# CS 255 Business Requirements Document – Jose Medina

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?*

* DriverPass aims to provide comprehensive training for driving tests, including online practice exams and on-the-road training. The system should cater to various user needs, including accessing data online, making reservations, and tracking changes.

### 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 noticed a significant gap in the market for effective driving test preparation tools. They found that a majority of students fail their driving tests due to inadequate preparation. DriverPass intends to bridge this gap by offering a system that provides online and practical training to improve pass rates.]

### 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?*

* Provide an online platform for students to take practice exams.
* Offer on-the-road training scheduling and management.
* Ensure data accessibility and security for different user roles.
* Track and report changes made to reservations and user accounts.
* Integrate with DMV updates for compliance with current driving test standards.

## 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?*

* **Environments**: The system needs to run in a web-based environment, accessible through all major web browsers and on various devices, including desktops, laptops, tablets, and smartphones. Additionally, native mobile applications for both Android and iOS platforms should be supported.
* **Speed**: The system should ensure that page load times are minimal, with a target of under 2 seconds for most interactions. The mobile application should also be optimized for quick load times and smooth navigation.
* **Concurrency**: The system should handle at least 1000 concurrent users without significant performance degradation.
* **Updates**: The system should have regular updates for both the web and mobile applications, scheduled monthly for minor updates and quarterly for major updates, ensuring improvements and security patches are consistently applied.

#### 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?*

* **Supported Platforms**: The system should run on both windows and Unix-based operating systems for the server side components. The back-end should be supported by robust database management systems like MySQL or PostgreSQL, with cloud-based infrastructure services such as AWS or Azure for scalability and reliability.
* **Database**: A relations database is required to manage user data, appointments, and other system data. The system should use SQL for database queries and support for ORMs (Object Relational Mappers) to facilitate interaction with the database from the application code.

#### 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?*

* **User Differentiation**: Each user should be uniquely identified by a combination of a username and email address. The system should ensure that usernames and email addressed are case-sensitive to maintain unique identification.
* **Input Validation:** All user inputs should be validated to ensure correctness and prevent errors. The system should notify the admin immediately of any discrepancies or potential issues such as invalid data entries or failed transactions.   
    
  **Error Reporting:** The system should include detailed error logging and reporting mechanisms, informing the admin of any issues in real-time via email or dashboard alerts.

#### 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?*

* **User Management**: Admins should be able to add, remove, or modify user accounts through a web-based administrative interface without changing the underlying code. Role-based access controls should be implemented to manage different levels of permissions.
* **Platform Updates**: The system should be designed with modular components to allow easy updates and integration with new platform versions. Continuous integration / continuous deployment (CI/CD) pipelines should be used to facilitate smooth updates and maintenance.
* **IT Admin Access**: IT admins need full access to system settings, user management, and system logs. They should also have the capability to perform system backups, restore operations, and monitor system performance.

#### 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?*

* **Login Requirements**: Users should log in with a unique username and password. Multi-factor authentication (MFA) should be implemented to enhance security.
* **Secure Connections**: All data exchanges between the client and server should be encrypted using SSL/TLS protocols to ensure secure connections.
* **Brute Force Protection**: If a brute force hacking attempt is detected (e.g., multiple failed login attempts), the account should be temporarily locked, and the user should be notified. The system should also inform the admin of the suspicious activity.
* **Password Recovery**: If a user forgets their password, they should be able to reset it via a secure, automated process involving email verification and security questions. Admins should have the ability to manually reset passwords if necessary.

### 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 register for a new account.
* The system shall provide a user-friendly interface for scheduling driving lessons.
* The system shall allow users to view, modify, or cancel their appointments.
* The system shall send email confirmations and reminders for scheduled lessons.
* The system shall allow instructors to update lesson details and provide feedback.
* The system shall track and report all changes made to reservations and user accounts.
* The system shall integrate with the DMV database to update test rules and policies.
* The system shall provide practice tests that simulate the actual DMV tests.
* The system shall generate and display progress reports for users on their practice tests.
* The system shall offer multiple user roles (admin, IT officer, secretary, student) with specific access rights.
* The system shall allow IT administrators to reset passwords and manage user access.
* The system shall ensure secure handling of credit card information for lesson payments.
* The system shall log all user activities and generate audit reports for administrators.
* The system shall provide a way for users to recover their passwords securely.

### 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.)?*

**User Needs:** The interface needs to be intuitive and user-friendly, accommodating different types of users including students, instructors, admins, and secretaries. It should be accessible via both web browsers and mobile applications.

Different Users and Their Needs:

**Students:** Register, log in, schedule, view, modify, and cancel lessons, take practice tests, view progress reports.

**Instructors:** Log in, view their schedule, provide lesson feedback, update lesson details.

**Admins:** Full system access, manage users, reset passwords, view system logs, generate reports, handle system settings.

**Secretaries:** Log in, schedule lessons for students, manage appointments, handle customer information.

**Interaction:** Users will interact with the interface primarily through web browsers on desktops, laptops, tablets, and smartphones. Native mobile applications for Android and iOS will also be available for seamless interaction on the go.

### 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 users will have reliable internet access to use the online features of the system.

It is assumed that all users have basic computer literacy and can navigate a web-based or mobile application interface.

It is assumed that the DMV will provide timely updates for test rules and policies, and the system will be capable of integrating these updates.

It is assumed that the cloud infrastructure will provide the necessary scalability and reliability to handle peak loads and multiple concurrent users.

### 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?*

**System Design:** The initial system design may not include advanced features such as AI-driven personalized training recommendations or advanced analytics, which could be considered for future updates.

**Resources:** Limited resources may restrict the scope of initial development, focusing on core functionalities and deferring advanced features to later stages.

**Time:** The project timeline may impose constraints on the development process, necessitating a phased approach to roll out features.

**Budget:** Budget constraints may limit the ability to implement certain high-cost features or integrations.

**Technology:** The system relies on external data sources (e.g., DMV updates), and any delays or issues from these sources could impact the system's functionality.

### 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 table with text and numbers

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