CHAPTER 4

Result and Discussion

This chapter presents the results and discussions based on the evaluation of Sports Events Athletes Management System, a Digitalizing Sports Event and Athlete Performance Management. The study involved a usability assessment utilizing the ISO 2025:2011 standard. The evaluation leverages the ISO/IEC 25010:2011standard, which defines critical software quality characteristics and sub-characteristics to assess the performance and effectiveness of software solutions.

The assessment collected responses from 25 participants, who evaluated the system across eight core quality characteristics defined by the ISO/IEC 25010:2011 standard: functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. Participants rated each characteristic on a 5-point Likert scale, where 1 signifies "Very Poor" and 5 indicates "Excellent." This evaluation provides a comprehensive analysis of Sports Events Athletes Management System capabilities, highlighting strengths and areas for improvement to enhance the system's overall quality and impact.

Presentation of Results

This chapter discusses the findings in relation to the study's objectives outlined previously.

1. Designing and Development of "Sports Events Athletes Management System" has been successfully achieved. The system has been fully designed and developed, with a screenshot of the landing page provided below to illustrate its interface and functionality.

Figure 8.1

Athlete Registration Page

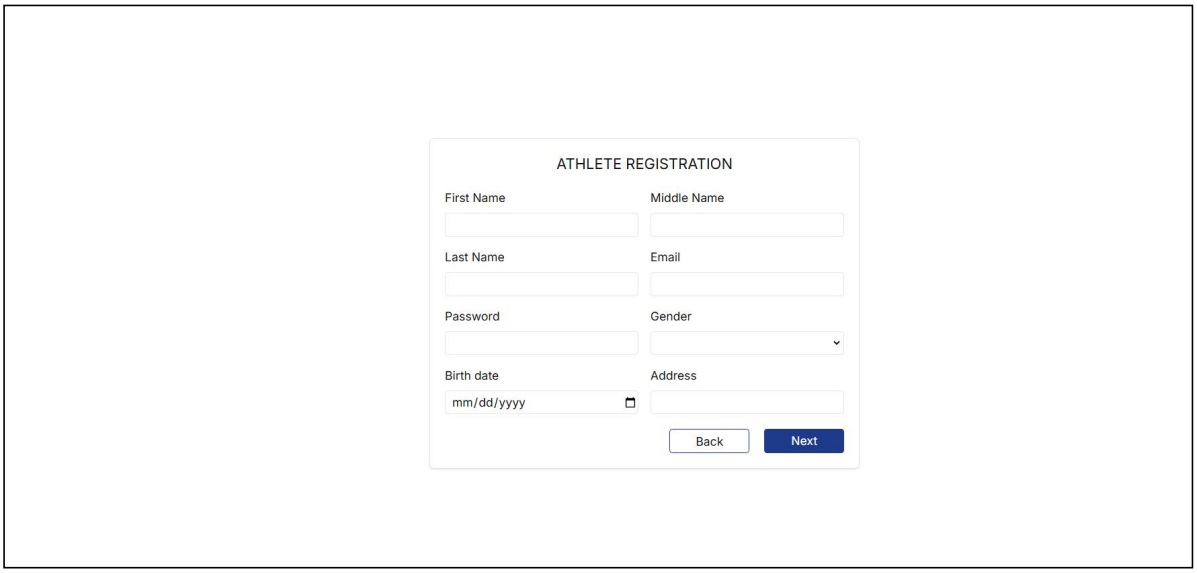

Figure 8.2

Athlete Registration Page

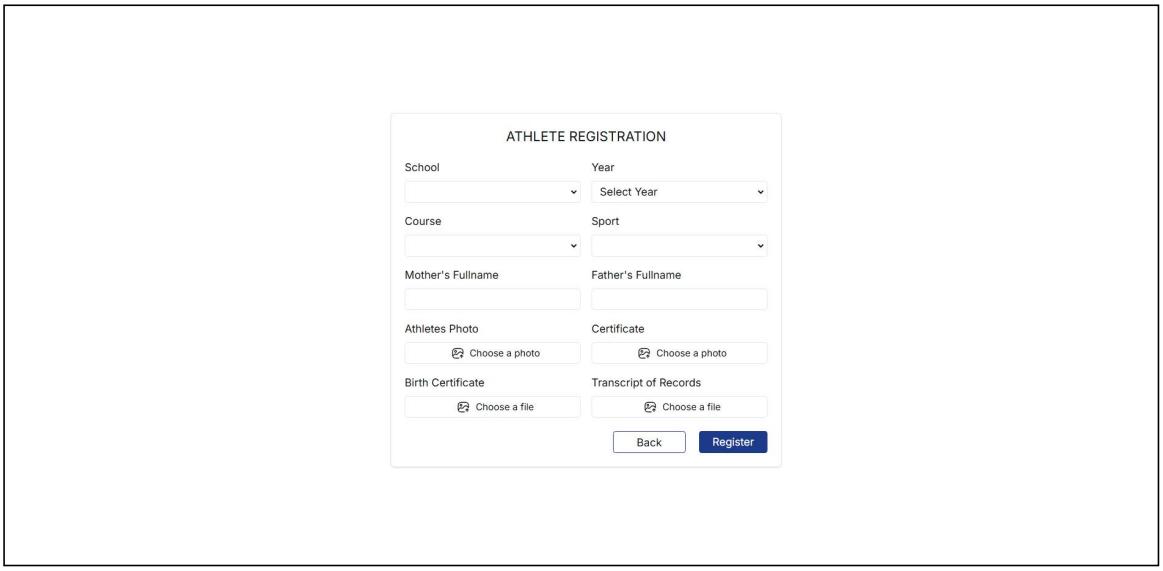

Figure 8.1 and 8.2 show the athlete registration page, which is exclusively accessible to athletes. The athlete must first register and provide the necessary data to complete the registration.

Figure 9.1

Athlete List of Forms

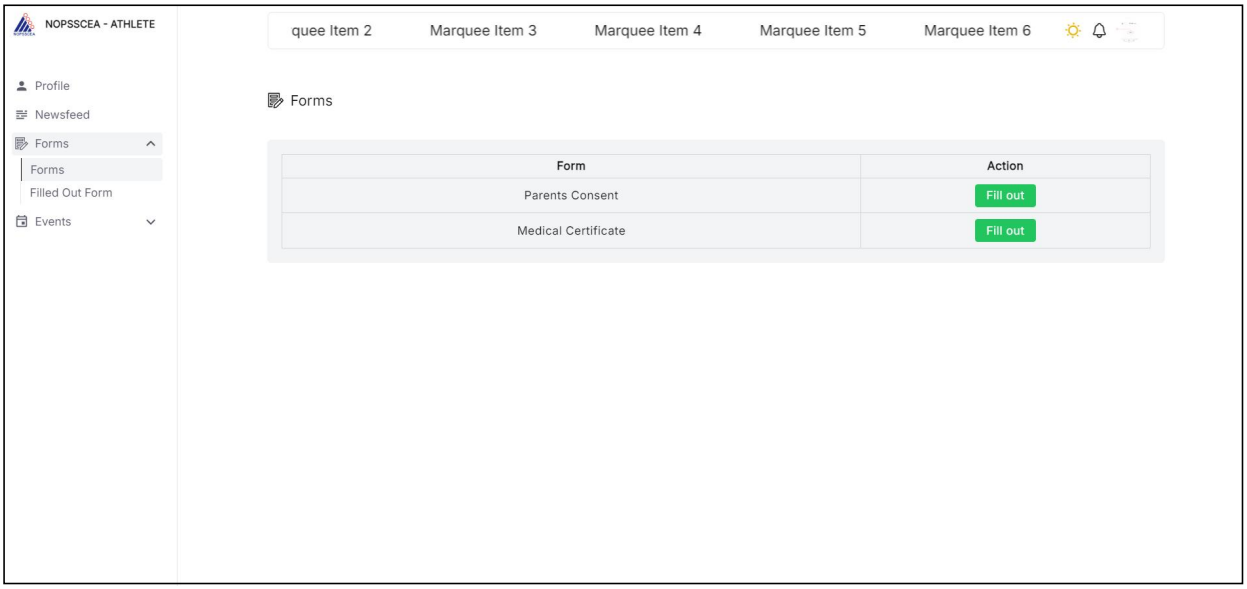

Figure 9.1 shows the Forms page, which is exclusively accessible to athletes. On this page, the athlete can view forms that need to be filled out, such as the Parent's Consent and Medical Certificate. The athlete is presented with options to fill out the forms by clicking the "Fill out" buttons next to each form.

Figure 9.2

Athletes form to be filled out.

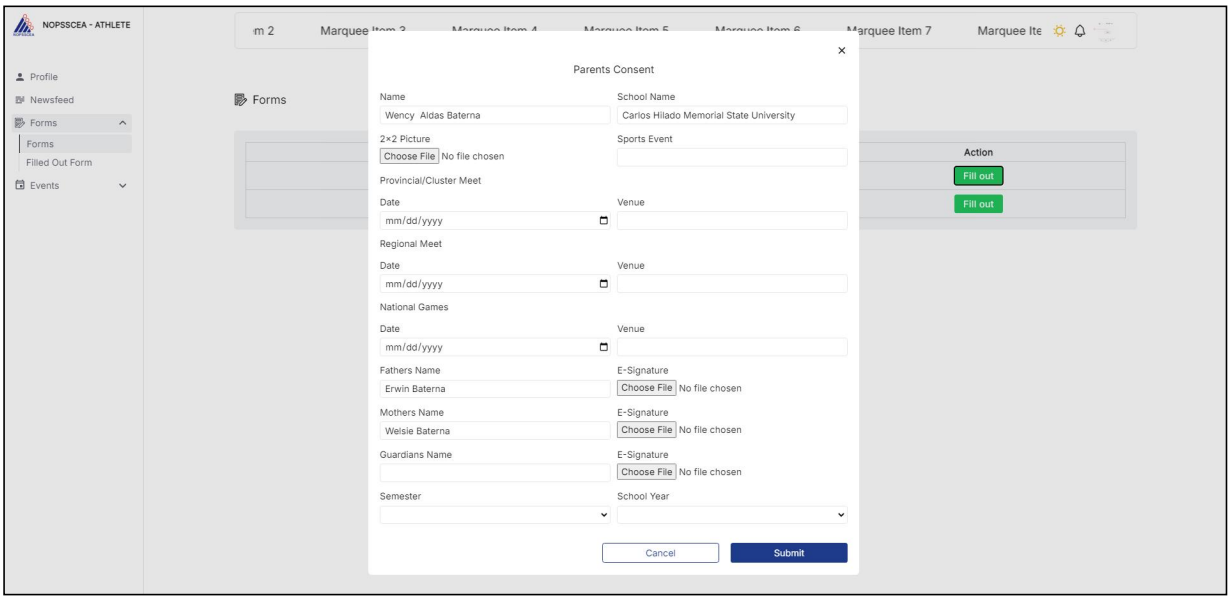

Figure 9.2 shows the forms to be filled out by the athlete, depending on the type of form the athlete selects to complete. The athlete must fill out all the required fields in order to successfully submit the completed form.

Figure 9.3

Athletes filled out forms.

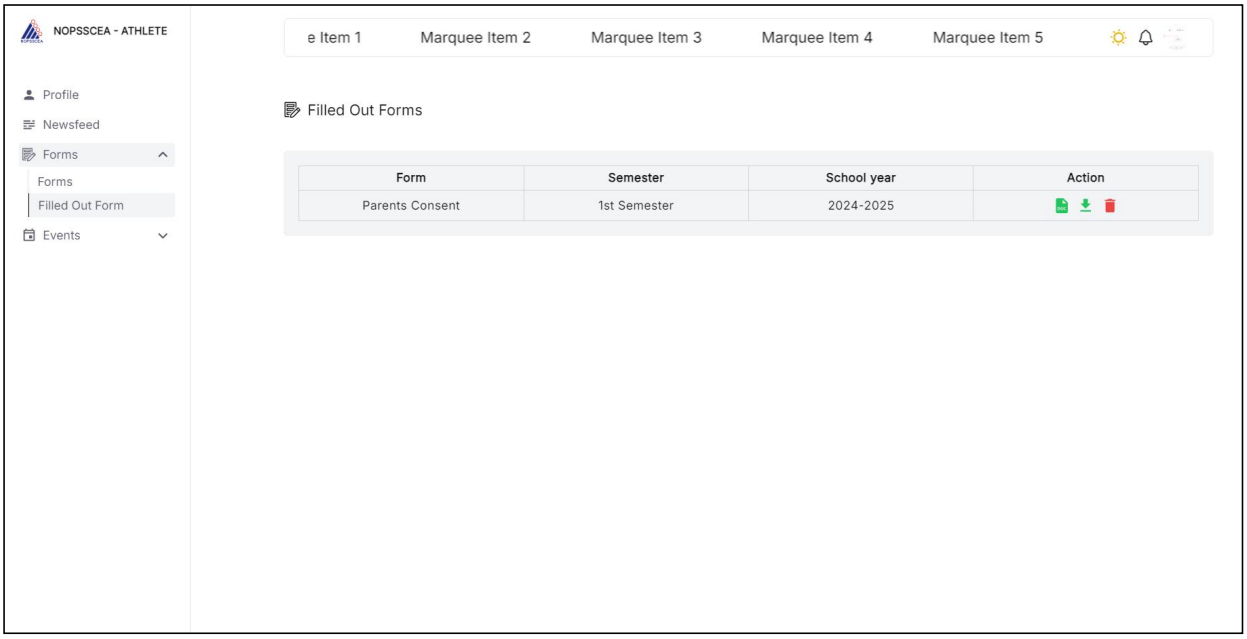

Figure 9.3 shows the section where all of the athlete's filled-out forms are stored. The athlete can view, download, or delete the forms they have completed.

Figure 10

Athlete Sport Selection Page

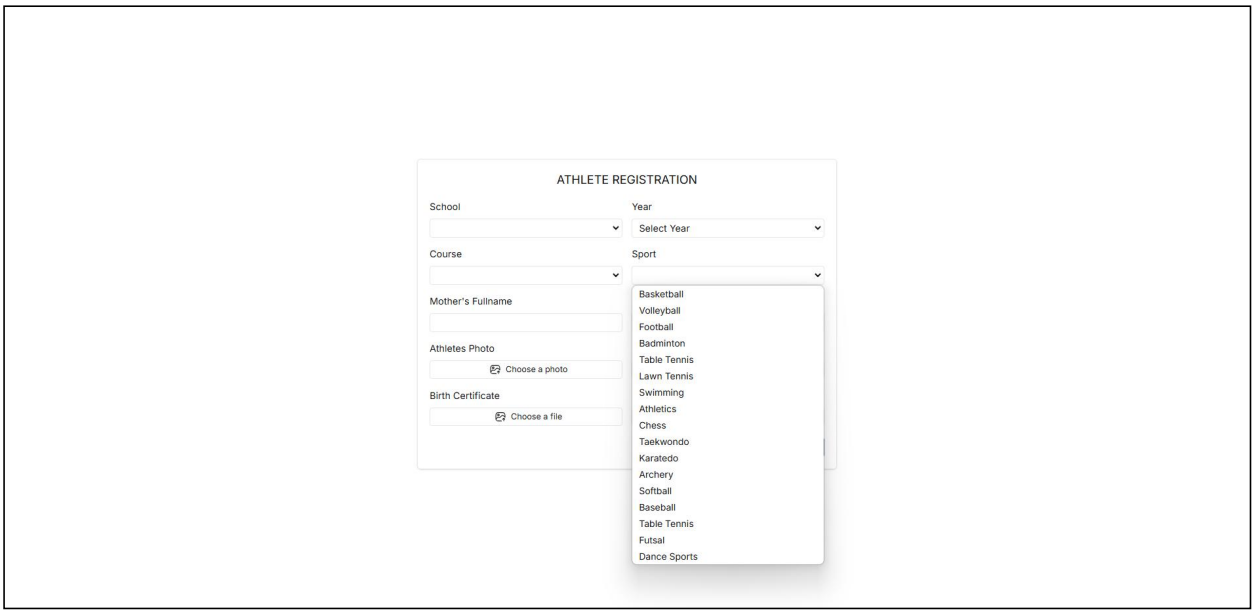

Figure 10 shows the section where athletes can choose the sport they want to participate in.

Figure 11.1

List of all events

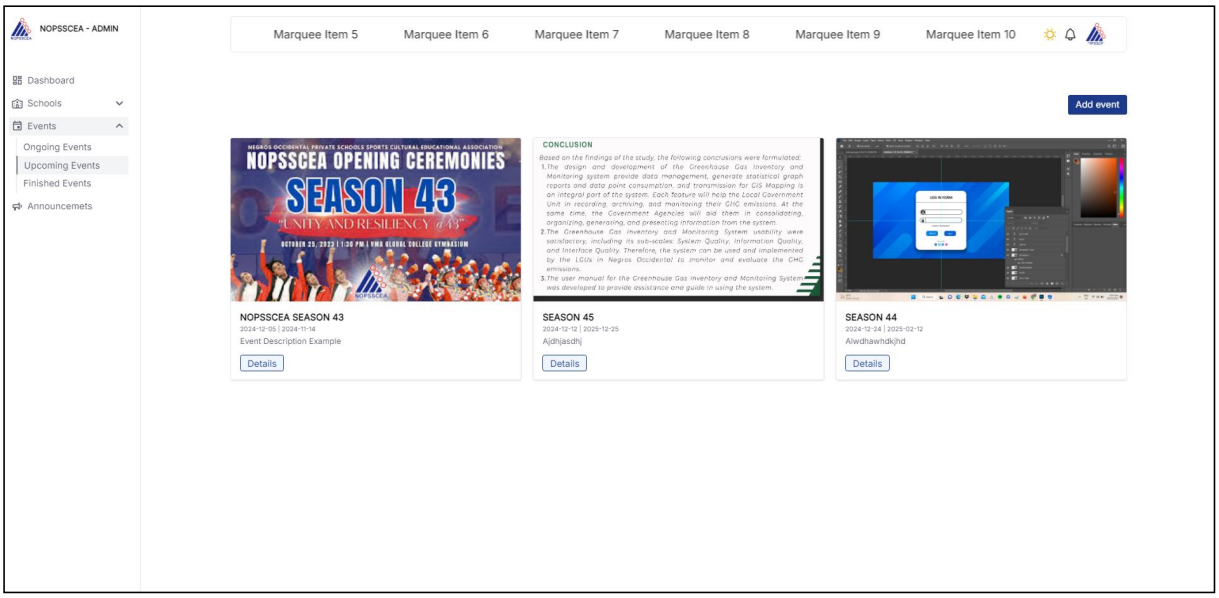

Figure 11.1 shows a list of all events. This page allows the admin to view ongoing, upcoming, and finished events. By clicking the Details button, the admin can access detailed information about a selected event.

Figure 11.2

Adding a New Event

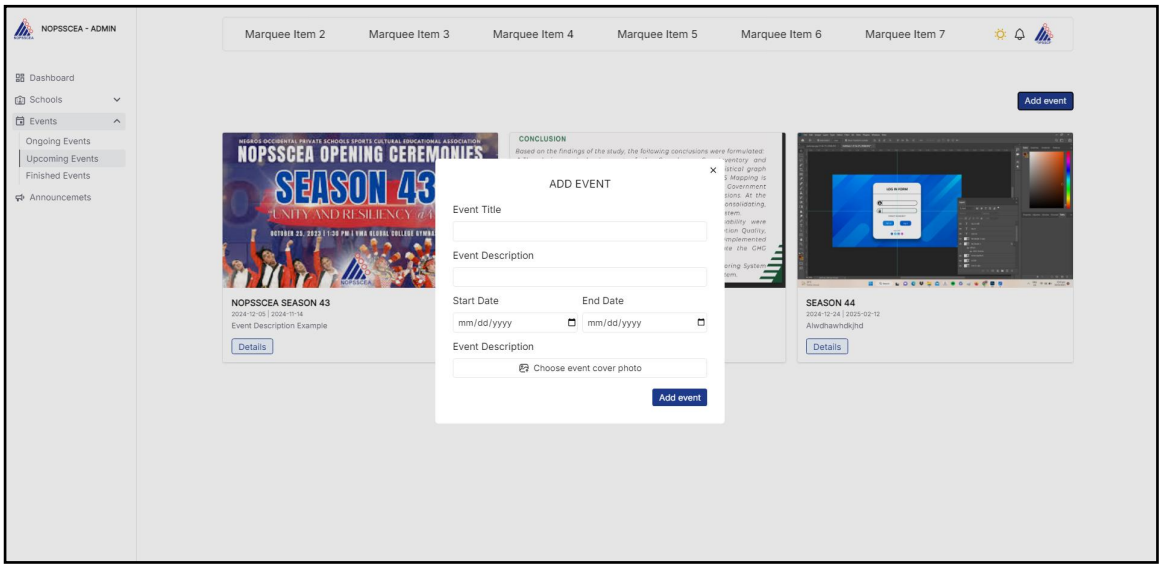

Figure 11.2 shows the process of adding an event. The admin must fill in all the required fields to add a new event.

Figure 11.3

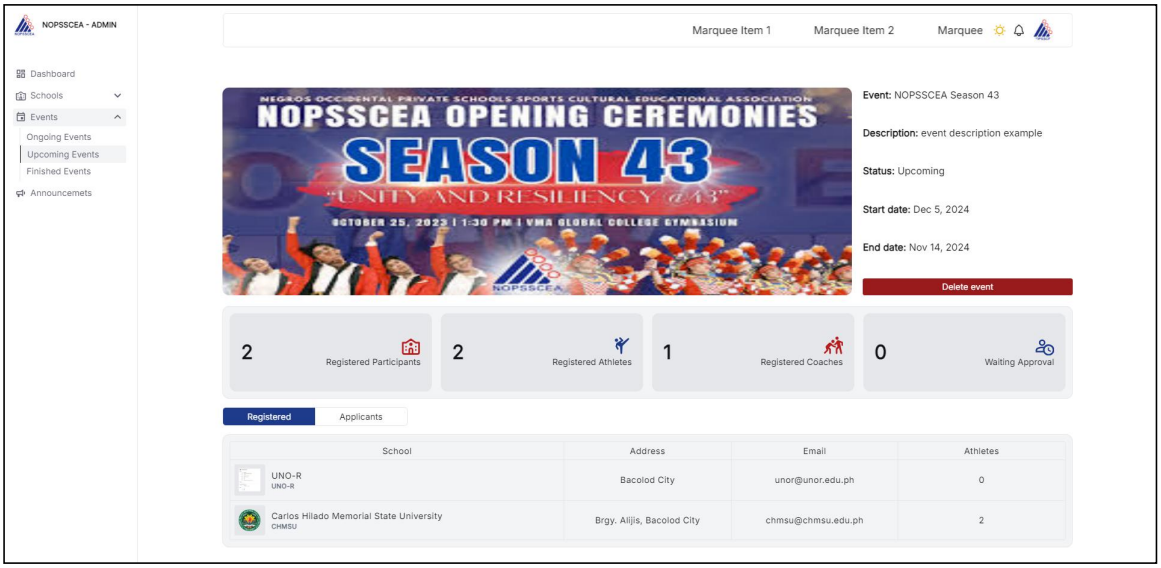

Figure 11.3 shows a detailed view of an event, where the admin can access information such as the description, status, and dates. Additionally, the admin can view the total number of registered participants, athletes, coaches, and the scheduled games.

Figure 11.4

Event Deletion Confirmation

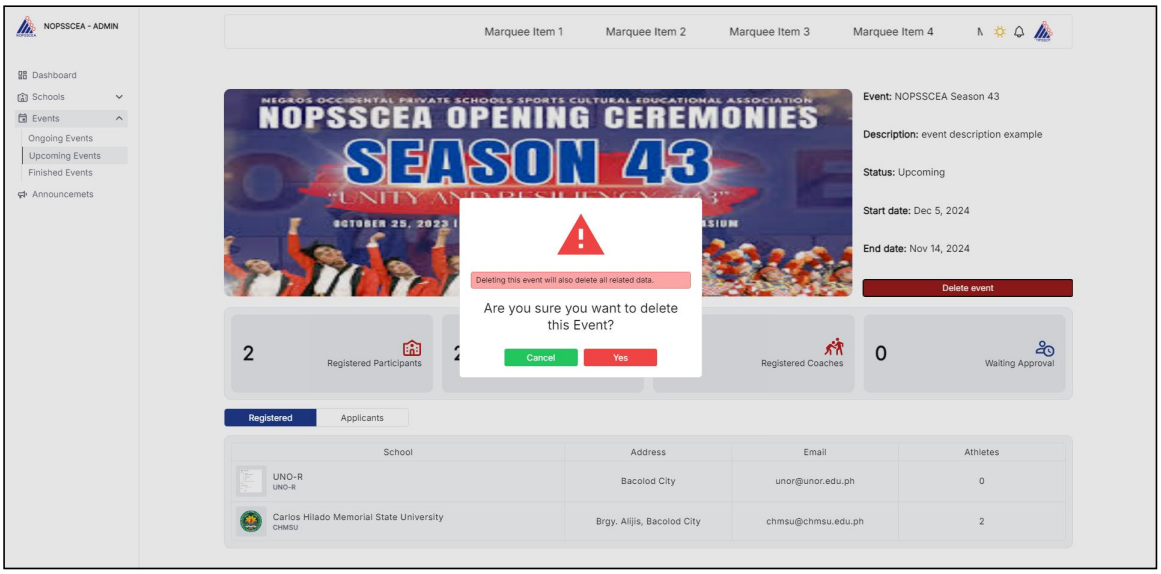

Figure 11.4 shows the confirmation for deleting an event. A modal will appear on the screen to ask the admin for confirmation before deleting the event.

Figure 12

Athlete's Training Progress

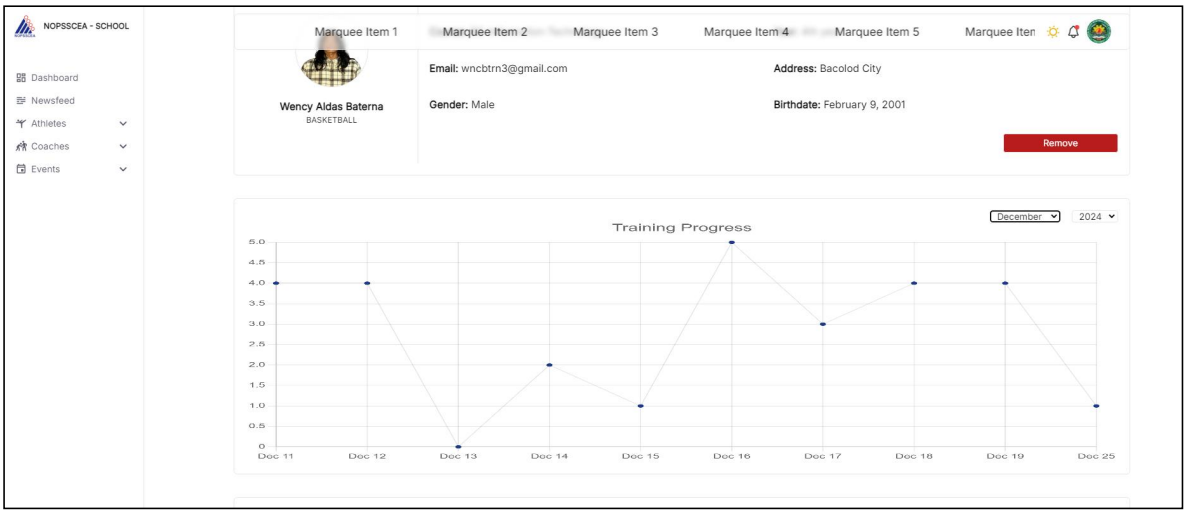

Figure 12 shows the athlete's training progress for each session. It provides an overview of the athlete's performance and tracks improvements. This allows the coach and the school to monitor the athlete's development over time.

Figure 13.

Dashboard

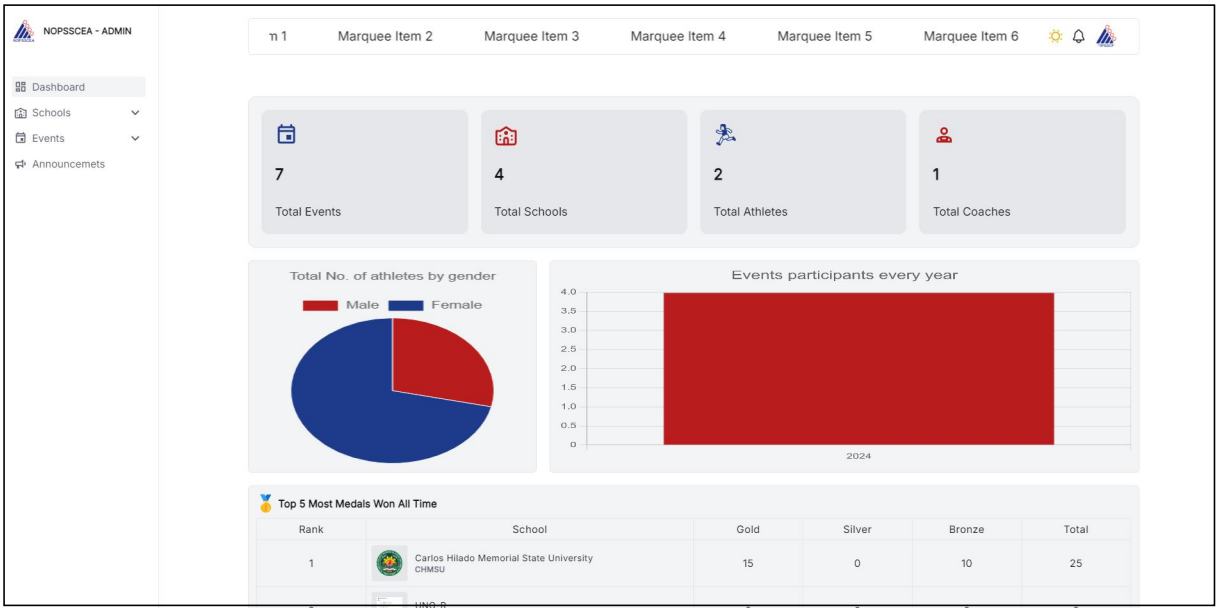

Figure 13 shows an overview of sports event data, including participant numbers, total schools, total athletes, total coaches, top-performing schools, and schools with the most medals won of all time.

Evaluation of the System

Table 13

Functional Suitability

Functional Suitability	Mean Score	Interpretation
Functional completeness	4.72	Excellent
Functional correctness	4.84	Excellent
Functional appropriateness	4.8	Excellent
Total Score/ Mean Score	**4.79**	**Excellent**

Table 13 shows the system's mean score of 4.72 in Functional Completeness, indicating that it delivers its intended features comprehensively and efficiently. For Functional Correctness, the system scored 4.84, demonstrating its ability to perform accurately and meet its objectives. Functional Appropriateness received a score of 4.80, highlighting the system's reliability, ease of navigation, and alignment with its purpose. With an overall mean score of 4.79, these results confirm the system's excellent performance in all aspects of functional suitability.

Table 14

Performance Efficiency

Functional Suitability	Mean Score	Interpretation
Time Behavior	4.68	Excellent
Resource Utilization	4.72	Excellent
Capacity	4.76	Excellent

Total Score/ Mean Score	**4.72**	**Excellent**

Table 14

The Performance Efficiency of the system was evaluated across three key aspects: Time Behavior, Resource Utilization, and Capacity. Time Behavior received a mean score of 4.68, indicating fast response times and a smooth user experience. Resource Utilization, with a score of 4.72, shows the system efficiently uses available resources like CPU, memory, and bandwidth. Capacity scored 4.72, meaning the system handles typical user demands effectively, though it may have some limitations under heavy load. The total mean score of 4.72 reflects overall strong performance across these areas.

Table 15

Usability

Usability	**Mean Score**	**Interpretation**
Appropriateness	4.84	Excellent
Recognizability	4.84	Excellent
Learnability	4.92	Excellent
Operability	4.68	Excellent
User Error Protection	4.72	Excellent

User Interface Aesthetics	4.8	Excellent
Accessibility	4.68	Excellent
Total Score/ Mean Score	4.78	**Excellent**

Table 15

The system's Usability was evaluated in several areas. It scored 4.84 for Appropriateness Recognizability, indicating intuitive features, and 4.92 for Learnability, showing users could easily understand and navigate the system. With a score of 4.68 in Operability, users found the system easy to use. User Error Protection scored 4.72, excellent error prevention, while User Interface Aesthetics scored 4.8, reflecting excellent performance. Accessibility also received a high score of 4.68, ensuring the system is user-friendly for all. The overall mean score of 4.78 reflects strong usability.

Table 16

Compatibility

Compatibility	**Mean Score**	**Interpretation**
Co-existence	4.05	Very Good
Interoperability	4.10	Very Good
Total Score/ Mean Score	**4.1**	**Very Good**

Table 16

The Compatibility of the system was evaluated based on Coexistence and Interoperability. The system received a mean

score of 4.05 for Co-existence, indicating that it functions well alongside other systems without conflicts. For Interoperability, the system scored 4.10, reflecting its ability to work effectively with other platforms and technologies. The total mean score for Compatibility is 4.1, suggesting that the system is compatible and performs well in interacting with other systems and technologies.

Table 17

Reliability

Reliability	**Mean Score**	**Interpretation**
Maturity	4.8	Excellent
Availability	4.76	Excellent
Fault tolerance	4.72	Excellent
Recoverability	4.84	Excellent
Total Score/ Mean Score	4.78	**Excellent**

Table 17

The Reliability of the system was assessed across four factors: Maturity, Availability, Fault Tolerance, and Recoverability. The system scored 4.8 for Maturity, indicating a stable and well-developed system. For

Availability, it earned a score of 4.72, showing that the system is consistently available and operational. The Fault Tolerance score of 4.72 suggests that the system can handle errors and continue functioning effectively. Recoverability, with a score of 4.84, reflects the system's ability to recover from failures. The total mean score for Reliability is 4.78, indicating that the system is reliable overall, with strong performance in key areas.

Table 18

Security

Security	**Mean Score**	**Interpretation**
Confidentiality	4.84	Excellent
Integrity	4.88	Excellent
Non-repudiation	4.84	Excellent
Accountability	4.84	Excellent
Authenticity	4.88	Excellent
Total Score/ Mean Score	4.86	**Excellent**

Table 18

The Security of the system was assessed across five areas. Confidentiality scored 4.84, indicating excellent data protection, while Integrity scored 4.88, showing accurate and trustworthy data. Non-repudiation scored 4.84, excellent in

preventing users from denying actions. Accountability received 4.84, indicating effective tracking of user actions, and Authenticity scored 4.88, showing reliable user verification. The overall security score of 4.86 is categorized as Excellent, indicating effective performance.

Table 19

Maintainability

Maintainability	**Mean Score**	**Interpretation**
Modularity	4.76	Excellent
Reusability	4.84	Excellent
Analyzability	4.72	Excellent
Modifiability	4.8	Excellent
Testability	4.8	Excellent
Total Score/ Mean Score	4.78	**Excellent**

Table 19

The Maintainability of the system was evaluated across five areas: Modularity, Reusability, Analyzability, Modifiability, and Testability. The system scored 4.76 for Modularity, indicating that its components are well-structured and easily manageable. Reusability received a score of 4.84, showing that the system's components can be reused effectively. The Analyzability score of 4.72 reflects that the system is easy to analyze for debugging and

improvements. Modifiability scored 4.8, suggesting the system is easy to modify and adapt to changes. Testability earned a score of 4.8, indicating that the system is easy to test for errors. The total mean score of 4.78 for maintainability suggests that the system is highly maintainable with strong performance across all areas.

Table 20

Portability

Portability	**Mean Score**	**Interpretation**
Adaptability	4.1	Very Good
Installability	4.0	Very Good
Replaceability	4.20	Very Good
Total Score/Mean Score	4.1	**Very Good**

Table 20

The Portability of the system was assessed in three areas: Adaptability, Installability, and Replaceability. The system received a score of 4.1 for Adaptability, indicating that it can easily be adjusted to different environments or platforms. Installability scored 4.0, showing that the system can be easily installed and set up on various devices or systems. Replaceability also received a score of 4.20, suggesting that components of the system can be replaced or upgraded without significant issues. With an overall Portability score of 4.1, the system is highly portable, demonstrating strong

flexibility in adapting, installing, and replacing components across different platforms.

The system's overall evaluation, based on various quality characteristics, demonstrates strong performance across most areas, with an overall mean score of 4.79, categorized as Excellent. It excels in Functionality Suitability (4.79), Performance Efficiency (4.72), and Usability (4.78), highlighting its high level of functionality, efficiency, and user-friendliness. Security received the highest score of 4.86, while Compatibility (4.1) and Portability (4.1) received lower ratings, indicating areas for improvement. Reliability (4.78) and Maintainability (4.78) are also rated very well, showing consistent performance and ease of maintenance. Overall, the system is praised for its functionality, performance, and security. All the feedback provided by respondents reflects excellent performance across the various criteria.