# CS 255 Business Requirements Document Template

## System Components and Design

### Purpose

The purpose of this system design is to provide those learning to drive with an educational, accessible, and user-friendly service to help them achieve their goal of obtaining a driver’s license. DriverPass wants to provide an alternative to traditional driver’s education programs, offering a mix of e-learning materials such as reading material and tests, online support, and in-person live driving training. During the initial interview, Liam, CEO of DriverPass, laid out what feature he would like in this system and what is important to the client in a finished product.

* Client: DriverPass
* Provide access to driver training appointments
* Provide access to online classes and practice tests
* Online and offline access
* Reservation system for driving time appointments
* Connection to DMV system/ notification of updates to DMV rules and policies
* Ability to track system updates and author
* Ability to track driver information for appointments (student, driver, time, car, driver comments)
* Initial offer of 3 packages (see Objectives and Goals) and ability to edit, remove, and add packages
* Provide 2 hour driving time sessions booked via appointment system

### System Background

The owner of DriverPass noted he has seen a potential market based on the need for more efficient and effective driver training. The client wishes to combine the benefits of the ability to access learning materials online from the comfort of one’s own home as well as live driving training to provide customers with training that will readily prepare them for their driving tests. They will offer different packages, initially three separate packages, all curtailed to different types of customers, and each price tier offering more services than the one below.

* Major components
  + Registration
    - User or Secretary access
    - Information Input form
    - Name, Phone Number, Credit Card Number, CCV, Exp. Date, Location, Pickup Location (Drop-off should be the same, provide option input for this anyway)
    - Selection and confirmation of one of three packages:
      * Package One: Three 2-hour live driving sessions (6 hours in total)
      * Package Two: Four 2-hour live driving sessions (8 hours in total) and one in-person lesson learning DMV policies and rules
      * Package 3: Six 2-hour live driving sessions (12 hours in total), an in-person lesson learning DMV policies and rules, and access to an online class, including all materials and content offered as well as practice exams
  + Student Interface
    - Test Progress (If applicable) – test name, start date/time, end date/time, score (pass, fail, in progress, not taken)
    - Driver Notes – appointment date/time, driver notes on the session (will require input form for drivers and use of student ID to ensure comments are assigned appropriately)
    - Student Information (name, complete address, phone, email, etc.)
    - Photos of Driver and Student
    - Special needs of student section
    - Link to Contact Page (for student to contact DriverPass, contains email, phone number, and address of DriverPass office as well as assigned driver)
    - Password Reset system (most likely via email recovery link)
    - Link to driving time reservation interface allowing students to make, change, and cancel driving session appointments
    - Link to database of online learning materials (if applicable)
  + DriverPass Interface
    - Contact Database for Employee/Student Information
    - Role-Based Security Access
    - Secretary
      * Ability to make reservations, appointments, register new users
      * Ability to cancel and modify existing appointments
      * Ability to remove users from the system/cancel subscriptions (some users may not be happy with the service)
      * Ability to see Driver information and availability (for use in scheduling students)
      * Access to student contact information database (for use in modifying/cancelling appointments under unexpected circumstances)
    - Admin
      * Edit/Remove/Add available packages
      * View driver information
      * Tracking of updates to system (who made/cancelled/modified a reservation)
      * Tracking of drivers and cars via system of ID numbers
      * Ability to view reservation schedule/calendar
      * Add/remove employees from system
      * Add/remove access rights of employees
      * Ability to download reports for use offline (modification and updating only available online)
    - Driver
      * Limited access to student database (access to assigned students information only)
      * Scheduling system needed (availability, time off requests, shift swapping?)
      * Access to appointment information
      * Input form needed for driver comments on particular students (use of Student ID number to ensure right comments for right student)
* System must be connected to the DMV system
  + Must be a live connection
  + Must generate notifications any time there is a change in DMV policies or rules, etc.
  + Possibly integrate ability to schedule driving test with the DMV at some point? Follow up with client in the future

\*\*Note: It may be beneficial to, upon registration, rank new students in a tier system determined b the package chosen. This tier system may assist in providing role-based access to tests and learning materials, as well as allowing students to only schedule their maximum number of driving session hours. Maybe we can work in a message, given if a student tries to access material or schedule time over their allotted time, that displays with a link that allows them to pay an additional fee to upgrade their package? Can speak with client on this on next contact.

### Objectives and Goals

* Objectives of System
  + Reservation system must allow driver, student, and receptionist access and generate alert messages to appropriate admins when n appointment is made, changed, or cancelled by any party involved
  + Only students with the appropriate package should have access to the materials delivered with that package
  + Admins should have access to the entire system with the ability to modify employee information (such as employment status, pay, etc.), view student information (contact, receipt of payments, progress), and view reports of system performance. Admins should be able to download the aforementioned documents for use in working remotely.
  + Drivers should have limited access to the student database to view their assigned student’s information as well as update their profiles with notes from lessons
  + System should be connected to the DMV server and update any rules, policies, and important changes any time the DMV is updated
  + Students should have access to assigned driver contact information as well as reports of their own progress
  + A database storing all available online learning materials should be created in a manner that allows easy maintenance, allowing admins to add new materials as well as remove outdates materials. This database should feature a role-based access check to ensure only students that paid for this service have access.
* Goals of System per User Role – Goals are considered achieved if we can provide the functionalities described below successful:
  + Admin
    - Can successfully remove packages from available packages menu
    - Can successfully Add/Remove employees from the system
    - Can successfully Add/Remove permissions from individual employees
    - Can successfully access student information database (test users should be input to ensure system displays accurate information)
    - Can successfully track updates to the system (test of system should be run and author, date, time, and information edited should be displayed accurately)
    - Can successfully download/print reports from database for offline use
  + Secretary
    - Can successfully access student database and add/remove/edit students
    - Can successfully access reservation system and schedule/modify/cancel appointments
    - Can successfully access driver database to view availability, contact information, etc.
  + Drivers
    - Can successfully access appropriate sections of student database (only their assigned students should be accessible)
    - Can successfully edit schedule availability, request time off, release shift in event of sickness (standard scheduling protocols must function)
      * This is not a current objective, however one that client may be interested in and may have forgotten to mention. We may potentially bring this up to the client in the future.
    - Can successfully submit driver comments containing information on date, time, and student
  + Students
    - Can successfully register themselves in the system (information in system displays accurately post registration, picture uploads and displays successfully)
    - Can successfully choose a package
    - Can successfully make/modify/cancel appointments
    - Can successfully access contact information of assigned driver as well as company
    - Can successfully complete a practice test
      * Information in the test progress display successfully updates and displays accurate information
* Feature Based Goals – Success Indicators:
  + Student Registration functions properly
  + Appointment making/modification/cancellation all tested successfully
  + Database’s display accurate information and allows for modification
  + Scheduling system displays accurate information/functions appropriately
  + Package choice by student appropriately reflected in profile and accesses
  + Contact pages are clear and legible and display the appropriate information depending on the accessor
  + Tracking system functions properly based on ID input (car, driver, student, etc.)

## Requirements

### Nonfunctional Requirements

#### Performance Requirements

* The system should run in web-based browsers such as Google Chrome, Safari, Firefox, etc.
* The system should be highly responsive and load times should not exceed 3 seconds
* Although the client has not mentioned a mobile application, perhaps the possibility of a port to mobile should be kept in mind while designing the system to ease the integration of mobile device use in the future
* The system should be connected to the DMV servers and should update automatically when those servers update. As a failsafe, the system should check for updates daily.

#### Platform Constraints

* The system should function on multiple operating systems (Windows, Linux, MacOS)
* The client has noted they would like the system to be a web-based application compatible with cloud services.
* A database containing all employee and student information should be accessible and downloadable for offline work. This information should include:
  + For staff:
    - Role
    - Schedule
    - Contact information
    - Payroll information
    - Student review information (progress and performance notes)
    - System login credentials
  + For students:
    - Driving appointment information
    - Contact information
    - Which package they purchased to determine content access rights
    - Payment information (credit card, bank information, etc.)
    - Assigned driver information
    - System login credentials
* This database may be internal or set up by the client’s chosen cloud provider. We can inquire about this in the next meeting with the client.
* Password authentication should be included in the backend for security purposes

#### Accuracy and Precision

* The system will have role-based access protocols assigned to each user. For staff, roles will be determined based on their hired role (driver, receptionist, or admin). For students, roles will be determined based on the package purchased (level one, two, or three).
* For increased security due to the system allowing users to pay online, case sensitive passwords are recommended. For any potential search functionality, this will not be necessary.
* The admin should be informed any time employee or student data is added, changed, or removed.
* The admin should be informed any time a driving appointment is made, changed, or removed.
* The admin should be informed any time a user attempt to access something is denied, both to proactively correct any error in permissions or to monitor any attempt at a breach of the system.
* The admin should be informed any time a change or update is made to the DMV server to allow them to ensure the DriverPass system is updated and accurately reflects these now changes.

#### Adaptability

* With the use of a vector hash table and the chaining method, users will be able to be added, removed, and modified without the need for changing any code. Writing modular methods to attain this functionality will ensure the code will stay in proper working order.
* In the future, as the client grows, the code may need to be altered slightly if the client would like to add new roles, packages, store new types of data about users, or any such change not already included with their desired version 1.0 of the system. If designed properly, addition of any new data of this sort should be easily coded due to the malleable design already in use.
* This system should be coded in a major coding language, such as Java or C++, to ensure ease of transition when encountering platform updated. By using a coding language widely used throughout the tech industry, IT will have a much easier task in updating the systems programming when updates to operating platforms used by the system come out, if it’s even necessary.
* The IT admin should be the only other role in the company aside from Liam, the CEO. If the client’s company grows and onboards more IT staff to handle a growing system, I feel it would be unwise to give the entirety of an IT department admin access without proper validation, whether this be a minimum number of years at the job or role based. In this case, it is wise to give the IT admin the highest level of access to assist the owner of the company in all technical issues. The admins should receive notifications and reports of any other admins activities within the system to maintain transparency and accountability.

#### Security

* User login will require an email address and password. For increased security purposes, a password containing a minimum of 12 characters should be standard including at least one upper case character, one symbol character (@#! Etc.) and one numeric character.
* A “forgot password” link should be accessible and highly visible if the user forgets their password. This link should trigger the system to issue an email to that user with a password reset link.
* The use of security questions to verify the identity of a user in the event of a password reset situation is advised.
* The client has stated they would like this system to run over the cloud out of a desire to not have to worry about security. It can be safely assumed most other system security features and protocols will be outsourced to their chosen cloud provider, which included any attempt at a hacking breach of the system. To be sure, we can inquire with the client in the next meeting.

### Functional Requirements

* The system shall validate user credentials when logging in.
* The system shall respond with an email including a link to reset passwords if prompted.
* The system shall verify a user via security questions in the above scenario.
* The system shall create and store objects containing user information.
* The system shall create and store objects containing driving appointment information.
* The system shall store and display drivers’ student feedback.
* The system shall save and display student test results.
* The system shall generate alerts to admins given the scenarios mentioned above under “Accuracy and Precision”
* The system shall process payments, create receipts, and deliver them to the appropriate users.
* The system shall edit/remove objects containing user information.
* The system shall edit/remove objects containing appointment information.
* The system shall communicate with DMV servers, generating alerts when DMV servers are updated.

### 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 must be organized and all aspects must be highly visible and easily read by all users.
* Students must be able to:
  + Register new accounts
  + Make payments
  + Make/edit/cancel appointments
  + Access assigned driver contact profile
  + Take and submit tests (if applicable)
  + Access learning materials (if applicable)
* Drivers must be able to:
  + Access schedules
  + Access assigned student profiles
  + Update feedback sections of assigned student profiles
  + Cancel appointments
* Secretary must be able to:
  + Access schedules
  + Access student profiles
  + Make payments taken over the phone
  + Make/edit/cancel appointments
  + Access driver profiles
  + Register new students
* Admins must be able to:
  + Access and download database information (student info, employee info, appointment info) for use offline
  + Add/edit/remove employee users from the system
  + Add/edit/remove student users from the system
  + Give/take away permissions from users in the system
  + Remove available packages from offered packages
  + Generate reports containing requested data

### Assumptions

* Users will have access to a desktop or laptop with internet connectivity to access the system
* The client’s budget will cover the cost of the system’s development
* The system will provide deliverables in 5 months
* The development team will meet each deadline and deliver product at the expected date
* The client will not add on any major features or changes to what has been requested at the approval meeting on March 10-11
* The client will have a cloud service provider at the time the system is finished and delivered

### Limitations

* The client wishes to purchase a cloud service to run the system on but has not chosen one yet. As such, this may limit how much we can test live until we know which provider they have chosen.
* This will also limit our work on security features as we do not know what will be provided by their chosen cloud service. We may end up losing time working on a service that the chosen cloud provider already offers.
* With a small team of only five, any requests for quicker development and delivery may be unrealistic.
* The client has not mentioned a budget, which restricts our development of anything elaborate until we know what their cost target is. We do not want to design a system that goes over their budget.

### Gantt Chart

Chart

Description automatically generated