# CS 255 Business Requirements Document Template

## 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 is a new startup company that has decided to venture into the untapped market of online driver education.
* The company wants to be the first to provide its users with online DMV training materials, practice tests, and the ability to schedule a behind-the-wheel session led by an instructor and provide a student vehicle.
* They wish to build a system that will have the following functionality:
  + Deliver content and provide access anywhere over an Internet connection
  + Operate the system over any mobile device or PC operating system platform
  + Provide the user with a personal account and history of activities
  + Integrate their system with the DMV systems to keep the program’s content current
  + Provide registration capability, scheduling, and calendaring to users
  + Allow users to reserve personnel and vehicle assets

### 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 sees an opportunity to provide its customers with the convenience of being able to access driver training materials, practice tests, and schedule behind-the-wheel driver training lessons from the comfort of their home.
* They want to give users the flexibility to access the system from any PC or mobile device where an Internet connection exists, to avoid the need for customers to have to physically show up to conduct most driver training activities.
* DriverPass wants to provide customers flexible package options that cater to their customers’ specific needs.
* DriverPass also wants to give its customers the ability to obtain quick access to scheduling behind-the-wheel driver training lessons and access to a motor vehicle where none may exist.
* They wish to grant their users access to online set up that will allow them to register for a new account and allow them to provide billing and account information securely.
* The company administrators want to be able to administer accounts and download reports or other system data to be able to work remotely (using Excel for example).
* They wish to build a system that will support the following attributes:
  + The system will exist on a Cloud platform
  + Support will exist for both mobile and PC platforms
  + Web-based user interface
    - Customer account administration
    - Company account administration
  + Account security role support for Admin, Account Administrator, Agents, Instructors, and Users
  + Security administration
  + Integration with the DMV systems for material updates
  + Online data storage and the ability to pull data to a local static repository
  + Database (for images, user account data, and training resources)
  + Appointment registration and scheduling support for internal and customer self-help
    - Vehicle and driver resource tracking
  + Reporting and data export functionality for working with static data offline
  + System and account auditing

### 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 completed system will possess the following **user interface design** hosted on a cloud server:
  + A hosted web user interface system divided into two functional categories
    - **A customer-facing** web-enabled user interface used for account creation and management
      * Accounts to contain: First name, Last name, Address, Phone number, State, CC number, CC expiration date, and security code
      * Additionally, an email address would be collected to support password reset functionality
      * Accounts will also contain user credentials for accessing a customer-facing portal
      * A login interface to allow users to access their account information
    - **A company Administrative** web-enabled user interface for DriverPass employees to manage accounts, appointments, and billing information
  + Supported web browsers: PC, Android, and iOS operating system platforms
  + Driver training package selection with the ability for a customer to select from 3 available packages
    - Package 1: Includes Six hours with car and trainer
    - Package 2: Includes Eight hours with car and trainer, access to one in-person lesson to go over DMV rules and policies
    - Package 3: Twelve hours with car and trainer, one in-person lesson to go over DMV rules and policies, plus access to online classes with all content and material. The online class includes practice tests
  + Package administration functionality will be limited to – enabling or disabling packages for this release version
* The completed software will contain a **reservation system** with the following:
  + The ability for customers to call in and make a reservation over the telephone or the Internet
    - The reservation system will support the ability to:
      * Provide a calendar of available appointments to both DriverPass employees and customer-facing self-serve appointments
        + Fixed length appointments of 2 hours
        + Driver allocation tracking and display
        + Vehicle allocation tracking and display
        + Management should be able to audit changes made to scheduling (cancellations and modifications)
      * Allow users to select available pickup location where the customer wants to be picked up
      * The system should auto-select the drop off location (*should be the same as the pickup location*)
    - Track the availability of resources and present only available options to customers while making appointments
      * Identify and allocate the driver providing the lesson
      * Identify and allocate the vehicle to the customer
      * Match a customer with a driver
      * Set the appointment time on the calendar
* Security feature considerations:
  + Security roles and privileges for system users will consist of: Administrative, Customer, and Management
  + Password reset options available within the customer-facing user interface
  + Account administration functionality for blocking account access from both employees and customers
  + Ability to provide customers with password reset assistance
  + System auditing functionality for tracking system modifications made by all user roles
  + Ability to securely authenticate users and store password and billing information
* Reporting
  + Administrative functions to export data into XLS or CSV format
  + Ability to generate audit level reports
* Integration features to deploy:
  + The system should integrate with a cloud database for storage of all system data
  + The system should integrate with DMV systems to keep up with changes to DMV materials
  + A mechanism should be developed to process DMV Notifications from the DMV when new updates are announced

## 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?*

* The application should consist of a web-based user interface.
* The system should support all current versions of supported web browsers.
* The system should provide users remote access to materials over an Internet connection.
* The application should be responsive and provided near-instant access to all driver training materials.
* The system should deliver content at a minimum rate of 1.5 Mbps/per user session.
* The system should run on redundant servers to provide failover during maintenance or any other service interruptions.
* The system should be updated every 24 hours.

#### 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 application should run on the most recent versions of Windows, Mac, Android, and iOS operating systems.
* The application should be supported by most modern web browsers (Chrome, Firefox, Edge, Safari, and equivalent mobile browsers).
* The application back-end should utilize a could-based database for housing all data and to deliver all user content.
* The core application server will need to reside on hosted Unix servers in the cloud.

#### 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?*

* The application should provide online user account registration.
* The system will need to support user account roles consisting of Admin, Account Administrator, Agent, Instructor, and User.
* The system should audit all new account creation and inform the administrator when a new account is created.
* The system should possess the ability to detect and notify the administrator when critical system processes restart or encounter a critical error.

#### 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 should possess a customer-facing web-enabled user interface to allow for the ability to add, remove, or modify their account attributes without changing code.
* The system should possess a company-facing web-enabled user interface to administer accounts, change passwords, manage appointments and billing information without changing code.
* The system will adapt to platform updates every 24 hours daily during the established maintenance window of 1:00 AM to 6:00 AM.
* The system IT admin needs connectivity and rights to see and manage the hosted cloud data center and connectivity to the databases that house all customer data and local copies of system materials.

#### 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 system will adhere to ISO 27001 for all information security measures that are implemented.
* The system should have the ability to authenticate using a REST API call.
* The system will require complex passwords, case sensitive, and with minimum requirements of 8 characters, 1 capital letter, one number, and one symbol.
* The application should support 2-factor authentication.
* The system should provide for three authentication attempts before locking the user’s account.
* The system should perform account password auditing and when three or more password attempts have failed on an account, the system should notify the administrator.
* The system should provide users with an automated online method to reset their forgotten password or locked account by using backup authentication methods such as cellular SMS and email on file.

### 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 allow customers to create new accounts and modify user account information in the database in response to commands issued through the administrative portal.
* The system shall allow customers to self-register into available courses within the course catalog.
* The system shall authenticate all users by verifying a password and allowing them to log in.
* The system shall send a verification email to the user’s registered email address when 2-factor authentication is enabled.
* The system shall lock a user account after three consecutive failed logins.
* The system shall send an email to the user email address on file with a temporary password in the event a user requests a forgotten password.
* The system shall keep track of a calendar of available appointments and schedule new appointments in response to customer or administrator requests.
* The system shall notify users with appointment reminders by sending an email to the customer’s email address that is on file with their account.
* The system shall track vehicle allocation and assign vehicles to users when they request a driver and vehicle from the administrative portal.
* The system shall automatically reserve and assign an available vehicle and driver when a customer makes a reservation through the administrative portal
* The system shall allow the customer to schedule a pick-up location and automatically assign the drop-off location to match the pick-u location that was entered.
* The system shall allow administrators to schedule automatic reports and to manually pull reports from the system data in XLS or CSV format.
* The system shall audit all system activity and track all modifications made by user roles.
* The system shall integrate with the DMV systems and automatically notify administrators when any of the DMV rules change.

### 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 user interface will need to run in most modern web browsers (Chrome, Firefox, Edge, Safari, and equivalent mobile browsers) from off of the cloud.
* The interface will need a **new account input form**, **main panel**, **contact form**, **scheduling panel**, an **online catalog of content**, and **administrative control panel**.
* The new account input form would be where the customer or secretary fills in the new account information.
* The contact form will be needed to allow customers and the company to contact each other.
* The main panel will need to display the customer's most frequently used account details such as first name, last name, address, city, state, zip, phone, and email.
* The main panel will need to provide a view of the customer’s online test progress.
* The main panel interface will also need to display any special needs the customer has.
* The main panel interface will need a location to display any notes a driver has made during driver training sessions. The notes will need to display the lesson time, starting hour, ending hour, and any driver comments that were made during the session.
* The main panel will need a place to display a driver’s photo and a photo of the customer/student.
* The interface will need a sub-panel for managing the schedule of events. The panel would appear when a user activates it to schedule a driving appointment, test, or classroom session.
* The interface will need an additional sub-panel that would appear when a user activates it to view the online course catalog.
* The interface will need an administrative function sub-panel that would appear when the user activates it administer the system. To support access to these forms and functions, the user interface will need to support controlled access via user account roles. The account security roles would be System Administrator, Account Administrator, Driver, Course Instructor, and User. Depending on the user’s role the interface will allow only certain information to be modified.
* Admins will have complete control over every function in the system. They will be able to perform any activity, including deletion of all data.
* Account Administrators will have the ability to modify customer records, including changing appointment details and manipulating customer records, or manipulating scheduling.
* Drivers would only be able to modify only the information that applies to the driver training portion of the interface. They would need the ability to modify driver notes.
* Course Instructors would be able to modify the catalog of courses, tests, and alter any progress the student has made through their online and in-person courses.
* Users would be able to create a new account and modify their account information, schedule and cancel appointments, access the course catalog training material, and view the main interface panel that contains their related account information.
* All user roles will interact with the interface through a web browser. Interface operations will be supported via Java, JavaScript, REST APIs, and C++ for certain back-end 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?*

* It is assumed that customers will have access to a supported Internet-capable computer or mobile device to access the system.
* It is assumed that DriverPass already has an adequate network infrastructure to deploy and support hosting the program over a large enough Internet pipe for connectivity.
* It is assumed the DMV has an API that will allow DriverPass to access or be notified of rules updates.
* It is assumed DriverPass has the staff to manage all roles we have developed for the system.
* It is assumed DriverPass has the vehicle fleet to support hands-on driver training lessons.
* It is assumed DriverPass has the content that they wish to provide to users for the online catalog, training, and tests.

### 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?*

* The system design may prove to be more challenging than is anticipated. For example, there are missing interface elements in the customer requirements that may prove to add additional time when designing and developing the end product.
* Because of the lack of fully fleshed-out design requirements, we may run into delays during the Customer Approval phase of the project in addition to the Testing and Sign-off phases of this project. The customer may make changes or request additions to the project as we did not foresee.
* We may have underestimated the time frame for which the programming development project can be completed. With the additional interface elements alone we may not have enough programming talent to complete the Build Interface phase of the project.
* Due to the fact, the customer wishes this project to exist on the cloud, we might have additional time constraints due to the negotiations that will need to take place. This may also lead to budgetary constraints because of third-party costs. Because of this, we may be limited on third-party system capabilities that are available to support certain features.
* Because this is a web browser-based system there is no way of telling if technological advances will occur that would cause developmental delays.
* We still have to explore the DMV system integration and it may or may not be possible to smoothly integrate with their information systems.
* Multiple platform support (Windows, MAC, iOS, and Android) may add complications to the design to support differences in those platforms.

### 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.*

