

Gym Area Scheduling System

Project Backlog

Team Number: 23

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Problem Statement

College campuses with shared gymnasium facilities lack centralized, user-friendly systems for students and organizations to reserve spaces for practices, scrimmages, and tournaments. Current solutions often rely on fragmented processes such as email chains, physical sign-up sheets, or outdated booking systems that do not support real-time availability, team coordination, or competitive event organization. Our project delivers a unified scheduling platform purpose-built for athletic facility management, combining reservation capabilities with social features like team formation, group messaging, and achievement tracking, creating a cohesive experience that existing generic room-booking tools fail to provide.

Background Information

Existing solutions like EZFacility and DSE Recreation Software provide robust administrative tools for gyms, offering facility scheduling, membership management, and intramural registration. However, these platforms are designed primarily for staff administrators rather than end-users, resulting in interfaces that prioritize back-office workflows over student experience. EZFacility excels at resource management and POS integration but lacks native tournament bracket generation and offers no built-in social features for team coordination.

DSE provides strong club sports registration but relies on web-based access without true native mobile applications, and neither platform includes community-building tools like group messaging, achievement systems, or gamification to drive ongoing student engagement. Our solution flips this model by having students be the main focus, giving them a mobile-first experience with native iOS and Android apps, integrated team formation and real-time chat, automated bracket generation for tournaments, and an achievement system that rewards participation, all while maintaining the scheduling fundamentals these legacy platforms provide.

Functional Requirements:

1. As a user, I would like to register for an account, optionally with social OIDC / institutional SSO, w/wo 2FA

2. As a user, I would like to see when and where my account was last accessed, see a table of sessions.
3. As a user, I would like to receive alerts for suspicious login activity, including unauthorized access.
4. As a user, I would like to login to my account, with email/password, social OIDC / institutional SSO.
5. As a user, I would like to be able to manage my account status (delete / temp. deactivate)
6. As a user, I would like to be able to change my profile information (name / email / bio / etc.)
7. As a user, I would like to reset my password, which sends a reset link to my email, so that If I forget it, I can create a new password.
8. As a user, I would like to access the service on multiple platforms (web and mobile).
9. As a user, I would like to log out before the session expires.
10. As a user, I would like to be able to report other users for any inappropriate use of the application, view reports submitted, and associated status.
11. As a user, I would like to view and manage my notifications within the application.
12. As a user, I would like to adjust certain accessibility attributes of the application (color / font size).
13. As a user, I would like the application to have support for multiple world languages (internationalization), so I can read things in the way I am most comfortable.
14. As a user, I would like to have guides for all parts of the application, so that I know what features are available and how to use them.
15. As a user, I would like to send messages to other individual members.
16. As a user, I would like to have multiple group chats, focused on messaging my team.

17. As a user, I would like to see the previous chat logs, so that I can refer to past information.
18. As a user, I would like to join and view available tournaments.
19. As a user, I would like to gain and view my achievements so I can feel accomplished.
20. As a user, who is a student, I would like to view other students' profiles so I can see things like their achievements and tournament results and compare them with mine.
21. As a user, who is a student, I would like to see videos of certain sports, so I can learn how to get better at them.
22. As a user, who is a student, I would like to see recap videos of previous tournaments of the highlight moments if recorded/ stored.
23. As a user, who is a student, I would like to have the ability to see live streams of tournaments either through the app or with a link.
24. As a user, who is a student, I would like to view gym availability, so that I can plan a tournament/ match at specific time and location.
25. As a user, who is a student, I would like to block other students.
26. As a user, who is a student, I would like to report other users in case of any inappropriate text messages.
27. As a user, who is a student, I would like to create a team and manage it.
28. As a user, who is a student, I would like to send / accept a request / invitation to join a team, will send notification to regarding the request/ invitation.
29. As a user, who is a student, I would like to be able to leave a team.
30. As a user, who is a student, I would like to be able to see the availability of a gym on a screen outside of it
31. As a user, who is a student, I would like to be rewarded for participating in tournaments, so that I am motivated to attend them

32. As a user, who is a student, I would like to be rewarded for winning tournaments, so that I am encouraged to play as well as I can in tournaments making them competitive
33. As a user, who is a student, I would like to showcase my tournament wins if I wanted to, so that I can show to other users how successful I've been in tournaments
34. As a user, who is a student, I would like to be rewarded for engaging with others on the app
35. As a user, who is a student, I would like to receive reminders about upcoming tournaments.
36. As a user, who is a student, I would like to be suggested certain users who have similar interests to me, so I can find people to practice and potentially form teams with.
37. As a user, who is a student, I would like to receive alerts whenever my configured gym areas availability status changes.
38. As a user, who manages an organization, I would like to create tournaments, optionally with a maximum amount of teams
39. As a user, who manages an organization, I would like to create a round robin system for tournaments so that teams can be ranked before being put into a bracket
40. As a user, who manages an organization, I would like to modify and delete tournaments.
41. As a user, who manages an organization, I would like to send out invitations to teams to join a tournament
42. As a user, who manages an organization, I would like to create announcement-type group chats where only certain people can text
43. As a user, who manages an organization, I would like to add and remove teams from tournaments
44. As a user, who is part of a team, I would like to send messages to other teams

45. As a user, who is part of a team, I would like to block teams from messaging our team
46. As a user, who is part of a team, I would like to be able to schedule meeting ups with other teams
47. As a user, who is part of a team, I would like to be able to be able pick a member as team captain
48. As a user, who is part of a team, I would like to be able to remove a member as team captain
49. As a user, who is part of a team, I would like to be rewarded for engaging with others on the app, so that I am encouraged to use the app more
50. As a user, who leads a team, I would like to set gym availability's status including time and location, after the user manually reserved it.
51. As a user, who leads a team, I would like to send an invitation to other students to join the team.
52. As a user, who leads a team, I would like to remove students from the team.
53. As a user, who leads a team, I would like to delete a team.
54. As a user, who leads a team, I would like to send messages and notifications to my teammates, so that I can keep them informed.
55. As a user, who leads a team, I would like to be able to change my team captain status towards other students within my team.
56. As a user, who manages a department, I would like to be able to manage the messages sent between teams
57. As a user, who manages a department, I would like to be able to delete messages sent by users
58. As a user, who manages a department, I would like to be able to suspend or ban users
59. As a user, who manages a department, I would like to temporarily restrict user actions instead of fully banning them.

60. As a user, who manages a department, I would like to manage gym availability and notify users if the time they scheduled becomes unavailable, so that what is shown in the service matches real world conditions.
61. As a user, who manages a department, I would like to set warnings if certain elements within the gym aren't available.
62. As a user, who manages a department, I would like to view usage statistics, so that I know how the gyms are being used.
63. As a user, who manages a department, I would like to create tournaments that are put on by the department.
64. As a user, who manages a department, I would like to sponsor certain tournaments for more attention.
65. As a user, who manages a department, I would like to make certain events only available to certain students based on skills or other elements.
66. As a user, who is an IT service employee, I would like to manage SSO integration.
67. As a user, who is an IT service employee, I would like to have a health check, so that if the site goes down, we can know about it.
68. As a user, who is an IT service employee I would like to have test tournaments to see if any issues with creating tournaments come up.
69. As a user, who is an IT service employee, I would like to have all the documentation within descriptive files to allow future developers to work on it.
70. As a user, who is an IT service employee I would like to have certain text messages auto delete if inappropriate.
71. As a user, who is a staff member, I would like to have access to all tournaments going on, so that I can inform people in the tournament where they are if they ask
72. As a user, who is a staff member, I would like to recommend tournaments to students.

Nonfunctional Requirements:

Architecture/Performance:

We plan to develop our software be a Capacitor-based application providing native experiences on iOS, Android, and web browsers. The frontend will be built with Vue 3 and Pinia for state management, delivering a responsive and intuitive interface for all scheduling and social features. Our backend will use NestJS written in TypeScript, using Prisma as the ORM for type-safe database interactions. The API will handle authentication, reservations, tournament logic, messaging, and achievement tracking. If cross-service communication becomes necessary (e.g., notification workers, analytics pipelines), BullMQ or Kafka will be employed for message queuing.

Usability: We want the interface to be simple enough so that any user can access anything they want on the software easily and that the average user has no problems using the website. We also want users to quickly be able to find gyms that fit their needs quickly and easily. Users should also be able to use the website on any device regardless of screen size or resolution.

High Availability: Gyms, especially campus gyms are typically open 7 days a week with long hours. Interruption or service uptime issues can seriously impact normal operations at a gym if this software is implemented. We can vastly reduce the likelihood of these issues occurring through clustering and load balancing both the backend service and it's downstream resources