**Software Engineering Project Proposal**

Sports Court Reservation System

**Project Idea:**

The Sports Court Reservation is designed to ease the booking process for various sports courts like tennis, basketball, football and volleyball, by allowing users to view availability, make reservations, and manage bookings easily through web platform. This application is mainly focused on sports facilities, community centers, schools, and private sports clubs, aiming to reduce double-booking issues and improve the overall user experience for both court managers and players.

**Problem Statement:**

Finding and booking sports courts can often be challenging due to old reservation methods, lack of real-time availability, and manual coordination. For facilities, managing reservations, cancellations, and payments manually is time-consuming and can have some errors, leading to user dissatisfaction. This system will simplify the reservation process, providing users with a transparent, user-friendly experience while enabling the facility (courts) managers to make their operations easier.

**User Personas:**

1. **Player**
   * Age: 18-40, often engage in sports activities.
   * Goals: Easily find and book available courts, receive booking confirmations, and manage reservations.
   * Needs: Real-time court availability, quick booking, and an easy way to modify or cancel bookings.
2. **Facility Manager**
   * Age: 25-60, responsible for managing court schedules and customer interactions.
   * Goals: Maintain an up-to-date schedule, avoid overbooking, and manage cancellations efficiently.
   * Needs: Dashboard for real-time updates on reservations, ability to block out times for maintenance, and manage user bookings.
3. **Club Member**
   * Age: 15-60, regular player with membership privileges.
   * Goals: Utilize exclusive booking rights, access special rates, and view their booking history.
   * Needs: Exclusive booking windows, discounted rates, and quick access to booking history and member-specific options.

**Functional Requirements:**

**1. User Authentication & Profile Management**

**Functional Requirements:**

* **User Registration: Allow new users to sign up by providing necessary information (e.g., name, email, password).**
* **User Login: Enable users to log in to their accounts securely using credentials.**
* **Profile Creation & Management: Users can create and edit their profiles, which include personal details, preferences, and contact information.**
* **View Booking History: Users can see a record of their past reservations, including dates, times, and court types.**
* **Account Deletion: Users can delete their account if they choose to no longer use the service.**

**Non-Functional Requirements:**

* **Security: Use encryption to protect user credentials and sensitive data. Implement multi-factor authentication (MFA) for added security.**
* **Performance: Login and registration processes should be quick, with minimal delays (typically within 2-3 seconds).**
* **Scalability: The authentication system should scale to accommodate increasing numbers of users, without affecting performance.**

**2. Court Availability & Reservation System**

**Functional Requirements:**

* **Real-Time Availability: The system should display real-time availability of courts, including booking status (available, booked, blocked).**
* **Time Slot Selection: Users can choose available time slots based on their desired court and date.**
* **Reservation Confirmation: After selecting a time slot, users should receive a confirmation of their reservation, including date, time, and court number.**
* **Cancellation & Modification: Users can cancel or modify their reservations within specified conditions (e.g., a certain time before the booking).**
* **Booking Limitations: Set restrictions, such as limiting the number of bookings per user within a given period (e.g., per day or week).**

**Non-Functional Requirements:**

* **Availability: The system should ensure that court availability information is accurate and updated in real-time to prevent double-booking.**
* **Reliability: The reservation system should have high uptime (e.g., 99.9%) to ensure users can always access it.**
* **Speed: The time to check court availability and confirm bookings should be under a few seconds (no significant delays).**
* **Usability: The reservation interface should be user-friendly, intuitive, and easy to navigate for both new and returning users.**

**3. Payment Process**

**Functional Requirements:**

* **Online Payment Integration: Users should be able to make payments using popular online gateways (e.g., Stripe, PayPal, or local payment processors).**
* **Secure Payment Transactions: Ensure that payment data is handled securely, and transactions are encrypted.**
* **Payment Confirmation: After a successful payment, the system should send a payment confirmation to the user (via email or in-app notification).**
* **Refund & Cancellation Policy: Users should be able to cancel their bookings and request a refund according to the facility’s cancellation policy.**

**Non-Functional Requirements:**

* **Security: Payment transactions must be secured using industry-standard encryption (SSL/TLS) and comply with PCI-DSS (Payment Card Industry Data Security Standard).**
* **Reliability: Payment system should have minimal downtime and high availability (99.9% uptime).**
* **Latency: Payment processing should be fast (less than 10-15 seconds for most transactions).**
* **Compliance: Ensure compliance with relevant laws and regulations related to payments (e.g., GDPR for data protection).**

**4. Notifications & Reminders**

**Functional Requirements:**

* **Booking Confirmation: Send immediate email or SMS notifications upon successful booking, including details like court, time, and date.**
* **Reminder Notifications: Send reminder notifications (email/SMS/push notifications) before the reserved court time (e.g., 24 hours, 1 hour).**
* **Cancellation Notifications: Notify users when a booking is canceled (either by them or by the facility).**
* **Custom Notification Preferences: Allow users to set their notification preferences (e.g., SMS vs. email, reminder timing).**

**Non-Functional Requirements:**

* **Timeliness: Notifications should be sent promptly, with no delays, ideally within seconds after booking or cancellation.**
* **Scalability: The notification system should scale to handle large volumes of users and notifications, especially during peak booking times.**
* **Reliability: Notifications must be delivered reliably to ensure users are properly informed.**
* **Opt-In/Opt-Out: Users should have control over the notifications they receive, complying with privacy preferences.**

**5. Dashboard for Facility Managers**

**Functional Requirements:**

* **View Bookings: Facility managers can view a list of all bookings, including details like time, court, and user information.**
* **Manage Reservations: Managers can approve, reject, or modify reservations as needed.**
* **Block Court Time: Facility managers can block out specific court times for maintenance, events, or other reasons.**
* **Cancellation Handling: Managers can manually cancel bookings and send notifications to users.**
* **Reporting & Analytics: Provide insights like court utilization rates, peak booking times, and user activity.**

**Non-Functional Requirements:**

* **Usability: The dashboard should be intuitive and easy for managers to navigate and use.**
* **Performance: The system should handle large datasets (e.g., many reservations) with no significant delays (less than 2 seconds to load booking data).**
* **Security: Ensure that facility managers can access the dashboard with proper authentication and permissions to prevent unauthorized access.**
* **Availability: The dashboard should have high availability, ideally 24/7, to support facility managers during business hours.**