equipment return in the navigation bar to return the loaned equipment. The page shows the records of the loaned equipment that have not been returned. You can see the loaned information, such as the borrower loaned equipment, the amount and reason of loaned equipment, etc.

Click Return on the page to return the operation, as shown in Figure 8.

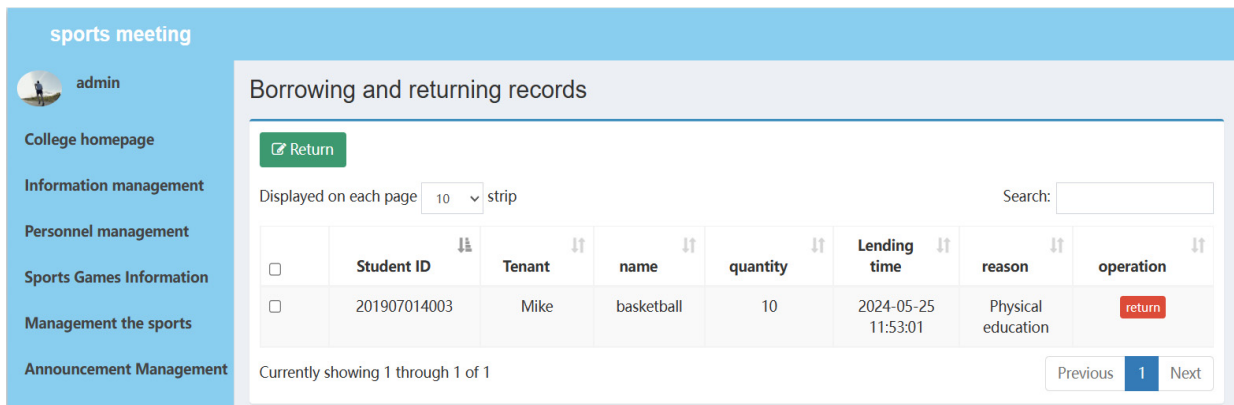


Figure 8. Equipment returns

5. Conclusion

The front-end page of the system adopts popular front-end frameworks and plug-ins such as JQueryUi and Bootstrap, which makes the page style of the system unified, fast response, easy to use and deploy, and improves the user experience of the system. In addition, some optimization strategies are adopted in the system design and implementation, such as the use of cache Mybatis technology, which effectively reduces the pressure of database access and improves the query efficiency and response speed of the system. The realization of the university sports meeting management system is innovative and practical, which provides a new solution for the university sports meeting information management and better meets the needs of the university sports meeting information management.

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