# CS 255 Business Requirements Document Template

## System Components and Design

### Purpose

* Our client is hoping to start a new company called DriverPass. This company hopes to capitalize on a gap in the market relating to driver’s education. The client is seeking to improve the driver-exam scores of customers by offering education services in the form of in-person lessons and online practice tests.
* They want us to build a system which will assist in coordinating several aspects of their business.
  + They want this system to feature aspects of an online storefront by showcasing education packages.
  + They want a user to be able to log-in and take online DMV drivers exam practice tests. The test results will be saved and accessible to the user.
    - These practice tests will be comprised of sample questions provided by the DMV; this system will be capable of receiving updates from the DMV regarding changes to their sample questions.
  + Finally, this system will be capable of facilitating and modifying the scheduling of in-person driving lessons.

### System Background

* The client has indicated that this is the initial system for a start-up business, thus we will be creating a new system; no current system exists.
* The client wants customers to use a web-based platform to choose from a selection of driving lessons packages.
  + There will initially be three packages, however these packages are subject to updates.
  + The system will initially be simple; there will be no payment processing in the current project; business will be conducted in part over the phone. Customers will need to call the office in order for an account to be created; a staff member will process payments and account creation.
* Customers will use the system to schedule appointments for driving lessons.
  + Office staff will also use this same system for making appointments over the phone.
* Customers will also be able to take practice tests which are based on the current written test which the DMV provides.
  + These customers should be able to see past attempts at the written exam and to review their performance.
* The client wants all employees to have some level of access to this system depending on their roles in the organization. Employees should be capable of creating accounts, creating appointments, and changing account information. There will be some ability to generate reports and to download and access these documents for work offline.

### Objectives and Goals

* There shall be a website which enables users to log in to an account and have use roles and permissions appropriately applied
  + Customers should not be able to view or modify information about other customers
  + No user other than the primary administrator should be capable of removing employee account
  + Staff members should be capable of scheduling appointments on behalf of customers and be capable of viewing their account information
  + The secretary role and administrator roles should be capable of creating and modifying an account on behalf of the customer
  + The primary administrator role should be capable of creating, modifying, and removing staff member accounts
  + Customers shall be able to view and modify their account information
  + All staff members shall be capable of viewing customer account information and creating driving lesson appointments on behalf of the customer
* Customers shall be capable of scheduling in-person driving tests using the web interface
* The system should be capable of tracking the number of remaining in-person driving lessons which a customer is eligible for
  + Administrator and secretary roles shall be able to add education packages to a customer account which add to the driving lesson balance of a customer and may enable them to access online practice tests
* Customers who purchased the correct package shall be able to use the web interface to start, finish, and review online practice tests for the DMV
* Customers shall be able to view information on the website which displays information about how to contact the office
* All actions by staff members and customers shall be recorded and accessible through log files for review by administrators.
* The same user or car cannot be booked for two lessons during the same point in time
* Administrators should receive a notification whenever DMV policies, procedures, or sample test questions are updated
  + The system should support occasional modification of sample test questions and be capable of displaying questions and answers of various lengths between 20 and 1000 characters

## Requirements

### Nonfunctional Requirements

#### Performance Requirements

* Customers will interact with the system through a web-page.
  + All web pages should load within 5 seconds
  + All interactions within a webpage should yield a visual response within two seconds
* The client has expressed a strong preference for a cloud-based server
  + Customer seeks minimal maintenance overhead
  + This server will have a minimal storage capacity, but sufficient enough to support a simple customer information database and webpage assets
    - In addition to OS storage requirements, an additional 8gb of should be sufficient.
* This system should be capable of supporting up to 200 users simultaneously
* Because a low-maintenance system was requested, this system will be designed with a high standard for stability and should be expected to run without human maintenance for at least 12 months at a time.
  + The client may wish to update information on the system more frequently, such as rewriting practice test questions, adding or removing users, updating contact information, and modifying sales package details.
  + Client wishes for backups to occur automatically without any human input or maintenance.

#### Platform Constraints

* We recommend an enterprise distribution of Linux as the operating system.
* The system will feature a database which will keep track of several types of information:
  + Employee information
  + Customer information
  + Car information
  + Scheduling information
  + A pool of practice test questions
  + Customer test history

#### Accuracy and Precision

* There will be five organizational roles
  + “BIG BOSS” will have full administrative control of the system and users per client request
    - In order to mitigate security breaches, we should revisit this decision with the client
  + “TECH SUPPORT” will have full administrative control of the system except when modifying user accounts of the “BIG BOSS” and “TECH SUPPORT” roles
  + “SECRETARY” role will have broad administrative capabilities within the website including
    - Access to customer account creation and modification
    - Access to the driving lesson scheduling system
  + “DRIVER” roles will have access to the driving lesson scheduling system
  + “CUSTOMER” roles will have directed access to
    - Modifying their own user account information
    - Deleting their own user accounts
    - Creating, updating, and removing their own scheduled driving lesson.
* In order to meaningfully use the system, users will need to log in with a username and password
  + The secretary role will create and modify accounts for customers
  + The “BIG BOSS” role will create, modify, and remove accounts for employees and customers
  + Even though users do not create their own account, user credentials should be case sensitive in order to maintain data security.
* In the event of an issue, users are expected to orally inform a staff member in person or via a telephone call.
* In the event that the DMV changes their written exam questions, a notification should be sent to system administrators.

#### Adaptability

* New users will be able to be created, removed, and modified by nondevelopers
  + The secretary role will create and modify accounts for customers
  + The “big boss” role will create, modify, and remove accounts for employees and customers
  + These new users will be created via a web page; user roles will be determined at the time of account creation.
* The client wishes to be capable of changing sales packages, but has agreed to be limited to disabling and enabling packages that are already programmed.
  + This form of editing may be achieved by a toggle button within the web page
* Written test questions will need to be updated periodically by system administrators
  + The client did not specify how this editing should function
  + For now, directly modifying a text file should be adequate to update the test question pool.
    - The practice test web page should be capable of dynamically displaying a variable number of questions and a variable question text length.
    - A specialized web page to create, remove, and edit test questions may be developed later and hooked into the existing text file framework

#### Security

The interview only briefly covered security concerns; they wish for security to be handled automatically. However, as this system contains mildly sensitive identity information such as the names of customers, their phone numbers, and their physical addresses. As such, appropriate security precautions should inferred:

* The majority of traffic to the system will involve HTTPS web traffic
* For very occasional server maintenance by system administrators, an encrypted SSH tunnel will need to be used.
* User access will be restricted according to the aforementioned roles.
* In the event of a forgotten password, users are expected to orally inform a staff member in person or via a telephone call.
* New users will be prompted to change their account password on the first login.
  + Requirements for passwords will be moderate in order to prevent easily guessable or crack-able passwords
* Malicious password attacks will need to be addressed within the system:
  + After ten failed login attempts to any user account, the account will be locked and user will be directed to make a phone call to the office.
  + After 40 failed login attempts from any source, additional login attempts will be ignored until an administrator removes the block
  + As this is a small business located in one town, After 40 failed attempts originating from a different country (except any very close countries where a customer could conceivably live), all traffic from that country will be ignored for 24 hours.
  + All of the above situations will generate an alert which is sent to the administrators.
* Common forms of attack such as DDOS will be handled by the cloud server company
  + We should select a company which offers adequate protection

### Functional Requirements

* The system shall be capable of generating reports in a spreadsheet format
  + Reports shall be able to be downloaded by the user role “BIG BOSS”
  + Reports shall include a logs of user modification activity
    - Shall include username of modified account
    - Shall include username of the modifier of the account
    - Shall include the time this interaction took place
    - Shall include the type of interaction
    - Shall include previous and new values
  + Reports shall include a summary of upcoming driving lesson appointments
    - Shall include the name of the customer, name of the driver, the ID of the car, and the time of the appointment.
* The system shall enable customers and staff to create reservations for in-person driving lessons
  + Each lesson shall be two hours
  + Each lesson shall have an assigned time and date
  + Each lesson shall have an assigned customer
  + Each lesson shall have an assigned driver
  + Each lesson shall have an assigned car
  + The system shall be capable of detecting scheduling conflicts and ensures that a car or driver or customer is not double-booked
* The system shall offer education sales packages and allow those packages to be applied to a user
  + Number of driving lessons
  + Number of in-person classes
  + Access to online practice tests
* System shall include a database
  + System shall be capable of storing data about customers
    - E-mail (for account ID purposes)
    - First name
    - Last name
    - Address
    - Phone number
    - State
    - Credit card number
    - Expiration date
    - Security code
    - Pickup location
    - Drop off location (which defaults to the pickup location and is only editable by employees)
    - Assigned driving instructor
  + System shall be capable of storing data about scheduled appointments
    - Type of appointment
    - Start time
    - End time
    - Participants
      * Customer
      * Driver
    - Car used
  + System shall be capable of storing data about cars
    - ID number
    - Appointment times
  + System shall be capable of storing data about employees
    - Sign-on information
    - User permissions and roles
  + System shall be capable of storing data about sample test questions
    - Questions, answers, and correct answers
  + System shall be capable of storing data regarding past sample test results
    - Time taken, questions asked, answers given, grade, status
* System shall receive data from the DMV system and alert administrators with updates to rules, policies, or sample questions

### User Interface

* The system shall host a website
  + Website shall have a sales page which lists several sales packages
    - Sales package visibility may be toggled by user roles “BIG BOSS” or “TECH SUPPORT”.
    - Package One: Six hours in a car with a trainer
    - Package Two: Eight hours in a car with a trainer and an in-person lesson
    - Package Three: Twelve hours in a car with a trainer, an in-person lesson access to our online class with all the content and material. The online class also includes practice tests.
  + Website shall have a user account creation tool
  + Website shall have A welcome page which welcomes the customer, briefly describes services offered and prominently displays a login section
    - Contains a link to the sales page
    - Contains a link to the contact us page
    - Contains a link to the about us page
  + Website shall have a form which updates customer information such as
    - E-mail (for account ID purposes)
    - First name
    - Last name
    - Address
    - Phone number
    - State
    - Credit card number
    - Expiration date
    - Security code
    - Pickup location
    - Drop off location (which defaults to the pickup location and is only editable by employees)
    - Assigned driving instructor
  + Website shall have a page which facilitates taking a practice test
    - The precise nature of the practice test was not specified and we do not currently know the format of the test. For now, we should assume that the questions will come with four multiple choice questions which will have tick-boxes beside each potential answer; the test section should be able to be configured for multiple choice answers.
  + The Website shall have a page which allows staff members to view and modify user accounts including
    - Customer information
    - Upcoming appointments
    - Test results
  + Website shall have a landing page for logged in customers with a company logo on top. On this page there will be:
    - A section practice tests at the top left which users can use to create new tests, resume in-progress tests, and attempt new ones. It shall display the following information:
      * Name
      * Time taken
      * Score
      * Status
        + Taken
        + In progress
        + Failed
        + Passed
    - A section for in-person driving lessons.
      * There will be a clickable button which enables an appointment to be made for the customer.
        + If the customer has no remaining appointments left, direct the user to the sales page.
        + Only displays times slots in which the assigned driver is available and has a car also available
      * For each appointment, there will be a section which will display the following about driving appointments:
        + Lesson time

Start hour

End hour (defaults to two hours after start hour)

* + - * + Driver comments
        + A clickable button to cancel the appointment.
        + If the current user has access, there will be buttons to modify lesson time and driver comments
        + If the current user has access, a button to finalize the appointment and deduct the hours balance from the customer’s account.
        + If the current user has access, there will also be information about which car the appointment is scheduled to use
    - On the right side of the page there will be information about the customer including
      * Name, address, phone number, and other previously mentioned information.
    - Below the customer information, there will be a section for special needs
      * + For now, this will be a simple text box
        + There should be a button which can edit this section
        + At the bottom right of the page there will be a Driver photo (auto-populated from backend logic) and a student photo with an upload button.
    - At the bottom of the page there will be small links to the contact us page and the about us page.
    - The mobile version of this landing page will have the above elements stacked on top of each other in descending order starting at the top of this bullet list.

### 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?*

* We will assume the highest level administrator does not lose login access to their account and that the company does lose access to the administrator.
  + Consequences of this assumption not being true could impact business operations and data security in the event of lost or stolen credentials of staff members or in the case of failing to deactivate access of a former employee.
* We will assume that the DMV has a suitable data source where the system can automatically collect updates to testing, procedures, or sample test questions.
* We will assume that the office retains a functional phone number and is capable of inputting and processing payments for the various packages; the system we were commissioned for does not currently include a payment system.
* We will assume customers are capable of placing phone calls to the office; Customers who are not able to place phone calls to the office will face significant barriers to using this system, particularly during account creation.
* We will assume that the web hosting platform has suitable uptime, performance, and bandwidth to support the system and that both customers and the office can reliably connect to the webserver.

### Limitations

* One limitation may be budget; since this is a startup company, there is no current revenue stream. We should attempt to stay within the budget that the client has outlined. As the client is operating off of an initial investment, we may need to anticipate changing funding situations in future maintenance of the system.
* Because the company has no revenue stream, and there is no existing system for the company, we should develop the system very rapidly.
* As stated previously, the client needs this system to have minimal levels of maintenance; we need to design for stability and simplicity within a cloud environment so there are no physical machines for the client to take care of.
* In order to provide feedback and finalize appointments, drivers will need to have connectivity to the system including internet access; they will likely be required to park their cars and head into the office after each appointment.
* Alternative modes of access, such as accessibility for visually impaired users, is not directly supported by this project.

### Gantt Chart

