

# Sports Complex Management System

July 14, 2025

## Abstract

The Sports Complex Management System is a web and mobile-based platform designed to streamline the management of sports equipment and live sports events within a college campus. It allows students to request and return equipment, join specific sports clubs, and view real-time match scores. Admins can manage inventory, approve requests, update scores, post announcements, and track student participation for university team selection.

## User Roles and Permissions

- **Student:** View equipment, request/return items, join clubs, view live scores, view announcements.
- **Admin:** Manage inventory, approve requests, schedule matches, post announcements, manage clubs and selections.
- **Scorer:** Input and update live match scores.
- **Viewer (Optional):** Access live scores and announcements without login.

## Functional Requirements

- Equipment inventory and issuance system
- Role-based authentication (student/admin/scorer)
- Live scoring for ongoing matches
- Match scheduling and results history
- Sports club join/leave system
- Club member management and university team selection
- Announcement system for event notifications and updates

# Non-Functional Requirements

- Mobile and web support
- Real-time updates using WebSockets or Firebase
- Clean and responsive UI (Flutter and React)
- Secure access control and data protection

## System Modules Overview

### 1. Equipment Management

Students can request sports equipment. Admins approve or deny requests. Inventory updates are automatic.

### 2. Live Scoring System

Admin or scorer inputs match scores. Scores are pushed in real-time using Socket.IO/Firebase.

### 3. Club Enrollment System

Students browse and join clubs. Admins manage members and select participants for university teams.

### 4. Announcement System

Admins post general or club-specific announcements. Students receive updates on their dashboard or via push notification.

## System Flow

### Student Flow

Login → *ViewEquipment* → *RequestEquipment* → *JoinClub* → *ViewScores&Announcements*

### Admin Flow

Login → *ManageInventory* → *ApproveRequests* → *ScheduleMatch* → *InputScores* → *PostAnnouncement*

### Scorer Flow

Login → *SelectMatch* → *UpdateScore* → *SystemBroadcastsUpdate*

## Database Tables Overview (Simplified)

- users(id, name, email, role)
- equipment(id, name, quantity, status)
- *issues*(id, student\_id, equipment\_id, status, date)
- *matches*(id, team1, team2, datetime)
- scores(id, match\_id, details)
- clubs(id, name, description)
- club\_members(id, club\_id, student\_id, status)
- announcements(id, title, content, type, created\_by, date)

## Technology Stack

- **Frontend:** React.js (Web), Flutter (Mobile)
- **Backend:** Node.js + Express
- **Database:** MySQL/PostgreSQL
- **Real-time:** Socket.IO or Firebase
- **Notifications:** Firebase Cloud Messaging
- **Deployment:** Vercel, Netlify, Railway, or Render

## Conclusion

This system will automate and digitize the college's sports complex operations, allowing efficient management of resources, improved communication via announcements, and effective tracking of student participation for team selections.