# 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?*

* The client, DriverPass, would like a web application designed where users can sign up for on the road training and get access to online practice exams to help them prepare for their driver’s test.
* DriverPass would like users to be able to create an account, be able to purchase different road training and materials packages, and be able to sign up for time slots for their on-the-road training with drivers.

### 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 users to be able to have online access to their account and be able to sign up for on-the-road training with drivers, purchase different packages, as well as see different DMV materials such as sample tests or their own online training course.
* Since many people fail the road tests through the DMV, DriverPass would like to offer resources to help students better prepare for the road test and the written test that is administered through the DMV.
* A web application UI will be needed with capabilities for users to enter in their information for an account, purchase road test preparation packages, and sign up for, modify, or cancel their two-hour block reservations for on the road time with DriverPass’s drivers.
* An administrator account will be needed so that activity can be monitored, such as tracking changes of what reservations have been made or modified recently, and these should be able to be downloaded to a CSV file so that it can be looked at offline as well.
* Logic will be needed to determine what time slots on which dates are available for users to sign up for. DriverPass has ten drivers so their schedules will need to be inputted into the website logic and updated as students sign up and fill their open time slots.
* The website will need to stay up to date with the latest DMV policies and rules, so they will need a way to get updates from the DMV if they have updated any of their rules, policies, or changed their testing in any way.
* They will also need an account as well as a UI for their secretary who will be able to schedule students for driving appointments as well as take their information in so they can purchase different road test preparation packages.
* They will also need a way for the user to be able to download materials such as practice exams and view their online course if they have purchased package two or three that includes these items.

### 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?*

* When completed, this system will have a page that the user will see when they login. They will be able to see their online test progress, their personal information, their lessons schedule and any driver notes if the lesson has already taken place.
* The secretary and any new user will have an input page where they are able to input information and purchase different packages. The secretary will also have a page where she can schedule on-the-road lessons for users if they want to call in and schedule, and the users will have a page where they can sign up for on-the-road lessons.
* The administrator will have the ability to download reporting from the site and be able to see site activity and any modifications, transactions, or sign-ups for lessons so that they can monitor in case anything goes wrong.
* The students will be able to have access to their online course materials and practice DMV assessments if they have selected a package that includes these materials.
* Measurable tasks to make sure that these items are achieved include:
  + Mapping out the architecture of the code in terms of class diagrams, UML, use case diagrams, activity diagrams
  + Researching and building out the user interface design for the site
  + Setting up a database to store data
  + The customer wanted this to be on a cloud server so setting up the cloud architecture
  + Testing the system for all possible use cases and user type
  + Getting feedback from the customer
  + Deploying the program

## 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?*

* This system needs to be able to view any videos or material in the online class and allow students to download study and help packets to help them study and learn for their driver’s test. The system also needs to allow teachers to access and download data to an excel spreadsheet. Capability to stream videos or class material as well as download material so, the server connection must be quick, stable, and have a large bandwidth so that downloads aren’t taking too long, and so that videos aren’t left buffering while students are trying to watch.
* The system will be set up as a web application. Students and teachers/admins will be able to login and access the site’s functionality in their web browser. Since the site is running on the internet, the users will have to have internet access to have full functionality and access to the site, though if an employee or student downloads data to have a local copy, this can be accessible offline.
* Since the DMV periodically updates their material, rules, and policies, the system needs to check for updates from the DMV’s site, so that updates can be downloaded from their site to keep the material up to date.

#### 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?*

* This system is going to be a web-based application and the client side of the application will need to be able to run in multiple systems, depending on which type of system that the student or teacher is accessing the system, so it needs to be compatible with Windows and MacOS, as well as be optimized to run on a student’s or teacher’s browser in their cell phone if they wanted to access the site from their iPhone or Android device, however at this time a full application wouldn’t necessarily be needed, and a web application where the student can login with their account on a web browser will suffice. One thing to note with being able to access the web app on the cell phone is that the site’s UI would need to change for the cell phone to make it more user friendly and easier to navigate with a smaller, touch screen.
* On the server-side of the application, an API will need to be set up, as well as a SQL database to store all the information. For instance, a table for user login, personal information, and roles that each user has, tables to store the information for the reservation system. Also, all of the data for each of the modules and packages that customers will have access to if they choose to purchase different plan will need to be saved in a table so that the package that the customer purchased and their user name can be associated with that package and the customer will be able to have access to the material. Another table will also be needed so that when changes are made, this change is recorded, date and time stamped, and saved to a table for the purposes of keeping track of who made certain changes in the system.
* This server will be cloud-based, so a reliable internet connection will be needed to access any data.

#### 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 users will be set up into different roles. The customers will have a customer role, the IT officer and the owner of DriverPass will have administrative privileges, while their secretary will have privileges to register users for different packages and sign them up for driving appointments. This way the different access levels for each user will be distinguishable and the principle of least privilege can be followed.
* Users will each have a username and password and will be stored in the database using a primary key, and if a user tries to register a username that is already taken, the database can check for the username in the database (not case-sensitive) to make sure that there is no match.
* The password will be case sensitive, will be hashed for security when stored in the database, and will have certain requirements such as length, needing a mix of lowercase and uppercase characters, digits, and special characters, this will keep the system more secure and help protect against outside threats.
* Any errors should be logged so that the administrator can see these errors. This way, if there are errors, the error codes will be logged and it will be easier to debug what the issue is, whether it’s server-side, client-side, and which API calls or which parts in the process are causing the errors. For example, a 503 error would indicate some sort of server-side error versus a 401 or 403 error which would indicate a client-side error with permissions.
* Some sort of tool should also be used to track the health of the system. This could be something that the cloud provider offers, where it tracks traffic and the number of requests made and the percentage of failed versus successful requests. This way, if a certain threshold of bad calls are made, this can signal an unhealthy system that needs to be fixed and the IT Officer can be alerted that there is an issue.

#### 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 IT Officer should have access to be able to reset a user’s password. While this could be automated with asking security questions and sending verification codes to the user’s email/phone, I believe that this very limited functionality is important for the IT Officer to have just in case a user is locked from their account and calls in needing assistance with getting into their account. This is a very limited update functionality, as they will not have access to change or view anything else about the user except username, and will only be able to reset the password, not view their current password. This is to protect the user so that their personal information such as name, address, credit card information, and password, are not accessible to the IT Officer. This reset password could be set up as an API Put endpoint and only the IT Officer’s role is given access to this endpoint. This endpoint would function to reset the password of a user to a default password so that they can login and then upon their successful login would need to change their password.
* The IT Officer will also have access to change user’s role in case, for instance, they are an employee who is let go and needs to be blocked from the system.
* When possible, the UI will be set up to use the default conventions for the platform, so that if a platform is updated, the system will auto adapt if any defaults are updated. This leaves less need to rework code if a platform is updated and suddenly one design element is no longer valid or supported in a newer updated version of the platform.

#### 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 users will be set up into different roles. The customers will have a customer role, the IT officer and the owner of DriverPass will have administrative privileges, while their secretary will have privileges to register users for different packages and sign them up for driving appointments.
* Since this is a cloud-based system, much of the security will be taken care of by the cloud provider.
* If a user forgets their password, it will need to be reset, and to verify the user’s identity, this could be done by answering security questions, sending a code to their email, phone call, or text message so that they can verify that they requested the password to be reset.
* The password itself will be set up to require uppercase characters, lowercase characters, digits, special characters, and have a minimum length requirement. Also, the system will lock after a set number of login attempts. This will protect against brute-force attacks as the user will only get a certain number of attempts before they get locked out of their account and will need to contact IT to reset their password for them.

### 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 validate user credentials when logging in.
* The system shall allow users to set up their user profile and add and save their personal information and credit card information.
* The system shall allow the IT Officer to reset a password if a user forgets it.
* The system shall allow customers to browse package details and purchase packages.
* The system shall allow customers to access and view the online course materials that they have purchased.
* The system shall allow the administrator to download and export data to an excel file.
* The system shall allow the customers to view available driving sessions as well as register for driving sessions
* The system shall allow the secretaries to view available driving sessions and register customers for sessions.
* The system shall allow the administrator or IT Officer to disable packages that are no longer available for purchase so customers are no longer able to buy these packages.
* The system shall notify the administrators and IT Officer when the DMV has updated their materials, rules, or policies so that the latest material can be retrieved.
* The system shall contain a section with the company’s contact information so that the students can contact the company if needed.
* The system shall show the secretary, administrator, or IT Officer each student’s contact information so that they are able to contact the students if needed.
* The system shall allow students to see their driver session schedule, including past and upcoming sessions. For past sessions, the system shall show the student notes from the driver, and for both past and upcoming sessions, the system shall show the student the date, time, and the driver’s name for each driving session.
* The system shall allow drivers to see their upcoming schedule, pick-up, and drop-off locations for their students.
* The system shall allow drivers to submit their schedule, and either open days that they are available so that students can schedule sessions with them on those days, or black out days when they are unavailable (for instance if they are out of town).
* The system shall allow drivers to submit notes for each of their driver sessions so that the students can view these notes on their profiles.

### 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 five types of users for the system: the student, the driver, the secretary, the administrator, and the IT Officer.
* The student will need to be able to input and update their personal information such as address, phone number, credit car information. They will also need to be able to view their driving sessions both past and present to see any driver notes from past sessions, and the date, time, and pick-up location for any future sessions. They will also need to be able to browse and purchase different packages, and once purchased, will need to have access to the content that they have purchased depending on the package.
* The driver will need to be able to log in, see their upcoming schedule and where the pick-up and drop-off locations are for each of these sessions. They will also need to be able to input any notes from the driver sessions so that the students can view them. The drivers will also need functionality to put in their availability so that students can see which drivers are available during which days and time slots and schedule sessions with them, and so that if a driver is on vacation or unable to be scheduled for driving sessions, they can go into the system and black those days out.
* The secretary needs to be able to log in to the system, and as she is answering phone calls needs a place to input student information and sign them up for different packages and driving sessions. The secretary should also have a read-only view of a student’s schedule, in case they get a call from the student with questions about their schedule or need help with something scheduling related.
* The administrator needs to be able to log into the system, and will need to have access to download and see all of the site data. For instance, they will need to be able to download a record of when changes were made so they can see which students signed up for which classes and when (in case there are issues), and they also need to have access to a list of all students and which packages they currently have access to. The administrator also needs access to the driver’s schedules and if needed, for instance if a driver calls in sick, the administrator needs to be able to change a driver’s schedule and cancel a student’s lesson if needed.
* The IT Officer needs access to logging information of the overall health of the system. They need to be able to see the site traffic, bandwidth, and make sure that there isn’t an extraordinary amount of failed API calls which would indicate an unhealthy system. They also need to have access to resetting users passwords if they get locked out and for some reason are having trouble unlocking their password. The IT officer also needs access to be able to set and update roles and permissions for different users on the site. If an employee is let go, they need access to be able to block this employee from the site, and if an error occurs with a student’s roles or permissions, the IT Officer needs to be able to look into the issue and be able to fix the problem if necessary.

### 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?*

* I am assuming that the secretaries will only be accessing the site via a desktop platform, since they are going to be in the office, answering calls, scheduling driving lessons, and helping customers purchase packages. The secretary UI can be made only for a desktop platform since they wouldn’t be taking this home and answering calls and scheduling lessons when they are not at the office.
* I am also assuming that the students, secretaries, administrators, drivers, and IT Officer have basic computer knowledge and will be able to use a well-designed and intuitive UI, and if the student needs help purchasing a package they can contact the secretary.
* I am also assuming that the cloud provider that will be used will have built in security features to make the site more secure and take the burden off of the IT Officer who asked that the cloud provider handle reliability of the system as well as most security features.
* Since the application is web-based, I am assuming that each user of the system has access to a reliable, high speed internet connection whether this is through a computer network, Wi-Fi, or using data on their mobile phones.

### 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?*

* One limitation is with using the cloud server. While the cloud server will allow the IT Officer maintaining the application, one downside to using a cloud server is that the user needs to have a stable internet connection to login to the application.
* Additionally, since some of the course material will be in the form of large files to download or videos to stream, the customer’s internet connection needs to be high speed and reliable as well so that the downloads do not take too long and so that the videos aren’t constantly buffering.
* DriverPass’s team has only an owner, secretary or secretaries, and an IT Officer per the interview transcript. So if a programming bug is found and needs to be corrected, or DriverPass would like to make updates to the site that require coding changes or rework, unless the IT Officer also knows how to code and correct these changes, they will need to find an outside source to assist with correcting these bugs.
* While being able to log in, schedule driving sessions, checking your schedule for your upcoming driving sessions, and purchasing packages is easy to do via mobile, some of the course materials that come straight from the DMV may not be optimized to be utilized or viewed on a mobile device and it may be hard for students to view this material on their phones, however, since this comes from a third party source, it may not be able to be formatted to be optimized for a mobile screen.

### 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.*

Note: while this version is horizontal, it’s quite small and hard to read. So, a larger version of this same Gantt Chart is also attached on the next page sideways for easier readability.

Chart, timeline

Description automatically generated

Chart, timeline

Description automatically generated

**Sources**

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