

## **Ludus**

### **Project Backlog - Team 33**

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#### **Problem Statement:**

There are various platforms designed to share educational content with students. However, we have identified two major shortcomings with these existing platforms. First, most of these platforms focus either only on academic or only on professional education, forcing prospective learners to visit many different places to learn new skills, and potentially leaving these students in the lurch when it comes to learning recreational skills. Second, the existing platforms do not provide clear guides to learners completely new to the skill, which sometimes can result in users gaining only a piecemeal understanding of the topic.

#### **Background Information:**

Audience: Our audience includes any who seek to learn more about a given topic (like juggling, piano, magic, physics, or even software engineering), from as well as those who wish to teach others. This project caters to those who enjoy learning through a community-based approach, which is more relaxed than a traditional classroom format that may involve online homework.

#### **Similar platforms:**

Currently, platforms such as Khan Academy and Coursera allows users to choose their own learning pace, but only about educational topics. Khan Academy only has videos which are approved by the site administrators, which both slows down the output of educational content and limits the variety for educational topics. Furthermore, Khan Academy does not have a framework for providing course feedback or recommendations on other videos that a student

might also enjoy. Another example of a platform that offers educational content, YouTube allows for any type of recreational or educational content to be uploaded. However, the search results can be disorganized, unless the uploader has created a custom playlist for them. YouTube also does not support a system by which students can objectively track their mastery of a topic, such as via quizzes or tests. Our project aims to allow anyone to be a teacher, so that the topics won't be limited; and also to support courses for a given topic that may include mastery tests.

## **Requirements:**

### **Functional:**

1. As a user, I would like to be able to create, update, delete an account.
2. As a user, I would like to be able to log into an existing account.
3. As a user, I would like to have a mechanism to reset a lost password.
4. As a user, I would like the ability to filter out potentially offensive content.
5. As a user I would like to discuss lesson content with other users in a comment section.
6. As a user, I would like to be able to list my preferred hobbies and interests so that courses are better catered to my interests.
7. As a user, I would like to be able to create course paths from existing courses (idea like playlist).
8. As a user I would like to be provided with a rough estimate on how long a course may take me to complete.
9. As a user I would like the possibility to create a student and or teacher account (and manage them separately).
10. As a student, I would like to be able to track the courses I have completed.
11. As a student, I would like to be able to learn from multiple teachers.

12. As a student, I would like to be able to follow teachers so that I am notified when new material is available.
13. As a student, I would like to be able to rate courses I have already taken.
14. As a student, I would like to view courses another student is taking/following (if time allows).
15. As a student, I would like the courses to be organized so that it is clear what class I should take next, such as learning paths.
16. As a student, I would like to be able to make recommendations about courses I've taken.
17. As a student, I would like to be able to view recommendations for courses that others have taken.
18. As a student I would like to be able to search for courses by criteria (tags, teachers, topics, etc).
19. As a student I would like to see courses recommended based on courses I've completed (prerequisites and related topics).
20. As a student I would like to be able to bookmark courses I wish to take.
21. As a student I would like to be able to view all my ongoing and/or completed courses at once
22. As a student I would like to be able to save progress on a course and resume it later.
23. As a teacher I would like to be able to be provided with statistics on who is viewing my courses, such as age range, stated hobbies, etc.
24. As a teacher I would like to make and publish courses.
25. As a teacher I would like to be able to assign tags and other information to classify my course so that they can be searched.

- 26. As a teacher I would like to be able to define required or recommended prerequisite topics.
- 27. As a teacher I would like to be able to remove courses or modules I have created.
- 28. As a teacher I would like to be able to make edits to published courses.
- 29. As a teacher I would like to be able to view feedback specific to my courses.
- 30. As a teacher I would like to be able to remove my own courses.
- 31. As a teacher I would like to be able to give feedback to other teachers courses.
- 32. As a teacher I would like to be able to my suggest courses to other's learning paths.
- 33. As a developer I would like to make storage and transfer of sensitive data secure
- 34. As a developer, I would like to be able to connect all course paths and lessons in a tree like structure.

#### **Non-Functional:**

##### **Architecture and Performance:**

The frontend will be written using Bootstrap, CSS, and powered by React. The backend will be implemented with Node connected to Firebase. The site should be able to handle 10,000 users/teachers online at any given moment, while at the same time meeting Google's benchmark of loading the homepage in under a half second.

##### **Security:**

Security is essential for Ludus, particularly in storing and accessing sensitive information.

Firebase has many security measures already in place and provides easy-to-use tools to help developers make their apps secure specifically for authorization, authentication and validation.

We will use Firebase Authentication which supports both OAuth 2 (support for Google, Facebook, etc) as well as email & password login, which will securely identify our users. To further ensure security for data access, we will create rules to specify rights for data access. Firebase Database Rules allow you to control access for each user. With these two essential procedures in place, our application will be predominantly secure since the data will all be handled by Firebase. Furthermore, we will also use Firebase validation to ensure that the data stored in the database is in the correct format.

### **Usability:**

In order for students (and teachers) to be able to focus we need them to feel comfortable in their environment and with the tools that they will use to learn. An intuitive interface allowing any user to view all their current options without being overwhelmed is desirable. Ideally we want our website to be centralized, with both teachers and students using a similar interface only splitting off within the initial site, to a course development dashboard and a learning dashboard.

Teachers will have more options than students, only by virtue of having more necessary actions to fulfill. Students could have access to those features upon their own decision to develop and publish their own coursework. This will allow both types of users to be familiar with the same platform, preventing any divide between teachers and students from being created by virtue of environment.

**Hosting/Deployment:** The frontend and backend will be on a server hosted by DigitalOcean and the database will be hosted on Firebase