# CS 255 Business Requirements Document

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## System Components and Design

### Purpose

* The client is DriverPass, they would like to create a cloud-based web app to train students to pass their driving tests.
* The system should be able to:
  + Provide online classes, including practice tests.
  + Provide on-the-road training.
  + Access data on desktop and mobile.
  + Download reports and other information in CSV format.
  + Allow customers and secretaries to create appointments for driver training.
  + Track who created reservations and who last modified them.
  + Allow customers and secretaries to modify reservations.
  + Track which car, driver, and time is assigned to which user.
  + DMV updates send notifications so that the training remains up to date.

### System Background

* DriverPass wants the system to allow users to schedule driving appointments.
* Also wants the system to have three packages to purchase:
  + Package 1 is 6 hours in a car with a trainer.
  + Package 2 is 8 hours in a car with a trainer plus an in-person lesson about DMV rules.
  + Package 3 is 12 hours in a car with a trainer plus an in-person lesson about DMV rules and full access to the online class and practice tests.
* The system should also allow customization of packages in the future. Disabling individual packages are needed for the initial release.
* Customers register via phone call and provide full name, phone number, address, state, and full credit card info, and pickup/drop off location, which must be the same location.
* Each driving lesson is 2 hours long, so Package 1 will have three different appointments, Package 2 will be four different appointments, and Package 3 will be six different appointments.
* Users must be able to automatically reset passwords on their own.
* Customers can schedule appointments on the internet, or via phone call.
* There are 10 cars, and each car has its own driver.
* IT administrator role should have administrative privileges over the system. The secretary role must be able to modify all user accounts to create appointments etc. The boss role gets full privileges.

### Objectives and Goals

* The user interface should show the progress of the user’s tests. This includes what tests are not taken, in progress, failed, and passed for the logged-in customer.
* Customers should be able to register and create an account.
* Customers should be able to purchase packages.
* Customers need to be able to schedule appointments.
* The secretary needs to be able to schedule appointments for any customer.
* The secretary needs to be able to modify appointments for any customer.
* The system should assign an available driver to each user’s appointment.
* The boss needs to be able to disable packages.
* If there are no available drivers, how this is handled must be figured out.
* The website should have access to the online classes in some way.
* Payment integration is likely needed for customers to purchase packages.
* Driver notes and other data, such as appointments, must be available for download by the boss.
* After the current step, which is system analysis, the system must be designed, implemented, and finally maintained after release.
* The system design includes mapping out the database tables, including each table and its rows and columns, and how they are related to one another.
* The website needs a page for the customer to contact the client and a page for the client to contact the customer.
* The web servers should utilize cloud technology to ensure minimal technical issues.
* Notifications must be sent when the DMV updates its rules, policies, or practice tests so the client can stay up to date with training materials.

## Requirements

### Nonfunctional Requirements

#### Performance Requirements

* The system is web-based and should run in all popular modern web browsers.
* The system should not take more than three seconds to perform any operation.
  + These operations include:
    - Database transactions
    - Fetching web pages from servers
    - Fetching data from servers (available appointments, etc.)
    - Processing user input
    - Scheduling appointments
* The system should be updated when the DMV updates its rules, policies, study materials, and/or tests.

#### Platform Constraints

* The clients will be able to access the system from any operating system that runs popular modern browsers.
* The system should be hosted on a cloud provider.
* To reduce system maintenance, cloud technologies should be utilized which include benefits such as:
  + High scalability
  + Load balancing for high uptime rates and responsiveness
  + Automated data backups
* To reduce system administration efforts, the system should consider utilizing security-as-a-service technologies.
* The backend will require a database, likely any SQL-based database will do such as PostgreSQL.
* The backend should be built with a backend framework to minimize development efforts, I such as Node.js which has a wide selection of packages and a robust package manager, Node Package Manager (NPM). Java or similar is also suitable depending on the expertise of the development team.
* The front-end should also utilize a framework such as React (or similar depending on the expertise of the team and the language chosen for the front-end) to streamline the development of the application.

#### Accuracy and Precision

* The User actor will have an authorization type such as admin, secretary, or base user.
* The user fields such as email, username, and password are case-sensitive.
* System administrators should be notified of a problem when:
  + Servers go down.
  + Users submit a complaint.
  + Users report a problem.
* Different errors or administrator notifications will have severity levels, the higher the level, the faster the issue needs to be fixed.

#### Adaptability

* There will be a webpage for creating an account where users can sign up.
* Package customizations will be added in a future release, not the initial release.
* Packages are what DriverPass offers its customers for driving test preparation, and packages include:
  + In-person student driving training with a driver
  + In-person driving test lessons based on DMV rules
  + Access to an online course including practice tests.
  + Additional package contents are unknown (what options are possible to be in a package) and must be clarified for the future release, but not the initial release.

#### Security

* Email or username and password are required for user login.
* JWTs can be used to authenticate and authorize users in subsequent logins.
  + The JWTs should have a relatively short expiration time, about 30 minutes.
  + A refresh token can be implemented with a longer expiration time such as 7 to 15 days.
  + This allows users to obtain a secure and signed authentic token from the server that allows them to be authorized to do protected operations such as logging in without needing to enter their user information again until expiration.
  + The JWT secrets used to sign and verify the tokens must be cryptographically secure and protected from attackers.
* The user's account should be locked after a certain number of failed logins.
* CAPTCHA can be implemented to deter brute force attacks.
* HTTPS should be used for connection between client and server.
* There will be secure automated password resets for users who have forgotten their password and need to regain access to their account.
* Password resets should send a secure one-time link generated by the server to the user’s email address on file where the users can reset their password.
* Multi-Factor Authentication could be offered to users who would like additional security for their accounts.

### Functional Requirements

* The system shall allow authorized users to download data for offline viewing.
* The system shall validate all user input.
* The system shall authenticate users when logging in.
* The system shall authorize users when attempting to access protected routes.
* The system shall allow users to make reservations for driving practice.
* The system shall allow authorized users to make reservations for other users.
* The system shall allow authorized users to cancel and/or modify appointments.
* The system shall take online payments for the packages.
* The system shall allow authorized users to disable packages.
* The system shall send a notification to the authorized user(s) when a DMV update occurs.

### User Interface

* The interface should show online test progress for the logged-in user.
* The interface should show the information of the logged-in user.
* The interface should show driver notes and/or scheduled driving lessons if there are any.
* The interface should show a photo of the student as well as their assigned driver.
* The interface should show any special needs of the student.
* The interface should have a page for signing up with a form to enter the student’s information.
* The interface should have a contact page for the business.
* The types of users are:
  + Student
  + Driver
  + Secretary
  + Admin
  + Boss
* The interface should be responsive, rendering nicely on a wide range of screen sizes from mobile to desktop.

### Assumptions

* The users should be able to either read or listen to text-to-speech.
* The users should be able to see the webpage or have the necessary assistance to understand its contents.
* The user must have an internet connection.
* The user must have a device capable of running a modern web browser.
* The servers which hold the data must be connected to the internet.
* A cloud platform will be available with a reasonable offer suitable for hosting the application, and at a price within budget.
* The cloud servers used will have reasonably good uptime.
* A system administrator will be notified when the servers are down.

### Limitations

* The initial release will take about 15 weeks with a full team of developers.
* The budget cannot exceed what the client is able to afford.
* Non-developers cannot add or modify packages in the initial release, other than disabling.
* The system cannot be accessed without a secure internet connection.
* Data modifications cannot be done offline.

### Gantt Chart

A calendar with red squares

Description automatically generated