## System Components and Design

### Purpose

* The purpose of this project is to provide prospective DriverPass students access to driver’s training materials to assist them with their tests at the Department of Motor Vehicles (DMV). The system should also be capable of booking appointments for a students on-the-road training. In addition, DriverPass wants the system to contain study materials and practice exams for students to complete. The project will use a robust administrative backend to assist DriverPass in providing tailored education to their students.

### System Background

* The client wants the application to be a web-based Learning Management System that assists students in the use of their courses, practice exams, and reservation services.
* The system will provide a simple and easy way for students to access learning materials that will help them pass their driving test.
* The DriverPass LMS should be accessible from any mobile device or PC.
* DriverPass wants students to have the capability to make reservations at three package levels.
  + Package One: Six hours in a car with a driver
  + Package Two: Eight hours in a car with a driver and an in-person lesson on the DMV's policies and regulations
  + Package Three: Twelve hours in a car with a driver, an in-person lesson on the DMV policies and regulations, and access to DriverPass’ online class and practice exams.
* The system should track and show a student’s information and course progress.
* The LMS should have role-based access control with the following roles:
  + Student: A student is a user that is using the system with intent to access the course material and reservation functionality. Students will be able to utilize DriverPass’ scholarly resources and book reservations for behind-the-wheel training. They should be able to input all personal identifying information and purchase packages using a credit card. This user should be unable to modify any course, grade, or other user information.
  + Driver: Drivers should be able to see the information pertaining to the appointments they have and the students who scheduled them. This user will write feedback for the student that is stored on the student’s account.
  + Secretary: Secretaries will have access to all account creation, reservation, and purchasing functionality. They will use this to create accounts, purchase packages, and schedule appointments for students that visit their physical location or call via phone.
  + Administrator: The administrator will be capable of creating, modifying, and deleting all course, test, user, or reservation information. They will be able to use this for a variety of purposes. For instance, resetting passwords, deleting unused accounts, or viewing student information.
* The components of the system will be the cloud server and any client PC or mobile device that accesses it.

### Objectives and Goals

The objective(s) of the system is/are to:

* Provide the user with a Learning Management System that stores classes and practice exams that assist students with studying for their DMV tests.
* Create an appointment booking system for students to schedule on-the-road training.
* Implement an administrative backend where relevant user information can be collected and observed. The information that will be displayed includes personal and credit card information, course progress, and driver notes.

The goals are achieved if we are able to provide the following functionality:

* Unique user accounts with access controls that are dictated by the role they fill in the DriverPass system. The roles in our application include Student, Driver, Secretary, and Administrator.
* Persistent user information that shows a user’s progress in their courses, tests, and driver’s training appointments. This includes personal and credit card information for students.
* Creation and modification of test and course materials that are in line with DMV regulations.
* Purchasing of packages for driver’s training appointments and course materials using user credit card information.
* Creation, modification, and deletion of behind-the-wheel training appointments
* Viewing all relevant student information including first and last name, address, phone number, state, credit card number, expiration date, security code, test and course progress, and driver feedback.

## Requirements

### Nonfunctional Requirements

#### Performance Requirements

* The system will be a web-based application that has its data stored on a cloud-based server.
* Our LMS should have sub-second response times to increase user retention.
* Courses should be updated when the DMV changes their driver’s training curriculum.

#### Platform Constraints

* Due to the nature of web-based systems, the application will run in any web browser.
* Any PC or mobile device with a web browser should be able connect to the system.

#### Accuracy and Precision

* To distinguish between users, every user should have a unique username and password for their account.
* The input for both username and password will be case sensitive.
* Administrators should be notified within 30 minutes of any system error.

#### Adaptability

* Administrators should be capable of adding, removing, and modifying user data without changing any code.
* IT will have access to user information stored in the user’s account.
* The courses provided will be modified in accordance with DMV curriculum updates.
* The system should update on the first Sunday of each month from 1-3AM. Maintenance will be announced on the website 48 hours in advance.

#### Security

* A username and password are required to login to a user account.
* Passwords will be stored and checked using a hash function to protect user passwords.
* If a password is guessed incorrectly 5 times or forgotten by the user, the account will be frozen and need email verification to unlock. In cases like these, an email with a random five-digit integer will be sent to the email address on file for the account. The integer should be input on the application to reset the user’s password.

### Functional Requirements

The system shall:

* Facilitate creation of user accounts that require the following information: username, password, first and last name, address, phone number, state, credit card number, expiration date, and security code.
* Designate roles to users depending on their relation to DriverPass. System roles are Students, Drivers, Secretaries, and Administrators.
* Allow modification of any user account data.
* Validate user credentials during the login process.
* Store user passwords only after they have been hashed for security purposes.
* Schedule appointments for users based on their desired day, time, and location.
* Allow users to change time, day, or location for their existing appointments.
* Create tests and courses based on DMV learning materials.
* Facilitate the access of learning resources.
* Allow Drivers to provide feedback to Students after behind-the-wheel training.
* Automatically grade any tests completed and relay that grade to the student.

### User Interface

* The user will be able to interact with the system using any web browser.
* Students, Drivers, Secretaries, and Administrators should be capable of using the system through its user interface.
* The interface should have webpages for the following purposes for each role or group of roles:
  + Students:
    - Accessing the courses that the Student has purchased.
    - Completing the tests that supplement their courses.
  + Drivers:
    - Providing feedback for Students after completing driver’s training.
  + Administrators
    - Modifying account information and deleting accounts.
    - Creating and changing course date for Students to utilize.
    - Visualizing the account information, course progress, and driver feedback for a Student.
  + Secretaries, Administrators, and Students:
    - Creating an account with inputs for first and last name, address, phone number, and state.
    - Purchasing one of DriverPass behind-the-wheel packages with a Student’s name, address, credit card number, security code, and expiration date.
    - Booking, modifying, and cancelling appointments for on-the-road training.

### Assumptions

* Users will need a device with a web browser to access the system
* Students need to acquire their own or a parent’s credit card to purchase packages.
* The user must live in or near an area that is serviced by DriverPass to make effective use of the appointment booking system.

### Limitations

* The LMS must be accessible from the region that DriverPass provides their services.
* The system should not exceed the budget specified by the client.
* Hardware limitations should not be a problem as all server interactions are taken care of by a third-party. Scaling the DriverPass system up for more users should be simple because of this.
* The application must run in a web-based environment. The system should be able to run on most PCs and mobile devices.

### Gantt Chart

Chart, timeline

Description automatically generated