# SNHU 255 – System Analysis and Design

05 Jun 2022  
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# 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 purpose is to create a website for a client called DriverPass.
* They want a Website that can schedule online or in person driving classes for students.
* When the student schedules a class, the system will then prompt a phone call in order to make the payment and reserve that slot.
* Their purpose of the project as a brand is to provide driving lesson packages, online and/or live, that will help people better their skills and pass the driving tests.

### 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 will offer appointments for three different types of driving lesson packages.
* The problem they want to address is that currently, more than 65% of people fail their driving tests at the DMV.
* Package classes components are:
  + 1: Six hours
  + 2: Eight Hours and 1 in person Lesson of Rules and Policies
  + 3: Twelve Hours and access to online classes with all content and material including practice tests.
* Website components:
  + Online Test Progress
  + Driver Notes
  + Driver Information
  + Special Needs
  + Driver Photo
  + Student Photo
  + Contact Us

### 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?*

* Users can create, upload, edit in user information
* Users can create, edit and delete reservations
* Users and employees can access course material offline
* Registered users can take practice exams
* System tracks user’s progress
* User can reset their own password
* Admin has master access to everything
* Allows employees to reserve for customer’s online
* Admin and Employees receive notifications when the DMV changes any policies

## 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?*

* To ensure easy access and cloud database implementation, the system build will be web-based; Scheduling classes, calendar, access DMV material will be stored on the cloud.
* Regular maintenance will be performed on a weekly basis, and system updates every two weeks.
* The progress information from user classes will be stored in the cloud, opted to use firebase.
* The system should run as fast and smooth as possible, no more than five seconds for loading time.
* The system will be connected to a DMV database to receive updates pertaining driver’s tests and updates on new laws.
* The database will store encrypted information on users regarding their current progress on classes, like their instructor, preferences, and previous attempts.

#### 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 website will run on Desktop and Mobile. There will be no mobile application as of now, so the site will be accessed through a browser like Firefox, Brave, or Chrome. A mobile version will be created as well.
* Because its execution is done on a browser, it will not require an installation and can run on any operating system, as long as the browser is already installed.
* Backend will require a cloud database to store information on the user's progress. The company opted for a NoSQL database with Firebase, since it can also be used offline.

#### 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 use of session cookies allows the system to distinguish between clients, and it only lasts for as long as the web application is running; once the website or tab is closed, the session times out.
* Input is not case-sensitive for the most part; passwords will always be case-sensitive.
* The system will save information in real-time, and whatever is not saved will be logged in the backend.
* Alerts regarding any possible leak of information; the site should be constantly checked for backdoors and malicious activities.
* Login will require an email, password and full registration to have access to the classes.
* Students, instructors and admin will have different roles in the system in order to encapsulate data according to the user type.
* In case an attempted password fails five times, the user will have to set a new password to be able to access the web-application again.
* Scalability in the system is crucial, since it is a one-to-many use case and the database will always grow and never remove customer data unless required by the student.
* Expansion planning will be in place to support mobile application with scalability.
* The design will focus on user experience, will be easy to navigate and intuitive. Shortcuts will facilitate student’s navigation through menus.
* Material provided will always be in compliance with material provided by the DMV.

#### 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?*

* Ensure that the website is up-to-date with browser updates.
* Any changes to the users will be processed in the backend and won’t affect the user interface of the application and its code. Change requests and forms can be made by students in case there is information that needs correction. For simple user settings, the application will have a menu allowing students to change password, email, address, and school preferences through a POST request.
* Users can delete accounts with no loss of information. Their data shall be kept secure in the application’s database and can be recovered if the user decides to come back, only requiring identification confirmation.
* System users shall be able to delete/remove accounts.
* Updates will be done after working hours and avoid peak times of usage be it by students or admins.

#### 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?*

* Users require email and password to create an account and login. 2FA is optional, but can be activated in the user settings to increase security.
* Once a user exhausts five login attempts, the system will send an email to the registered address so the password can be changed.
* The web-application will make server requests through HTTPS, ensuring end-to-end security between server and client-side communication.
* Encryption will also be used to manipulate any information pertaining to users.

### 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 require email and password for the user to login, as well as to create an account for both authentication and validation.
* The system shall send a reset password email to the user in case they exhaust 5 failed attempts to login.
* The system shall automatically lock the account until a new password is set.
* The system shall send a mobile SMS to the user regarding failed password attempts when 2FA is activated.
* The system shall make real-time communication between server and client-sides to safeguard user information and progress from being accidentally wiped out.
* The system shall provide a calendar to the students in order to schedule their next lessons.
* The system shall send notifications regarding scheduled classes and appointments.
* The system shall log new information and notify admins anytime there is any significant change in the DMV guidelines.
* The system shall have an option to access the content of the classes offline.
* The system shall track user progress and inform admins of any appointments canceled or change in the schedule.
* There will be a progress report so students can track their progress.
* The system shall provide reporting, such as a detailed activity report.
* The system shall define the fields for user registration: Name, Email, Full Address, Phone, user number given by admins in the app.
* The system shall allow students to make packages to purchase on the website in order to fit their specific goals and needs.

### 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.)?*

* Web-based application that can be accessed through mobile or any desktop operating system.
* Users will access the frontend through desktop or mobile browsers.
* Student users will have freedom to manage their accounts, and will also be able to purchase and check out packages online.
* Student users will have an order history of completed purchases.
* Admin users will have access to student scheduling and account retrieval if necessary. The access will be provided by the company, by giving them Admin permission into the web-application.
* Menus available on the interface for Student users:
  + Home
  + Sign in | Create Account | Forgot Password on main page
  + Available Courses
  + Purchased Courses
  + Driving on Site Reservations | Scheduling
  + Account Settings
  + Student Progress
  + Practice Exam Progress (In case user couldn’t finish and needs to resume from where they left)
  + User Calendar
  + Contact Us
* Menus available on the interface for Admin users:
  + Home
  + Identity Verification
  + Scheduling Information from Students
  + Cancel | Modify Reservations
  + Access User Information (For Student Accounts)
  + Unlock User Accounts

### 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?*

* Assume students already know how to access the internet.
* Assume students already have a device able to use a browser.
* Assume they have a browser installed.
* Assume students already have an email account.
* Assume that the DMV changes will always be consistent, so the system can be immediately updated every time a new patch rolls up.
* Assume that internet access will always be available and server will be functional to perform HTTP requests.
* Assume that most customers who are trying to get a driver’s license are young and will resort to purchasing the packages online rather than through traditional methods, like in person or over the phone.

### 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?*

* Time restraints; the website will need at least 16 weeks to be fully functional.
* The system cannot predict that changes will happen to the environment after deployment. For example, IE 11 was just retired by Microsoft, and won’t be used for testing environment anymore. But some customers might still prefer the experience with this browser.
* DriverPass is unable to predict if there will be drastic changes in DMV protocols in a small amount of time.
* The system requires user to be connected on the internet for crucial changes, like account management, practice exams, purchase, and scheduling. The material won’t be available offline by default, and the user needs to save the documents prior to going offline. Videos require streaming and won’t work properly.
* Budget may be a limitation if the project turns out to cost more than the original quote accounted for.
* The amount of people in the project is also directly connected to the budget originally given to the customer. The company might need to involve more engineers if crunch time is too close.

### 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.*

