## System Components and Design

### Purpose

* The purpose of this project is to provide better driver training via online classes and in-person practice tests.
* The client is DriverPass, Liam is the boss and Ian is the IT Officer.
* The system needs to function as the focal point for DriverPass both for customers and for employees of DriverPass.
* The system needs to work as a way to currently show information, allow users to plan future appointments and handle billing.

### System Background

* Creating an interface for their customers and employees to interact with to view their dashboards with.
* These employees and customers will have various roles the primary roles will be the driver role and the user role. The driver role will update information by providing feedback to the student on the course as the user role completes classes.
* The user role will be the account for the student/parent/guardian of a student which will be able to change information as needed such as contact methods, credit card number, etc. The user role will use the information provided to study for tests.
* After that there will also be an admin role and secretary role both act as supports to the other two roles. The secretary role will assist creating the calendar events for students and assign drivers based on scheduling. The admin role will help by updating the information and increasing performance of the application by editing it.
* The system needs to be cloud based, our team needs to take care of the backup and security as well.
* The need to handle backup means that our team will have to maintain a development environment and a production environment. This will likely include a server of some sort that will be a cost for the client and for our team to maintain.

### Objectives and Goals

* The main goal is scheduling and progress. The website/application needs to show the current progress of the user and allow them to view their lesson progress.
* The system must be able to administer online classes these online classes should be downloadable so that customers may read the material offline. While online, the system needs to allow customers to schedule in-person driving practice classes, view their current progress of classes, access the online testing, view current instructors pictures and change their personal information (personal information also will include the ability to change customer passwords autonomously).
* The drivers need to be able to access the system, assign and re-assign appointments for driving tests, update materials and provide feedback via a message board to the student. This includes updates that are primarily online, but offline functionality should be logged as best as possible to preserve any information being recorded about students (since mobile internet connection may vary). Web pages should be static so that the drivers can input information on the go and then when they get a internet connection restored the application will send the information off. This would also include allowing the drivers to see their schedules and have a list of the time and date of appointments that they need to be present at and the start/end of the route the student will be driving.
* The system needs to be able to allow secretaries to view the driver schedules, add new appointments, modify current appointments and delete current appointments.
* The system needs to be able to allow administrative employees to access activity logs, disable modules that are no longer available, and block access to terminated employees or customers.
* Lastly the system must be able to automatically update itself based off of information materials sent down by the state DMV. For scalability purposes the materials sent down will vary both in length and in the requirements to keep current with their program.

## Requirements

#### Performance Requirements

* The system should have a web-based application, this is crucial to the customers since many of the target demographic will be parents that want their student driving teenagers to be able to drive well.
* It should also be able to run on a mobile application to make it easier on the Drivers to log information into the system.
* The system should be very fast and responsive to users, ideally no more than 1 second load times between screens.
* The system should not be updated too often, it matters mostly on the department of transportation or the DMV since they will be one of the driving forces of changes to course materials.

#### Platform Constraints

* The application will be hosted on a Linux server.
* The backend of the application requires a database with a few tables such as an activity log, a user log, and a feedback log.
* The application requires a framework for the platform to use, I recommend Ubuntu because it is free and quite popular.

#### Accuracy and Precision

* The system will distinguish users via roles and logins. The login will give access to a unique access number that identifies what user is accessing the application. The role will control the level of access and visibility the account has.
* The inputs for login pages will be case sensitive. This gives the user more options for their username and password.
* The inputs for information will not be case sensitive, everything will be displayed in all caps.
* All roles will have the least amount of access necessary to complete their task to reduce security risks (the administrator having the most access to everything).
* The system will send off an email to the admin immediately if there is a problem. However, if it is an error report not by the system and by a user these reports will be compiled for review later since no action will likely be taken until a course of action is decided that benefits DriverPass the best.

#### Adaptability

* The system will be able to modify users based on a database that hosts the logins on a table. The table will have multiple roles (for modification purposes) such as User, Driver, Secretary, Admin. The admin accounts will have access to modify, add, or remove accounts from the table to prevent any unauthorized account from having access (such as a fired employee).
* The IT Admin will have complete control of the entire application. They will have access to the code being used and access to modify any of the tables withing the database.

#### Security

* The user will need a username and password to login. This will be generated by an email and password combination. Users signing up will create their own password.
* The password must contain one Uppercase Alphabetical Character, one Lowercase Alphabetical Character, one numeric character and must be at least 8 characters in length.
* If a user forgets their password, they must reset their password using their own email account to access their information. Should an email be lost or stolen they will have to contact the office and get in touch with a secretary (or admin) that will be able to edit their information to a new email and change their password.
* The connection between client and server will be secured with a TLS/SSL level of encryption to prevent easy access to data being sent.
* Should a hacking attempt happen a secretary or administrator account can close off the account to prevent further damage. There will be an administrator account that will always have access to the entire system should the system be compromised. This account will also be able to rollback the database incase any damage is done to the system or materials.

### Functional Requirements

* The system shall provide information to students such as driver feedback, course materials, training videos, and other information.
* The system shall take payments by the customer via QuickBooks which will access the accounts and approve or deny credit card transactions.
* The system shall provide a schedule that is accessible online and offline to drivers that will have the appointment and a location to start and end the driving tutoring.
* The system shall encrypt data being transmitted between the client and server.
* The system shall have a hard coded administrator account that has complete control of the system.

### User Interface

* The interface will be easy to understand and will not be cluttered with information or widgets/buttons.
* There will be three different kinds of users for the interface, User, Admin, Secretary, and Driver.
* Users will be able to look at their progress (via a profile page), edit their schedule for appointments, and read over the notes or course materials.
* Admin roles will have complete access to everything in the system, additionally will be able to update the course materials based on DMV or DOT data.
* Secretary roles will primarily be able to change user account and access the schedules of both the drivers and the users.
* Drivers will have access to leave notes for the users and will be able to adjust their schedules and appointments.
* The user will interact with the interface on both mobile and web browsers.

### Assumptions

* I am assuming that most of the web-based application will be accessed on mobile devices or web browsers.
* I did not address push notification or other forms of notification.
* I am assuming that the financials will be covered for an TLS/SSL certificate and a database.

### Limitations

* Time is a big limitation; the schedule is already set for the project.
* The amount of time to test the system a limitation, all use cases should be easy to complete but some more advanced cases or exceptions may not make it to the first iteration.
* Resources are a limitation since there is only one developer on the team.

### Gantt Chart

A screenshot of a project schedule

Description automatically generated