# CS 255 Business Requirements Document – Jef DeWitt

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?*

* Client: DriverPass
* Problem to address: There is a need for better driving training as more than 65% of people fail their driving tests at the DMV.
* Project purpose: The purpose of this project is to provide better driver training through online courses and live instruction.

### 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?*

* The DriverPass system will offer appointments for live training sessions, in person lessons and online courses that include practice tests.
* The problem DriverPass seeks to solve is reducing the skills gap of new drivers. The system will facilitate the training of new drivers and fill in where existing driver training materials fall short.
* The different components of the system include:
  + 10 vehicles and drivers
  + Instructors
  + Web-based distributed application that stores user information, course material current with DMV regulations and an online reservation system. Backend and database layers are included in this distributed system.
* Reporting for Reservation tracking (create, modified and canceled).
* Report downloading for offline access.
* System roles defining access for owner, IT officer, secretary and customers/students.
* Schedule appointments for driving lessons.

### 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 should be able to create accounts.
* Users should be able to reset passwords
* Users should be to select one of three instruction packages.
* Users should be able to make, cancel and edit driving reservations.
* Users should be able to view online course material from any network connected device.
* Users should be able to take practice exams.
* The system should track user practice exam progress.
* The system should store and allow modification of user contact information.

## 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.*

* The system shall run reliably, being failure tolerant and able to maintain accurate accounting of student progress at all times.
* The system shall be performant and meet expectations in terms of page load speed, for example.
* The system shall be secure with measures in place to protect personally identifiable information (PII).
* The system shall be scalable and able to accommodate a growing number of students, as well as new and updated learning material.
* The system shall support mobile devices, designed with responsive layouts in mind.
* The system interface shall be intuitive, so it is easy to use.
* The system learning material shall be current, trustworthy and compliant with DMV guidelines.
* The system driver instructors shall be thoroughly vetted, licensed and certified (if necessary).

#### 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 is a web-based distributed system. The backend will be Linux-based servers serving various browser clients.
* The system should be performant as the application includes network intensive activities, such as accessing current DMV-compliant testing material and sending in form data to make reservations or update user account information.
* The system should update the database layer any time progress is made on practice exams, driver submitted feedback is received from driving lessons, reservations are made/completed/updated/canceled or when the DMV releases more current guidelines

#### 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?*

* Since the system is web-based, it is platform-agnostic (will work on Mac, Linux, Windows operating systems). Browser development will be considered for the following current versions of mainstream browsers:
  + Chrome
  + Edge
  + Firefox
  + Safari
* The backend will require a database. We can choose a SQL- or NoSQL-based solution, depending on our needs and/or backend application.

#### 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?*

* System users shall be distinguished by password-protected accounts.
* Usernames and passwords shall be used for authentication.
* System users shall be assigned roles, defining their authorization levels and access to system resources.
* Input shall be case-sensitive for greater security.
* A limit shall be placed on the number of incorrect password submission attempts and will result in notifying the admin.

#### 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?*

* System users shall be able create/add accounts. This functionality is true for customers and DriverPass staff.
* System users shall be able to modify their account info (such as contact information) and it should be editable via form submission/POST requests. Underlying system code should be written to accommodate this feature.
* System users shall be able to delete/remove accounts.
* In many cases, the users’ browser will continually update. This will not affect backend code in most instances. When necessary, patches and updates will be made when client updates affect underlying system behavior.
* System application updates (frontend/backend/database layers) will be done when features/bug fixes are completed as agile scrum development allows, and only during off peak-use hours to mitigate negative application impacts.
* Agile development will allow smaller changes to be implemented more frequently and with less regression risk than larger, major application overhauls.
* The IT admin will need full access over accounts, for updating passwords or removing access to former employees.

#### 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 shall need usernames and passwords to log into the system.
* Network requests shall be made through HTTPS, providing secure communication between client devices and back-end applications.
* Sign-in form submissions shall be made via HTTPS POST requests, preventing sensitive data from being transmitted in the URL of the request.
* Cryptography shall be implemented to encrypt sensitive data communicated across networks.
* Too many incorrect sign-in attempts (5) shall result in a locked account, preventing brute force hacking of accounts. Locked accounts will notify the IT admin. The admin can then notify the user of the steps needed to update their password and unlock the account.
* Password reset requests can be handled by the user. These requests shall involve matching an identifying piece of user account information, such as email address, and a reset link will be forwarded to that address.

### 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 user authentication and authorization; i.e., validate user credentials and when logging in. Authorization (access) level is determined by account type.
* The system shall be web-based. Instructional material may be accessed offline (by download) but data can only be updated/modified (reservations, password resets, etc.) online.
* The system shall track user activity, indicating which user made a reservation, canceled a reservation and last modified it.
* The system shall provide reporting, such as a detailed activity report.
* The system shall initially list three DriverPass course package types, and allow individual packages to be disabled. New packages may be added as features in future development.
* The system shall accept customer details for account registration:

1. First name
2. Last name
3. Address
4. Phone
5. State
6. CC number, expiration date, security code

* The system shall allow users to reset passwords.
* The system shall provide instructional material compliant with current DMV guidelines.
* The system shall display user exam progress/grades.
* The system shall provide instructor feedback to students.
* The system shall allow exams/material to be added/modified/deleted.
* The system shall allow users to be contacted by instructors/secretary/admin.

### 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 will include the following pages:

1. Home page
2. Account registration page
3. Course material access page
4. Driving lesson reservation page
5. Student info page
   1. Includes sections for test progress, contact form, driver notes, etc.
   2. Test progress section includes test name, time taken, score, and status
      * 1. Status is either not taken, in progress, failed or passed
   3. The driver notes section contains a table with lesson time, start and end hours, and driver comments fields
6. DriverPass contact page

* The interface users and system access levels are shown below:

1. DriverPass owner – full access over accounts, update passwords
2. DriverPass information technology officer – full access over accounts, update passwords
3. DriverPass secretary – access to schedule, cancel and modify appointments
4. Customers/students – access to create an account, access to learning material, as well as access to schedule, cancel and modify appointments

* The system is web-based, so the interface interaction will occur through browsers, whether mobile, tablet, or desktop. At this time, there are no plans for native device app versions of DriverPass (Android, iOS).

### 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?*

* The Internet is available 24-hours a day, 7-days a week for system communication to records student progress, update exams, schedule driving lessons, etc.
* It is an assumption that DMV guidelines are consistently kept current, at this point, and that these guidelines are widely/freely available.
* With the popularity of phone apps, native DriverPass apps (iOS and Android) may soon become a priority.
* DriverPass users have a working client device that can connect to the Internet, with an operating system and browser that meet DriverPass system requirements.
* It is safe to assume that most customers will be younger and more tech savvy. Therefore, the website will receive the most traffic, as opposed to in-office visits or phone calls.

### 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?*

* As a web-based application, this system is reliant on network connectivity. This means that user data can’t be created, updated or deleted when network access isn’t available. This also means that content cannot be accessed unless online; i.e. study material and practice exams (potentially available for download, allowing offline access) or driving lesson reservations.
* Clearly, electricity must be available to power the DriverPass system and client devices.
* Initial capital expenditure a limitation. Physical hardware (servers) will have considerable upfront cost as well as costs related to provisioning and maintenance. I recommend a cloud-based backend/database architecture. This allows for less upfront capital expenditure on physical hardware and total cost is determined by the amount of services actually used. While conserving financial resources, this strategy also reduces time to market by redirecting development resources away from buying, provisioning, and maintaining hardware.
* Budget/time limitations will determine the number of staff assigned to this project and whether outside contractors or additional staff will be needed/hired.
* The skill-set of our current staff may impact our budget/time constraints as developers will be necessary for web-based interface and cloud-based back-end/database layers. These staff members may need additional training if working with unfamiliar technology.
* DriverPass instructional material is reliant on current DMV guidelines. Thus, limitations exist around the consistency, speed and access to guidelines if/when they change.

### 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.*

