Student Management System Proposal

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Problem Description Write-up

Project Description

This project will entail a modern version of a student management system (SMS). This is a piece of software used by primary and secondary educational institutions to maintain student grades, attendance, and behavior.

Most current systems are overly complex and not user-friendly- requiring the regular contact of the development team to fix small issues. For something that will be used everyday in such an important capacity, simplicity is really the best option. Students, teachers, administrators, and parents alike will be using the system. It is important that the system provides the simplest path for each user while maintaining the level of access needed.

Problem Solved

The new system will focus on only providing access to what a user needs. For example, a teacher has no need to view data for students that they do not teach. Why then provide full access to the system. Likewise, parents may need access to multiple student's grades under a single login (multiple children in a single school). The goal is to maintain the balance between simplicity and power. Users should be able to easily access everything that they need quickly and efficiently- without extraneous options hindering the process.

Personas

The users of this platform can really be broken up into two main domains. Teachers/Administrators and Students/Parents.

School staff will have edit access to the data. They will be able to change and update grades. Record attendance. And modify behavioral logs. Teachers will have limited access- only to the students they directly teach. While administrators will have access to the student population.

Students and Parents on the other hand will have view-only access. These users will only need to view grades, attendance, and behavior. More specifically- these users will only be able to view these data on an individual basis. Students will not be allowed to view other students. And parents will only be able to view their children.

Project Benefits

The simple nature of the new application will make it easier for users to complete the required tasks. As of now, entering grades and behavioral referrals in existing systems is cumbersome and endlessly complicated. A user may have to make multiple entries to ensure the data was recorded properly.

The new system will make an effort to have a simple and streamlined system. The menu will be clearly identified to access grades, attendance, and behavior. With one click the users will be where they are needed to be.

User Interaction

Users will interact with the app by selecting pages from a list of menu options. By selecting “Grades” the user will be taken to the appropriate grades tab. For example, a teacher will be taken to their class page while a student will be taken to a progress report of sorts. The user interaction will involve less clicks to ensure simple yet powerful access to the necessary data.

Minimum Viable Product (MVP) Write-up

High-Level Overview of Features

All users will be required to login to the web application. This will ensure that each user has the correct access to the web application. Students and parents will only be able to see individualized data. These users can select a web page from a menu of options. Each webpage will be associated with data entered by a school staff member. For example, the “Behavior” page will contain data related to the student’s behavior. Students and parents can only view this data. The simplicity of the menu items will allow parents and students to both stay up to date on the students progress at school.

School staff members will initially enter the web application in the same manner to students and parents. Logging-in to ensure the correct permissions are set for the user. Teachers will have access to change attendance, grades, and behavior referrals for all of their assigned students. While administrators will have the same access for all students. School staff members can write data as well as read it.

In addition to the minimal requirements of reading and writing data. The application will have a few extra features for teachers and administrators. It is often important to pull reports of failing students, or students with repetitive behavioral tendencies. An additional reports feature will be added for school staff (including failing students, behavior reports, attendance reports, and report cards).

Minimal Required Features

At minimum, the application will require web pages for grades, attendance, and behavior. These three pages will display the associated data to the end users. In the simplest form- these three pages would create a limited, yet functional SMS. School staff would have the ability to write data on each page while students could only view the data.

There would at minimum have to be a layer of security to ensure the users are only accessing the data they have been allowed. Students will only be able to view their own data, while teachers can view and write data for each of their students.

High-Level Architecture Overview

The web application will have at minimum three layers. Of course, the application will have a simplified User Interface. All users will directly interact with this layer to read and write data. The goal of this layer is to simplify the user’s access and management of data. There will also need to be a data layer- stored in a relational database. The data

needs to be stored in a safe location, away from the user layer to prevent data from being corrupted or viewed without permission.

There will also need to be an intermediate layer between the user and the data. This layer will store the logic to control what data is viewable to which users. Teachers will be able to view the data representing every student found within the classes they teach. On the other hand, a student can only view their own data. Administrators will have full access and can pull reports to show attendance and grade trends. The intermediate layer will work to query the SQL database to pull the necessary data from the data layer.

High-Level Data Overview

The web application will use a relational database (such as PostgreSQL). A relational database is preferred because of the inherent relationships within the data. Students are related to parents and teachers. Grades and classes are related to teachers and students. And so forth.

A student will represent an object. The student object will contain the following data at minimum:

- Student Name
- Student ID
- Parent Name
- Classes Assigned
- Grades
- Attendance
- Behavior

A teacher will represent an object. The teacher object will contain the following data at minimum:

- Teacher Name
- Classes Taught
- Contact Information

A class will represent an object. The class object will contain the following data at minimum:

- Class Name
- Teacher Name
- Students Enrolled
- Class Description
- Class Time