mango

Team 10 - Product Backlog

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Problem Statement

Students and faculty members alike are required to use different platforms and services to manage, consume, and curate content for courses. Our project aims to unify the features of different platforms, creating an intuitive service that centralizes quizzes, homework, attendance, grades, and relevant course information via a well-designed web application.

Background Info:

Audience

Modern learning experiences no longer exist solely in the classroom. Students and teachers across the world interact with their classes using online platforms and services. It's surprising that despite the huge target audience, existing options are poorly designed, lacking the centralized features that students and teachers need.

Similar Platforms

There are several existing course management services like BlackBoard, HotSeat, iClicker, and Piazza. These services allow students and teachers to interact with their classes online, but in different ways. BlackBoard focuses on grade management and file submission, Piazza provides a place for students to ask questions and receive class updates, and iClicker and HotSeat focus on taking attendance.

Limitations

While many of these existing platforms are useful, their main limitation is that they are all separate services. We believe that students should not need to use multiple services to manage coursework for a single class. In addition, several of these services have poorly designed interfaces that make them difficult to navigate for both students and instructors. Our goal is to make the platform intuitive, so that users will immediately know how to get things done without the need for tutorials.

We aim to address these problems by creating a platform that combines many of these different services into one highly polished package.

Functional Requirements:

1. As a user, I would like to be able to register for a Mango account.
2. As a user, I would like to be able to login and manage my Mango account.
3. As a user, I would like my password to be reset if I forget it.
4. As a user, I would like to be able to easily navigate to any course page.
5. As a user, I would like to be able to easily access Mango across all of my devices.
6. As a student, I would like to be able to view my grades.
7. As a student, I would like to be able to take quizzes.
8. As a student, I would like to be able to submit files for grading.
9. As a student, I would like to be able to view my courses.
10. As a student, I would like to be able to easily view course content.
11. As a student, I would like to be able to ask questions and respond to others on a course messaging board.
12. As a student, I would like answer instant polls during class.
13. As a student, I would like to be able to easily view and analyze my instant poll results.
14. As a student, I would like to receive notifications for grades.
15. As a student, I would like to be able to receive email notifications for course announcements.
16. As a student, I would like to be able to view and export my course calendar.
17. As an instructor, I would like to be able to create and manage a course.
18. As an instructor, I would like to be able to assign grades.
19. As an instructor, I would like to be able to create weighted sections for grading.
20. As an instructor, I would like to be able to create quizzes.
21. As an instructor, I would like to be able to receive file submissions from students.
22. As an instructor, I would like to be able to create announcements for my course.
23. As an instructor, I would like to be able to respond to student questions on a course messaging board.
24. As an instructor, I would like to be able to create instant polls for students to answer.
25. As an instructor, I would like to be able to easily view and analyze instant poll answers.
26. As an instructor, I would like to be able to post generic course content (plain text, embedded videos).
27. As an instructor, I would like to be able to add events to my course calendar.
28. As an instructor, I would like to be able to view and export my course calendar.

Non-Functional Requirements:

Architecture and Performance

We plan to develop the application with a completely separate frontend and backend. This will allow us to effectively divide our work, and make it easier to avoid compatibility problems between the frontend and backend. The backend will model a RESTful API (Representational State Transfer), written in PHP using the popular Laravel framework. Laravel is a powerful PHP framework that

packages many features that will allow our web application to be scalable, such as a database caching system and an advanced ORM (Object-Relational Mapping) library. We will also deploy our web app with the new PHP 7, which has proven to be significantly faster and less memory intensive than previous versions.

The frontend will be developed using AngularJS, and will pull data from the backend via requests to the API. Separating the front and back ends will make it easy to expand to other platforms (e.g. Android or iOS) in the future should we choose to do so.

Security

Security is crucial for Mango, since it will house various pieces of sensitive information. The Laravel framework comes with several security features out of the box to prevent common exploits such as cross-site-scripting and SQL injection. We will also implement a roles and permissions system to ensure users can only access material they should be able to. Course instructors will only be able to view and control content for courses they teach, and students should only be able to view content for their own class sections. All requests to the API will need to be authenticated in order to prevent abuse.

Usability

The interface should be easy to navigate and simple enough for the average user to understand. Given the variety of features, it's important that the user interface is well designed, so that the website doesn't get in the way of learning. Similar platforms have entirely separate websites for instructors to enter data and create course-wide content, but we want to have a central platform and interface for both instructors and students. This will ensure that both parties can access and input information in the same place. Instructors will use a similar frontend to the students, but they will have additional administrative options enabled. We also want to ensure that our application is accessible on all screen sizes and resolutions, as well as on all browsers.

Hosting/Deployment

Because the front and back ends will be entirely disjoined, they can be deployed and updated separately. Once we are far enough along in development, we can deploy the backend to a DigitalOcean server for testing. The frontend can then be easily hosted for free as a GitHub Pages site.