UJ Sport Athlete and Booking Management System

Background, Problem Statement and Proposed Solution

Introduction:

UJ Sport Athlete and Booking Management System. This document aims to address the inefficiencies and challenges faced by UJ Sport's current athlete management and operational logistics systems. Through a comprehensive digitization effort, we propose a solution that will revolutionize the way athlete-related activities are managed, ultimately enhancing performance and efficiency within the organization.

This document will cover various sections, including the company/industry background, current systems and procedures, problem statement, proposed solution, and additional considerations for actor-specific solutions. Each section will provide detailed insights into the existing landscape, challenges, and proposed solutions to drive meaningful change and improvement.

Background:

UJ Sport is a leading entity in the sports industry dedicated to promoting physical fitness, talent development, and athletic excellence within the university community. With a diverse range of sports programs and facilities, UJ Sport plays a vital role in supporting the holistic development of its athletes and fostering a culture of sportsmanship and teamwork.

In recent years, the sports industry has witnessed significant advancements in technology and management practices, leading to higher expectations for efficiency, performance, and athlete well-being. However, UJ Sport's current systems and procedures have struggled to keep pace with these developments, resulting in inefficiencies and challenges in athlete management and operational logistics.

Current Systems and/or Procedures:

UJ Sport's current athlete management system tracks athlete's progress and training sessions attendance manually on platforms like excel and WhatsApp; and in some in cases word of mouth.

1. Manual Tracking via Excel and WhatsApp: Athlete progress, training session attendance, and communication are primarily managed through manual methods such as Excel spreadsheets and WhatsApp groups. This approach lacks integration and real-time updates, leading to data discrepancies and communication delays.

2. Word of Mouth Communication: Critical information regarding training sessions, scheduling changes, and other important updates is often communicated through informal channels like word of mouth. This informal communication method is prone to misunderstandings and can result in missed opportunities and confusion among athletes, coaches, and managers.

3. Booking Processes: Booking for gym slots and sports buses is currently a cumbersome process, involving multiple phone calls and manual coordination with individuals responsible for booking management. This fragmented approach leads to scheduling conflicts, wasted time, and frustration among stakeholders.

There are existing systems and software solutions in the market that offer functionalities similar to those proposed for the UJ Sport Athlete and Booking Management System. Here are some examples:

Athlete Management Systems:

TeamSnap: TeamSnap is a sports team management software that allows coaches and managers to organize team schedules, communicate with athletes and parents, track attendance, and share team updates. It provides features for scheduling, communication, and roster management, similar to the proposed athlete management system.

SportEasy: SportEasy is another sports team management platform that offers tools for scheduling, communication, and performance tracking. It allows coaches to create training sessions, track attendance, analyse performance metrics, and communicate with athletes and team members.

Booking Systems:

BookedIN: BookedIN is an online booking system that allows businesses to manage appointments, reservations, and bookings. While primarily designed for service-based businesses, it offers customizable booking forms, real-time availability updates, and automated reminders, which can be adapted for gym slot bookings and sports bus reservations.

Bookly: Bookly is a WordPress plugin that provides online booking and scheduling capabilities. It allows businesses to set up booking forms, manage appointments, accept payments, and send automated notifications. With customization options, it can be configured to handle gym slot bookings and transportation reservations.

While these existing systems may not offer the exact combination of features and functionalities proposed for the UJ Sport Athlete and Booking Management System, they provide valuable insights into the types of solutions available in the market and can serve as reference points for designing and developing the proposed system.

Problem Statement:

The current athlete management system at UJ Sport is riddled with inefficiencies and limitations, impeding the organization's ability to effectively manage athlete-related activities and operational logistics. These challenges have manifested in these key areas:

1. Lack of Integration: The existing systems and manual methods employed by UJ Sport operate in silos, lacking integration and coherence. Data fragmentation and communication gaps hinder collaboration and decision-making processes. Coaches, athletes, and managers struggle to access and share critical information seamlessly, leading to disjointed workflows and missed opportunities for optimization.

2. Inefficient Communication: Informal communication channels, such as word of mouth and messaging platforms like WhatsApp, have become the primary means of disseminating information regarding training schedules, updates, and event notifications. However, these channels are prone to inconsistencies, resulting in missed updates, scheduling conflicts, and confusion among stakeholders. As a result, athletes may miss important sessions, coaches may overlook performance updates, and managers may struggle to coordinate logistics effectively.

3. Manual Booking Processes: Booking procedures for gym slots and sports buses are characterized by tedious manual processes, consuming valuable time and resources. Coaches and administrators must navigate through multiple channels and engage in time-consuming phone calls to secure bookings. This inefficiency not only impacts operational efficiency but also contributes to athlete dissatisfaction and frustration. Moreover, the lack of real-time availability updates and capacity management exacerbates scheduling conflicts and compromises the athlete experience.

4. Data Inaccuracy and Redundancy: The prevalence of manual data entry and disparate systems contributes to data inaccuracy and redundancy. Inconsistent data entry practices and the absence of centralized data management result in duplicate records, outdated information, and inaccuracies in athlete profiles, performance metrics, and scheduling details.

5. Limited Access to Critical Information: The lack of centralized access to critical information hampers decision-making and performance analysis. Coaches, athletes, and managers struggle to access comprehensive athlete profiles, performance trends, and scheduling updates, hindering their ability to make informed decisions and optimize training strategies.

6. Inefficient Injury Management: The absence of a dedicated injury management module complicates the process of tracking and managing athlete injuries. Coaches, athletes, and medical professionals lack a centralized platform to record injury history, track rehabilitation progress, and communicate treatment plans, leading to delays in recovery and increased risk of re-injury.

7. Limited Coaching Support: Coaches lack comprehensive tools to provide personalized feedback, training plans, and performance evaluations to athletes. The absence of interactive coaching tools hampers the coaching process, hindering skill enhancement and technique refinement for athletes.

These challenges collectively undermine UJ Sport's ability to deliver optimal athlete performance, facilitate effective communication, and streamline operational workflows. The disjointed nature of existing systems and procedures results in suboptimal performance, missed opportunities for improvement, and overall dissatisfaction among athletes, coaches, and managers. Urgent intervention is required to address these issues and implement a comprehensive solution that integrates systems, enhances communication channels, and systemises booking processes to drive efficiency and improve the athlete experience.

Proposed Solution:

To address these challenges, we propose the implementation of the UJ Sport Athlete and Booking Management System. This system will provide a centralized platform for managing athlete-related activities and operational logistics, offering the following key features:

- **Comprehensive Athlete Profiles:** Detailed profiles containing essential athlete information, demographics, medical history, and performance metrics.
- **Dynamic Scheduling and Calendar:** Streamlined scheduling capabilities for managing training sessions, competitions, and personal appointments, integrated with external calendars and notification systems.
- **Performance metrics:** Dedicated athlete performance tracking enabling monitoring of training progress and performance metrics.
- **Virtual Injury Management:** Seamless communication between athletes, coaches, and medical professionals for tracking injuries, rehabilitation programs, and injury prevention strategies.

- **Interactive Coaching and Feedback:** Tools for personalized feedback, training plans, and performance evaluations, including video analysis for technique refinement and skill enhancement.
- **Enhanced Team Management:** Features for roster organization, communication, and collaboration, including group training schedules and coordination tools.
- **Robust Reporting and Analytics:** Comprehensive reporting and analytics capabilities providing valuable insights into athlete performance, team dynamics, and strategic planning.

Additionally, the system will include efficient booking systems for gym slots and transportation, offering real-time availability updates and capacity management to optimize facility usage and streamline transportation logistics.

By implementing this solution, UJ Sport will significantly enhance its operations, athlete performance, and overall efficiency, empowering athletes and coaches to achieve new levels of success.

For a minimum viable product (MVP) of the UJ Sport Athlete and Booking Management System, our focus will be on delivering essential features that address the core challenges identified in the problem statement while providing immediate value to users.

1. User Authentication and Profiles:

- Allow athletes, coaches, and managers to create accounts and access their profiles.
- Basic profile fields such as name, contact information, and role (athlete, coach, manager).

2. Scheduling and Calendar:

- Implement a basic scheduling system to allow coaches to create and manage training sessions, competitions, personal appointments, and team meetings.
- Include basic calendar functionality for athletes and coaches to view upcoming events and schedules.

3. Virtual Injury Management:

- Provide a simple interface for recording and tracking athlete injuries.
- Allow coaches and medical professionals to add injury details, treatment plans, and progress updates.

4. Interactive Coaching and Feedback:

- Enable coaches to provide feedback and training plans to athletes.
- Include basic text-based feedback and training plan creation functionalities.

5. Performance Management:

- Allows coaches to efficiently manage athlete performance data. Coaches can add new performance entries, view previous entries, and access automatically generated performance graphs and reports for individual athletes.

6. Team Management:

- Allow coaches to create and manage team rosters.
- Implement basic communication features for coaches and team members.

7. Basic Reporting and Analytics:

- Provide basic reporting capabilities, such as viewing athlete attendance and performance metrics.
- Include simple analytics to track trends and performance over time.

8. Booking Systems:

- Implement a basic booking system for gym slots and sports buses.
- Allow coaches to reserve slots and request for transportation through the platform.

9. User Interface (UI) and User Experience (UX):

- Design a clean and intuitive interface for easy navigation and use.
- Ensure a responsive design to support access from different devices (desktop, tablet, mobile).

10. Notification System:

- Implement basic notification functionalities to alert users of upcoming events, changes in schedules, or new messages.

11. Security Measures:

- Implement basic security measures to protect user data and prevent unauthorized access.

This MVP will provide the essential functionalities needed to address the core challenges identified in the problem statement while laying the foundation for future enhancements and additional features based on user feedback and evolving requirements.

Requirements Extraction

Functional Requirements

1. Login:
    - All Users should have the ability to enter their email address and password.
    - All Users should have the ability to update their passwords.
    - The system will authenticate a User by comparing their email addresses and passwords with entries in the user database table.
2. Profile Creation & management:
    - A Sports Manager should have the ability to create a new profile for all other stakeholders.
    - A Sports Manager should have the ability to update information in existing athlete profiles.
    - A Sports Manager should have the ability to remove a profile.
    - A Sports Manager, Coach, Medical Professional, Athlete, and Logistics Manager should have the ability to view their profiles.
3. Performance Management:
    - A Coach should have the ability to add a new athlete performance entry and capture additional notes for each entry.
    - A Coach should have the ability to view an athlete's previous performance entries.
    - The system generates a performance graph based on an Athlete's performance data.
    - A Coach should have the ability to view an Athlete's performance graph.
    - The system generates a performance report.
    - A Coach should have the ability to view an Athlete's performance report.
    - A Coach should have the ability to download an Athlete's performance report.
4. Injury Management:
    - A Coach should have the ability to add a new injury entry for an athlete; capture from fields such as type of injury, severity, and affected body part.
    - A Medical Professional should have the ability to upload athlete recovery progress report.
    - The system generates an injury graph based on data from previous injury entries.
    - A Medical Professional, Coach, and Sports Manager should have the ability to view an Athlete's injury graph.
    - A Coach and Sports Manager should have the ability to view and download an Athlete's progress report.
5. Attendance Management:
    - The system generates an attendance code.
    - A Coach should have the ability to share an attendance code.
    - An Athlete should have the ability to enter an attendance code.
    - The system generates an attendance graph based on an Athlete's attendance entries.
    - A Coach should have the ability to view an Athlete's attendance graph.
6. Team Management:
    - A Coach and Sports Manager should have the ability to add an Athlete to a team (e.g. 1st Team, 2nd Team, women's team, etc).
    - A Coach and Sports Manager should have the ability to remove an Athlete from a team.
    - A Coach and Sports Manager should have the ability to view all teams.
    - An Athlete should have the ability to view their team.
7. Calendar Scheduling:
    - A Coach and Sports Manager should have the ability to add training session, competition, team meeting, and personal meeting events to the schedule. With event specifications of date, time, location, duration, and type of event.
    - A Coach and Sports Manager should have the ability to edit an event that was previously scheduled.
    - A Coach and Sports Manager should have the ability to remove/cancel an event from the schedule.
    - A Coach, Sports Manager, and Athlete should have the ability to view events in the schedule and export the calendar.
8. Reporting and Analytics:
    - A Sports Manager should have the ability to view an average attendance graph for a certain time interval.
    - A Sports Manager should have the ability to view an average progression graph for the different teams.
    - A Sports Manager should have the ability to view an average progression graph for all the athletes.
    - A Sports Manager should have the ability to view an average attendance graph for different teams.
    - The system generates all the graphs needed in this subsystem.
9. Announcements & Notifications:
    - A Coach and Sports Manager should have the ability to add an announcement; with specifications of title, details, and type.
    - The system will send notifications when a new announcement is published.

- A Coach and Sports Manager should have the ability to view all previously published announcements.
- A Coach and Sports Manager should have the ability to specify which teams and Athletes can view an announcement (viewing rights).
- An Athlete should have the ability to view announcements that they have been granted viewing rights to.
- A Coach and Sports Manager should have the ability to edit an announcement.
- A Coach and Sports Manager should have the ability to delete an announcement.

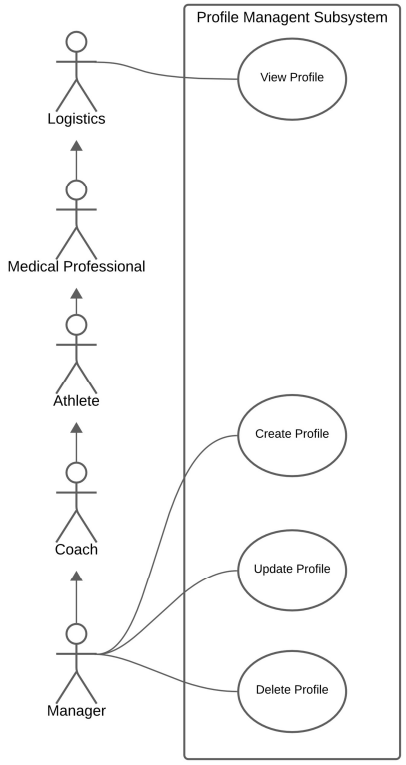
10. Session Completion Management:
    - An Athlete should have the ability to submit a new session completion entry.
    - An Athlete should have the ability to upload photographic proof of session completion on a submission form.
    - The system generates a session completion graph based on session completion entries.
    - A Coach should have the ability to view the session completion graph of an Athlete.
    - A Coach should have the ability to create a new session submission form.
    - A Coach should have the ability to edit a session submission form.
    - A Coach should have the ability to delete a session submission form.
11. Gym Slots Booking:
    - A Coach and Sports Manager should have the ability to reserve gym slots online using a calendar-based interface, displaying time slots and facilities.
    - A Coach and Sports Manager should have the ability to view all gym slot bookings, via calendar interface.
    - A Coach and Sports Manager should have the ability to cancel/ delete gym slot bookings.
12. Transportation booking:
    - A Coach and Sports Manager should have the ability to submit a Transportation Booking Request.
    - A Coach and Sports Manager should have the ability to view transportation booking confirmation.
    - A Logistics Manager should have the ability to submit booking confirmation.
    - A Logistics Manager should have the ability to view transportation booking requests.

Non-functional Requirements

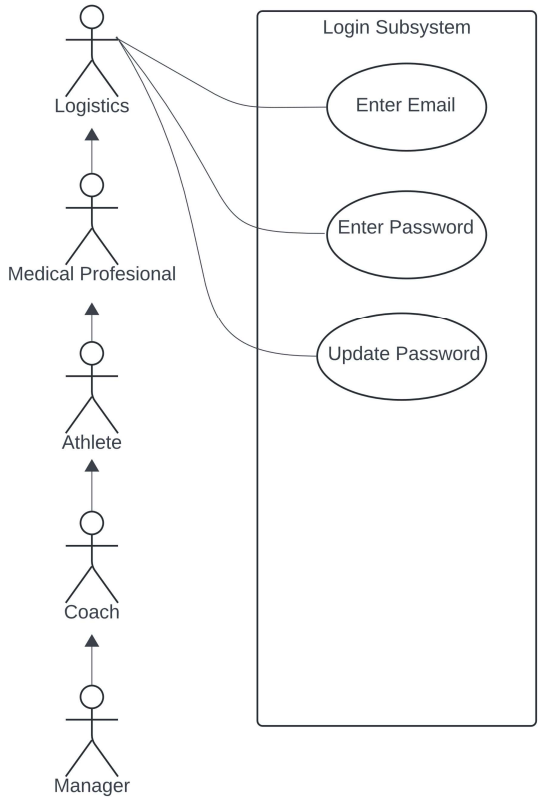
1. Performance – The system should maintain a user-acceptable performance through fluctuating system conditions. This requirement will use the following metrics:
    - Response Time: Specifies the response time for user requests. The response time of database requests, data processing, and output generation are all contributing factors that will determine the response time for user requests. The system is expected to have a reasonable response time.
    - Throughput: Specifies the maximum number of transactions and operations that the system can handle, within a given period of time. Many users will be interacting with the system. It is thus, necessary for the system to have the ability to handle many transactions and operations.
    - Scalability: Determines the system's ability to handle increased workloads by allocating more resources. It is essential that the system has a good scalability rating as more users will be added to the system as time progresses and this will, in turn, increase the system's workload.
    - Reliability: Specifies whether the system functions correctly during normal and abnormal conditions.
2. Scalability – The system should be adaptable to handle increased workloads by allocating more resources. The metrics are as follows:
    - Throughput: Indicating the maximum number of transactions and operations the system can handle, within a given period of time.
    - Capacity: Specifying the maximum number of users, or amount of data, the system can handle.
3. Accessibility – The system should be usable to all users, including users with disabilities (including visual and hearing impairment, or cognitive disabilities). The metrics for this requirement are as follows:
    - User Interface Design: Specifies the layout, navigation, and visual elements in the user interface. This field would answer the question of whether the flow of our user interface is intuitive.
    - Assistive Technology Capability: Does the system provide support for screen readers, magnifiers, and braille displays? Can our system integrate with voice recognition and dictation features? The Assistive Technology Capability rating will cover these bases.
    - Content Accessibility: This field will cover the basis of whether the content is perceivable and understandable by all users.
    - Learnability: Speaks to whether the mechanics of the system are easy to learn and understand.
4. Security – The system should adhere to certain security standards:
    - Authentication: Specifies the mechanisms for identifying users or systems, for integration.
    - Authorization: Defines the access rights and permissions granted to different roles.
    - Compliance ensures that the system adheres to laws, regulations, and industry standards. The following metrics are associated with compliance tracking:
        - Number of security controls implemented: Tracks the total number of security controls in place.
        - Security Policies and Procedures: Measuring the number of documented security policies and procedures demonstrating efforts to establish clear guidelines for security practices.
5. Auditability – associated with logs and audit trails for monitoring and accountability. The metrics for this requirement are as follows:
    - Visible Modification: Are changes, that are made to the system's data records, tracked? Defines the logging mechanisms that are in place for tracking data record modifications.
    - System Documentation: Does the documentation exist that would allow an auditor to understand a system's design, processes, and data flow? This field would track all documentation available for the system.
6. Portability:
    - Compatibility: This metric would define how well the system runs on various operating systems.
    - Platform Independence: Measures the degree to which the software relies on specific hardware and software platforms. The system should minimize dependence on platform-specific features.
    - Adaptability: Assesses how easily the system can be adapted to accommodate changes in requirements.
    - Data Portability: Assesses the software's ability to transfer data to different systems or between different versions of the software, to ensure data consistency.

Identification and Prioritisation of Use Cases

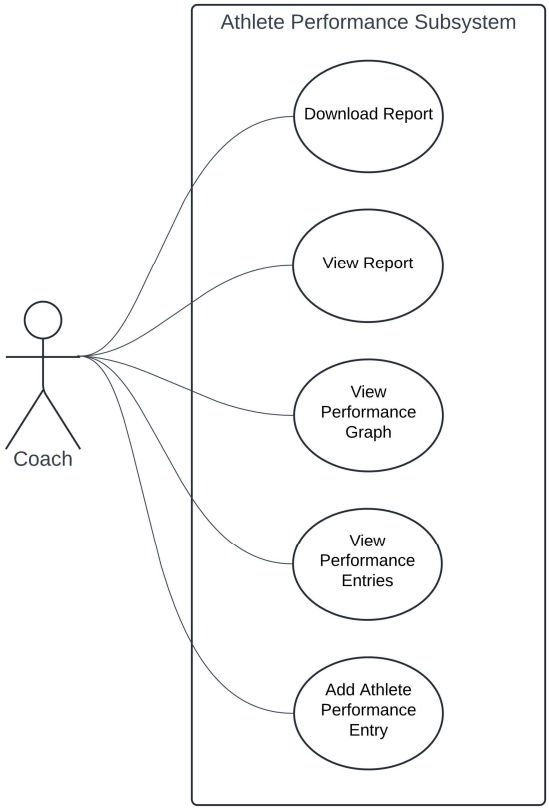
Profile Creation & management:



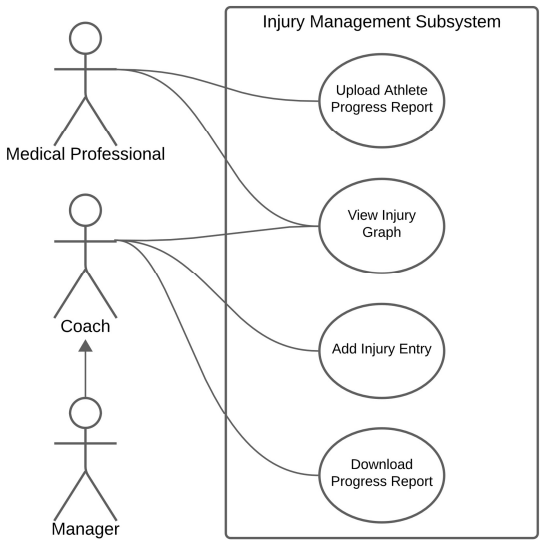
Login:



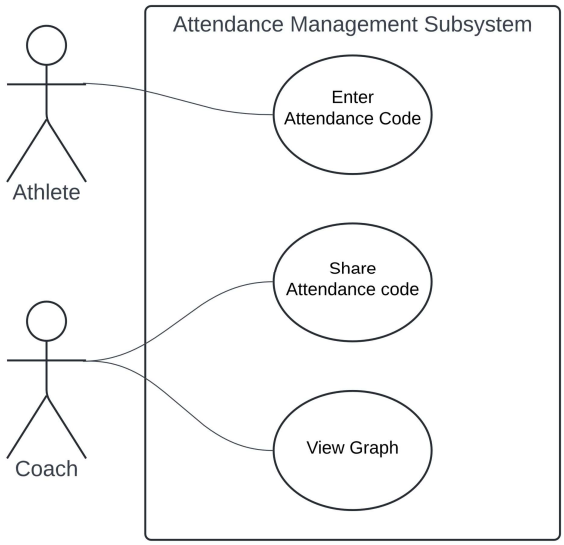
Performance Management:



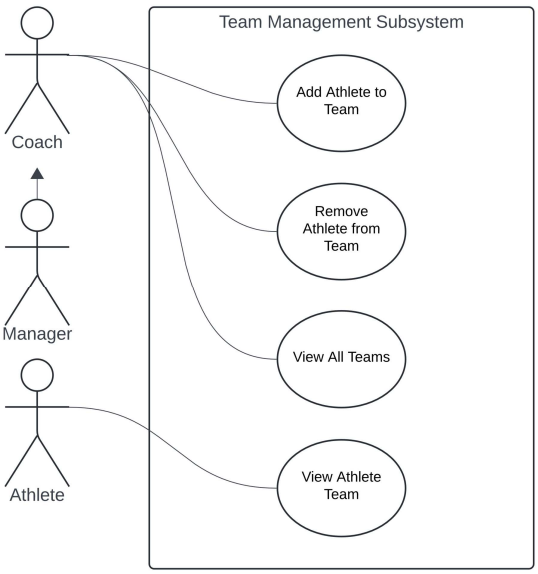
Injury Management:



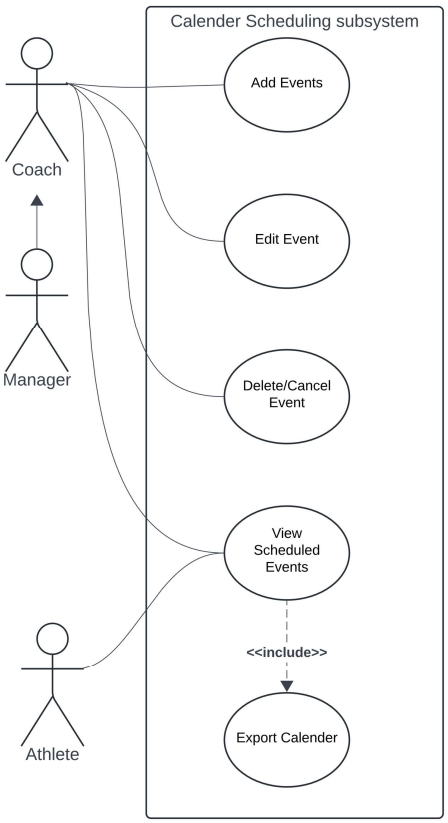
Attendance Management:



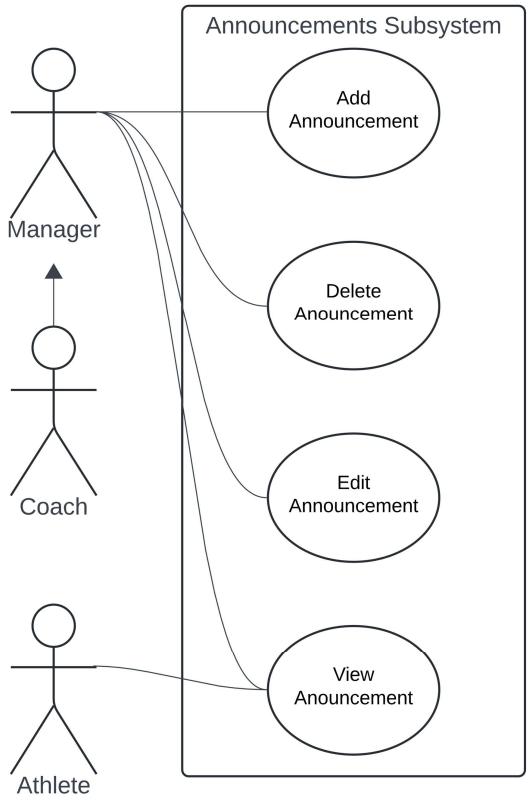
Team Management:



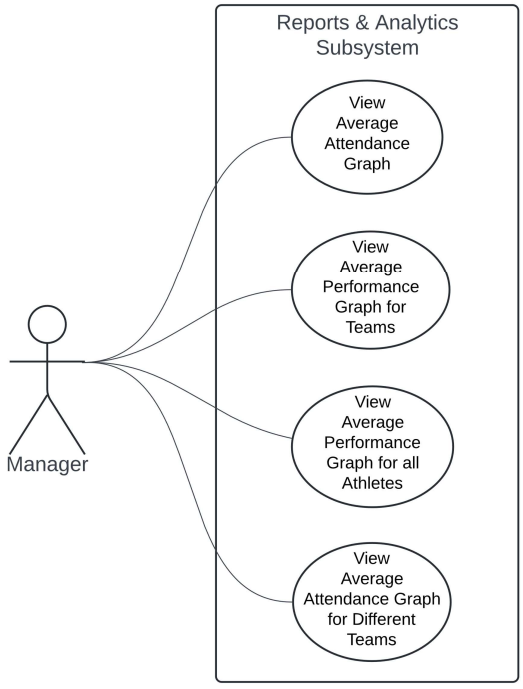
Calendar Scheduling:



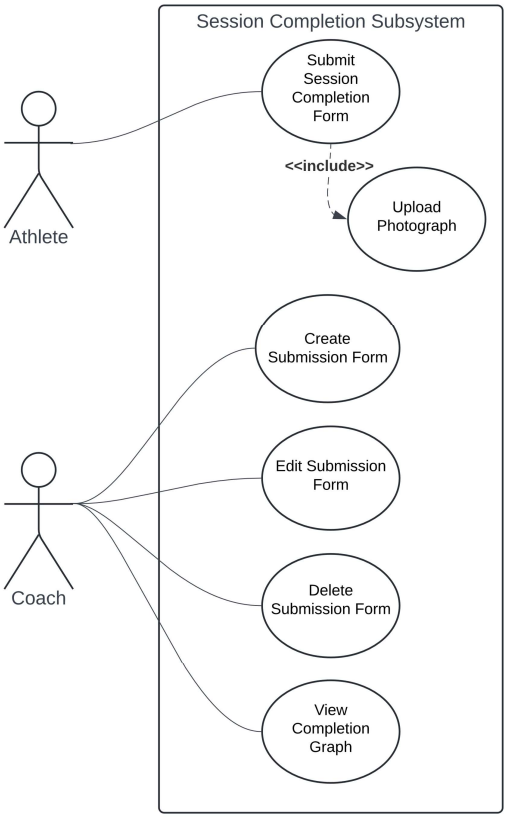
Announcements:



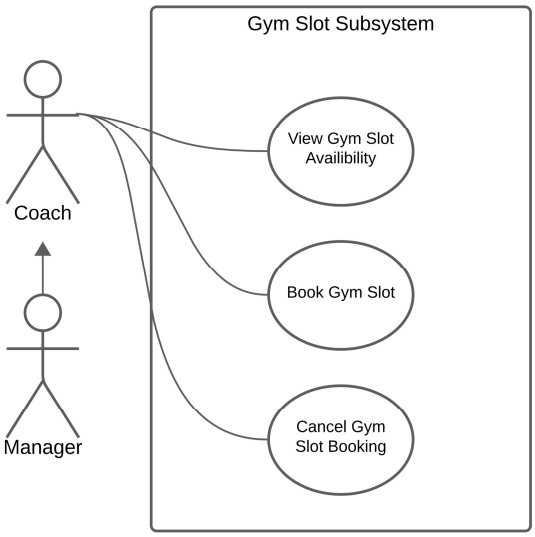
Reporting and Analytics:



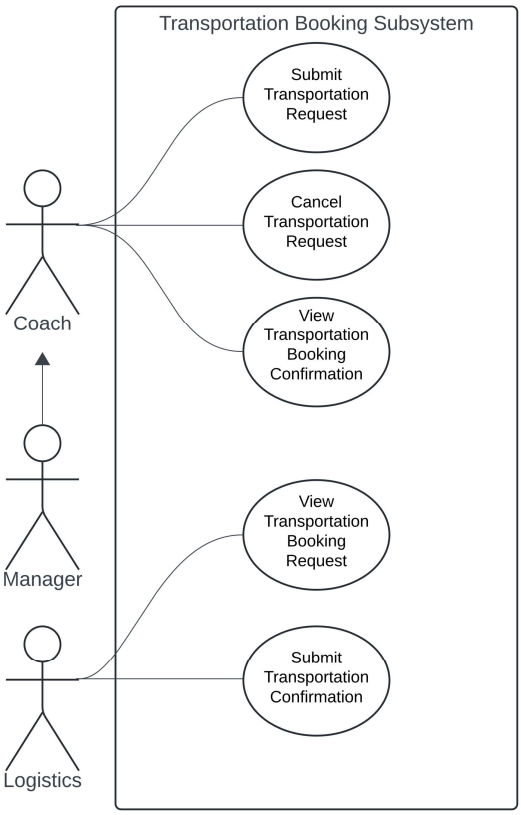
Session Completion Management:



Gym Slot Booking:



Transportation Booking:



Feasibility and Risk Study

Feasibility Study

a. System Feasibility:

Similarities with existing systems: While there are existing systems like TeamSnap and SportEasy for athlete management and BookedIN and Bookly for booking systems, the proposed UJ Sports Athlete and Booking Management System offers a unique combination of features tailored to UJ Sport's specific needs. The proposed system addresses integration issues, communication inefficiencies, and manual booking processes, providing a comprehensive solution. The proposed system aims to offer a more streamlined and customized solution by integrating these functionalities into a single comprehensive platform.

b. Technical Feasibility:

Hardware and software requirements:

Software: The proposed technologies such as coding languages (HTML, CSS, JavaScript and C#), databases (MySQL), and application frameworks (React Native, ASP.NET Core) are widely used and easily accessible for development. However, as students, the team needs to have access to suitable hardware and software environments for development.

Hardware: Servers for hosting, storage devices, and network infrastructure are necessary, which could be a challenge.

Integration: The system needs seamless integration with existing systems like calendar applications and other tools used by UJ Sport.

c. Economic Feasibility:

As students, the team may face budget constraints. However, since the system aims to reduce operational costs and improve efficiency in the long term, it can be economically feasible.

However, open-source tools and platforms will help reduce development costs. The long-term benefits of the system, such as operational efficiency and improved athlete performance, justify the investment.

d. Operational Feasibility:

The system’s success will rely on the user’s acceptance and adoption. Providing user-friendly interfaces, comprehensive training, and ongoing support is crucial. Additionally, integrating a community channel in the mobile app can enhance user engagement and foster a sense of unity among athletes and coaches.

Risk Study:

a. Technical Risks:

Learning curve: Since the team consists of university students, we may encounter challenges in mastering new technologies like React Native and ASP.NET Core which may require additional time and effort from the team. Access to learning resources and mentorship will reduce this risk.

Integration challenges: Integrating front-end, back-end, and database components may pose technical challenges, particularly for a small team. Prototyping, thorough testing and regular communication among team members will help identify and address integration issues early to help address integration issues.

b. Operational Risks:

User adoption: Resistance to change among athletes, coaches, and managers could hinder the system's adoption. Engaging stakeholders early, gathering feedback, and conducting training sessions will mitigate resistance and promote user acceptance.

Maintenance and support: As students, we may face difficulties in providing ongoing maintenance and support for the system. Establishing clear support processes and leveraging community resources will help us reduce this risk.

c. Financial Risks:

Budget constraints: Limited financial resources may impact the team's ability to acquire the necessary tools and resources for development. Exploring cost-effective options such as open-source tools will be a good solution for us to mitigate this risk.

d. Schedule Risks:

Time constraints: Balancing project work with academic commitments may result in delays in project delivery. Setting realistic timelines, prioritizing tasks, and effective time management can help us mitigate schedule risks.