# CS 255 Business Requirements Document

## System Components and Design

### Purpose

*What is the purpose of this project? Who is the client and what do they want their system to be able to do?*

* The purpose of this project is to build and deploy a web-based online training and practice system for the DriverPass organization.
* The client is Liam, the owner of DriverPass.
* The client saw a need for better driver training at the DMV and wants to build a system that can help students take online classes, practice tests and schedule on-the-road lessons with reservations.

### System Background

*What does DriverPass want the system to do? What is the problem they want to fix? What are the different components needed for this system?*

* DriverPass wants the system to provide a solution and additional resources for driving students. It wants to provide students with training by giving scheduled road lessons, practice exams, and classes.
* There are many people failing their driving tests at the DMV due to lack of training and practice. DriverPass hopes to solve that problem by providing online and on-the-road lessons.
* Domain, web hosting, databases, cloud hosting, authentication features, scheduler for appointments and security roles are some of the different components needed for this system.
* DriverPass wants to implement an Administrator management control panel that will monitor account activities including who can access what.
* DriverPass wants to implement a system where students themselves can schedule appointments to take driving lessons.
* DriverPass customers should be able to pick between three packages for lessons.

### Objectives and Goals

*What should this system be able to do when it is completed? What measurable tasks need to be included in the system design to achieve this?*

* The system should be able to automate the lesion scheduling and students should be able to pick between the three packages available.
* The system should be able to track users’ activity by admin management.
* The system should be able to run completely on the cloud.
* The system should be able to show customers what’s in progress and what’s completed.
* Measurable tasks such as online classes offering learning material and quizzes, scheduling services for driving lessons, and flexibility to customers to either register online or through an agent will achieve the above goals.

## Requirements

### Nonfunctional Requirements

*In this section, you will detail the different nonfunctional requirements for the DriverPass system. You will need to think about the different things that the system needs to function properly.*

#### Performance Requirements

*What environments (web-based, application, etc.) does this system need to run in? How fast should the system run? How often should the system be updated?*

* The system needs to be web-based hosted on the cloud to minimize maintenance and security oversight.
* Customers should be able to access the website from all popular mobile or desktop devices, and load times should be less than 5 seconds.
* The system needs to be updated frequently to fix the latest security vulnerabilities, provide bug fixes, and keep it up to date with the latest web-based library versions.

#### Platform Constraints

*What platforms (Windows, Unix, etc.) should the system run on? Does the back end require any tools, such as a database, to support this application?*

* Linux is a preferable environment in terms of running cloud-based applications. However, the cloud provider should be able to take care of the environment configuration as DriverPass wants to run their business with minimal technical problems.
* The back end of the system will require multiple databases to store data such as login info, customer info, payment info, scheduling info, activity logs and much more. The cloud provider should be able to provide database tools to create these databases to use with the system.
* The DriverPass website should be accessible on a variety of devices such as desktops, laptops and mobile phones running different operating systems.

#### Accuracy and Precision

*How will you distinguish between different users?* *Is the input case-sensitive? When should the system inform the admin of a problem?*

* The system will be able to distinguish between different users by using their email ID provided while registration as an identifier and as a userID to perform operations. Admin accounts will have a special identifier with their userIDs to provide elevated permissions to perform monitoring.
* Password input field must be case-sensitive while registration and login. Failure to do so could lead to major security issues such as incorrect encrypted password phrases.
* System should inform admin every time there’s a connection issue, downtime, malicious login attempts, security breach or suspicious activity log.

#### Adaptability

*Can you make changes to the user (add/remove/modify) without changing code? How will the system adapt to platform updates? What type of access does the IT admin need?*

* As user data is stored in databases separate from system code, admins should be able to add, remove or modify user accounts without making any changes to the code.
* The system should be able to merge the new platform updates with its existing code base. The new updates should be thoroughly tested before implementing in the live environment and should be merged without breaking existing functionality. The system should adapt to platform updates smoothly, so the users don’t see any interruptions. The platform updates should be implemented gradually over time to add new features and improve existing ones.
* The IT admin needs super user access or elevated access than normal users. This access must include permissions such as activity monitoring, account modification, system maintenance, full access to the code base, code commits for any updates, and database management.

#### Security

*What is required for the user to log in? How can you secure the connection or the data exchange between the client and the server? What should happen to the account if there is a “brute force” hacking attempt? What happens if the user forgets their password?*

* The user must have a valid combination of username (their email id) and password, and 2-factor authentication code if they are enrolled in the feature to login to DriverPass system.
* We must ensure that the system is using HTTPS(SSL/TLS) communication protocol as it encrypts data transmitted between the client's browser and the server. DriverPass is hosted on cloud so there will be built-in tools to manage the certificates for this. Implement monitoring and logging for the system and cloud infrastructure. This enables the system to detect unusual activity or potential security breaches and respond promptly.
* If there is a brute force hacking attempt, the impacted account should be temporarily locked out if a certain number of consecutive failed login attempts are detected within a specific time frame. The user should be notified about the failed login attempts and the account lockout. Then the user can contact customer support to investigate and unlock the account manually.
* If a user forgets their password, there should be an option on the login page to reset password. The system then should send a password reset link to the user's registered email address to set a new password. This link should have a time limit and be usable only once to ensure security.

### Functional Requirements

*Using the information from the scenario, think about the different functions the system needs to provide. Each of your bullets should start with “The system shall . . .” For example, one functional requirement might be, “The system shall validate user credentials when logging in.”*

* The system shall provide a user-friendly learning environment for driving. Users should be able to access online classes, practice tests and schedule on the road training by scheduling reservations on the website.
* The system shall have tracking functionalities to match students up with a certain trainer, time, and a car. Needs tracking to be able make logs such as who made a reservation, who canceled it, who modified it last. Should be able to print activity reports based on the logs.
* The system shall allow the users to be able to make appointments, cancel and modify appointments online if they so choose.
* The system shall offer 3 different packages to users when scheduling a driving session.
* The system shall support different user roles to be able to modify and maintain data.
* The system shall allow data modification only when online.
* The system shall be able to collect and store customer information such as full name, address, phone number, state, credit card information, and location.
* The system shall be connected to DMV to provide latest rules, polices or sample questions.
* The system shall display users completed and ongoing classes and quizzes.
* The system shall have brute force attempts protection measures.
* The system shall validate the user’s username and password when logging in.
* The system shall distinguish the type of user between customer and admin.
* The system shall allow students to register for new or upcoming courses.
* The system shall allow admins to add, remove or modify user accounts.
* The system shall accommodate Special needs students with certified instructors.

### User Interface

*What are the needs of the interface? Who are the different users for this interface? What will each user need to be able to do through the interface? How will the user interact with the interface (mobile, browser, etc.)?*

* The interface needs to be simple and intuitive to use for students and admin. The interface should show a logo of driver pass at the top of the website. On the top left page there should be Online Test Progress. On the top right there should be the Information section that shows the user’s first name, last name, address, city, state, zip, phone, email etc. On the bottom left there should be Driver notes. And on the bottom right there should be a section for Special Needs, Driver Photo and Student Photo.
* There are different users such as Students, Instructors (Employees), and IT Administrators for this interface.
* Students should be able to register, login, update their profile, view and register for courses, view and schedule driving lessons, practice test and quizzes, check grades and progress and view the Driver information.
* Instructors (DriverPass employees) should be able to login, view and edit assignments, provide study material and quizzes, provide student notes through the interface.
* IT administrators should be able to monitor activity, update the system, modify user accounts and their data, and provide support.
* The user should be able to interact with the interface via desktop browsers, tablet browsers or any smartphone browsers. All user interfaces should accommodate for different screen sizes and different input methods.

### Assumptions

*What things were not specifically addressed in your design above? What assumptions are you making in your design about the users or the technology they have?*

* All users have online access to interact with the website.
* All users are competent enough to navigate and use the website.
* The cloud provider is reliable and up to date on cloud security with 99% uptime.
* There are enough cars and drivers available for the demand.
* The DMV API connection is reliable.

### Limitations

*Any system you build will naturally have limitations. What limitations do you see in your system design? What limitations do you have as far as resources, time, budget, or technology?*

* DriverPass has 10 cars, but that might not be enough if the demand is higher, this can lead to long waiting times.
* Users might not have the latest operating system running on their client devices so some features might not work straight away and might need fixing.
* The project timeline is about 5 months, starting from Jan to May. If there are unexpected hurdles, that can lead to deployment being delayed.
* No budget has been given during the requirement collections, so it is hard to estimate the project budget. It could lead to project over budget.

### Gantt Chart

*Please include a screenshot of the GANTT chart that you created with Lucidchart. Be sure to check that it meets the plan described by the characters in the interview.*

*A chart with multiple colored blocks

Description automatically generated*