# 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?*

* Client – *DriverPass* a company that offers customers driver lessons, courses, and practice tests.
* Liam is the Boss; Ian is the IT officer.
* This system should allow data management, and administration functions for Liam
* Be maintainable by Ian
* Encapsulate the process of signing up, driver lesson package selection, scheduling and data analysis by all other users (IE customer, secretary, customer support, boss, and IT officer).

### 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* meets the demand for better driver education and training.
* The system must provide a streamlined experience for staff and customers to provide excellent driver training.
* *DriverPass* will provide online classes, driving lessons, and in person lessons (IE in person classes).
* The system will handle the management, payment and scheduling of these lessons while providing useful data to Liam and the customer.

### 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?*

* Track different types of user information if different roles and access.
* Allow all users to schedule and track 2-hour driving lesson appointments.
* Track Lesson Time, Start Hour, End Hour, and Driver Comments for the driving lesson.
* Allow all users to schedule in person lessons like classroom time.
* Allow Customers to schedule online classes and practice tests.
* Track status of online classes and practice tests with score for practice tests.
* Offer these different lessons in 3 packages.
* Allow for Customers to reset their own password.
* Allow Liam and Ian to reset all passwords.
* Track DMV updates to stay compliant with current practices.

## 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?*

* Web-based Backend Environment – allows for cloud hosting and the most accessible through computers and mobile devices. Data transfer to frontend through JSON.
* Application Frontend Environment – Mobile device compatibility requires either a responsive web application or a mobile application. Data transfer to backend through JSON.
* Sub-second Response Times – reduce probability of scheduling errors and enhance user experience with updating progress, generating reports, and utilizing classes and practice tests.
* Maintenance and Security updates – Scheduled maintenance may initially occur monthly and fluctuate as the business requires. Critical issues may be updated as needed.
* DMV updates – To maintain relevance the system must receive notifications when the department of motor vehicle updates rules, regulations, and tests. The system must apply these updates immediately.

#### 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?*

* Backend Server – The system requires a web-based backend preferably hosted in the cloud by DriverPass. The web-based allows cross-platform compatibility through browsers. This can be expanded to respond to a mobile application JSON request.
* Server OS – Linux provides an extensively community supported open-source platform. Open source lowers the licensing requirements to run a production environment. The extensive community support is beneficial for the small IT department. Linux also provides excellent security features.
* Database – Cloud hosted relational database meets DriverPass’s requirements for structuring data between user accounts, data, and scheduling.
* Authentication – Incorporating an authentication service allows for more means of authentication effectively decreasing sign-up time and attracting more customers for ease of use while providing standardized security authentication.
* Reporting tools – To enhance data reports for DriverPass CEO reporting tools can aggregate data to downloadable document formats such as Excel.
* DMV API – incorporating an application programming interface will allow communication with the DMV to receive constant and instant updates regarding any changes.

#### 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?*

* Role-Based Access Control – Having different roles for users allows authentication to provide specific privileges and capabilities. Roles defined in the interview are Admin (Liam, and IT Officer), Secretary (employees with authority to schedule reservations), Customer ( Users seeking driver training), and Driver (Employees that provide driver training). Each user will only have access to perform functions they are allowed to perform.
* Authentication – For username and password authentication case-sensitive passwords are standard along with salting and hashing techniques. Usernames can be the email address eliminating the necessity for case-sensitivity while maintaining uniqueness.
* Security Breach – any potential security breach should notify administration accounts of the issue. A security breach may include a locked user, excessive login attempts, Unauthorized access, Denial of Service attacks, Privilege Escalation etc.
* System Errors – Error handling shall inform the admin of error details.

#### 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?*

* Profile manipulation – User profiles and data shall be stored in a database. This allows user profile deletion, insertion, and modification through RBAC and forms. Commands to update user information, delete users, and create users will be written in the code and governed by role based authentication.
* Modular Design – Microservices architecture provides independent capabilities which preserve system stability and allow continuous integration and development for evolving technologies.
* Cross Platform capability – Utilizing a responsive web design permits web browser capabilities across platforms. Mobile cross platform frameworks ensure one app can be produced across multiple platforms. Both designs are easily updated to support platform updates.
* Testing – regular testing will be conducted to identify any modifications required due to platform changes.

#### 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?*

* Third-Party Authentication – Authentication protocols or third party authenticators can be used to securely authenticate users through popular companies such as Facebook, Google, Instagram, and Github
* Memorized Secrets – To authenticate users directly the National Institute of Standards and Technology publication SP 800-63B section 5.1.1.2 outlines the requirements for passwords and password storage. Passwords shall be “salted” by the addition of a random value provided by a hashing function. The NIST includes examples of acceptable key derivation functions, PBKDF2, and hashing function, SHA-3.
* Usernames – Must be a unique identifier. E-mail addresses are acceptable.
* Encryption – The World Wide Web Consortium establishes guidelines Hyper Text Transport Protocol Secure using TLS in the Secure Contexts documents. Utilization of HTTPS provides the standard for secure communication between the client and server.
* Lock Accounts – During a brute force attack the account shall be flagged and locked. A notification shall be sent to the administrators and to the verified users email address. The administrator shall initialize the password reset protocol.
* Password reset – In the event a user forgets their password the NIST recommends secure Out-of-Band communication resulting in a recovery link or token sent to a verified recovery email. Email verification shall be complete to validate user profiles.

### 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.”*

* Email verification shall be complete to validate user profiles.
* The system shall validate user credentials when logging in.
* The system shall allow users to create accounts, including entering their personal information such as name, address, phone number, and email.
* The system shall enable users to reset forgotten passwords securely.
* The system shall assign role-based access levels to users.
* The system shall allow customer to schedule driving lessons online.
* The system shall allow the secretary to create, modify, and cancel reservations on behalf of customers.
* The system shall assign available drivers to customers based on selected dates and times.
* The system shall ensure that no driver or customer is double booked.
* The system shall offer defined driving lesson packages to the customer.
* The system shall allow administrators to enable or disable packages.
* The system shall notify the administrator of new material from the DMV.
* The system shall log all changes made to reservations.
* The system shall provide progress reports for driving lessons and online materials.
* The system shall generate activity and data reports for the administrator.
* The system shall integrate with the DMV to fetch updates and changes.
* The system shall support access from multiple platforms.
* The system shall securely store and process payment information.
* The system shall allow customers to provide payment information during account creation.
* The system shall log all failed login attempts and notify Administration of security issues and system errors.
* The system shall use HTTPS to encrypt all communication between client and server.
* The system shall notify customers with reminders for tests and practices.
* The system shall notify customers of upcoming driving lesson reservations.

### 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.)?*

* Customers: Primary interaction through mobile, possibly browser.
  + Create an account, Login, Verify email, manage profile.
  + Schedule driving lessons
  + View upcoming reservations
  + Track progress of all materials and lessons
  + Provide payment
  + Access study materials and online practice tests
  + Modify reservations.
  + Reset password
* Drivers: Primary interaction through mobile, possibly browser.
  + Leave feedback for customers
  + Track/update lesson status
  + Manage availability
  + Log in, validate email, reset password
  + Verify customer attendance
* Secretary: Primary interaction through browser
  + Log in, verify email, manage profile.
  + Schedule/ modify driving lessons
  + View driver availability
  + Contact customers
  + Access customer profiles to assist with updates
* Admin
  + Log in to system/ configure settings
  + Manage all user accounts
  + Access/download analytical reports
  + Receive notifications about system issues and account issues
  + Integrate and update DMV materials
  + Monitor system performance and security logs
  + Perform system updates

### 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?*

* Internet access – In the above design it is assumed all users will have internet access and a mobile phone capable of running the application or using the web application through a browser.
* IT Proficiency – it is assumed the IT officer is technologically proficient in handling IT Customer support and system troubleshooting.
* DMV API – The existence or capability of an API to interact with the DMV for regulation and policy changes is assumed.
* Payment Processing – It is assumed that DriverPass has a working payment processor, and the IT Officer knows how to troubleshoot payment processing errors.
* Technical Proficiency – This design is assumed to have developers technically capable of completing the project without outsourcing.

### 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?*

* Cloud Hosting – The system requires a budget that can accommodate the cloud hosting environment.
* Time – 4 months are allocated to the project.
* Staff – the system must accommodate a small customer support staff.

### 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.*

A screenshot of a computer

Description automatically generated