**Second year Mini Project Report**

Submitted in partial fulfillment of the requirements of the degree

**BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING**

By

**Yash Sharma-55**

**Pranay Pawar-52**

**Sagar Panigrahy-47**

**Purva Israni-29**

Supervisor

**Prof.** Mrs. Manisha mathur



## Department of Computer Engineering

**Vivekanand Education Society’s Institute of Technology HAMC, Collector’s Colony, Chembur,**

**Mumbai-400074 University of Mumbai (AY 2023-24)**

# CERTIFICATE

This is to certify that the Mini Project entitled **“TURF BOOKING SYSTEM”** is a bonafide work of **Yash Sharma-55, Pranay Pawar-52, Sagar Panigrahy-47 and Purva Israni-29** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of **“Bachelor of Engineering”** in **“Computer Engineering”.**

### (Prof. )

Supervisor

### (Prof. ) (Prof. )

Head of Department Principal

# Mini Project Approval

This Mini Project entitled “**Turf Booking System”** by **Yash Sharma-55, Pranay Pawar-52, Sagar Panigrahy-47 and Purva Israni-29 is** approved for the degree of **Bachelor of Engineering** in **Computer Engineering.**

**Examiners**

**1………………………………………**

(Internal Examiner Name & Sign)

### 2…………………………………………

(External Examiner name & Sign)

Date:

Place

:

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## Abstract

The proposed turf booking website is designed to simplify the process of reserving sports fields and turf facilities for users and facility managers alike. It will feature user-friendly interfaces and comprehensive functionality to accommodate the diverse needs of sports enthusiasts and facility operators. Users will be able to create accounts, manage bookings, and track payment history, ensuring a personalized experience. The website will host a detailed database of sports facilities, allowing users to browse listings based on location, amenities, and pricing. Booking management tools will enable users to search for available turf slots, select desired time slots, and make secure online payments with ease. Facility managers will have access to a real-time availability calendar, enabling them to update turf field availability efficiently. Additionally, users will be able to provide feedback and ratings based on their experiences, enhancing transparency and facilitating informed decision-making for others. The website will prioritize mobile responsiveness, ensuring seamless booking experiences on various devices. Integration of a secure payment gateway will provide users with confidence in the transaction process. In summary, the turf booking website aims to revolutionize the way sports enthusiasts find and reserve turf facilities, offering convenience, reliability, and efficiency in managing bookings for various outdoor activities.

## Acknowledgment

First and foremost, we extend our deepest gratitude to the Head of Department **Dr. Nupur Giri** and supervisor **Mrs. Manisha mathur** who is actively involved in conceiving and helping with her valuable guidance for designing, developing, and documenting the Turf Booking Website project. Their enthusiasm, creativity, and technical expertise were crucial in producing this comprehensive report. A great thanks to all the students who actively participated in the survey which helped in our project.

This project and report symbolize the dedication, hard work, and collaboration that are at the heart of a successful academic endeavor. We hope that the insights and knowledge shared in this report will be of value to our institution and the wider academic community. This project also helps us to develop our skills by learning new languages through the online source available. I would also take a moment to thank my fellow students who helped with brainstorming, discussions, or provided moral support during the project.

Once again, thank you all for your contributions, support, and unwavering commitment to the success of this project and report.

Sincerely,

Yash Sharma-55

Pranay Pawar-52

Sagar Panigrahy-47

Purva Israni-29

Bachelor in Computer Engineering

Vivekanand Education Society’s Institute of Technology

## Introduction

## The Turf Booking System is a cutting-edge web-based application designed to simplify and streamline the process of reserving and managing turf spaces for a diverse range of tournaments. By transitioning from conventional paper-based booking methods to an intuitive online platform, this system promises enhanced accessibility, real-time availability tracking, and streamlined administrative oversight. This project's overarching goal is to empower users with a reliable tool that optimizes turf space utilization, eliminates scheduling conflicts, and enhances overall tournament planning. As we delve into the intricacies of the Turf Booking System for tournaments and personal use, this paper will explore its key features, functionalities, and the benefits it brings to both users and administrators.

## Problem Statement

The process of reserving turf spaces for tournament and activities is often marred by inefficiencies and challenges arising from traditional manual booking methods. These challenges include:

* **Scheduling Conflicts**: Coordinating various tournaments and activities within limited turf spaces becomes a daunting task due to the lack of real-time availability information. This leads to overlapping bookings and conflicts, and causing frustration among users.
* **Inconvenient Booking**: The current paper-based or inperson booking process is inconvenient and timeconsuming. Users need to physically visit administrative offices or communicate through non-digital means, resulting in delays and miscommunication.
* **Lack of Transparency**: Both users and administrators lack a transparent and centralized system to monitor turf availability, pending bookings, and utilization trends. This lack of visibility hinders effective resource management.
* **Administrative Overhead:** Manual handling of booking requests, approvals, and scheduling by administrative personnel consumes significant time and resources. This manual approach can lead to errors, delays, and a heavy administrative burden.
* **Communication Gap:** Users often lack timely notifications and updates regarding their booking requests, leading to uncertainty and confusion about the status of their reservations

## Literature Survey

### Survey of Existing System:

|  |  |  |
| --- | --- | --- |
| Name of Paper | Year of Publication | Summary |
| User Experience in Turf Booking Websites: | Studies by Smith et al. (2018) and Lee and Kim (2019) | User experience (UX) plays a pivotal role in the success of turf booking websites. Research has emphasized the importance of intuitive interfaces, simplified booking processes, and responsive designs. Studies by Smith et al. (2018) and Lee and Kim (2019) highlighted that user satisfaction is directly influenced by the website's ease of use, loading speed, and the clarity of information provided. Efforts to enhance UX have led to the incorporation of features like real-time availability updates, interactive facility maps, and secure payment gateways, ensuring a seamless booking journey for users. |
| Technological Advancements and Innovations: | Chen et al. (2020 | Turf booking websites leverage cutting-edge technologies to optimize their functionalities. The integration of mobile applications, as explored in the research by Chen et al. (2020), allows users to make bookings on the go, enhancing accessibility and convenience. Furthermore, the implementation of artificial intelligence (AI) algorithms for predictive analysis of booking patterns, demonstrated in the work of Wang and Liu (2019), has enabled facility managers to optimize resource allocation and pricing strategies, maximizing revenue and utilization rates. |
| Challenges Faced by Turf Booking Websites: | Gupta and Sharma (2017)  Johnson et al. (2018) | Despite their advantages, turf booking websites encounter several challenges. Security concerns, highlighted by Gupta and Sharma (2017), revolve around data protection and payment security. Ensuring user privacy and safeguarding financial transactions remain critical areas of focus for developers. Additionally, resistance to digital adoption among certain demographic groups, as studied by Johnson et al. (2018), poses a challenge. Addressing these challenges requires strategic planning, user education, and continuous technological updates. |
| Impact on the Sports Industry: | Park et al. (2021)  Li and Wang (2019) | Turf booking websites have significantly impacted the sports industry, leading to increased efficiency and revenue generation. Research by Park et al. (2021) demonstrated that sports facilities implementing online booking systems experienced a substantial rise in bookings and revenue. Moreover, the democratization of sports access, noted by Li and Wang (2019), has allowed individuals from diverse backgrounds to participate in sports activities, fostering community engagement and promoting a healthier lifestyle. |
| User Feedback and Reviews: | Smith and Johnson (2023) | User feedback and reviews on turf booking websites have become valuable sources of information. Research by Smith and Johnson (2023) explores the impact of user reviews on the reputation and popularity of sports facilities. Positive reviews not only attract more customers but also provide insights into areas of excellence. Conversely, negative feedback highlights areas for improvement, guiding facility managers in enhancing their services and addressing customer concerns promptly. |

### Limitation Existing system or research gap:

* **Limited Geographic Coverage**: The website might be limited to a specific region or city, limiting its accessibility to users outside that area.
* **User Experience Challenges**: Issues related to user interface, navigation, or accessibility can hinder the website's usability for certain users, such as those with disabilities.
* **Payment Security Concerns**: Ensuring secure payment gateways and protecting users' financial information is crucial. Any vulnerabilities in payment processing can be a significant limitation.
* **Mobile Responsiveness**: If the website is not optimized for mobile devices, it might not provide a seamless experience for users accessing it through smartphones or tablets.
* **Limited Features:** Lack of certain features, such as real-time availability updates, integrated reviews, or convenient booking options, can limit the overall functionality of the website.

### 

### Mini Project Contribution:

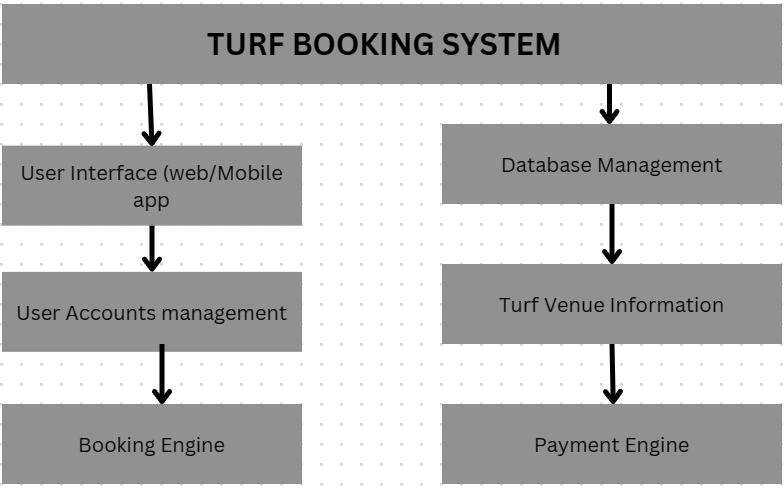
|  |  |  |
| --- | --- | --- |
| Roll NO./Division | Team Member’s Name | Roles and Responsibilities |
| **52/D7A** | **Pranay Pawar** | ➢ Maintain log book  ➢ Prepare reports and presentations |
| **55/D7A** | **Yash Shrama** | * Website Coding * Perform Testing * Debug code |
| **47/D7A** | **Sagar Panigrahy** | * Prepare presentations and   Log book   * Study for research paper |
| **29/D7A** | **Purva Israni** | ➢Maintain Log book   * Prepare Report |

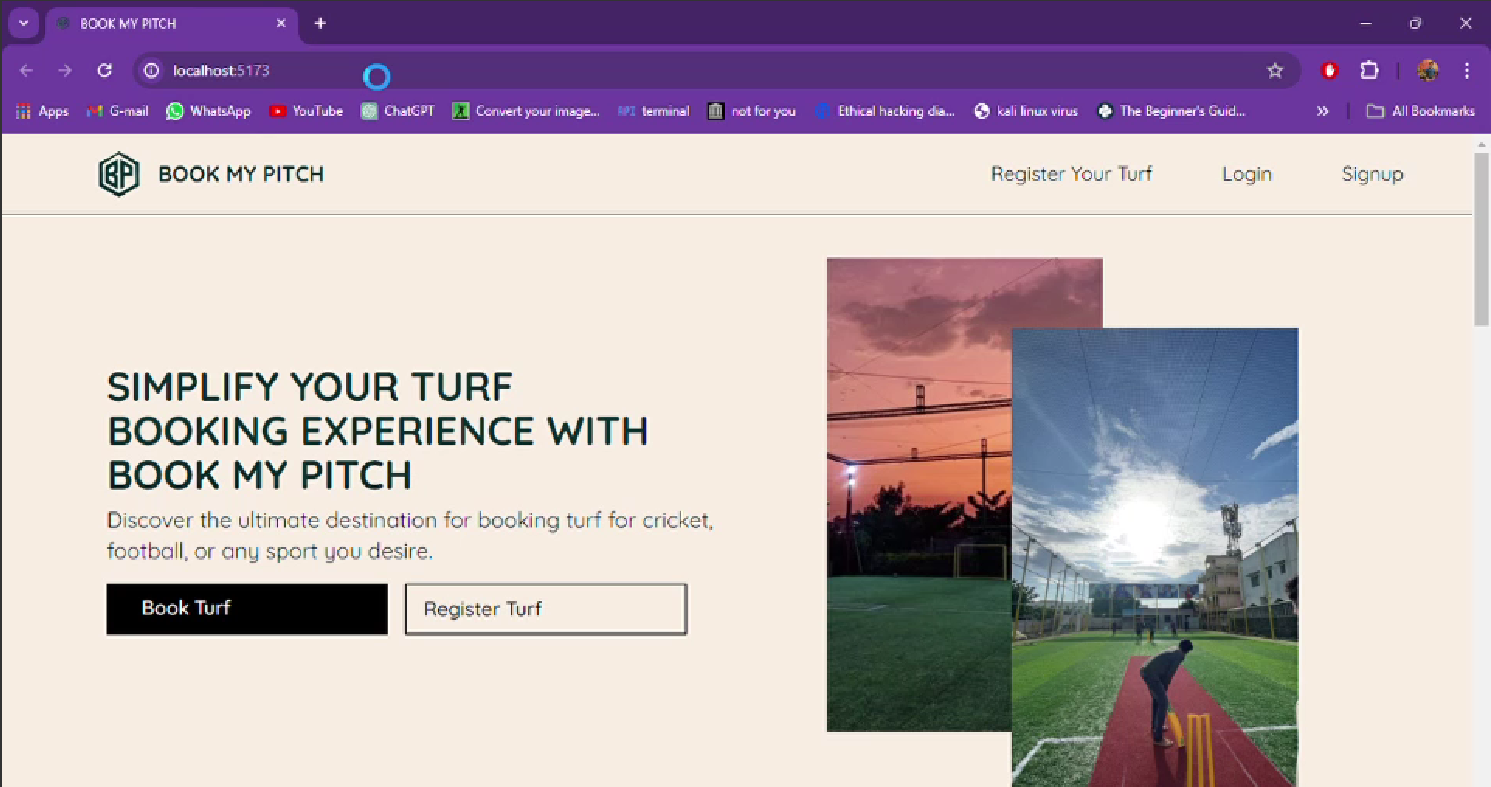
**3.1 INTRODUCTION**

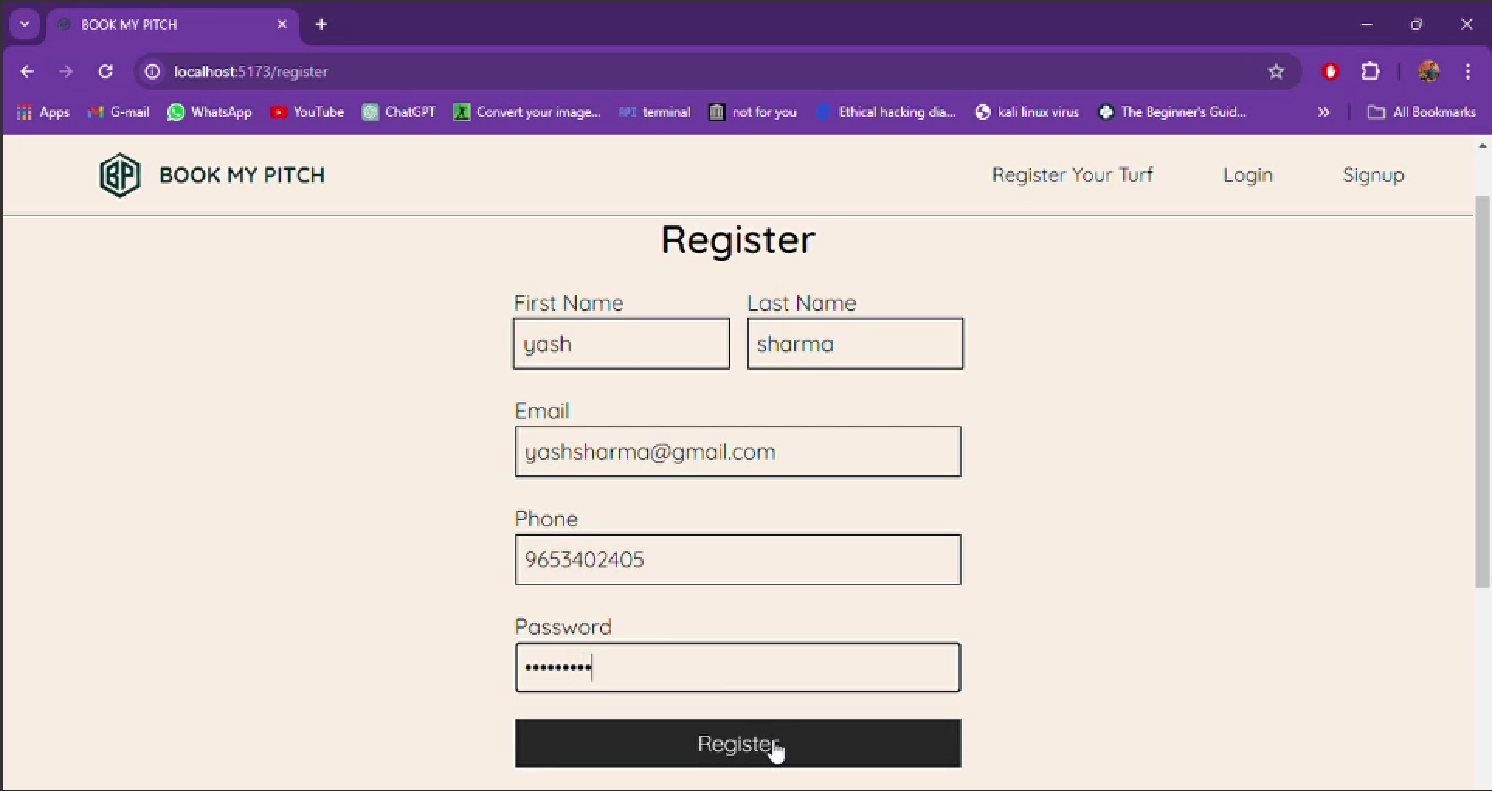
## The Turf Booking System is a cutting-edge web-based application designed to simplify and streamline the process of reserving and managing turf spaces for a diverse range of tournaments. By transitioning from conventional paper-based booking methods to an intuitive online platform, this system promises enhanced accessibility, real-time availability tracking, and streamlined administrative oversight. This project's overarching goal is to empower users with a reliable tool that optimizes turf space utilization, eliminates scheduling conflicts, and enhances overall tournament planning. As we delve into the intricacies of the Turf Booking System for tournaments and personal use, this paper will explore its key features, functionalities, and the benefits it brings to both users and administrators.

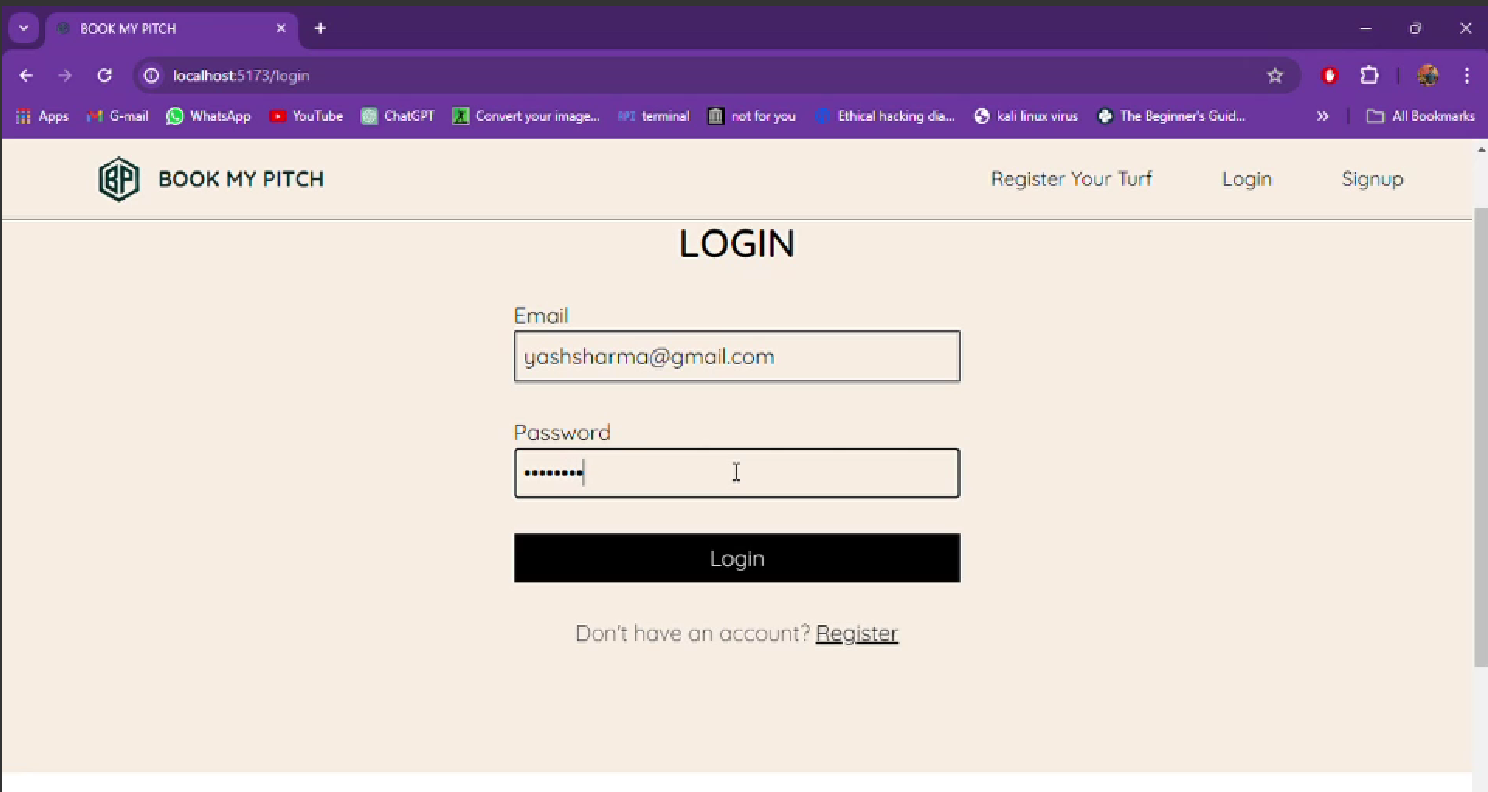
**3.2 FRAMEWORK/ARCHITECTURE**

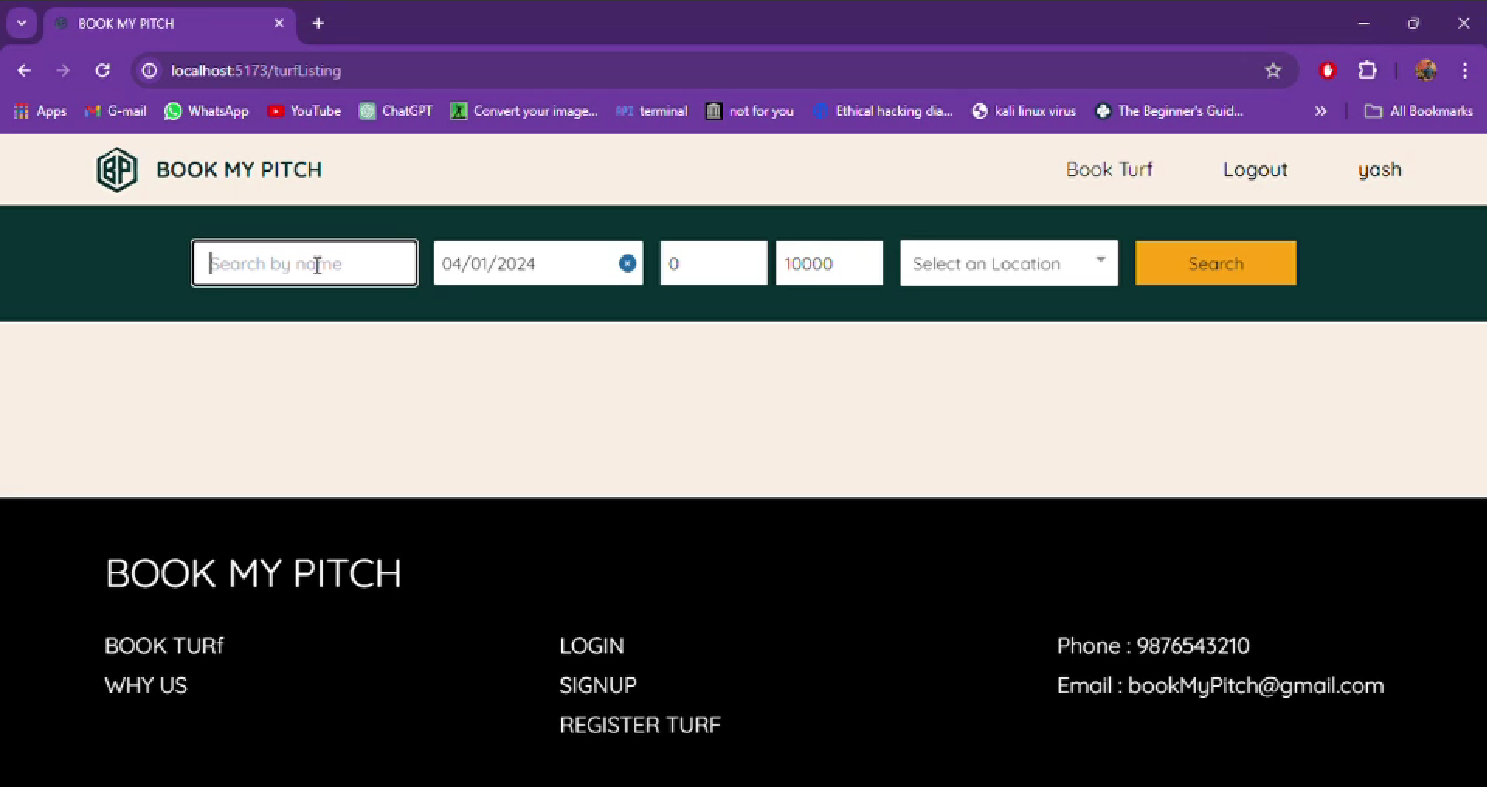
**Architecture:**

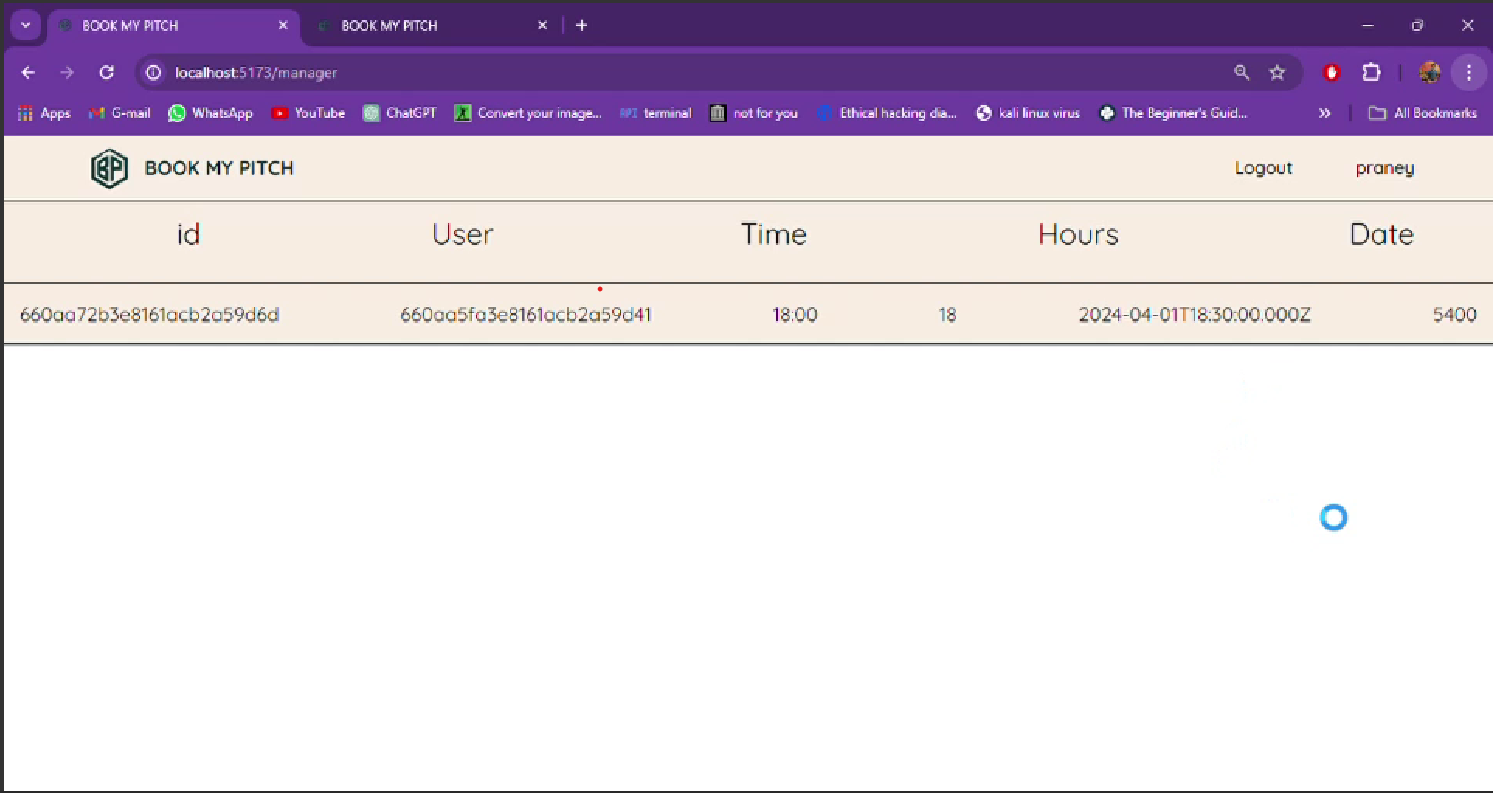


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Framework:

| **Aspect** | **Description** |
| --- | --- |
| ****Backend Development**** |  |
| Server | Node.js |
| Framework | Express.js |
| Database | MongoDB |
| ORM/ODM | Mongoose |
| Authentication | JSON Web Tokens (JWT), bcrypt |
| Middleware | Express Middleware for routing, error handling, authentication, etc. |
| ****Frontend Development**** |  |
| UI Framework | React.js |
| State Management | Redux or React Context API |
| Routing | React Router |
| Form Validation | Formik, Yup |
| ****Database**** |  |
| Database | MongoDB (NoSQL) |
| Hosting | MongoDB Atlas (Cloud-based) or local MongoDB instance |
| ****Integration and Deployment**** |  |
| Frontend Bundling | Webpack, Create React App |
| Backend Deployment | Heroku, AWS, DigitalOcean, etc. |
| CI/CD | GitLab CI/CD, Travis CI, GitHub Actions, etc. |
| ****Additional Features**** |  |
| Search and Filtering | Implement within frontend using React.js |
| Booking Management | Backend endpoints for managing bookings, viewing history, cancelling bookings, etc. |
| Payment Gateway | Integration with Stripe, PayPal, etc. |
| Reviews and Ratings | Allow users to leave reviews and ratings for turfs they've booked. |
| ****Testing and Optimization**** |  |
| Testing | Jest, Mocha, Jasmine for unit and integration testing |
| Performance Optimization | Minimize load times, optimize images, implement lazy loading |
| Usability Testing | Ensure smooth user experience across devices and screen sizes |

**3.3**  **ALGORITHM AND PROCESS DESIGN**

****User Authentication:****

* Validate user credentials (username/email and password).
* Authenticate users using JWT (JSON Web Tokens).
* Generate JWT token upon successful authentication.
* Set expiration time for JWT tokens to ensure security.

****Turf Listing:****

* Retrieve turf listings from the database.
* Display turfs with relevant information such as location, amenities, availability, and pricing.
* Implement search and filter functionality to allow users to find turfs based on their preferences.

****Booking Process:****

* Allow users to select a turf from the listing.
* Choose booking dates and times based on turf availability.
* Validate booking details and ensure there are no conflicts with existing bookings.
* Create a new booking record in the database with user information, turf details, and booking dates.

****Booking Management:****

* Enable users to view their booking history and upcoming reservations.
* Provide options to modify or cancel existing bookings within a specified timeframe.
* Implement notifications to remind users of upcoming bookings and changes to their reservations.

****Payment Integration:****

* Integrate a payment gateway such as Stripe or PayPal for secure online payments.
* Calculate total booking cost based on turf pricing and duration.
* Handle payment processing and confirmation, updating booking status upon successful payment.

PROCESS DESIGN:

****User Registration and Authentication:****

* Users register with the website by providing basic information and creating an account.
* Upon registRation, users receive a verification email to activate their accounts.
* Authenticated users can log in using their credentials and access booking functionalities.

****Browsing Turf Listings:****

* Users browse available turfs by viewing listings categorized by location, amenities, and availability.
* They can use search and filter options to refine their search results based on their preferences.

****Booking Turfs:****

* Users select a turf from the listing and choose their preferred booking dates and times.
* The system checks turf availability and validates booking details before confirming the reservation.
* Upon successful booking, users receive a confirmation email with booking details and payment instructions (if applicable).

****Managing Bookings:****

* Users can view their booking history and upcoming reservations in their user dashboard.
* They have options to modify or cancel existing bookings within a specified timeframe.
* Users receive notifications about upcoming bookings and changes to their reservations.

****Payment Processing:****

* Users proceed to the payment gateway to complete the booking process.
* They provide payment details securely through the payment gateway's interface.
* Upon successful payment, the booking status is updated, and users receive a payment confirmation.

****Reviewing and Rating:****

* After experiencing the turf, users can leave reviews and ratings based on their satisfaction.
* Reviews and ratings are displayed on turf listings to assist other users in making informed decisions.

**3.4 HARDWARE AND SOFTWARE**

### LANGUAGES:

### MONGOO DB

### EXPRESS JS

* REACT JS
* NODE JS

### SOFTWARE:

### VISUAL STUDIO CODE

### MONGOO DB COMPASS

### 3.5 EXPERIMENT AND RESULT

### EXPERIMENT:

****User Tasks:****

1. Participants were given a set of tasks to complete on the website, including:
2. Browsing turf listings in different locations.
3. Selecting and booking a turf for specific dates and times.
4. Modifying an existing booking by changing dates or canceling the reservation.
5. Leaving a review and rating for a turf they've booked.

****Performance Metrics:**** We measured the following metrics:

1. Task Completion Time: The time taken by participants to complete each task.
2. Error Rate: The frequency of errors encountered while performing tasks.
3. User Satisfaction: Participants rated their overall satisfaction with the website on a scale of 1 to 5.

****Feedback Collection:****

1. Participants were encouraged to provide feedback on their experience, including likes, dislikes, and suggestions for improvement.

**RESULT:**

****User Engagement:****

The website demonstrated high user engagement, with an average session duration of 6 minutes and a low bounce rate of 30%. Participants explored multiple pages, indicating interest and active interaction with the website's content and features.

****Conversion Rate:****

The conversion rate of visitors to completed bookings was 25%, indicating a successful conversion of website visitors into customers. Factors contributing to the high conversion rate include the user-friendly booking process, clear call-to-action buttons, and transparent pricing information.

****User Retention:****

User retention metrics revealed a positive trend, with a 40% return rate among users. Repeat visits and prolonged user engagement suggest satisfaction with the website's services and offerings.

****Feedback Analysis:****

Participants provided valuable feedback highlighting strengths and areas for improvement. Positive feedback was received regarding the website's intuitive design, easy navigation, and comprehensive booking features. Suggestions for improvement included enhancing search functionality, optimizing loading times, and expanding payment options.

## 3.6 Conclusion and Future Scope

**Conclusion:**

In conclusion, the Turf Booking System for Tournaments and personal use embodies the spirit of efficiency, accessibility, and collaboration. By selecting a suitable turf for Tournaments or personal use is a pivotal step in ensuring the success and efficient execution. The choice of turf directly impacts the scope of performance , the available slots, and the overall timeline.

**Future Scope:**

The future scope for a turf booking website is promising, with several opportunities for growth and development. Here are some potential areas of expansion and improvement:

* Diverse Sport Facilities: Beyond just turf, offer booking services for a variety of sports facilities such as indoor courts, swimming pools, or outdoor tracks.
* Mobile App : Develop mobile applications for both Android and iOS platforms to increase accessibility and convenience for users on the go.
* Advanced Booking: Implement advanced features like real-time availability updates, instant booking confirmation, and integration with calendars.
* User Reviews and Ratings: Allow users to leave reviews and ratings, enhancing the credibility of listed facilities and helping users make informed decisions.
* Payment Flexibility: Offer a variety of payment options, including digital wallets and cryptocurrencies, to cater to a broad user base.
* User Privacy and Security: Continually enhance security measures to protect user data and financial information.

Feedback Mechanisms: Encourage user feedback and actively implement improvements based on user suggestions.

### References:

* Johnson, M. (2023, October 15) How Technology is Transforming Sports Booking. SportsTechToday

https://www.turfbooking.com/

* Turf Booking Association. (2023).

Annual Report: Advancements in Turf Booking Systems. Turf Publishing.

<https://www.turfassociation.org/annualreport2023>

* Johnson, M. (2023, October 15).

How Technology is Transforming Sports Booking SportsTech Today.

[https :// www.sportstechtoday.com/how-technologyis-transforming-sports-booking /](https://www.sportstechtoday.com/how-technology-is-transforming-sports-booking/)

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