# CS 255 Business Requirements Document – Caio Mauro

## 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?*

* Client: DriverPass
* Problem to address: 65% of people fail their driving test, the goal is to lower this percentage.
* Project purpose: Provide better driver training through online courses and live instruction. Create a full LMS system to support both students and instructors.

### 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 to offer appointments for live training sessions, in person lessons and online courses with practice tests.
* The goal is to help people pass their driving’s tests faster. DriverPass will make it easier to teach new drivers the important skills that they need to pass their exams on the first try.
* Some components are:
  + Multiple cars, drivers, and instructors
  + Application to store each user’s information, up to date course materials that meet regulations and a registration system. There will also be a backend system that will interact with the database, transfer data, and maintain certain security aspects.
* Scheduling for lessons and a report system for actions interacting with the appointments. Also required is the ability to export reports to local files.
* Authorization roles for access restriction for owner, IT officer, secretary, and customers/students.

### 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?*

* Users will be able to create an account, reset their password, change their email and various other account management functions.
* Ability to access their materials, appointments, and support from multiple different devices.
* Users will be able to select an instruction package, pay for it and receive access to the materials.
* Users will be able to book, cancel and edit reservations for lessons.
* Users will be able to see their live progress as they complete assignments and take practice exams.

## 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.*

* Reliability, there should be measures in place to protect against large system failure. In the even that one or multiple systems should fail there should be back up systems and procedures in place to maintain uptime.
* Efficiency, the DriverPass application will be handling lots of data and be required to display much of that data to a user. It is important to implement things like pagination and efficient cache usage to keep high speeds all around.
* Security, it is very important to protect user data. There should be systems in place to prevent possible breaches. Penetration and static testing should be conducted regularly alongside a system to update libraries automatically while ensuring compatibility.
* Scalability will be crucial as the userbase grows the amount of traffic the infrastructure will be handling will grow exponentially. If scaling up is difficult there will be a bottle neck on the possible growth.
* Accessibility and ease of use will make or break the application. Taking a driving exam can be stressful and difficult as it is, DriverPass is here to make it easier and better. Being able to have a clean and efficient UI across multiple platforms will be very important. Users should have an easy time learning, checking progress and handling appointments whether on mobile or on a computer.
* It is important to have systems in place to be regularly updating the course material so that students are being taught the correct material. Alongside this it is important to make sure that any staff is trained and licensed to be instructing users on how to drive safely and pass their exams.

#### 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?*

* DriverPass wants to create a web-based application that can also be used in the mobile setting. The backend will be Windows and Azure based to support multiple different browsers. Azure will be able to handle multiple requests for appointment booking and manipulating, current progress checks and any other request-based tasks in the application. It will also be responsible for displaying the most current information possible and updating any user related information.

#### 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?*

* Since this is web-based, the OS of the system it is running on will not matter and instead the browser will be the main concern. It will be important to support major browsers but also have support for newer ones. A list of supported browsers is below:
  + Chrome
  + Edge
  + Firefox
  + Safari
  + Brave
  + Opera
  + DuckDuckGo
* The backend will be using Azure as its database since it is fast and using the many powers of SQL. It will also be important to use static code review tools and various security testing tools to make sure users can trust the platform.

#### 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?*

* System users shall be distinguished by password-protected accounts, within the database each account will have its own unique record with various fields. A 256-bit hashing system with checks will be in place to protect users when logging in with their username and password. Each record will have cells for permission levels, when checked they will gain that selected level. Things like email confirmation, 2fa and account locking will be in place to help protect accounts.
* Whenever an account is locked after multiple wrong passwords or 2fa failures and admin will be notified. The user can then submit a ticket through a no-account support page to attempt to unlock the account.

#### 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?*

* Any user will be able to create an account, as well as modify their account information. No code will be required since the backend will host API endpoints to take a request from a form, body, or search parameter to conduct an SQL query to complete an action. It is important to develop various POST and PATCH endpoint to support these actions.
* Only admins will be able to delete or remove accounts for security reasons.
* Application updates will be done when a new feature is ready, or a bug needs to patch. Version management will be supported so that users on the application during an update or not affect. Only once they have completed an action will the system update, preferably during low use hours.
* It will be important for the IT admin to have control over any management permissions. Creating, deleting, transferring, and updating many aspects of the database, server, and frontend should be possible by an IT admin.

#### 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?*

* Users will need to have a username and password to login, eventually 2fa will also be required as an extra layer of security.
* All network requests will be made through HTTPS, providing secure communication between the client and the back end. An SSL certificate will also be required for maximum safety.
* A system will also be in place to prevent too many incorrect log-in attempts. Any locked accounts will notify the IT admin and will have to be manually unlocked. Certain things like a password reset will be required to unlock the account.
* If a log-in is made from an unrecognized account, the user will be notified in their email and if the user does not use 2fa to finish the login they will be asked to reset their password.

### 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 will require user authentication and authorization. Users will need to be authorized into the application and accessing certain functions will require specific authorization level.
* The system will be web based and materials can be accessed while offline through downloading the material. Any actions requiring communication with the backend will require the user to be online.
* Tracking user activity such as, reservation creation, cancelling and editing will also be supported. The system will also provide reporting, through a detailed activity report for any user account.
* The system will initially prompt the user with three DriverPass course package and allow packages to be cancelled.
* When a user registers an account they will be asked to input:

1. First name
2. Last name
3. Address
4. Phone
5. Credit card information (verified)

* Password resetting, up to date material, user progress, general and specific feedback, material modification and contact information for instructors and other staff will be supported and made available to users.

### 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 will include the following pages:

1. Home page
2. Registration page
3. Course view page
4. Course specific material page
5. Reservation and appointment page
6. Account info page
   1. Will display progress, contact form, driver notes, feedback link and more.
   2. Progress section will have exam name, time taken, score, and status of the exam.
   3. The driver notes section will have a table with lesson length, start and end hours, and driver comments about the session.
7. DriverPass company contact page.

* The interface users and system authorization levels are:

1. DriverPass owner: full access over accounts, update passwords, database viewing and manipulating.
2. DriverPass IT Admin – full access over accounts, update passwords, database viewing and manipulating.
3. DriverPass secretary: Access to schedule, cancel and modify appointments for a specific user.
4. Clients: access to create an account, learning material, schedule, cancel and modify appointments

* Interactions will occur through browsers. There will be support to use the platform on any device that has a browser.

### 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?*

* Internet access will be permanently available.
* Easy access to DMV guidelines and training materials.
* Users have access to a browser connected to the internet.
* High traffic due to users constantly accessing materials, tracking progressing, and handling appointments.

### 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?*

* The system is dependent on network access for most of its uses.
* A budget will have to be allocated to purchase development tools, communication platforms, certain APIs like emailing and 2fa, and hardware for servers. Serverless or cloud-based systems are also available and would require significantly less budget and time to acquire.
* Time is a limitation to consider as deadlines will be prominent throughout the development process.
* The skill set of the staff may impact the budget and time-based constraints. Developers will be needed for the web-based interface and cloud-based back end/database layers. These staff members may need additional training if working with unfamiliar and new technologies.
* DriverPass instructional material is reliant on the DMV.

### 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 blurry image of a calendar

Description automatically generated