

## Deliverable-2

### Team-9

1. The overall structure of the system. This should contain a diagram and brief descriptions about the system structure including individual components (subsystems)

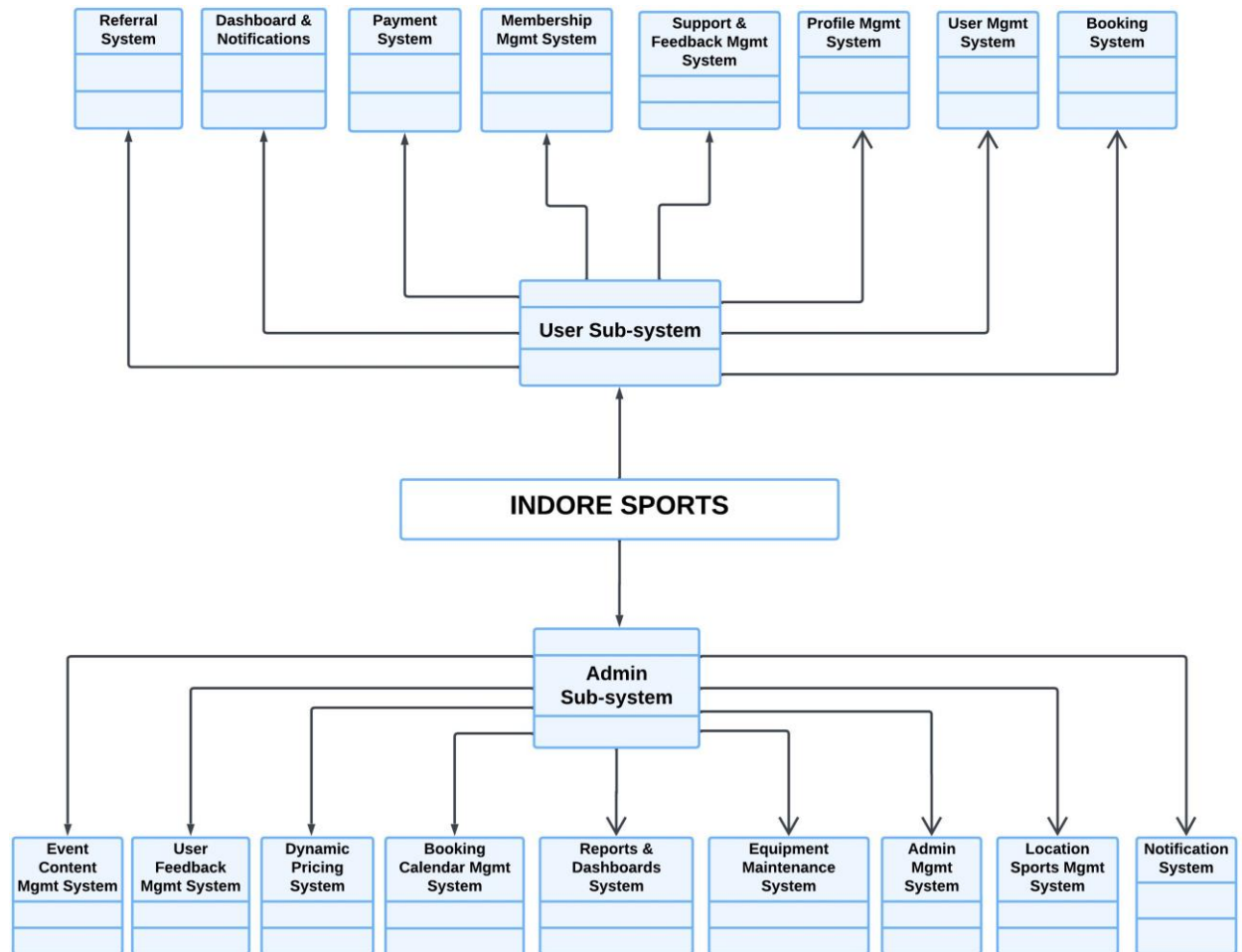


Figure-01

### Overall System structure:

The diagram illustrates the modular architecture of the Indoor Sports Booking System, breaking it into two primary subsystems:

1. User Subsystem
2. Admin Subsystem

Each subsystem interacts with different functional modules to manage bookings, payments, notifications, and other user/admin-related operations.

## **1. User Subsystem**

The User Subsystem handles all user-related functionalities, allowing users to register, book slots, manage profiles, and interact with the system. It consists of the following submodules:

### **Referral System**

- Users can refer friends and earn points.
- Tracks and updates referral rewards.

### **Dashboard & Notifications**

- Displays user activity (upcoming bookings, referral points, and membership status).
- Sends email and push notifications for booking confirmations, cancellations, and membership renewals.

### **Payment System**

- Secure online payments for slot bookings, membership subscriptions, and equipment rentals.
- Handles refunds and payment history.

### **Membership Management System**

- Allows users to subscribe to membership plans for discounted or premium access.
- Handles membership renewal and cancellations.

### **Support & Feedback Management System**

- Provides an interface for FAQs, customer support contact, and ticketing system.
- Allows users to submit feedback on facilities and bookings.

### **Profile Management System**

- Users can update their profile information, change passwords, and manage location preferences.
- Displays referral points and membership status.

### **User Management System**

- Manages user authentication (login/logout) and account settings.
- Tracks activity history, including past bookings and payments.

### **Booking System**

- Allows users to view available sports facilities and book slots.
- Maintains calendar-based booking management for users.
- Supports modifying or canceling existing bookings.

## **2. Admin Subsystem**

The Admin Subsystem provides administrators with the tools to manage sports facilities, users, bookings, pricing, and reports.

### **Event Content Management System**

- Admins can update homepage banners with upcoming events.
- Allows scheduling promotions and announcements.

### **User Feedback Management System**

- Admins can review user ratings and feedback on sports facilities.
- Helps in resolving issues reported by users.

### **Dynamic Pricing System**

- Implements price variations for peak and off-peak hours.
- Supports custom discount rules for memberships.

### **Booking Calendar Management System**

- Provides an admin calendar view to manage and approve bookings.
- Allows walk-in registrations and adjustments to booking slots.

### **Reports & Dashboards System**

- Generates analytical reports on bookings, payments, and user activity.
- Admins can track profitability and occupancy rates.

### **Equipment Maintenance System**

- Tracks sports equipment usage and maintenance schedules.
- Admins can update availability status for rentals.

### **Admin Management System**

- Supports multi-admin access with different permission levels.
- Allows creation and deletion of admin accounts.

### **Location & Sports Management System**

- Admins can add, edit, or remove sports facilities at different locations.
- Supports facility-based rules for availability.

### **Notification System**

- Sends alerts for new bookings, cancellations, and user requests.

- Supports bulk notifications for promotions and announcements.

## Interaction Diagram:



Figure-02

From frontend user sends request via API calls backend in backend it processes logic and interact with MySQL. It stores and retrieves system data.

## Subsystems:

### 1.Admin Workflow :

The following diagram illustrates the Admin Workflow of the Indoor Sports Slot Booking System with Equipment Rental, which represents how administrators go about accessing and utilizing the system step by step. The admin workflow begins at Admin Registration, where new administrators register for an account. Following the registration is the Admin Login process so that admins can log in to validate. If successfully logged in by the admin, then it checks if the admin is an existing user. If the admin is not present, they are pushed back to registration.

If there is successful verification of the admin, they have access to the Admin Dashboard, from where they can manage various system activities. The dashboard allows admins to manage users and roles so that they have appropriate control of access. They can even manage sports and venues by controlling their availability and info about various sporting venues. Also, the system contains functionality for managing slot availability, allowing users to book existing slots. The rental management of equipment is where admins can track rental activity.

The admin can also change prices of slot bookings and rentals according to need. The system also allows admins to view reports, getting a glimpse of the usage of the system, revenues, and user activity. Finally, customer support features aid administrators in solving user inquiries and issues in the most efficient way. This process ensures proper management, enhancing the user experience with guaranteed operational efficacy.

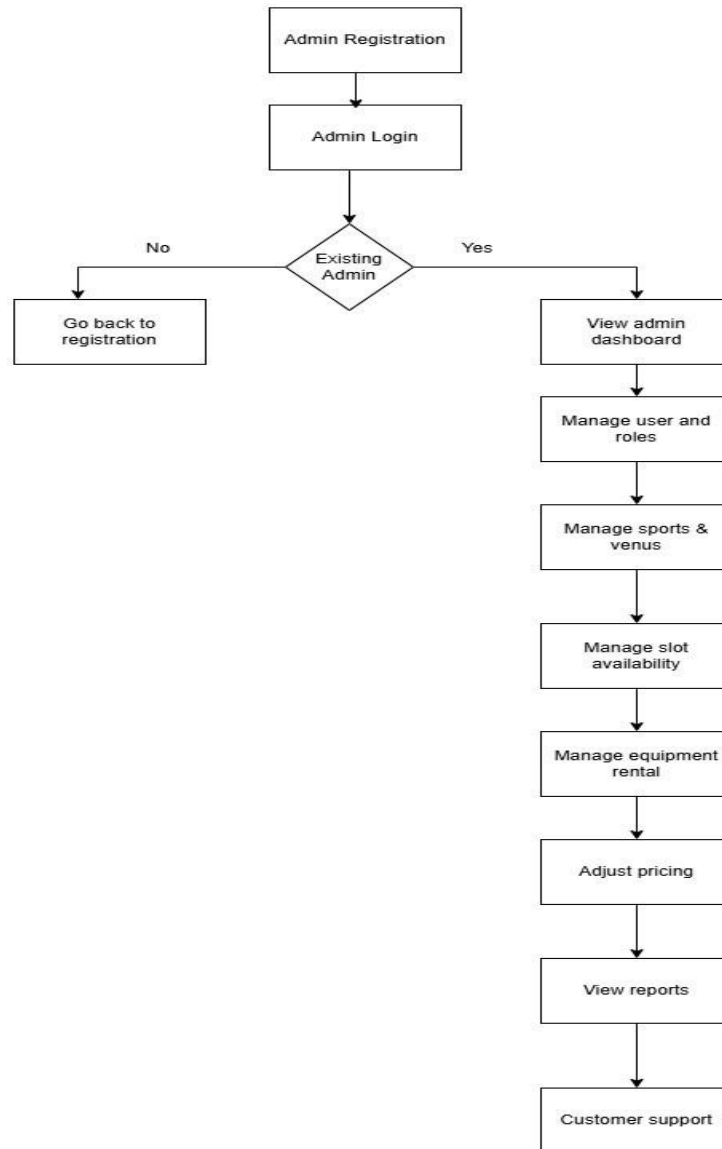


Figure-03

## 2. User Subsystem:

The following diagram illustrates the User Workflow for the Indoor Sports Slot Booking System with Equipment Rental, outlining the step-by-step process for users to register, book sports slots, and provide feedback. The process begins with User Registration, where new users create an account. After registration, users log in through the User Login page. The system then checks if the user is an existing user.

If the user does not exist, they are redirected back to the registration page. If the login is successful, users gain access to the Dashboard, where they can view available sports locations and slot availability. Users can then proceed with location access, followed by selecting their preferred sports activity. Afterward, users can view slot availability and select a date and time for booking. At this stage, users have two options: they can either proceed with equipment rental before making a payment or move directly to the payment process.

Once payment is completed, the system sends a booking confirmation email to the user. On the scheduled day, users check in at the venue to participate in the booked activity. Finally, users play and provide feedback on their experience, ensuring continuous improvement of the booking system and facilities. This structured workflow provides a seamless and efficient user experience, enhancing convenience for sports enthusiasts.

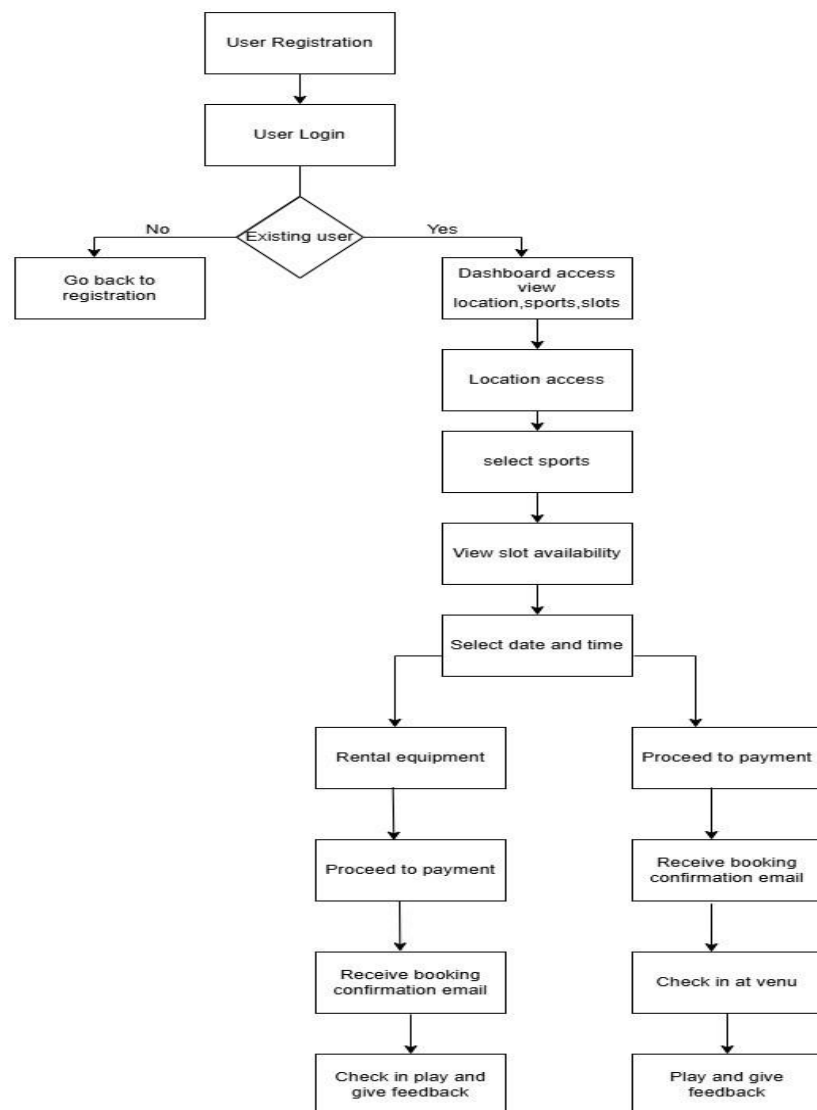


Figure-04

### 3.Booking subsystem:

The following diagram illustrates the Sports Slot Booking Process for project with Equipment Rental. The process initiates when a user selects a sport and venue, indicating that they wish to perform a specific activity. The system then indicates available slots for the chosen sport and venue, on which users can select an appropriate one. Once the user selects a date and time, they are given two options: proceed directly to payment or select equipment rental before payment. If the user rents equipment, they are redirected to the equipment rental page, where they can select the sporting equipment needed. Having selected the equipment, they proceed to the payment stage. If the user does not require equipment, they can proceed to the payment process directly after they have finished booking their slot. This streamlined workflow gives a seamless booking experience, where users have flexibility in choosing slots and equipment but also have an efficient payment process.

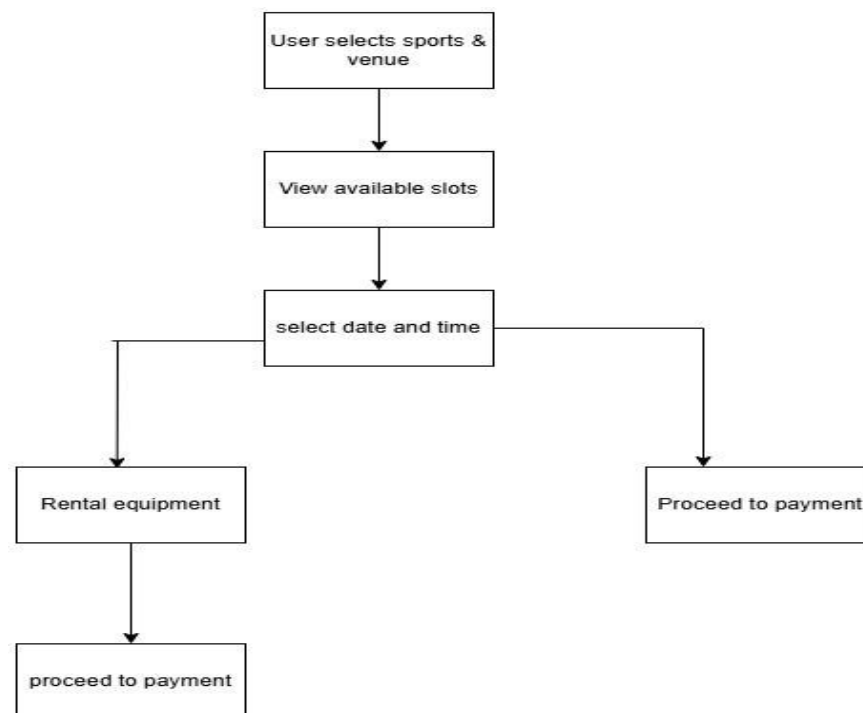


Figure-05

#### 4.Payment subsystem:

The following diagram shows the Payment Process Workflow of the Indoor Sports Slot Booking System with Equipment Rental. The process begins when a user proceeds to payment after selecting a sports slot and, if required, rental equipment. Users are offered the option to apply referral points for discounts prior to payment method selection. If they choose to pay using referral points, the system deducts the amount available, and then the user makes a payment method selection such as a credit card, PayPal. If the user doesn't pay using referral points, they go straight to the payment method selection. Once the payment method is chosen, the payment processing stage begins. If the payment is successful, a payment confirmation is generated by the system, and a confirmation email is sent to the user. If the payment fails, the user is prompted to retry the payment. This is done until a payment is successfully completed. The workflow structure gives a seamless, user-friendly payment experience with flexibility to provide discounts and handle potential transaction failures in an effective way.

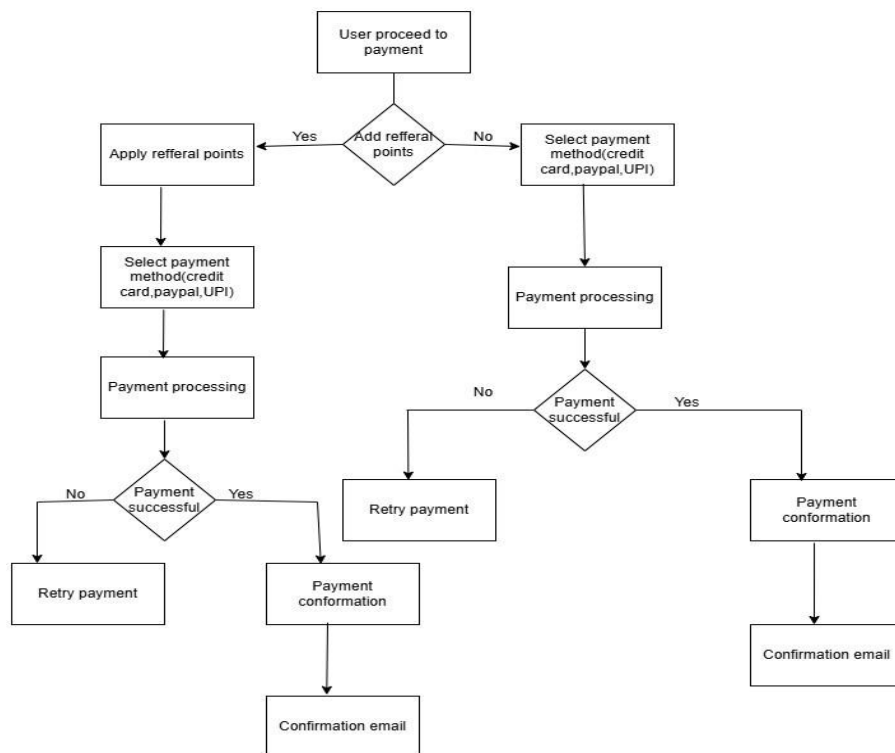


Figure-06



### **5. Equipment subsystem:**

The following diagram outlines the Equipment Rental and Return Process of the Indoor Sports Slot Booking System with Equipment Rental. It begins when a user books a sports slot and wishes to rent equipment. Next, the user is able to list available equipment and proceed with selecting the preferred equipment. The users can opt for using referral points to earn some rewards before proceeding to payment processing. Once the payment is confirmed, the system sends a confirmation email to the user. The user then picks up the equipment from the rented point. When the equipment is used, the user is required to return it, upon which an admin inspects the equipment for damage. In the event of no damage, the user is then able to give ratings and feedback for their experience. But if damage is incurred, the user is charged a damage fee before they are taken to the rating and feedback area. A workflow as efficiently structured as this ensures a smooth and prudent rental process that improves the user experience without compromising the quality of rental gear.

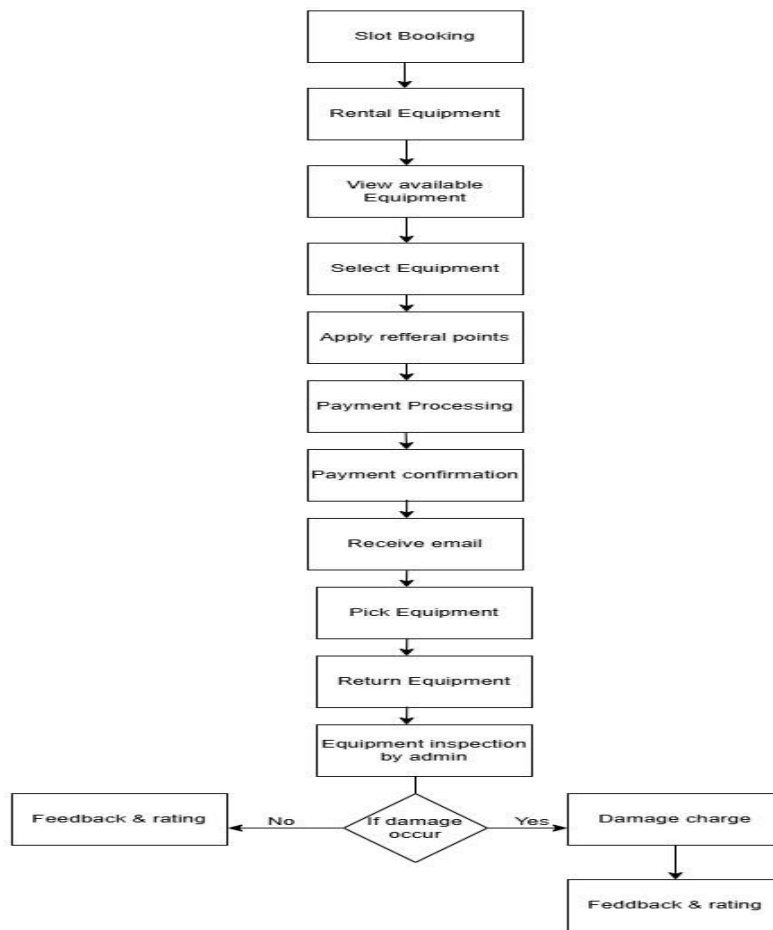


Figure-07

## 2. a. All Functional requirements

### User

1. **User Registration:** When a user enters the system, the user can register.
2. **Login and logout:** the user can be able to login and logout from system.
3. **Referral Option:** While registering to the system here there will be options like users can register through referral.

4. **Location Selection:** After login to the system, the user can view the user dashboard, in the user dashboard, user can access the location. Based on location available sports will be displayed to the user.
5. **Profile Management:** The system allows users to view and edit their profiles, including changing passwords.
6. **Referral Points:** referral points will be added to the user if they refer any one and these points will be in user's profile.
7. **Rating System:** User can provide feedback and ratings out of 5.
8. **Slot History:** The system will display the history of booked slots.
9. **Calendar View:** User can see the calendar view of booked slots and slots that are left in calendar view.
10. **Sports List:** User can see the list of sports available in particular location in the form of a dropdown.
11. **Membership Subscription:** User can allow to subscribe to membership plans.
12. **Payment Gateway:** The system can facilitate payment processing for memberships, slot bookings and rentals.
13. **Equipment Rentals:** Users are allowed to rent sports equipment if they needed.
14. **Home Screen Banner:** The system will show a banner on the home screen with navigation options.
15. **Booking Confirmation:** User will receive booking confirmation after payment is done through email.
16. **Customer Support:** The system provide a means for users to contact customer support provide FAQ users to contact through email or phone number.
17. **Forgot Password:** User can reset the password if they forget the password.
18. **Notifications:** The system sends email notifications for booking confirmations, cancellations.
19. **Referral Tracking:** The system will track referrals and update referral points accordingly.
20. **Feedback System:** The system allows users to provide feedback on their experience.
21. **User Dashboard:** The system will provide a personalized dashboard summarizing user activities, bookings, and points.
22. **Booking Modifications:** The system allows users to modify or cancel their bookings within a certain time frame.
23. **Membership Renewal:** The system will allow users to renew their membership subscriptions.
24. **Events:** update upcoming events on the home page.

## **Admin**

1. **Admin Registration:** existing admin can register another admin.
2. **Admin Login:** Existing admin can directly login to the system.

3. **Profile Management:** The system will allow admins to view and edit their profiles.
4. **Location Management:** The system allow admins to manage locations.
5. **Sports Management:** The system will allow admins to add, edit, and delete sports.
6. **Ratings Review:** admin can review the ratings given by user.
7. **Booking Management:** The system allows admins to view and manage booking slots and manage Walk-in Registration.
8. **Calendar Management:** admin can view the calendar for slot booking.
9. **Equipment Availability:** The system will allow admins to update equipment availability.
10. **Payment Management:** The system allow admins to manage payments.
11. **Notification System:** The system will notify admins of new bookings or cancellations.
12. **User Management:** User accounts will be manage by the admin.
13. **Report /Dashboard generation:** The system will generate reports on bookings, rentals, and payments.
14. **Event Management:** Website content can be mange by admin.
15. **Feedback Management:** The system allows admins to manage user feedback.
16. **Content Scheduling:** The system should allow admins to schedule content updates or promotions in advance.
17. **Multi-Admin Support:** The system supports multiple admin accounts with different access levels.
18. **Equipment Maintenance:** The system also allows admins to track and schedule maintenance for sports equipment.
19. **Dynamic Pricing:** The system allow admins to set dynamic pricing for peak and off-peak hours.

## **2. b. All Non-Functional requirements that are important to your system**

1. **Performance:** System can respond to user actions within 2 seconds.
2. **Scalability:** System can handle up to 10,000 concurrent users.
3. **Security:** The system will use encryption for sensitive user data.
4. **Availability:** The system will have an uptime of 99.9%.
5. **Usability:** The system will provide an intuitive user interface.
6. **Maintainability:** The system should be easy to update and maintain.
7. **Reliability:** The system will provide accurate information consistently.
8. **Accessibility:** The system should be accessible to users.

9. **Compatibility:** The system should be compatible with various web browsers and devices.

## 2. c. Interfaces (user, hardware, software, and/or communication):

### User interface:

This interface allows users (users, admin) to interact with the system. Web application which is of Responsive user interface. Technology used in this are HTML, CSS, JavaScript. Here features are user dashboard, slot booking, equipment rental, payment processing and profile management. In admin panel slot& venue management, user tracking, reports, pricing adjustment and equipment management.

**Hardware Interface:** Server infrastructure (AWS EC2, RDS, S3, lambda) for hosting backend Django and database MySQL user devices like laptop, mobile, tablet etc. for web based user interaction.

**Software interface:** For frontend to backend API, Restful APIs for backend database interface (MySQL via Django ORM) used for storing data like users, slots, booking, payment, rental equipment. Payment gateway (PayPal) for secure online payment processing. Notification system via email for sending booking confirmation.

**Communication interface:** Internet communication like HTTP for secure web communication between user devices and backend.

When it comes to user interface communication. We use web based and mobile based interface using technologies like HTML, CSS, JavaScript and HTTP communication protocol for secure data transmission which allow users to book slots, rent equipment, make payment and receive confirmation.

For frontend to backend communication, we use interface type API-based communication. Django rest Framework. communication protocol is HTTP with rest API calls. Which enables data exchange between user interface and backend handling like bookings, payments.

For backend database communication we use Django ORM with MySQL database. SQL queries with the help of a relational database for storing and retrieving user details, bookings, payment records and rental equipment.

## 3. Phase 1: Core System Development (MVP - Minimum Viable Product)

### Objective:

We build the basic structure of the system with essential functionalities for users and admins.

Functional Requirements in Phase 1 : (Timeline 2 weeks)

#### User Functionalities

- User Registration and Login --- It has Register, Login, and Logout
- Profile Management --- It has View/Edit Profile, Change Password
- Location Selection --- It has dropdown for choosing location
- Sports List Display-- Based on selected location all available sports in that location will be shown
- Booking System -- Users can book slots here
- Booking Confirmation --- Confirmation messages for slot booking
- Forgot Password --- Reset password functionality
- Customer Support --- Basic FAQ(frequently asked questions & contact info) will be updated

## **Admin Functionalities**

- Admin Registration and Login -- It has registration and login for admin.
- Profile Management (View/Edit) – Admin can manage his own profile .
- Sports Management (Add/Edit/Delete Sports) – Admin can be able to manage sports here.
- Booking Management (View & manage slots) -- Admin can be able to manage bookings here.
- Location Management (Manage locations) -- Admin can also manage locations .
- User Management -- Admin can be able to perform basic CRUD operations on user accounts here.

## **Non-Functional Requirements**

- Performance: System should respond to user actions within 2 seconds.
- Security: Implement basic encryption for user passwords.
- Usability: Simple and user friendly dashboards .
- Reliability: Ensure stable database connections.
- Accessibility: Compatible with web and mobile browsers.

Week 1: Set up the Django backend, database, and authentication, Implement core booking functionalities.

Week 2: Develop admin features (sports, location, user management).

Week 1-2: we will build user dashboard , Testing and debugging

## **Phase 2: Feature Enhancements & Payments**

### **Objective:**

**Enhance the system with membership, payment processing, rental features, and notifications.**

### **Functional Requirements in Phase 2 (Timeline 3 weeks )**

#### **User Functionalities**

- Membership Subscription -- Users can purchase membership plans here
- Referral System -- Users can sign up using a referral code
- Referral Tracking & Points System
- Payment Gateway -- Slot booking & membership payments
- Equipment Rentals -- Users can rent sports equipment here
- Booking Modifications -- Modify or cancel bookings within a time frame
- Slot History and Calendar View -- Display previous bookings
- Notifications System -- Email notifications for booking confirmations, cancellations

#### **Admin Functionalities**

- Equipment Management -- Admins updates equipment availability here.
- Payment Management -- Admins tracks payments here .
- Ratings & Reviews Management -- Admins review user ratings.
- Dynamic Pricing -- Admin sets pricing for peak/off-peak hours.
- Walk-in Registrations -- Admins manage direct slot bookings.
- Event Management -- Admins can update upcoming events.

#### **Non-Functional Requirements**

- Security: Implement payment encryption.

- Reliability: Booking system should always provide correct slot availability.
- Availability: Ensure 99.9% uptime.

Week 1: Implement membership & referral system ,develops payment processing & rental system.

Week 2: Build admin control for ratings, payments, and dynamic pricing.

Week 3: Implement email notifications and booking history, testing and debugging

## **Phase 3: Advanced Features & Optimization**

### **Objective:**

**Add advanced features, analytics, reporting, and system optimization.**

### **Functional Requirements in Phase 3 (Timeline : 3 Weeks)**

#### **User Functionalities**

- User Dashboard -- Summarizes user activities, bookings, referral points
- Feedback System -- Users can submit their feedbacks here.
- Membership Renewal -- Users can extend subscription plans
- Event Updates on Homepage -- Users see upcoming sports events

#### **Admin Functionalities**

- Report/Dashboard Generation -- Here admin can view bookings, payments, and rentals , user activity and reports .
- Calendar Management -- Admins view a detailed slot booking calendar.
- Content Scheduling -- Schedule promotions or sports-related announcements.
- Multi-Admin Support -- Allow multiple admins with different access levels.
- Equipment Maintenance -- Track and schedule maintenance for sports equipment.

#### **Non-Functional Requirements**

- Performance Optimization: Reduce response time for large queries.
- Security: Advanced role-based access control.
- Compatibility: Ensure cross-browser & mobile compatibility.
- Maintainability: Code should be modular for easy updates.

Week 1: Implements Dashboards, feedback system, and admin reports.

Week 2: Develop multi-admin support & content scheduling.

Week 3: Build event updates & homepage banners , Testing and Debugging .

## **Final Deployment & Maintenance**

**After Phase 3, the system will be deployed in cloud platform( as of now we decided AWS)**

### **Post-Deployment Tasks**

- Monitoring Performance (Identify slow queries & optimize).
- Bug Fixes & Feature Enhancements (Based on user feedback).

#### 4. Member contribution table

Member name	Contribution Description	Overall contribution(%)	Note (If applicable)
Yamini Malikireddy	Subsystem payment, functional requirements	11.1%	
Venkata Sai Vishnu Vardhan Reddy Tallapureddy	Interfaces, functional requirements	11.1%	
Kalyankumar Sandireddy	System diagram, Functional requirements	11.1%	
Anupama Bandoju	Booking subsystem, Functional requirements	11.1%	
Saranya Madala	Phases, functional requirements	11.1%	
Navya Eeshani Boyapati	Equipment subsystem, functional requirements	11.1%	
Jahn timer Chowdary Batta	Admin subsystem, Functional requirements	11.1%	
Shashank Reddy Gaddam	User subsystem, functional requirements	11.1%	
Nandini Saddireddygari	Functional and non-functional requirements.	11.1%	