
Team Name - Dal Chawal

1. Atharva Kalekar - https://github.com/AtharvaKalekar/Campus-Sports-Ground-Booking-System-.git
2. Samarth Devadiga - https://github.com/SamarthD1/Campus_Sports_Ground_Booking_System-.git
3. Ameya Sagwekar - https://github.com/Ameya48/Campus-Sports-Ground-Booking-System-.git
4. Rizwan Salmani - https://github.com/Rizwan2611/Rizwan-Salmani
5. Sarang Gole - https://github.com/Saranggole9106/112_SARANG_GOLE

Campus Sports Ground Booking System Documentation

Introduction

This documentation details the Campus Sports Ground Booking System project: its requirements, technology stack, backend and frontend design, deployment, research plans, and reflections.

Phase 1: Survey

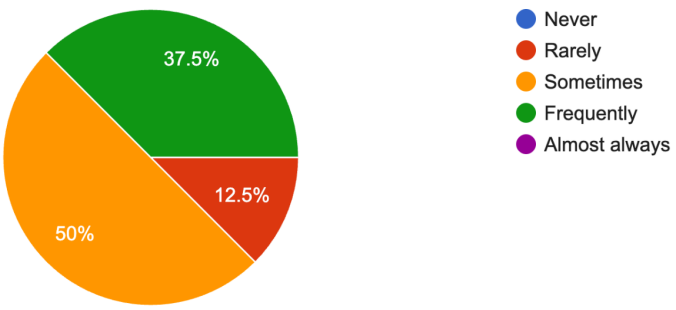
- **Goal**: Understand student & staff problems with booking.
- **Example Questions**:
    - How do you currently book the ground? (manual register / message / other)
    - What's your biggest issue? (double booking / no availability / fairness / etc.)
    - What problems do you face while trying to book or access a ground?

- Would you prefer an online system?
- Which features would you like in a booking system?

- **Expected Results**:
  - Most students face unfair multiple bookings.
  - Everyone wants a transparent online portal.

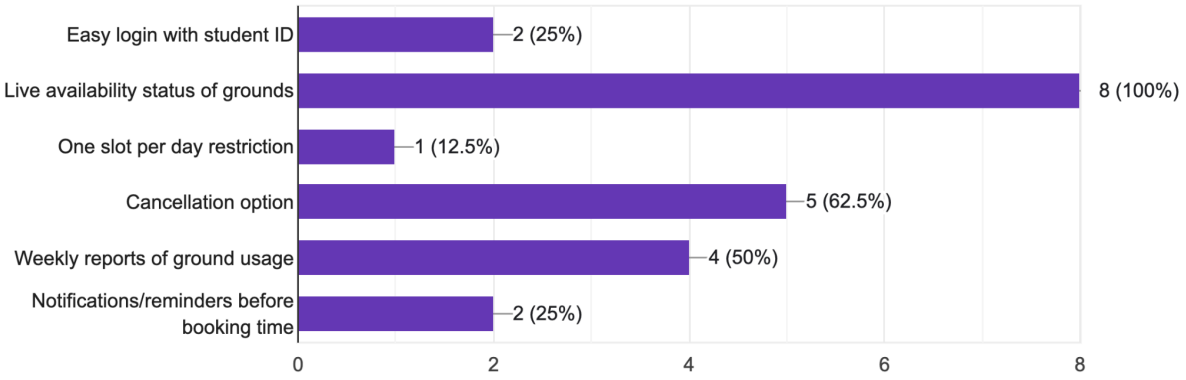
3. How often do you face difficulty booking a ground?

8 responses



6. Which features would you like in a booking system?

8 responses



Phase 2: Case Study

- **Case Chosen**: Sports Ground Booking.

- **Interviews**:

    - **Students** → "I try to play football but seniors book multiple slots."

    - **Staff** → "We write names in registers; sometimes two students claim the same slot."

1. Current Workflow

At present, the booking of campus sports grounds is handled in a **manual and unstructured way**:

- **Manual Registers:** Students approach the Sports Office and write their names in a physical register for a time slot.
- **WhatsApp/Verbal Requests:** In some cases, bookings are done informally via WhatsApp groups or direct messages to the sports committee members.
- **No Centralized Record:** Records are either paper-based or scattered across different communication channels, making it difficult to track usage history.

2. Identified Pain Points

Through observation and discussion, the following issues were noted:

1. **Overlap Bookings:**
   Multiple students/groups end up booking the same slot for the same ground due to lack of a real-time system.
2. **No Transparency:**
   Students cannot see who has already booked a slot, leading to confusion and disputes.
3. **Misuse of Facility:**
   Some students book multiple slots in a single day, leaving less opportunity for others.

4. **Administrative Burden:**
   Sports committee staff spend considerable time manually updating and verifying registers.
5. **Lack of Notifications:**
   Students are not informed if their booking is confirmed, rejected, or cancelled.

3. Stakeholder Interviews

A. Student Users (End-Users)

- **Feedback 1 (Student A):**
  "I often go to the football ground only to find out someone else has also claimed the same slot. It feels unfair and confusing."
- **Feedback 2 (Student B):**
  "It would be great if there was an app where we could see available slots in real-time and just book them."

Key Needs Identified:

- Fair access (limit to one-slot-per-day).
- Transparency (see available slots before booking).
- Convenience (book online without visiting the office).

B. Sports Committee Staff (Administrators)

- **Feedback 1 (Staff Member 1):**
  "We maintain a register, but students often argue if two names clash in the same time slot. It's time-consuming for us to resolve."
- **Feedback 2 (Staff Member 2):**
  "Sometimes students book multiple slots in a single day. We have no effective way to stop this manually."

Key Needs Identified:

- Automation of booking validation.
- Reduced disputes.
- Easy monitoring through a dashboard.

4. Conclusion & Insights

- **Students** want **fairness, transparency, and convenience.**
- **Staff** want **automation, reduced workload, and proper monitoring.**
- The **main problem** is the absence of a centralized, rule-based system.

- **Solution Direction:** A MongoDB-backed digital booking system enforcing **“one-slot-per-student-per-day”** with real-time updates and automated restrictions.

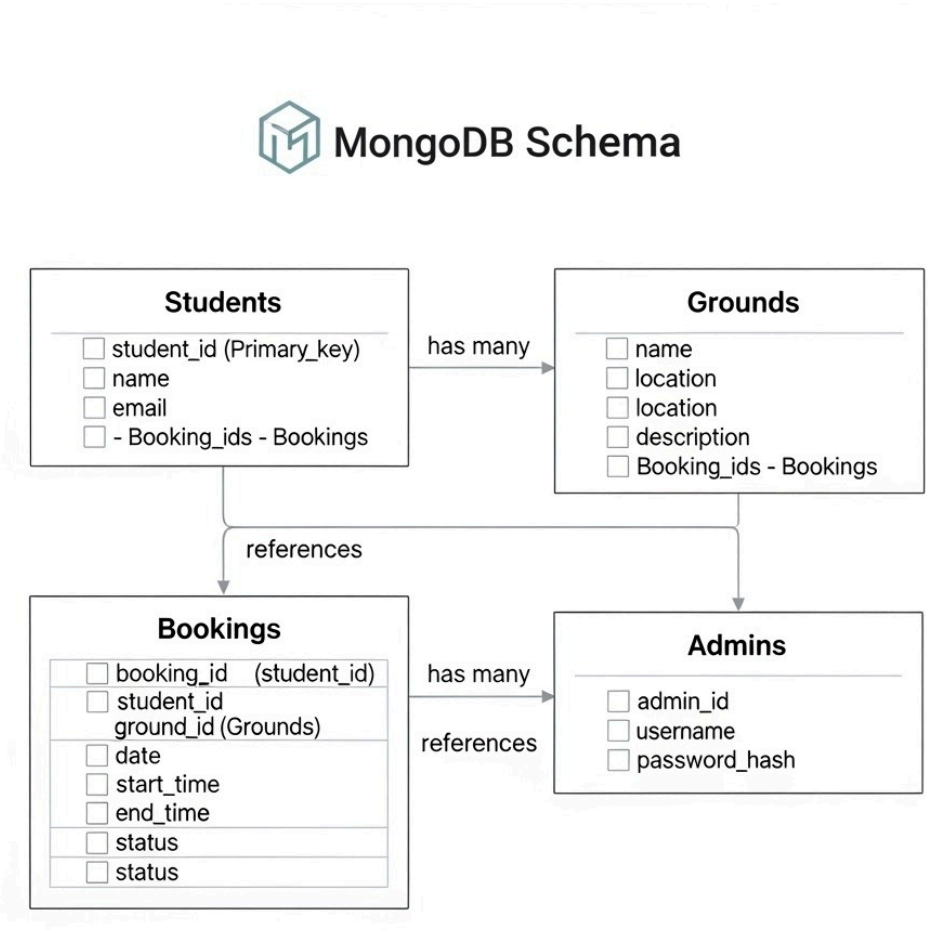
System Architecture

Architecture Overview:

- Backend: Node.js + Express with MongoDB for persistence.
- Frontend: React (or HTML/CSS/JavaScript) with Firebase Authentication and Firebase Hosting.

Phase 3: MongoDB Schema

- **Database**: MongoDB (flexible JSON-like).



Students

- `_id`, `name`, `email`, `rollNo`, `department`
  Example:

`json`

```
{
 "_id": ObjectId("507f1f77bcf86cd799439011"),
 "name": "Atharva Kalekar",
 "email": "atharva@123.gmail.com”,
 "rollNo": "CS2021001",
```

```
 "department": "Computer Science",
 "firebaseUID": "firebase_auth_uid_string",
 "createdAt": ISODate("2024-01-15T10:30:00Z"),
 "updatedAt": ISODate("2024-01-15T10:30:00Z")
}
```

Grounds

- `_id`, `name`, `location`, `slots[]`
  Example:

json

```
{
 "_id": ObjectId("507f1f77bcf86cd799439012"),
 "name": "Football Ground",
 "location": "North Campus Sports Complex",
 "slots": [
   "06:00-07:00",
   "07:00-08:00",
   "08:00-09:00",
   "16:00-17:00",
   "17:00-18:00",
   "18:00-19:00",
   "19:00-20:00"
 ],
 "description": "Full-size football field with grass surface",
 "capacity": 22,
 "isActive": true,
 "createdAt": ISODate("2024-01-15T10:30:00Z"),
 "updatedAt": ISODate("2024-01-15T10:30:00Z")
}
```

Bookings

- `_id`, `studentId`, `groundId`, `date`, `slot`, `status`
  Example:

json

```
{

 "_id": ObjectId("507f1f77bcf86cd799439013"),
```

```
  "studentId": "firebase_auth_uid_string",

  "groundId": ObjectId("507f1f77bcf86cd799439012"),

  "date": ISODate("2024-01-20T00:00:00Z"),

  "slot": "16:00-17:00",

  "status": "confirmed",

  "bookingReference": "BK1705312345ABC",

  "createdAt": ISODate("2024-01-15T10:30:00Z"),

  "updatedAt": ISODate("2024-01-15T10:30:00Z")

}
```

Phase 4

Functional Requirements

1. User Authentication

   Students sign up and log in using Firebase Authentication (via email/password or Google login).

   - Each logged-in student is mapped to a record in the Students collection in MongoDB.

2. Booking System

   Students select a ground, date, and time slot.

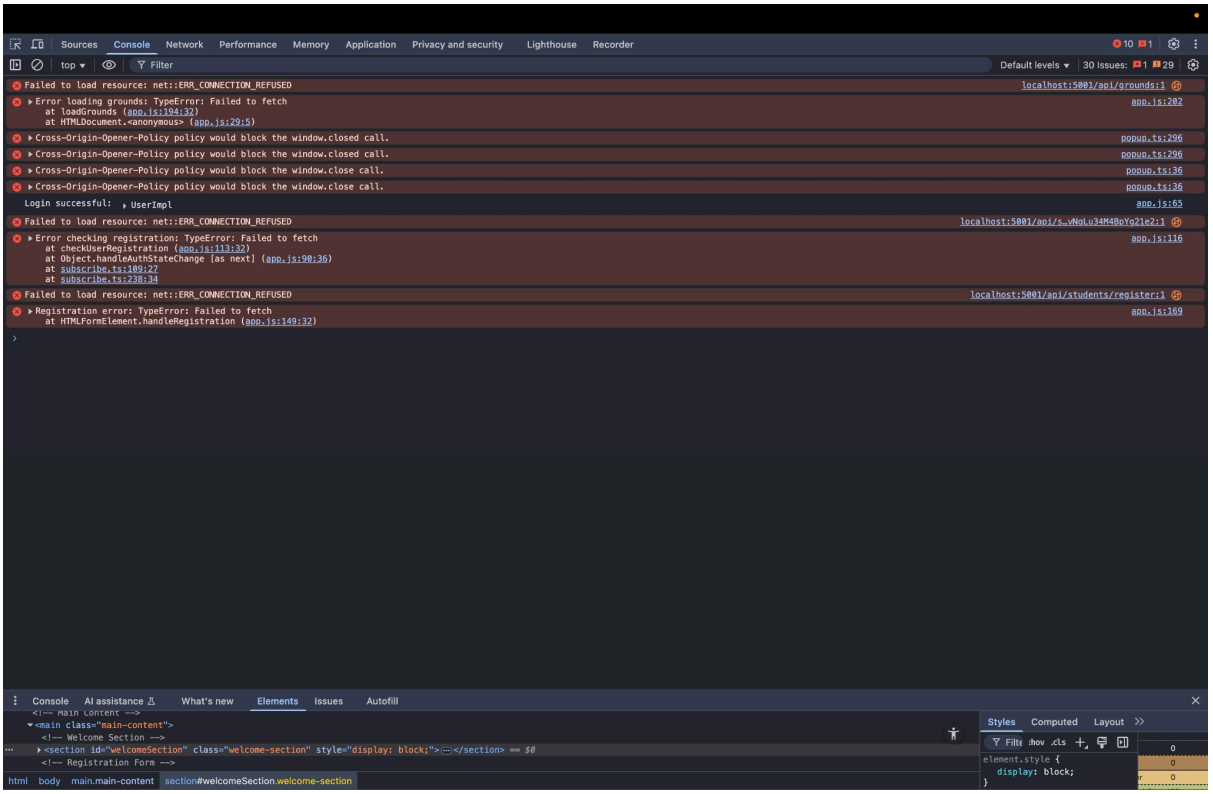
   - Before confirming, the system checks MongoDB to ensure:
     - The slot is available.
     - The student hasn't already booked for that date (restriction rule).

3. Real-Time Updates
    - Bookings are synced using Firebase Realtime Database or Firestore.
    - If a slot gets filled, other students immediately see it as unavailable.
4. Dashboard
    - Students → can view their upcoming bookings.
    - Admins → can view all bookings for all grounds and cancel/approve if needed.
5. Deployment
    - Frontend + prototype deployed on Firebase Hosting.
    - MongoDB stores booking data permanently.

Roles

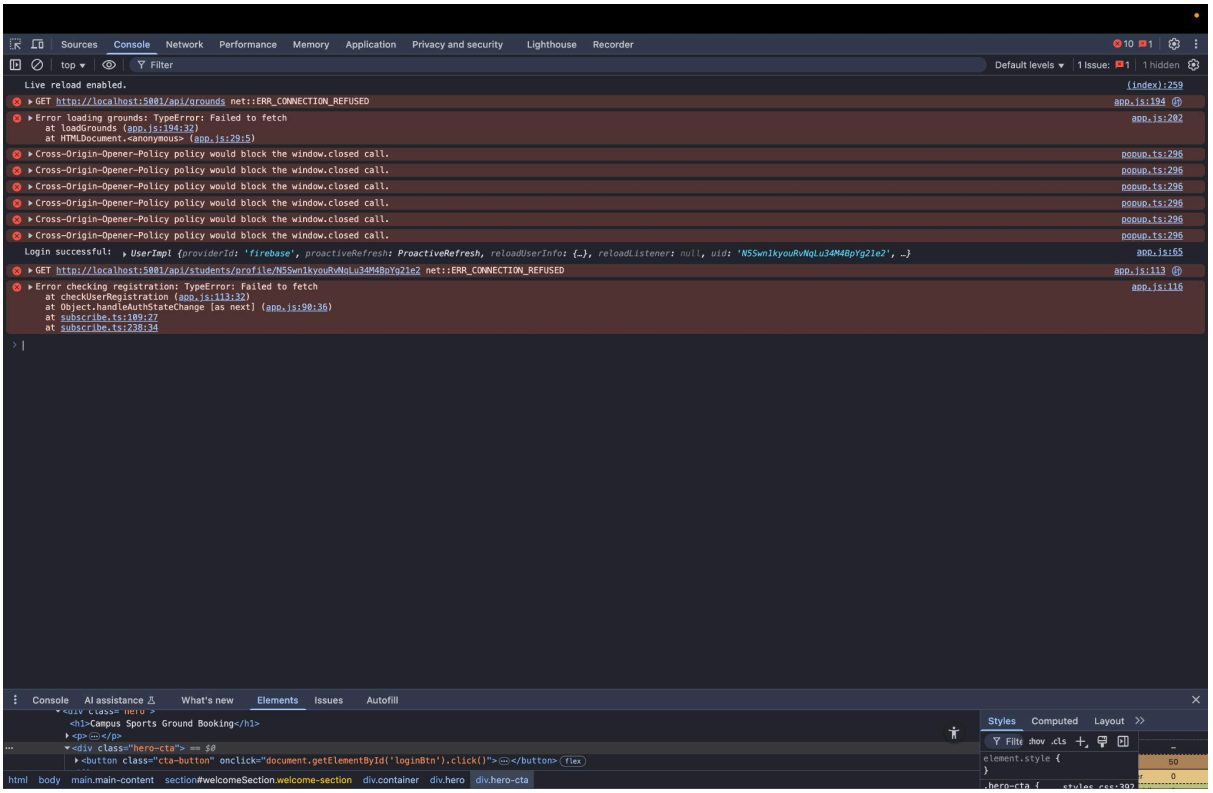
- Authentication - Rizwan
- Database - Sarang
- JS Code - Ameya, Atharva, Samarth
- Schema - Atharva & Ameya
- Survey - Atharva
- Documentation - Ameya
- Case Study - Samarth & Rizwan

Challenges / ERRORS faced



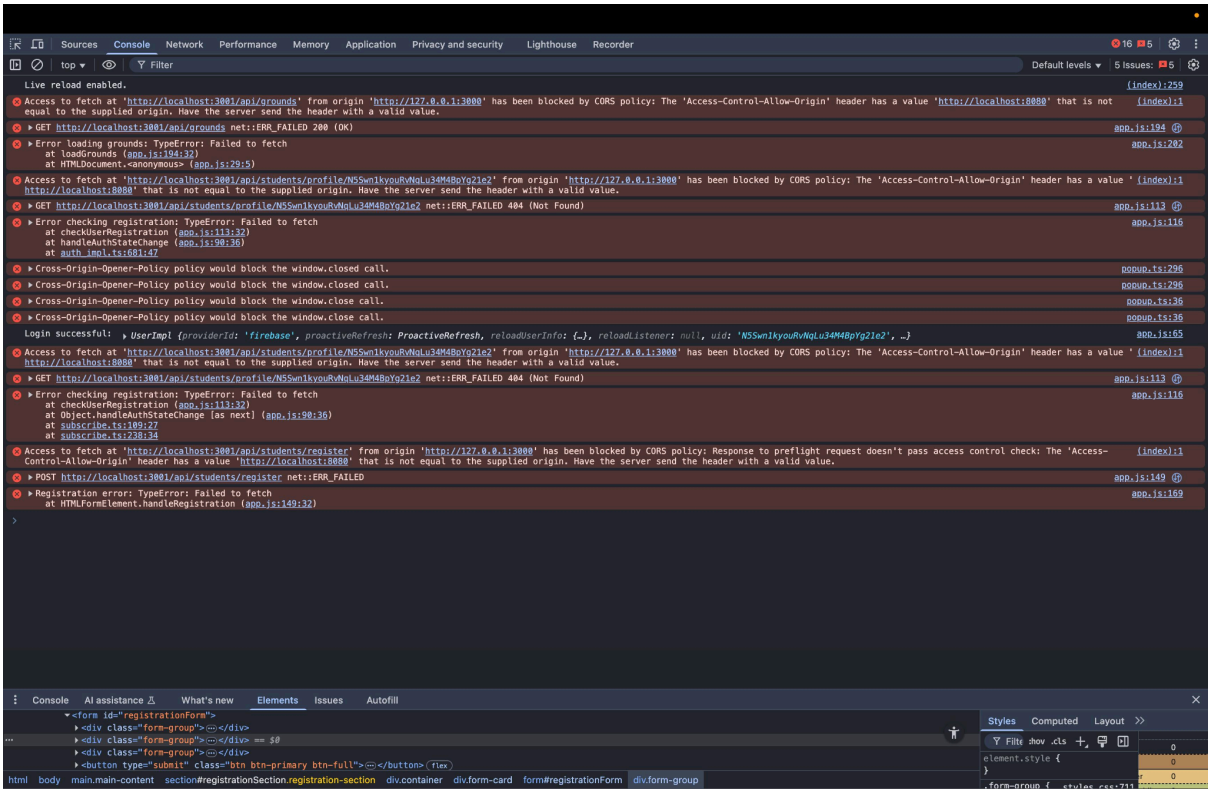
Errors

1. **Failed to load resource: net::ERR_CONNECTION_REFUSED**
2. **TypeError: Failed to fetch**
3. **Cross-Origin-Opener-Policy warnings**



Error

1. **GET http://localhost:5001/api/grounds net::ERR_CONNECTION_REFUSED**
2. **GET http://localhost:5001/api/students/profile/... net::ERR_CONNECTION_REFUSED**
3. **Cross-Origin-Opener-Policy warnings**



Errors

1. **CORS Policy Error**
2. **404 (Not Found) Error**
3. **CORS Preflight Error (for POST)**

References

- Google Docs API documentation
- Software project report examples
