# CS 255 Business Requirements Document Template

## System Components and Design

### Purpose

The purpose of this project is to develop a system, consisting of an online web application and website, for our client DriverPass. DriverPass is a business that offers online tests and on-the-road driving sessions to help prepare their customers to pass their DMV driving test.

### System Background

The flow of the DriverPass system can be summarized as follows. Customers create an account, select and purchase one of the available packages, make an in-person appointment, take tests online, and review their progress, all from their online profile. Additionally, DriverPass requires a website with several pages, including a front page that explains the services offered, and a signup page with a form where users can enter their information and create appointments.

In addition to customers, the system also supports administrative roles that follow a hierarchy. For instance, a receptionist has general access to create and modify accounts and appointments. An IT officer has additional privileges, such as access to an admin panel that shows system generated logs and direct access to accounts that fall below this role in the hierarchy, with the ability to reset passwords or outright disable accounts. Finally, at the top, the owner role has all the powers of an administrator and more, such as viewing business analytical data including sales, signups, etc.

Lastly, the system needs an external component to alert DriverPass of any policy changes so the company may remain compliant with the department of motor vehicles (DMV).

### 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?*

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| **DriverPass System Objectives and Goals** | |
| **Objective** | **Goal (measurable tasks)** |
| Develop a learning management system for online classes and DMV-prep practice tests |  |
| Develop a username-password authentication mechanism | * Shows error message upon failed attempts. * Locks accounts upon multiple failed attempts. |
| Develop an authorization mechanism | * System roles are as follows:   1. Owner   2. IT Officer   3. Employee (includes receptionist and driver instructors)   4. Customer |
| Develop a module that generates system data (reports) | * The owner can download system data (reports) from any authenticated devices. * Data will be chronologically and alphabetically sortable, and it will be available in spreadsheet compatible formats |
| Develop a logging module | * Logs are only viewable by the IT Officer and superseding roles * Logs user activity when purchases are made, CRUD operations are performed regarding user accounts and appointments * Logs and notifies administrator roles whenever there are changes to the DMV policies. * Logs are tagged based on severity of issue:   1. Critical   2. Error   3. Warning   4. Info |
| Develop a notification system | * Notifies system admins when there are changes to the DMV policies. * Notifies system admins when “critical” system logs are generated. * Notifies system admins when there are appointment changes and cancellations. * Notifies customers when there are changes to their accounts, like appointments changes, new instructor comments, etc. |
| Develop a front-end website | * A forum to create accounts   + First and last name   + Date of birth   + Address   + Phone number   + Payment information   + Geographic location for pick up and drop off location * Validation for all inputs * An advertisement page for DriverPass (including contact information) |
| Develop an administrator panel | * Administrator roles (Owner, IT officer, receptionist) can perform CRUD (Create, Read, Update, Delete) for accounts that fall under their authority. * Admins can view system data and logs * Admins can |
| Develop an account management system | * Each customer needs a discrete profile that includes the status of their online tests, their picture, their instructor’s picture, a table with session time frames and instructor’s comments for each session. * Customers can select a time for their appointments. The system assigns an available driver. * The driver user needs an availability attribute that is set to unavailable when they’re in a session with a customer or off the clock. * The driver can add comments to the customer’s profile. |

## Requirements

### Nonfunctional Requirements

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| **Requirement Category** | **Requirement** | **Rationale** |
| Performance | System must be accessible by all major web browsers. |  |
| The system must be accessible by any device: mobile or desktop. It must retain its front-end format when accessed from devices with smaller screens. |  |
| System must respond to user requests as fast as possible, maximum of 3 seconds. |  |
| The system should clear security logs every month for improved performance. |  |
| Platform Constraints | The system should use a columnar database to store user information. With a columnar database, business analysts can generate, sort, and download data based on values. |  |
| The system should run on a Linux based server hosted on the cloud. |  |
|  | System should be accessible from any desktop or smart mobile devices. |  |
| Accuracy and Precision | The system should employ the principle of least privileges. |  |
| Each role in the system can modify lower-ranking roles. |  |
| User inputs are case sensitive and can only contain alphanumeric letters. |  |
| Each input requires validation before it can be accepted: appointment dates must be in a near future; birthdates must be in the past; email addresses must follow a format such as [example@example.com](mailto:example@example.com); names must be longer than 2 characters. | To ensure valid data entry, defense mechanism against injection attacks |
| Administrators should be notified when new “critical” logs are created. |  |
| Adaptability | Changes made to the system should take effect immediately. |  |
| Administrators should be able to add, remove, or modify user profiles without requiring changes to the underlying code. |  |
| The system settings and configurations must be manageable through a user-friendly, administrative interface. |  |
| Security | The system should utilize Cloudfare security tools to mitigate DDoS attacks. | DDos (Denial of Service) attacks work by … |
| The system should temporarily block access to an account if 3 incorrect login attempts are made within 3 minutes | This is a defense mechanism against brute force attacks. |
| The system should use end to end encryption and secure transfer protocols (HTTPS) to transfer data from the client and servers. |  |
| Resetting user account information such as password is only possible by system administrators. |  |
| The system should generate logs when there are any changes to user accounts. |  |

### Functional Requirements

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| The system shall provide customers with a sign-up forum. |
| The system shall validate user credentials when logging in. |
| The system shall notify server administrators of changes in local DMV policies. |
| The owner can disable service packages so that it is unavailable for purchase. |
| Customers can purchase a service package from the website. |
| Customers can create appointments for dates and pick-up and drop-off locations. |
| The system shall generate logs when there are changes to appointments and user accounts. |
| The system shall generate analytical data that is available for download by the owner. |

### User Interface

The user interface should be designed with desktop as well as mobile devices in mind. Customers are the main users of the system. The customers registration and login interfaces should be user friendly, simple, and easy to identify from the main page on the front-page of the website. Upon successful login, customers can view their account and their information such as name, professional headshot, contact information, address, etc.

Here, the customer should be notified their registration isn’t complete because they need to purchase a training package first. Thus, a link should direct the customer to the sales page where the packages along with extensive details are listed. In addition, the contact information of the sales department of the business for more information should be displayed.

If the customer has already purchased a package and is entitled to an appointment, an empty appointment row with a plus symbol should appear. Clicking on this row expands it and prompts the customer to select a date and pick up location. Other fields will be greyed out until after the appointment takes place. The number of appointments depends on the package purchased. For each completed appointment, there will be a discrete row on the customer’s profile page. Each row will include appointment information such as dates and geographic locations previously selected by the customer, driver’s information such as name, picture, session notes, etc.

Once a session is marked as complete, the customer can create another appointment, until no more appointments are available according to the training package they purchased.

Other users of the system are the DriverPass employees, who can edit certain aspects of the customer’s profile. Drivers can mark appointments as complete or make cancellations. They can also edit the “driver notes” section of each appointment.

Another interface will show a list of registered users, customers and employees, to the IT officer, who can search and sort through them, freely update account information as well as disable or delete them. Similarly, an interface to view and sort through system logs should be available

### Assumptions

* Since the system is hosted on a cloud platform, it assumes users have access to a fast and reliable internet connection to access the system. Otherwise, slow load times and delayed responses will impact the user experience negatively.
* The system assumes users have access to a compatible device and web browser that meets the minimum requirements of the system. Otherwise, certain system features may not be available, or the user may not be able to access the system all together due to security vulnerabilities.
* The system assumes the user is authenticated by providing valid login credentials.

### Limitations

* The system relies on external services to receive updates (such as DMV) and perform secure connections (Cloudfare). If those services go down, the system will also be crippled from performing its functions correctly.
* The system stores data, including users, their accounts, appointments, system logs. Thus, since hardware resources (such as server storage, memory, or processing power) are limited, so is the system’s ability to handle a large number of concurrent users or extensive data processing.
* Budget constraints and deadlines may impose limitations on the implementation of and testing all the system’s functionality.

### Gantt Chart

The following Gantt Chart outlines the proposed timeline for this project:

A screenshot of a computer

Description automatically generated