# CS 255 Business Requirements Document

## System Components and Design

### Purpose

* The main objective of this project is to create a user-friendly system for our client, DriverPass. DriverPass is a company that wants to revolutionize the driver training industry by offering a comprehensive training program. Their goal is to provide students with an experience that includes access to online practice exams, on-the-road training, and additional resources to help them prepare for driving tests. The system we create should serve as an all-in-one solution, integrating features to meet the diverse needs of both students and instructors. Our consulting firm aims to deliver a system that not only meets but exceeds the expectations of DriverPass, setting a new benchmark for driver training programs.

### System Background

* DriverPass has identified an issue affecting our society: the lack of effective and easily accessible driver training programs. This gap often leads to students being ill-prepared for their driving tests, resulting in high failure rates and, more importantly, unsafe driving practices. In order to tackle this problem, DriverPass envisions a training program that combines both online and offline resources. The program will include classes, practice tests, and real-world driving lessons to create a well-rounded training experience. To bring this vision to life, the system will need to incorporate components such as a user-friendly interface for scheduling secure payment processing, online exams with instant grading, and data analytics to monitor student performance and tailor the training program accordingly.

### Objectives and Goals

To effectively cater to DriverPass requirements, the system should accomplish measurable goals:

* 1. User Registration and Profile Management: Enable students to register, create profiles, and manage their information. This functionality should incorporate verification processes to ensure data accuracy.
* 2. Scheduling On-the-Road Training: Facilitate the scheduling, rescheduling, or cancellation of on-the-road training sessions for students. Real-time availability of instructors and vehicles should be provided.
* 3. Online Practice Exams: Furnish a collection of practice exams that students can take multiple times. The system should provide grading and feedback to help students identify areas for improvement.
* 4. Training Packages: Present a range of training packages with features such as varying hours of in-car training, access to online resources, and additional perks. DriverPass administrators should have the ability to customize these packages according to market demands.
* 5. Secure Payment and Data Handling: Implement security measures to safeguard sensitive customer information, including payment details, pickup and drop-off locations, and exam scores.
* 6. DMV Rules and Policy Updates: Incorporate a feature that allows administrators to effortlessly update the system with any changes in DMV rules and policies, ensuring compliance with the training program.  
  Reporting and Analytics: Create reports that offer valuable information about how students are performing, financial metrics, and customer engagement. These reports should only be accessible to authorized personnel. Should help guide data-driven decision-making for DriverPass.  
  We can measure each of these goals using key performance indicators (KPIs), such as user engagement rates, the number of successful bookings, pass rates in exams, and customer satisfaction scores. This will enable us to assess how effectively the system meets our client’s requirements.

## Requirements

### Nonfunctional Requirements

#### Performance Requirements

The DriverPass system needs to be a high-performance application to ensure a smooth and responsive user experience. It should be accessible through the web on various devices, like smartphones, tablets, and desktop computers. The system should be optimized to load quickly within 2 seconds, even on standard broadband connections, so that users don't have to wait for long. Additionally, it should be designed to handle heavy usage without any decrease in performance, supporting up to 10,000 users simultaneously. To minimize disruption for users, any scheduled maintenance or updates should ideally take place during off-peak hours between 2 and 4 a.m. And users should receive notifications via email and in-app messages at least 48 hours in advance.

#### Platform Constraints

The system needs to be compatible with operating systems, including Windows, macOS, and Linux. It should also work efficiently on web browsers like Chrome, Firefox, Safari, and Edge. In the end, a reliable and scalable SQL database is necessary. It would be ideal if the database could be hosted on a cloud service such as AWS or Azure to ensure scalability, maintenance, and disaster recovery capabilities.

#### Accuracy and Precision

The system needs to ensure a level of accuracy and precision in its operations. It should accurately identify users, such as administrators, instructors, and students, based on their login credentials. To prevent errors, inputs for exams and user data should be carefully considered. Validated, without being sensitive to the letter case. Additionally, the system should include an error logging mechanism and an alert system that promptly notifies administrators via email and SMS if any critical issues occur.

#### Adaptability

The design of the DriverPass system ought to be flexible and scalable, ensuring it can meet demands without necessitating significant alterations to its code. It should provide administrators with a user admin panel for effortless updates to user role training packages and DMV rules. Additionally, the system should seamlessly adapt to changes in operating systems, browsers, and other software components it interacts with.

#### Security

Ensuring the utmost security is crucial for the DriverPass system, considering the nature of the data it will handle, such as user profiles, financial transactions, and exam results. To guarantee a level of security, the system will utilize the SHA-256 encryption algorithm to hash passwords and other sensitive information.

SHA 256 (Secure Hash Algorithm 256 bit) belongs to the SHA 2 (Secure Hash Algorithm 2) family, which is widely recognized as one of the secure hashing algorithms available today. It generates a fixed 256-bit hash that's extremely difficult to reverse engineer. This characteristic makes it highly resilient against collision attacks where two different inputs produce the output hash, thus providing a robust layer of security.

For accounts, two-factor authentication (2FA) will be mandatory to add an extra layer of security. This means not only having a strong password but also utilizing an additional verification method like a mobile OTP (one-time password).

Moreover, an intrusion detection system will be implemented in the system to continuously monitor and identify any suspicious activities. To deter brute force attacks, if there are three failed login attempts, user accounts will be temporarily locked for 30 minutes.

In case users forget their password, there will be a mechanism in place for resetting their password. To complete this process, we will send a link to the user's email address. This link is time sensitive. Will lead them to a secure page where they can reset their password. Before storing the password in our database, we will use SHA-256 encryption to ensure its security and align with industry standards for data protection.

Our goal is to implement a dependable solution that follows best practices in data security, providing a safe environment for our users.

### Functional Requirements

* The system shall verify user credentials when logging in to the system.
* The system shall allow new users to sign up by providing the required information.
* The system shall allow users the ability to change, update or change information in their profiles.
* The system shall show the time slots that are currently open for on-the-road training.
* The system shall enable students to book, reschedule or cancel their training sessions.
* The system shall send instructors email or SMS notifications regarding bookings, or any changes made by students.
* The system shall provide a range of practice exams for students to choose from.
* The system shall automatically grade exams and offer immediate feedback to students.
* The system shall display various training packages that are available for purchase.
* The system shall ensure secure online payments for all training packages.
* The system shall grant administrators the ability to update DMV rules and policies as needed.
* The system shall generate comprehensive reports on student performance, financial metrics, and customer engagement.
* The system shall have a “Contact us” section for customers to ask any questions they have.
* The system shall create notifications on training sessions, payment confirmations and other related events.

### User Interface

The DriverPass system has a user interface that is accessible through various platforms, such as mobile devices and web browsers, to make sure it can be easily used by a wide range of people. The interface is designed with different views for different types of users: students, instructors, and administrators.

For students, the interface offers useful features like booking and rescheduling training sessions, taking practice exams, and tracking their progress using a dashboard. Instructors can view their schedules, indicate their availability, and receive notifications about new bookings or changes.

Administrators have access to a comprehensive dashboard that allows them to manage users, update training packages, and generate reports for data-driven decision-making. The design focuses on being easy to use and intuitive for new users while still providing advanced features for experienced users.

### Assumptions

We have made several assumptions to fill in the gaps that were not explicitly addressed in the requirements. Firstly, we assume that all users will have access to an internet connection since the system primarily operates on the web. Secondly, we expect that the users possess a level of proficiency and can navigate through a digital interface without significant difficulties. Thirdly, it is presumed that the backend database will be strong enough to handle the expected data load and traffic during usage times. Fourthly, we assume that timely updates regarding any changes in rules or policies will be provided by the DMV, which can then be integrated into the system. Lastly, it is assumed that a dedicated IT team will maintain and update the system, ensuring up-to-date security protocols and incorporating user feedback and technological advancements into its development. These assumptions serve as guidelines for designing and implementing the system within an expected framework.

### Limitations

The DriverPass system has some inherent limitations that we need to acknowledge. The quality of the internet connection can impact its effectiveness since it relies on a web-based platform. If the connection is slow or unstable, users may experience suboptimal performance. Additionally, the system is designed with specific platform constraints in mind, which means it may not work perfectly on all devices or operating systems. While we strive to make it as user-friendly as possible, there might still be a learning curve for individuals who are not very tech-savvy. The scalability of the system is dependent on our backend infrastructure and allocated resources for maintenance and updates. Due to budget and time constraints, there could be limitations in implementing desired features, leading us to prioritize essential functions over additional value-added ones. It's crucial to recognize these limitations, as they define what the system can and cannot achieve.

### Gantt Chart

A screenshot of a project management

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