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Product Backlog

Project Name: Grapevine

Problem Statement

Students often struggle to find academic partners and may feel limited to their existing friend groups, who might not share similar academic interests. Our application enables students to connect with their peers to form effective study groups, fostering collaboration and improving academic performance. Unlike services like BoilerLink, which focuses on large-scale events with fixed timelines, our app prioritizes flexibility and direct student interactions.

Background Information

Domain

The application falls under the Education Technology and Academic Collaboration domain. It focuses on facilitating peer-to-peer learning by helping students form and manage study groups efficiently. Unlike general social platforms this application is specifically designed for academic collaboration and education.

Audience

Students and instructors alike benefit from participation in study groups. Study groups allow students to gain a better understanding of course material and connect with classmates. Instructors benefit as well, as study groups encourage active engagement with course content, leading to better-prepared students for exams and outside of university. The domain for this product would be education as this application helps students and instructors form study groups easier.

Similar Platforms and Their Limitations

There are some existing platforms that connect students with each other such as BoilerLink. However services like BoilerLink primarily focus on large events such as club meetings rather than academic collaboration. Messaging apps like Snapchat, Discord, and GroupMe are used for informal study groups but they lack tools for efficient planning and coordination. These platforms typically rely on word-of-mouth to form study groups which is an inefficient process. Additionally current tools do not help users coordinate study times and locations easily.

Our Solution

Our study group finder will provide a structured search and filtering option based on courses, assignments, availability, and study preferences. It will also offer group scheduling, messaging, and notifications to streamline study group coordination into one centralized location.

Functional Requirements:

User Registration & Authentication

1. As a user, I would like to register an account.
2. As a user, I would like to be able to log in to my account.
3. As a user, I would like to be able to enable 2-factor authentication during registration (if time allows)
4. As a user, I would like to reset my password in case I forget it
5. As an instructor, I would like to be able to verify my role (TA or professor) and the class I teach using my university email during registration (move to profile)
6. As a student, I would like to verify my enrollment in a university by sending a confirmation code to my university's email when I register an account.
7. As a user once I create an account I would like to be guided on account setup (courses, available times, etc…) (if time allows)
8. As a user I would like to be able to delete my account and all information tied to it.

User, Instructor, & Study Group Profiles

9. As a user, I would like to be able to modify my account information (password)

10. As a student, I would like to be able to set and display what course I am taking, what major I am in, what year I am in, what teachers I have, and what study groups I prefer.
11. As a student, I would like to be able to set my current friends
12. As a user, I would like to be able to set what times I am available
13. As a user, I would like to be able to set locations I would prefer to meet at
14. As a user, I would like to be able to write a bio about myself
15. As a user, I would like to be able to connect (make friends) with other users
16. As an instructor I would like to be able to set what courses I am teaching
17. As a instructor I would like to be able to see students enrolled in my courses
18. As a instructor I would like to be able to set my role (UTA, GTA, professor)
19. As an user, I would like to be able to view my rating/reviews
20. As an instructor, I would like to be able to specify my group as an instructor led group

Messaging & Notifications

21. As a user I would like to message other users and view my message history for that message thread.
22. As a user, I would to receive notifications (emails, browser alerts) about messages
23. As a user, I would like to be able to message one of my friends from their profile
24. As a user, I would like to be able to navigate to a user's profile from my message channel with them
25. As a user I would like to be able to search my message threads for a user and if I do not already have one to create a message thread with them through the search feature.

Discussion Forum

26. As a user, I would like to be able to view a list of discussion forum threads
27. As a user, I would like to be able to filter discussion forum threads
28. As a user I would like to be able to start a discussion forum
29. As a user I would like to be able to reply to discussion forums
30. As a user I would like to be able to upvote or downvote a discussion forum
31. As a user I would like to receive notifications about replies to my forum posts

Study Group Discovery & Scheduling

32. As a user I would like to be able to search for other users (potential connects/friends) based on my profile

33. As a user I would to be able to search for other users by filters
34. As a user I would like to schedule events
35. As a user I would like to see a collection of upcoming events on the events page
36. As a user I would like to register for an upcoming event
37. As a user, I would like be filter through upcoming events by date, location, and classes
38. As a user I would like to be able to set reminders about my upcoming events
39. As a student, I would like to rate other students or instructors in my study group (like Uber)
40. As a student I would like to provide a written review for other students and instructors
41. As a user, I would like to create study group profiles
42. As a student, I would like to see public study groups
43. As a user I would like to see private study groups. If they are private I would like to be able to send a request to the host to join the study group.

Navigation and Usability

44. As a user, I would like to be able to view a homepage that summarizes my upcoming events and account info
45. As a user, I would like to be able to access some info about the creators of the app
46. As a user, I would like to generate a QR code for my study group
47. As a user I would like to be able to scan a QR code and join a study group

Non-Functional Requirements:

Architecture and Performance

- We will be developing our frontend and backend separate from one another. This allows for modularization of our project allowing for an easy division of work. The backend follows the common RESTful API model and will be written in Java using the Java Spring Boot framework. Spring Boot is a powerful Java framework that packages many features that allow our web application to be scalable, such as built-in dependency management, an embedded server for easy deployment, and a robust ORM (Object-Relational Mapping) library through JPA/Hibernate.
- The frontend will be created using React and will request data from the backend using requests to our API.

- We will maintain a relational database that will be able to store data persistently
- General Architecture: Client - API-layer/server - database
- Upon startup our application will load within 2000ms.
- When switching tabs our application will have a maximum loading time of 500ms.
- Our application should run 24 hours per day as students often study at odd hours.
- These metrics are standard for industry applications.

Security

Security is essential for our service as it will handle user data and allows direct communication between students. The Spring Boot framework provides multiple built-in security features that prevent common threats. This includes BCrypt Password Encoding for password storage, XSS prevention, and SQL injection protection. We will also implement a roles and permissions systems ensuring students and instructors can only access features relevant to them. For instance instructors will only be able to manage study groups for their own courses, which will be verified, and students can only see study groups they are eligible to join. This prevents unauthorized access and misuse of the system.

Usability

Our application is designed with usability in mind. The interface will be clean, intuitive and responsive, allowing students to navigate between features. The app minimizes layers of page navigation, keeping things central to a home page. This allows all students to easily use our product.

Hosting/Deployment

For hosting and deployment our frontend and backend will be entirely separated. This allows us to deploy and update the frontend and backend completely separately of one another. The frontend will be deployed using Vercel, which allows for a simple and efficient way to deploy web projects. The backend will be hosted on Heroku which ensures reliability and scalability. The PostgreSQL database will be stored on Supabase with automatic backups to maintain user data. This allows our product to remain fast and reliable, while being easy to maintain.