# 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 client is DriverPass and they have recognized that many students fail their tests at the DMV.
* DriverPass wants to help with this by providing students with driver training in the form of in-car driving lessons, in-person lessons, and online classes (including DMV policy info, tests, and sample questions)

### 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?*

* Driver pass wants their system to allow students to make/modify/cancel reservations for in-car driving lessons (with DriverPass’ own instructors), in-person classroom lessons, and purchase/access online materials that will help with passing DMV tests. All online materials that are purchased should be available to students wherever they can access the website. The website should use cloud-based hosting so that technical issues are handled by a third party and employees at DriverPass should have different access levels based on their role in the company.

### 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 have multiple access levels including:
  + Boss - should be able to access data online and download reports that can be viewed and worked on using something like excel. Reports should include information about who has made/modified/canceled reservations so that activity can be tracked.
  + Boss and IT officer - should be able to contact students, reset passwords, enable/disable packages, update lesson materials, provide/restrict access for other employees, and view students progress and drivers notes
  + Secretary - should be able to contact students and make/modify/cancel reservations for them
  + Drivers – provide notes for students on their driving lessons
  + Students – should be able to create an account with DriverPass (providing: name, address, phone, state), purchase an available lesson package from a variety of packages available (providing cc number, exp date, security code), make/modify/cancel reservations online, by phone, or in office (providing pickup/dropoff location, cc number, exp date, security code), reset their password, view class materials and progress, and contact DriverPass.
* Website design:
  + Page for contacting DriverPass
  + Page for viewing class materials and progress. Progress includes in-car driver lessons notes (lesson time, start hour, end hour, comments), tests taken, what’s in progress, what’s been completed, and test info (test name, time taken, score, status - taken, in progress, failed, passed)
  + Input forms for creating accounts, managing passwords, entering cc information, and creating/modifying reservations
  + DriverPass should be notified whenever DMV updates rules, policies, or sample questions
  + DriverPass should be notified whenever students make changes to records and create/modify reservations
* Lesson packages and reservation information:
  + Lesson packages include:
    - 6 hours in a car with a trainer
    - 8 hours in a car with a trainer and an in-person lesson where DMV rules and policies are explained
    - 12 hours in a car with a trainer, in-person lesson, and access to online class with all content and material including practice tests and sample questions
  + When making reservations – each in-car training session must be two hours long.
  + DriverPass and students should be able to identify which driver (out of 10 drivers with their own cars), time, and car the student will work with before the reservation
* Future features:
  + Ability to add/remove lesson packages

## Requirements

### Nonfunctional Requirements

#### 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?*

* As developing native-applications can end up being more costly and time intensive (especially if developing for multiple platforms), I’ll be approaching this from the perspective that it only makes sense to build a native-application if a web-based environment isn’t fast enough or is not capable of supporting the features needed.
* The main functions of the system will revolve around viewing course materials, taking practice tests, making reservations, and viewing progress and account information. Web-based applications are fully capable of handling the speeds required by these kinds of tasks.
* Liam, the owner of DriverPass, has said that he needs to be able to access system information from anywhere online. This means that a web-based system will work best for him. Students will also benefit from not being tied down to a specific device, so a web-based application should support their needs.
* Given that DriverPass wants their system to stay up to date with new DMV rules, policies, and sample questions and those changes may be different from state to state across the US, online materials may need to be updated fairly frequently. This further supports the need for a web-based environment as it can be updated without waiting for users to do the updates themselves.

#### 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?*

* A web-based environment would be sufficient for this system. Therefore, it should be able to run on all platforms.
* A database will be required for storing course materials (which will need to be kept up to date with new rules, policies, and sample questions), storing user information (along with purchase information), and handling user access levels.
* DriverPass has said they do not want to worry about backups or security. Those backend details will be handled by a cloud-based hosting service.

#### 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?*

* Each users profile will be tied to a global identifier that is associated with their email address and phone number. The users will be able to change both the associated email address and phone number without risk of losing access to their profile.
* Login credentials will have to meet certain requirements for security and accuracy. For example, usernames and passwords will be case sensitive.
* The system should send an alert when certain predetermined performance related metrics reach predefined monitoring thresholds. This information can help system administrators determine if there is a need to begin scaling the resources available to the system.

#### 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?*

* There should be code in place that allows IT officers and the DriverPass owner to add/remove/modify users. Those kinds of changes should not require changing code. User information will be stored in a database that the code can make changes to.
* Most updates will likely be related to updating course information (e.g. sample questions, local dmv rules and policies, etc.). Those updates should make changes to information stored in a database and should not require changing any frontend elements.
* Additional updates will likely be related to keeping security up to date and adding/removing DriverPass offerings on the website.
* The IT admin should be able to access anything they need to keep the site secure and running. Things like users passwords would not be viewable to the admin as passwords would not be kept in plain text.

#### 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 will login with a user name and password. The system will be kept secured by following guidelines provided by NIST such as: minimum length requirements for passwords, hashed passwords, and limited password attempts.
* If there is a brute force hacking attempt on an account then, after multiple failed attempts to type the correct password, the user will be given a warning that they should try to reset their password or risk facing a delay until they can try their password again. The delay should increase with each failed attempt within a predefined time frame (e.g. If the user fails 3 times in a minute then they should receive a warning. If the user fails another 3 times in under 5 minutes from their first attempt then there should be a 10 minute delay which increases to 30 minutes and then if the user continues to fail then the account should be locked and the user will need to reset their password to regain access.)
* If a user forgets their password, the user will be able to request a link that will allow them to reset their password. This method is more secure then just allowing the user to get their password sent to them.

### Functional Requirements

* The system shall provide the user with an option to reset their password
* The system shall implement delays in login attempts if the user repeatedly fails to provide correct credentials
* The system shall display course materials that are stored in a database
* The system shall remain up at all times except for scheduled maintenance
* The system shall allow the IT admin and the owner of DriverPass to help in resetting passwords
* The system shall alert DriverPass of any users who have signed up, changed reservations or changed account details
* The system shall alert the IT admin of any unusual activity such as denial of service attacks or performance metrics exceeding predetermined monitoring thresholds.

### 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 need to be simple enough to be easily accessible for those with low tech literacy.
* The interface will also need to include elements that will work across a wide range of web browsers
* The different users of the interface include students, potential students, a system admin, the owner of DriverPass.
* Students and potential students should be able to view DriverPass programs and offerings, create an account, view course materials, view their profile and their progress.
* The system admin should be able to view any information they need to ensure the system is running properly. However, much of their information will likely come from third party tools related to performance monitoring.
* The owner of DriverPass should be able to access information such as how many students are registered with DriverPass, how many users have joined recently, what course offerings those students have selected, and other information related to business operations.

### 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?*

* I’m assuming the users will have access to a popular web browser
* I’m assuming the users have access to the internet when trying to use the website
* I’m assuming the users are familiar with common web design elements for navigating the website.

### 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 not stated any limitations related to time or budget in the transcript. Although those limitations likely do exist, it’s not clear what they are.
* The owner of DriverPass has stated that he needs to be able to access system information from anywhere. This means that the information will need to be kept in an online database.
* The owner of DriverPass has stated that backups and security should be handled by a third party cloud-based web hosting service – this limits the system’s backup and security tools to whatever is available from third parties.

### Gantt Chart

**References**

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