



Automating Student Registration and Placement for Seamless Athletic Tournaments

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Abstract:

Athletic tournaments play a crucial role in fostering well-rounded student development by promoting physical fitness, teamwork, and sportsmanship. However, the current manual system for managing student registrations and placements creates a significant logistical burden for schools and tournament organizers. This burden stems from repetitive tasks, meticulous record-keeping, and the complexities of re-registration and position assignment. These inefficiencies hinder the overall effectiveness of tournaments and diminish opportunities for student engagement. To address this challenge, this project proposes the development of Majlis Sukan Sekolah (MSS) Malaysia, an Android application designed to streamline athletic tournament management. The project employs an iterative development model to ensure the creation of a user-friendly, efficient, and reliable tool. Initial findings indicate that MSS Malaysia significantly reduces administrative burdens and errors, enhancing the overall experience for both organizers and participants. The application automates key processes, offers intuitive interfaces, and allows for seamless orchestration of events. Future work will focus on continuous testing, incorporating user feedback, optimizing performance, enhancing security measures, and providing comprehensive user training and support.

Key words: *Athletic tournaments, student registration, tournament management, mobile application, iterative development, automation.*

Introduction

Athletic tournaments serve as a cornerstone in fostering physical fitness, teamwork, and sportsmanship among students. These events, encompassing races, shot put, and high jump, contribute to well-rounded student development (Council on Sport, Physical Activity and Recreation, 2023). However, the logistical challenges of managing student registrations and placements often overshadow the excitement of competition (Jaye & Fryar, 2012).

The current manual system used by Majlis Sukan Sekolah Malaysia (MSS) for student registration presents a significant obstacle for both schools and tournament organizers. This process necessitates repetitive tasks and meticulous record-keeping, leading to inefficiencies and potential errors (Abd Rashid et al., 2018). While these tournaments play a vital role in nurturing athletic talent and promoting healthy lifestyles (Schaefer et al., 2016), the administrative burden associated with the manual workflow hinders their overall effectiveness.

The challenges extend beyond initial registration. Re-registering students and assigning positions presents another hurdle. Schools grapple with the intricacies of the process, while tournament organizers face the daunting task of manual position management. The absence of an automated system exacerbates these issues, impeding the smooth execution of athletic tournaments and diminishing their ability to foster student engagement and camaraderie (Abd Rashid et al., 2018).

A pressing need exists for an innovative solution that streamlines the registration process and automates student placement for athletic tournaments. By leveraging technology, such a solution has the potential to revolutionize event management. It can alleviate the administrative burden on schools and enhance the overall experience for all participants and organizers.

This project addresses these challenges by developing an Android application, MSS Malaysia, specifically tailored to the needs of schools and tournament organizers. Through iterative development and rigorous testing, MSS Malaysia strives to become a user-friendly, efficient, and reliable tool for seamless athletic tournament management. By automating key processes and offering intuitive interfaces, MSS Malaysia empowers schools and tournament secretariats to orchestrate successful events with ease and precision.

Research Methodology

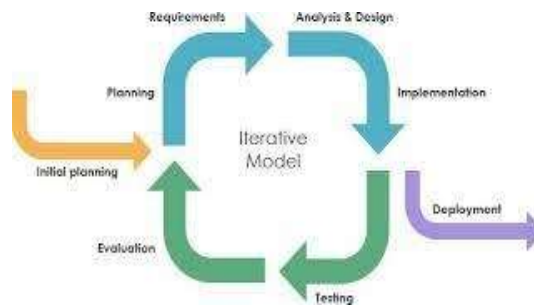


Figure 1: Iterative Model

The project adopts an iterative development model. This approach commences with a basic implementation of core functionalities, followed by progressive refinement and enhancement through repeated cycles until full functionality is achieved. Each iteration incorporates design changes and new features, facilitating continuous improvement. The Iterative model allows for the development of the system in a step-by-step manner, addressing requirements incrementally.

Application planning initiates the project. This phase assesses the need for a new system to achieve strategic objectives. It involves a comprehensive project proposal outlining the introduction, problem statement, goals, project scope, literature review, and methodology.

Next, in the Requirement Phase, a meticulous analysis and structuring of system requirements define the application's objectives. Collected requirements are organized and planned to streamline the development process.

Moving on to the Analysis and Design Phase, the foundation for the database model and business logic is established through in-depth analysis. Android Studio is chosen for app development due to its user-friendliness, and Firebase for its integration capabilities. Design activities encompass defining system features, establishing business rules, designing screen layouts, and creating entity relationship diagrams.

The Implementation Phase involves coding and building the user interface, followed by integration and testing. Unit tests are conducted throughout development to identify and rectify errors.

Finally, in the Testing Phase, rigorous testing is crucial to ensure the software's quality and functionality. Test cases are executed to validate the application's performance, comparing expected results with actual outcomes. The unit testing phase involves a detailed plan to detect any errors within the system. It focuses on testing individual units or components of the software to ensure they perform as designed. The plan includes various test cases, such as user login as a teacher or secretariat, with specific procedures, preconditions, and expected results defined. Each test case is executed, and the results are recorded as pass or fail. For example, the teacher login test verifies that the username, password, and other required fields are filled correctly, with the expected outcome being successful login and a notification of the school code. Integration testing, on the other hand, tests how different software modules work together. It's done by combining individual units of the program and testing them as a whole. The integration testing plan includes various test cases, such as verifying rules and regulations, participant numbers, menu navigation, and more. Each test case specifies the test procedure, preconditions, expected results, and the tester's result as pass or fail. For instance, the menu navigation test verifies that clicking the menu button displays the list of options for the user to navigate to another page, with the expected outcome being the successful display of the menu list.

Through this iterative methodology, the MSS Malaysia application is developed iteratively, ensuring alignment with user needs and industry standards. Each phase contributes to refining and enhancing the system, ultimately delivering a robust and user-friendly Android application for efficient tournament management.

Analysis and Discussion

The development of the MSS Malaysia system resulted in a user-friendly and efficient tool for managing athletic tournaments. Figures 1 through 6 showcase the system interfaces, illustrating the streamlined user experience. User Acceptance Testing (UAT) was conducted by the end-users, primarily schools and tournament organizers, to verify and accept the software system before its deployment.

The UAT plan included acceptance criteria and test results for various functionalities, such as login, student registration, deletion and update sections, search navigation, contact us, and logout. Each test result was recorded as pass or fail, along with any comments from the testers. For instance, the student registration test verified that the user could fill in the required details and save them successfully. This test was marked as a pass due to the efficient auto-generation of participant numbers. Figures 1 through 6 illustrate the following:



Figure 1: Login Page



Figure 2: Student Registration by Category



Figure 3: Drawer Navigation Interface

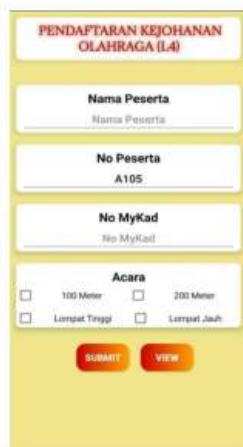


Figure 4: Athletic Tournament Registration Interface

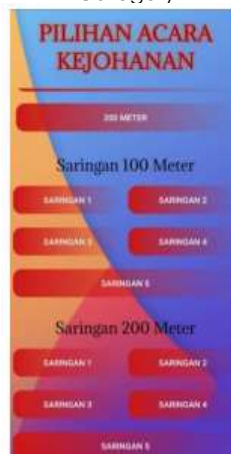


Figure 5: Athletic Tournament Registration Interface



Figure 6: 100/200 Meter Student Update Interface

These figures demonstrate the system's key interfaces and the ease of navigating through various functionalities. Overall, these testing phases ensured a thorough evaluation of the system's functionalities and validated its performance according to predefined criteria, leading to a robust and reliable software product.

Conclusion and Recommendation

The implemented testing phases, encompassing unit testing, integration testing, and user acceptance testing, played a pivotal role in guaranteeing the robustness and dependability of the MSS Malaysia Application. These meticulous procedures ensured a rigorous evaluation of all application aspects, leading to the identification and rectification of any potential glitches or concerns. Consequently, the application has been verified to meet the specified criteria and deliver a seamless user experience.

To further optimize the performance and usability of the MSS Malaysia Application, several recommendations are proposed. Firstly, establishing a continuous testing protocol is crucial to address any future updates or



modifications, ensuring sustained reliability. Secondly, implementing a user feedback mechanism can provide valuable insights into user preferences and areas for improvement. This allows the application to evolve and better meet user needs. Thirdly, conducting regular performance optimization tests is essential to maintain optimal responsiveness, particularly during peak usage periods. Fourthly, strengthening security measures is vital to protect sensitive student data. This may involve employing encryption techniques and access controls. Finally, providing comprehensive user training and support resources will enhance overall user satisfaction. User guides, tutorials, and a dedicated support channel can equip users with the knowledge and assistance they need to navigate the application effectively.

By incorporating these recommendations, the MSS Malaysia Application can continually improve its functionality, reliability, and user experience. This will allow it to fulfill its intended purpose of facilitating student registration and event management seamlessly, ultimately contributing to a more streamlined and efficient athletic tournament experience for all stakeholders.

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