WhiteBoard
An Efficient and Intuitive Learning Management System
Project Progress Report

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1   Background

A Learning Management System(LMS) is an interface between students, professors, and school administration. One of the most popular LMSes, especially at colleges and universities, is Blackboard[3]. Blackboard, however, is extremely slow and has unnecessary features that are often left unused. For example, Blackboard's personalize page features are rarely used, and students avoid the discussion boards. These LMSes' designs often make them difficult to navigate. For example, Blackboard has two sets of navigation tabs, and it is not obvious what the difference between them is. These problems add up to create an interface that is slow and difficult to use, even though there is no need for it to be that way. Students today would rather get what they need quickly than have hundreds of features that they rarely, if ever, use. Other LMSes include Moodle[2], Veracross[1], and Canvas[4]. Moodle is open-source, but it is difficult to use. Veracross is nice, but expensive. Canvas is more like Blackboard and is just not good.

2   Objective

WhiteBoard will focus on having an efficient, intuitive interface, and it will have features of excellent quality rather than a large quantity of features. It is open-source, allowing it to be customized and used as desired, although it focuses on the University of Rochester. Also, WhiteBoard will have a unified user experience. It shouldn't take a student who is majoring in computer science three days to find where the grades are posted, and even then to be confused about what their grade is, and it should be easy to navigate to the University of Rochester website. WhiteBoard's design will make such navigation a pleasure.

3   Features

Specifically, WhiteBoard will have the following features:

- Lightning-quick load times

- A secure and painless login system

- Course system, with registration and grades for students

- Convenient communication between administrators, professors, and students, both for general communication and announcements

- Open source

4   Current Assets

Our team's combined experience covers PHP and Javascript very well, the LAMP stack and all its associated programming languages, and even configuring a Linux server for web hosting. Everyone on the team understands design, and how to learn from both the successes and the mistakes of systems like Blackboard. As

students, we have constant access to Blackboard, and we have the expertise to dive into the site to see what code works well and what code doesn't. We are also constantly learning, and our ability in areas relating to this project will only increase.

We are also using several libraries to assist in creating WhiteBoard. We are using jQuery, a javascript library, and code from the open source PHP-Login project, so that we have a secure but simple to use system. The PHP-Login library also includes a module for sending email, so we don't need to deal with the intricacies of that. There are also many other libraries for Javascript and PHP available should we find them useful.

The server we are using is an Apache server on Ubuntu. We're using an Amazon EC2 free tier for testing and debugging. This won't work for any kind of production use, but it's fine for testing and debugging.

We're also using PHPMyAdmin and MySQL Workbench for designing and managing the database.

5 Budget

Because we aren't spending any money on a server for development, there are for the most part no costs. However, if this site were to go into production, then we would need a dedicated server, which would cost money.

6 Development Environment

We are collaborating over GitHub, which combines version control, file sharing, and the ability to edit files online into one service.

Some people have a local server for testing code directly on their computers. Others are unable to set this up, but this is not a problem since we have our testing and debugging server that we can use.

7 WhiteBoard, Currently

We have made significant progress on WhiteBoard. We've designed and set up the database, general layout of the website, and login system, and courses are almost completely implemented.

7.1 Database Structure

We have thoroughly planned the database for the entire system. The database is a MySQL relational database. Rather than trying to store too much data, and in an effort to make the database as efficient as possible, we are using only 14 tables, as we show in figure 1. This is far less than the approximately 200 tables that Moodle uses.

7.2 General Layout

The general layout of the page is straightforward: there is a header with a search bar and user info, a sidebar with tabs, and the main content area, as we show in figure 2. The goal of this project is not to make anything too fancy, and keeping the user interface simple like this is one of the main ways we accomplish this goal.

7.3 Login System

With the open-source library we're using, the PHP-Login project, the login system is complete. Users can register, and we've set up an email verification system. Users can log in and the system will remember them.

7.4 Courses

Users can search for courses via the search bar, and then they can add and drop courses. The system keeps track of which users are enrolled in which sections.
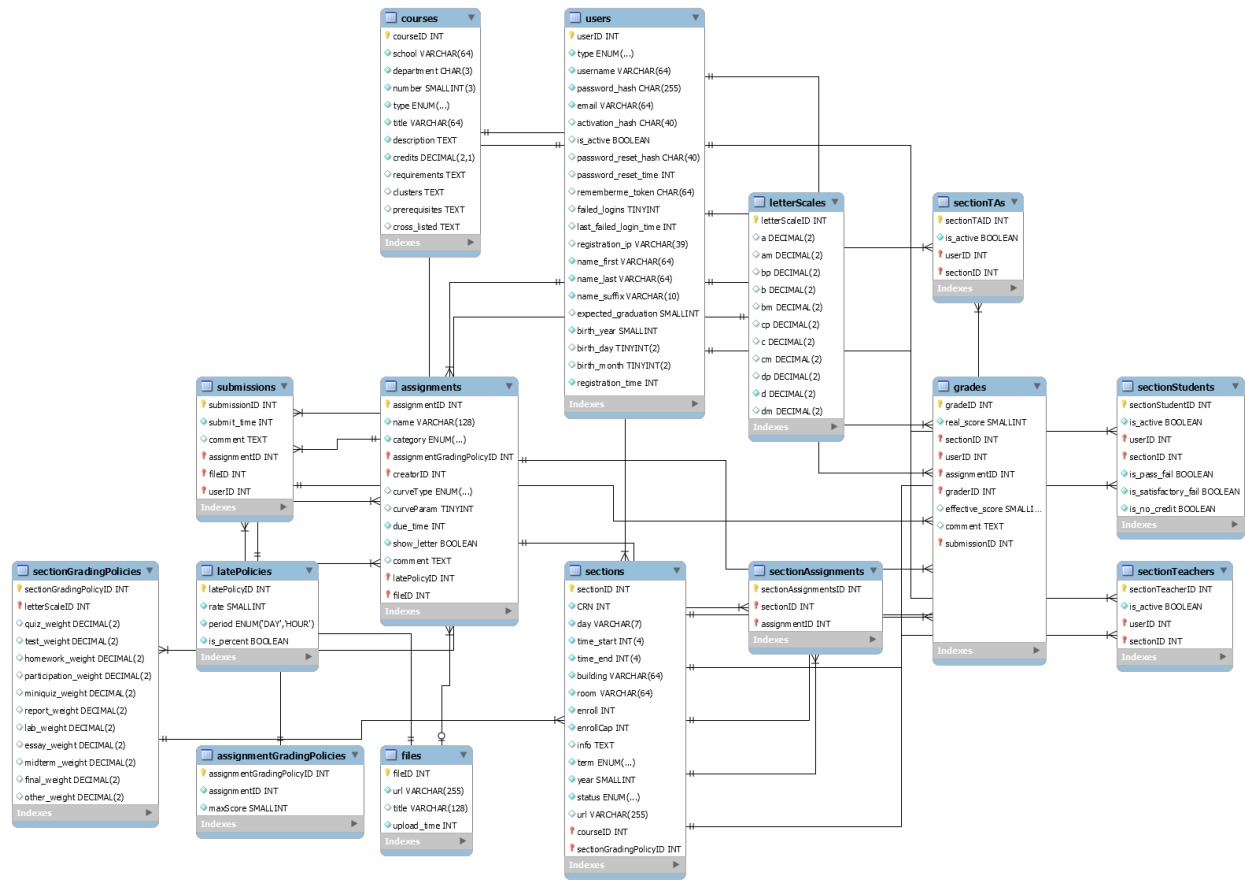
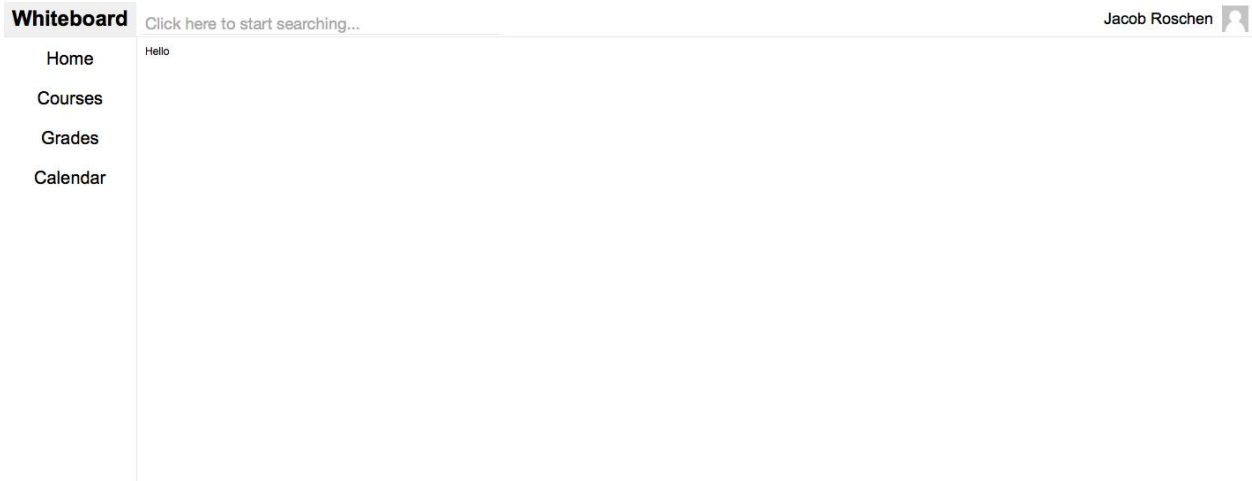Figure 1: The database diagram, generated by MySQL Workbench.

Figure 2: The general layout of the website. This shows the current homepage of a user that is logged in.

8 Future Plans

8.1 Courses UI

The courses UI could use a little more work for pretty it up and make it completely intuitive. There is not much more to do in this area, though; much of the courses UI has already been done.

8.2 Grades

8.3 Announcements and Communication

The primary aim of announcements and communication is for students to be able to contact other students in their classes. For simplicity, this will direct to email. It also will allow teachers to get a list of their students for whole-class announcements, and for students to get their teachers' emails easily.

8.4 Professors' UI

We plan to create a side for professors so that they could do administrative functions, such as adding students to classes.

References

[1] Breuer & Co. Veracross. https://veracross.com.

[2] Moodle HQ. Moodle. https://moodle.org.

[3] Blackboard Inc. Blackboard. https://blackboard.com.

[4] Instructure. Canvas. http://instructure.com.