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Catch Your Table: A Real-Time Sports Venue Management Application

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ABSTRACT

Catch Your Table" simplifies the process of reserving sports venues. Thanks to real-time availability and GPS tracking, users can find and book their favourite spots in no time. The interface is designed to be straightforward, allowing easy navigation, while personalized profiles help keep track of bookings and preferences. For venue administrators, the platform provides straightforward tools for managing bookings and gathering feedback to enhance operations. By prioritizing ease of use and technology, Catch Your Table links sports lovers to venues effortlessly, ensuring that playtime is stress-free.

Keywords: Sports venue booking, real-time availability, GPS tracking, online reservations, user-friendly interface, push notifications, venue management system, personalized profiles, booking optimization, sports facility management.

1.INTRODUCTION

Getting involved in sports and recreational activities is important for staying healthy and connecting with others. But booking sports venues can be tough because there aren't enough options, management isn't always smooth, and real-time information is often missing. Catch Your Table aims to solve these problems by offering an easyto-use platform for booking sports facilities. This platform features real-time tracking of availability, location services based on GPS, and quick notifications to make things easier for users. With its simple layout, personalized user profiles, and smooth payment methods, booking becomes a stress-free experience. Venue managers also have the advantage of a management dashboard that helps streamline their operations, encourages user interaction, and boosts service quality thanks to a feedback system. By using advanced technology, Catch Your Table makes managing sports venues easier and more efficient for everyone, while also providing venue operators with useful tools to help them succeed.

2. LITERATURE SURVEY

[1] N. Jayakanthan a, Kiruppa Sri S b: "Online Turf Booking System", ISSN 2582-7421, Volume 5,Issue 2.

A turf booking system is essential to streamline and enhance the management of sports facilities. It provides users with a convenient platform to reserve turf spaces for various sports activities, ensuring efficient utilization of resources. This system eliminates manual booking hassles, offering an easy online interface for users to check availability and secure bookings seamlessly.

[2] Harsh Shastri, Bhavesh Maheshwari: "QR Code Based Online Booking for Sports Complex System", ISSN 2349-9249, Volume 4, Issue 5.

Proposed a QR Code-based online booking system for sports complexes, aiming to streamline the appointment setting process, eliminate manual errors, and enhance security and verification through unique QR codes, providing a feasible and efficient solution for players and sports complex management..

[3] Aromal P Shaji1,Cristeena Yesudasan2, Ligin Thomas3, Merlin Benedict4 :" Turf Near You", ISSN 2582-7421, Volume 4, Issue 5.

Proposed a web-based Django application, "Turf Near You," facilitating location-based services for turf playground bookings, tournaments, and registrations, emphasizing user-friendly interfaces for teams, organizers, and administrators.

[4] T. Claudinus, M. P. Wicaksana, N. K. Sitorus, M. A. Gustiandza, T. Oktavia, T. Hosoda, and F. L. Gaol, :"Sport Field Reservation Based on Mobile Application," November 2020.

Developed a mobile app to address the manual field reservation process we encountered. Actors in our system are users, field owners, and admins responsible for managing and updating the app.

[5]. D. A. Pol, P. V. Patil, R. Shinde, and R. Dange, "Online Ground Booking System using Android Mobile Application," ISSN (online): 2321-0613, Volume 7, Issue 10.

The system interface allows users to log in or register as players or ground administrators. After logging in, users can choose an available time slot and select a nearby ground for booking. They make the payment through the provided payment gateway, and their details are stored in the database, generating a booking report.

[6] **E. N. Skarzhinskaya and E. V. Sarafanova:"Digital Technologies in Physical Culture and Sports Education.", Advances in Economics, Business and Management Research, volume 114**

Methods are the analysis of special scientific literary sources and the Internet, generalization, systematization.

[7] **"Web design structure with WordPress content management for sports centre booking system", ISSN: 2502-4752 Volume.19, Issue.3**

The research utilized WordPress to develop an online booking system for a sports center, building upon previous work. Users and administrators accessed the system through a login page. Users selected facilities, dates, times, and equipment, with available time slots displayed. Upon booking, users received email confirmations with details and QR codes. Administrators managed the interface, including adding, editing, and deleting posts, and had control over user management and bookings.

[8] **D. Caldas, E. Cruz, and A. M. Rosado da Cruz, "Time2Play - Multi-sided Platform for Sports Facilities: A Disruptive Digital Platform," pp. 269-277, 10.5220/0009412902690277.**

aims to create innovative artifacts to solve specific problems within a particular domain. This approach involves six main activities: problem identification and motivation, objectives definition, design and development, demonstration, evaluation, and communication. While these activities are typically carried

out sequentially, some phases may be repeated iteratively to achieve the best possible results. This iterative process allows for flexibility, enabling revisiting of earlier stages such as objectives definition or design and development if necessary, before progressing sequentially through all phases again.

3. TAXONOMY CHART

The following table represents the comparison between our system and the existing system as what all features are present in our system as compared to previously existing system.

Paper/Feature Name	Events booking	Venue Booking	Enquiry of Academies
Online Turf Booking System	✗	✓	✓
QR Code Based Online Booking for Sports Complex System	✗	✓	✗
Turf Near You	✗	✓	✓
Sport Field Reservation Based on Mobile Application	✗	✓	✗
Online Ground Booking System using Android Mobile Application	✗	✓	✗
Proposed System	✓	✓	✓

4. SYSTEM ARCHITECTURE

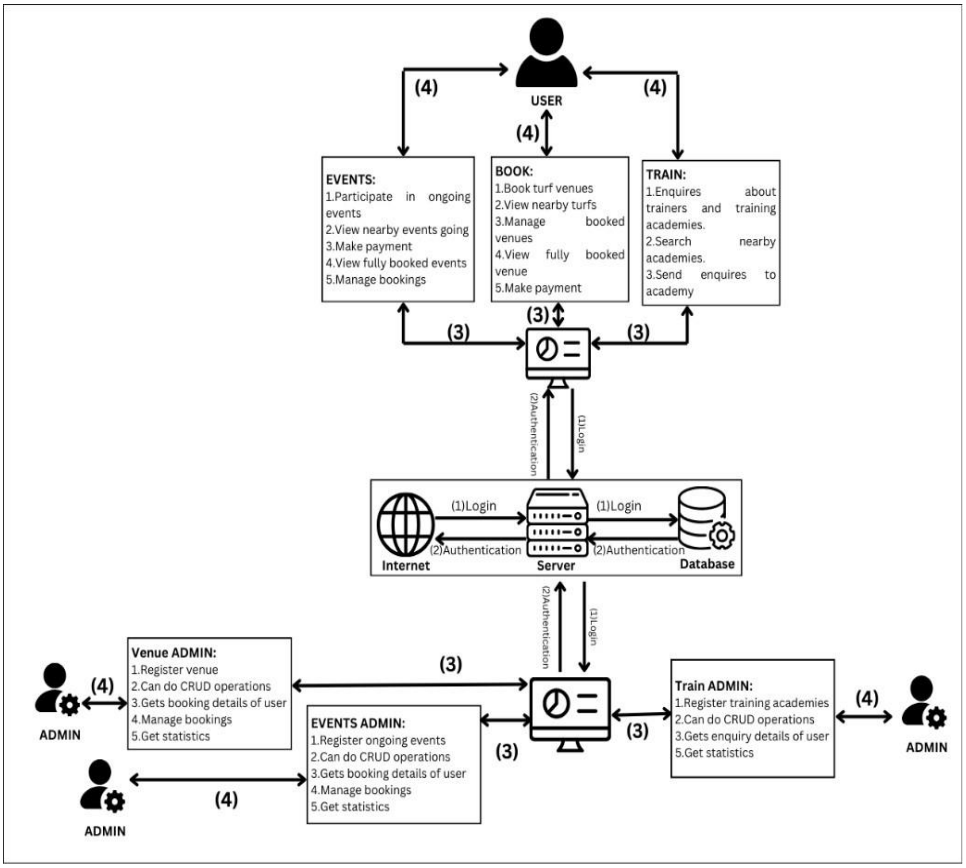

Figure 1.0: System Architecture

The Catch Your Table setup makes booking sports venues easy and smooth. It has three main parts: frontend, backend, and database, all working together with real-time updates and connections to other services.

The frontend uses React.js and React Native to create a friendly interface where users can explore venues, book their spots, and manage their reservations. Venue owners also have an admin panel to check availability and handle payments. It links to the backend, which is built with Node.js and Express.js, through APIs that manage user logins, bookings, and provide real-time updates.

The database, either PostgreSQL or MongoDB, keeps all the information about users, bookings, and venues, designed to handle many requests at once. Redis caching helps speed up access, while a payment gateway like Razor pay, Stripe, or PayPal makes transactions safe. Additionally, the Google Maps API helps with directions, and automated notifications keep users updated.

This system is hosted on AWS, GCP, or Azure and uses load balancing and auto-scaling to deal with busy periods. Security features such as SSL, RBAC, and monitoring tools help protect user information. All in all, Catch Your Table is a reliable and effective platform for managing sports venues.

5. UML DIAGRAMS

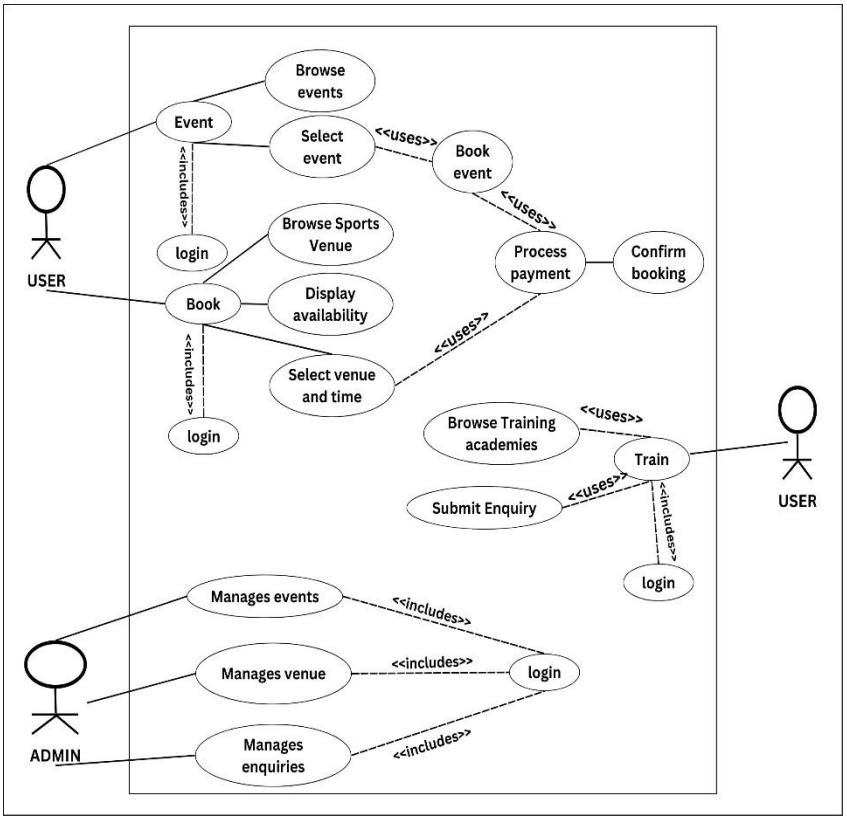

Figure 5.1: Use Case Diagram

The Use Case Diagram for Catch Your Table illustrates the interactions between different users and the system, defining key functionalities and relationships. It serves as a foundational tool for understanding system requirements, aiding communication among stakeholders, and guiding development. As shown in Figure 5.1, the following interactions occur:

a. User ↔ System:

Users can browse available sports venues, check schedules, and make bookings. They interact with the system to confirm reservations, make payments, and receive notifications.

b. User ↔ Admin:

Users can raise inquiries or disputes regarding bookings, cancellations, or venue-related concerns. The admin verifies and manages user requests, ensuring smooth operations.

c. Admin ↔ Venue Management System:

Admins manage venue availability, pricing, and event scheduling. They update venue details, approve bookings, and oversee transactions.

d. System ↔ Payment Gateway:

Upon booking confirmation, the system interacts with the payment gateway (e.g., Razorpay, Stripe) to process transactions securely, ensuring smooth payments.

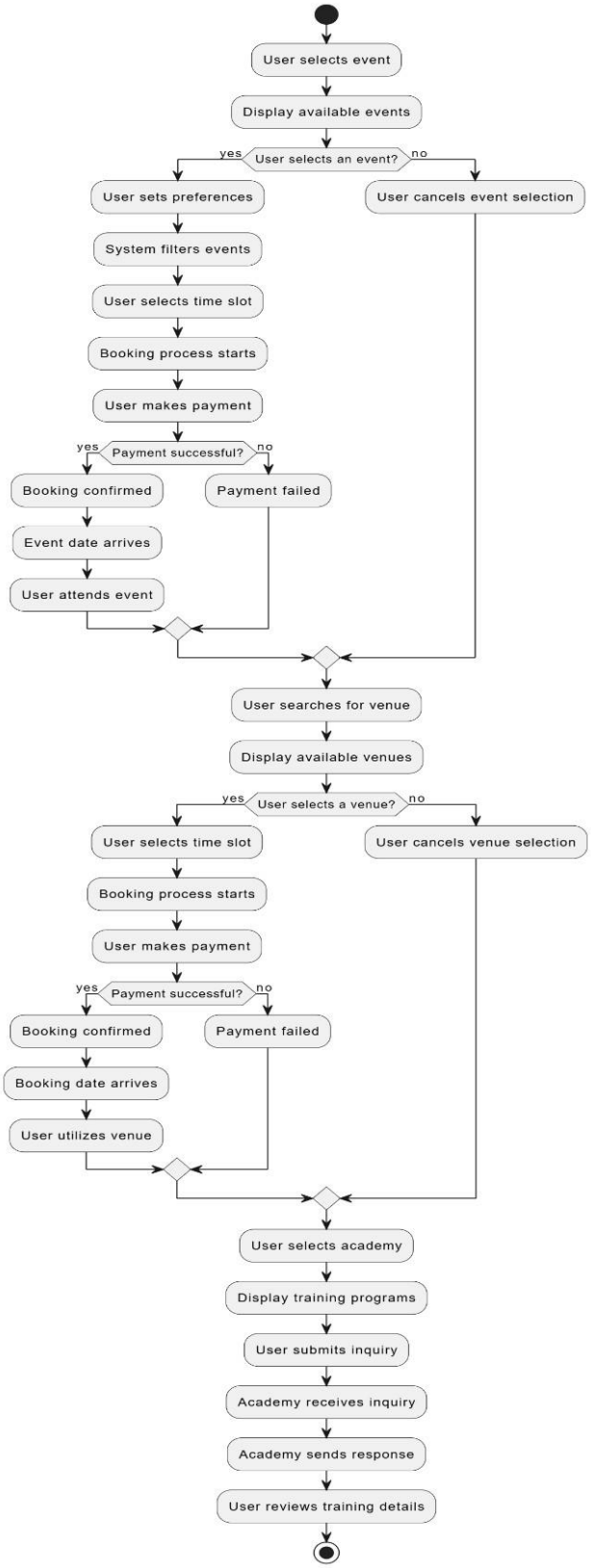

Figure 5.2: State Diagram

The **State Diagram** for **Catch Your Table** outlines the system's transitions during event booking, venue booking, and training inquiries. It ensures a smooth user experience by handling different states efficiently. As shown in Figure 1.2, the key transitions are:

a. **Idle State ↔ User Interaction:** The system waits for user input to initiate event booking, venue booking, or training inquiries.

b. **Booking & Inquiry Process:** Users select events, venues, or training programs. The system processes selections, payments, and inquiries. Successful bookings transition to a waiting state until the scheduled date.

c. **Payment Processing:** The system interacts with a payment gateway (e.g., Razorpay, Stripe). If successful, the booking is confirmed; otherwise, the user retries or cancels.

d. **Notifications & Updates:** The system sends real-time confirmations, reminders, and responses via SMS, email, or push notifications.

e. **Final State:** After processing bookings or inquiries, the system returns to the idle state, ready for new user interactions.

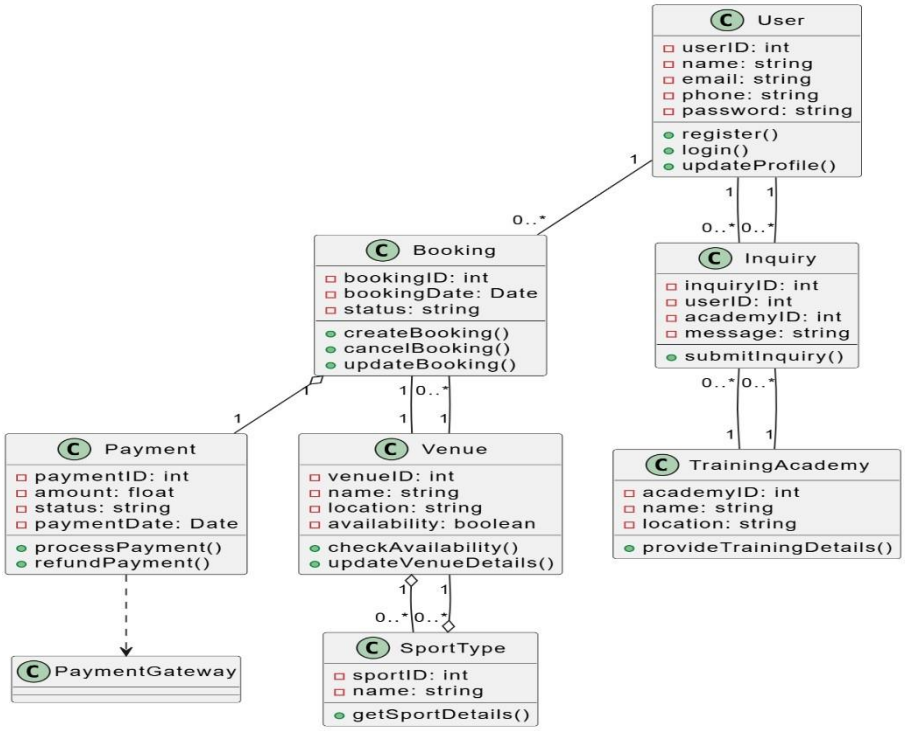

Figure 5.3 Class Diagram

The **Class Diagram** for **Catch Your Table** represents the system's structure, showing key entities, attributes, and their relationships. It defines how different components interact to manage users, bookings, payments, and venues. As shown in Figure 1.3, the key relationships are:

a. **User ↔ Booking:** Users can create, update, and cancel bookings for venues and events. Each user can have multiple bookings.

b. **User ↔ Inquiry:** Users can submit inquiries related to training academies, which the system processes for responses.

c. **Booking ↔ Venue:** A booking is associated with a specific venue, and the system checks venue availability before confirming a reservation.

d. **Booking ↔ Payment:** Payments are linked to bookings, ensuring secure transaction processing through the payment gateway. Refunds are managed when required.

e. **Venue ↔ SportType:** Venues are categorized based on sport types, helping users find suitable options.

f. **User ↔ TrainingAcademy:** Users can inquire about training programs, and academies provide relevant details.

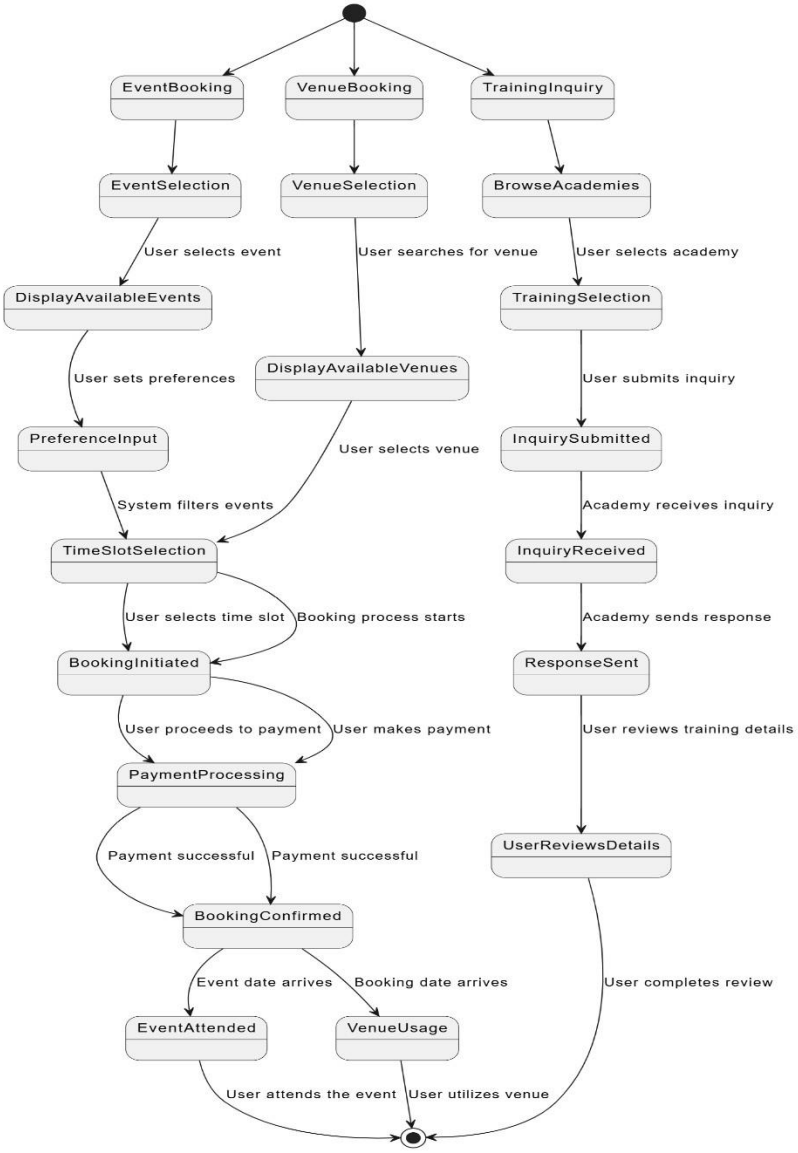

Figure 5.4: Activity Diagram

The **Activity Diagram** for **Catch Your Table** illustrates the flow of user interactions, depicting the sequence of activities in event booking, venue booking, and training inquiries. It provides a clear understanding of system processes and decision points. As shown in Figure 1.4, the key activities include:

a. **Event Booking Flow:** Users select an event, set preferences, and choose a time slot. The system filters events, and users proceed with booking initiation and payment. Upon successful payment, the booking is confirmed, and users attend the event.

b. **Venue Booking Flow:** Users search for a venue, browse available options, and select a preferred time slot. After booking initiation and payment, a successful transaction confirms the booking, and users utilize the venue on the scheduled date.

c. **Training Inquiry Flow:** Users browse academies, select a training program, and submit inquiries. The academy receives and processes the inquiry, responding with relevant details. Users review the response and complete the process.

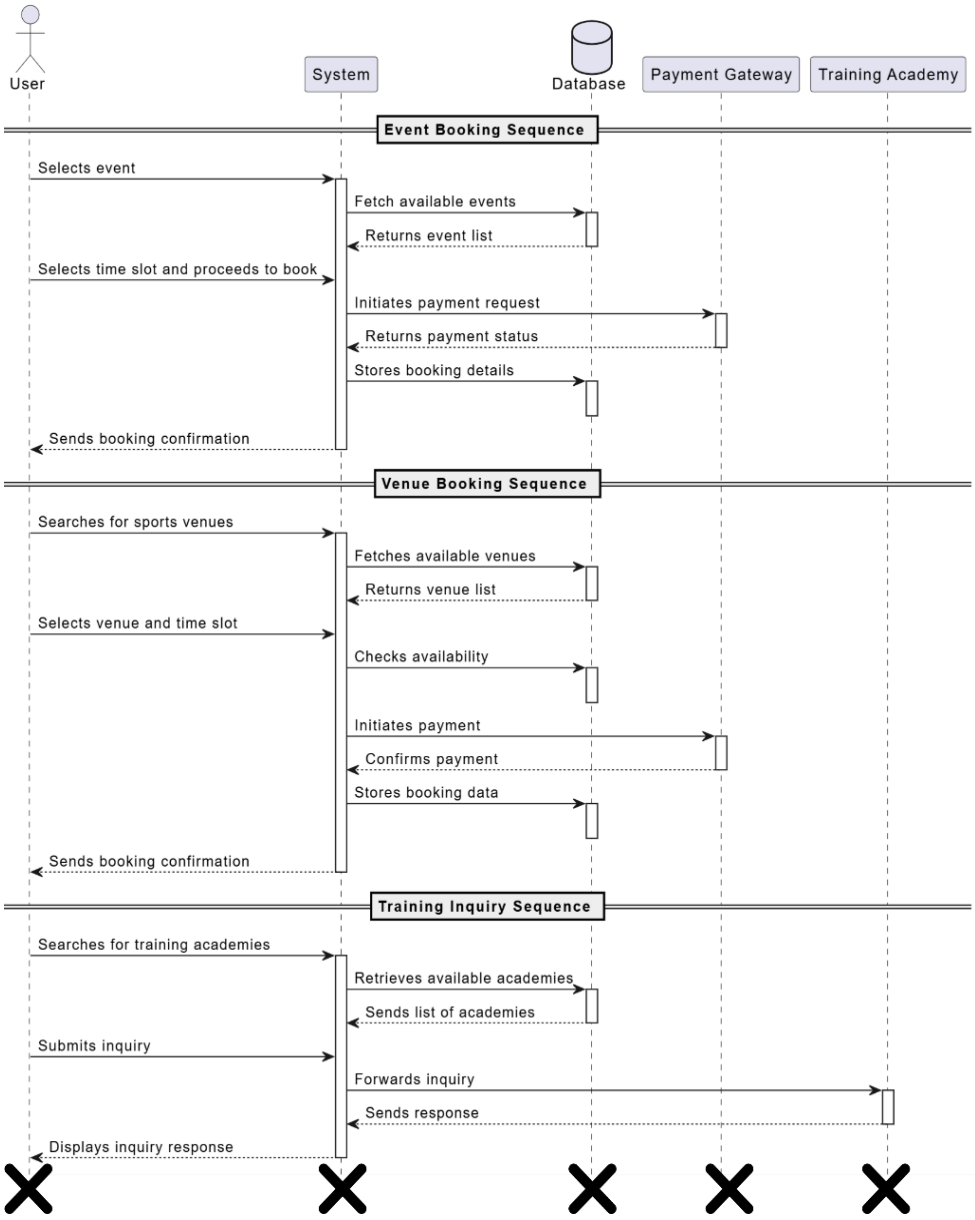

Figure 5.5: Sequence Diagram

The **Sequence Diagram** for **Catch Your Table** outlines the interaction between users, the system, the database, the payment gateway, and training academies, detailing the booking and inquiry process. It ensures smooth transaction flow and real-time communication. The key interactions include:

a. **User ↔ System:**

- Users can search and select events, venues, and training academies.
- The system processes booking requests, inquiries, and payments.

b. **System ↔ Database:**

- The system retrieves event, venue, and academy details from the database.
- Booking and inquiry data are stored for future reference.

c. **System ↔ Payment Gateway:**

- The system initiates payment transactions for event and venue bookings.
- Payment success or failure is confirmed before finalizing the booking.

d. **System ↔ Training Academy:**

- User inquiries are forwarded to the relevant training academy.
- The academy processes and responds to inquiries, which users review.

7. CONCLUSION

The project “Catch Your Table” aimed to solve the challenges of sports venue management by providing a realtime booking platform for users and venue owners. The system successfully integrated features such as realtime venue availability, seamless booking processes, and secure payment gateways, all of which contributed to enhancing user experience. By utilizing a cloud-based architecture, the system ensured scalability and efficiency even during high user traffic. One of the key achievements was the successful development of a user-friendly interface that allowed users to view available venues and make bookings instantly. Furthermore, the integration of notifications helped ensure transparency and timely updates to both users and venue managers. Overall, the objectives of the project were met by creating a robust, scalable solution for sports venue management, simplifying the booking process, and increasing participation in sports activities.

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