# CS 255 Business Requirements Document Template

Complete this template by replacing the bracketed text with the relevant information.

This template lays out all the different sections that you need to complete for Project One. Each section has guiding questions to prompt your thinking. These questions are meant to guide your initial responses to each area. You are encouraged to go beyond these questions using what you have learned in your readings. You will need to continually reference the interview transcript as you work to make sure that you are addressing your client’s needs. There is no required length for the final document. Instead, the goal is to complete each section based on your client’s needs.

**Tip:** You should respond in a bulleted list for each section. This will make your thoughts easier to reference when you move into the design phase for Project Two. One starter bullet has been provided for you in each section, but you will need to add more.

## 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?*

* DriverPass would like to requisition a system to serve new driver customers by offering online and in person training for the new driver exams given at their local DMV.

### 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 their system to allow customers to take online classes and practice tests in order to help them perform better on the DMV’s written exam, and also provide in person training for drivers for the practical portion of the local DMV’s driver exam. Customers must be able to make reservations for the 2-hour time slots needed for in person training. In addition they want employees of DriverPass to be able to access this data from different online devices while limiting resource access to only the employees that require it. The data that needs to be accessed will include which driver is paired with which student, and the time slot that they are assigned to.

The system will need an online component that is accessible by both customers and employees in order to schedule and modify appointments, or in the case of customers, access online courses related to the written exam. It will need a method to store persistent data, along with an audit trail to see changes that are made. In addition to this, DriverPass wants the system to be able to connect to the DMV to receive updates they may need to know about in order to remain in compliance with the current requirements for driver’s tests.

### 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?*

* ‘Customer’ should be able to login to the system after registering and take courses and practice tests, as well as schedule appointments for in person driver training.
* ‘Customer’ should be able to view their progress in the online course/test function, as well view and update their personal information.
* ‘Employee’ should be able to access any needed data in the system, as well as modify things like appointments, assigned drivers and students, related to the in person driver training.
* System should present multiple packages for customers to be able to sign up for different blocks of lessons at different prices, and also packages should have the ability to be disabled by an employee if necessary. In the future being able to modify the packages and add or remove packages is another feature the client would like.
* The client would like the system to run in the cloud with backup and security handled for them, so security auditing, and backup/restore testing should be done to show these have been accomplished.
* System should provide an audit trail with information like which user last modified a reservation, who canceled a reservation,

## 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 will need to run both in the browser and mobile applications, or possibly just in the browser with an accessible mobile version of the site.
* The system should run with page loads at least as fast as the Mozilla recommendations for page load speed, viewable at https://developer.mozilla.org/en-US/docs/Web/Performance/How\_long\_is\_too\_long
* As the system is a web application, the backend systems will need periodic updates to dependencies as well as things like the server operating systems. These generally need timing like monthly updates, but may need to be able to handle ad-hoc updates due to security issues that need patching with little notice.

#### 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?*

* The system should run on Linux, a widely available open source operating system with many different flavors (distributions). Linux is free but many companies offer supported distributions if a company doesn’t have the expertise necessary to administer it themselves.
* The backend does require a database for storing at a minimum, user logins and appointment data, although more data may need to be placed there like templates for different classes and lessons. PostgreSQL is an open source database that runs on Linux and will help reduce cost as it is free to use commercially.

#### 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?*

* Users will be stored by email (as their ‘username’), and upon creation each account will also receive a unique\_id that can be used to identify the account. This is automatic in database systems like PostgreSQL. The input will not be case sensitive to simplify code for user login.
* The system should only inform admin of a problem when the service is unavailable, this can be handled by external monitoring tools that check if a website is functional, or for more reliability browser based tests can be implemented with tools like Selenium, that can check the login flow functions normally by using a ‘test’ user. Another optional add-on is to alert the admin when response times from the backend are slow, as this may be an issue that makes the site ‘unusable’ from the perspective of a user.

#### 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?*

* The system will have the ability to do CRUD (create/read/update/delete) operations on objects in the application, and this should extend to user objects.
* The system can use a deployment pattern called Blue/Green in order to minimize possible downtimes during updates. Two instances (blue and green) of the application are run, and the frontend will use a load balancer to point at one of those instances. This allows safe updating of the non-live instance, and a method to fail back to a working instance if switching to the new one causes issues.
* The IT admin will need access to the server that the system runs on in order to restart the application, possibly update configuration files that are only available on the server, and diagnose problems at the server or application level.

#### 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?*

* To login the user will be prompted to create a password when their account is created, with the option in their profile to update their password.
* The connection to the website can be secured using SSL certificates on the server that runs the frontend or load balancer, making a user connection to the system secure from outside viewing when the password is entered.
* If the user forgets their password they will have a reset form that sends information and a password update form to the email the account was registered with.
* Brute force hacking attempts should be handled by timing out logins after a certain number of attempts, like 3 attempts, for up to a few minutes. In addition tools like CloudFlare can be used to detect and block IP addresses that may be software based bots used to perform brute force attacks.

### 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 present an interface to users upon browsing to the site, with a button to move to the login portion of the page
* The system shall handle validating user inputs to the login form in order to process a user login
* The system shall present registration functionality for customers to register for courses and practice tests
* The system shall allow users to register for driving instructor with a live instructor
* The system shall allow users to modify their appointment times for live instruction
* The system shall allow customers to update their personal information in their profile
* The system shall allow users to reset their password through their profile or through a form if they have lost their password and are unable to login
* The system shall present an interface for customers to check their progress in any of the online courses
* The system shall present an administrative interface for Employee users allowing CRUD operations on entities in the system including users, appointments, tests, and instructors.
* The system shall track all operations by users in the system in an audit trail that is accessible by Employee 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.)?*

* There are multiple types of users, including customers, employees, and administrative users all with different accessibility based on roles.
* Customers will need to be able to check their personal information and update it in their profile
* Customers will need to be able to check their online test progress, as well as sign up for new online courses
* Customers will have an interface that shows driver notes from their in person driving instruction, including lesson times and dates
* Customers will have an interface that shows a photo of themselves, and of their driving instructor in order for them to identify the instructor in person
* Customers will have a registration page for making new in person appointments
* Employees will have an interface that allows them to perform CRUD operations on entities in the system including users, appointments, tests, and instructors.
* Employees will have an interface that allows them to view an audit trail of user actions performed on entities related to their job function, such as tests, appointments, etc.
* Administrators will have access to an audit trail interface of all actions taken by any user in the system.

### 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?*

* Users have a valid email address in order to sign-up and login to the system
* Administrators at the company will be able to perform needed maintenance tasks related to the server and applications.
* It is assumed DriverPass will have or hire employees with the technical expertise to operate the system, or support will be negotiated to be provided.

### 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?*

* While the application can perform blue/green updates for minimal downtime, the database will need the site to be put into maintenance mode (inaccessible) while upgrades or migrations are performed.
* There is no plan for a testing environment, meaning any changes will be done on the live system and may result in bugs being user facing.
* The system is only accessible while a user is online, there is no functionality to cache data locally for any period of time.

### 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.*

