# CS 255 Business Requirements Document

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 of the project is to develop a comprehensive software system for DriverPass, a company aiming to address a market gap by providing high-quality driver training services for individuals preparing for their driving tests at local Department of Motor Vehicles (DMV) offices. DriverPass, the client, envisions a versatile system that can efficiently deliver a range of driver training services. This includes providing online classes and practice tests to aid in test preparation, offering on-the-road training sessions, and enabling customers to make reservations for driving lessons, specifying the day, time, and other relevant details. The system must manage various user roles, such as customers, the IT officer responsible for system maintenance, and secretaries handling appointments. It should also accommodate flexible training packages and ensure data accessibility and security. Moreover, the system needs to track and report user activities, integrate with the DMV for staying updated on test requirements, and operate seamlessly over the cloud. Additionally, the client has provided specific interface design preferences. Overall, the project aims to deliver a user-friendly, adaptable, and secure software system that meets the diverse needs of DriverPass and its customers.

### 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 envisions a comprehensive software system designed to tackle several critical challenges and provide specific functionalities. Firstly, the system is intended to offer users access to essential online driver education resources, including classes and practice tests, aimed at addressing the problem of inadequate test preparation that leads to many individuals failing their driving tests at DMV offices. Secondly, it seeks to facilitate the scheduling and management of on-the-road training sessions, ensuring users can book practical driving lessons conveniently. The reservation system, as the third component, allows customers to make reservations for driving lessons while efficiently matching users with available drivers, cars, and lesson times. Fourthly, the system manages user accounts, catering to various roles such as customers, the IT officer responsible for system maintenance, and secretaries handling appointments. Fifthly, the system supports flexible training packages, accommodating variations in durations and features, with the potential for customization in the future. Sixthly, it ensures data accessibility and security, enabling secure data access from anywhere while allowing varying levels of access for different employees. Seventhly, the system tracks user activities and generates activity reports, fostering accountability and error resolution. Eighthly, the system integrates with the DMV to stay updated with driving test requirements and rule changes. Ninthly, the system operates over the cloud, minimizing infrastructure concerns. Lastly, it incorporates a user-friendly interface with specific design preferences to enhance the user experience. Collectively, these components aim to revolutionize driver training services, offering a holistic solution to the existing challenges in the industry.

### 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?*

Upon completion, the DriverPass system is expected to encompass a comprehensive set of functionalities, each associated with specific measurable tasks to fulfill the client's requirements and objectives. These functionalities include the provision of online driver education resources such as classes and practice tests, the seamless management of on-the-road training sessions, a robust reservation system for users to schedule driving lessons, and user account management catering to various roles within the organization. Additionally, the system must offer flexible training packages, ensure secure data access from anywhere, track user activities for auditing purposes, integrate with the DMV to stay updated on test requirements, operate seamlessly in a cloud-based environment, and boast a user-friendly interface based on client-provided sketches. The measurable tasks associated with these functionalities encompass design, development, implementation, and testing efforts to guarantee that the system effectively addresses the challenges within driver training services, while also providing an intuitive and reliable platform for clients and end-users alike.

## 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?*

The nonfunctional requirements for the DriverPass system encompass critical aspects of performance, environments, system speed, and update frequency. To ensure optimal accessibility, the system is designed to operate primarily within a web-based environment, accommodating users across various devices and locations. Performance requirements mandate a highly responsive user experience, with web pages loading within 2 seconds, scalability to handle increased traffic, support for a significant number of concurrent users, and limited offline functionality for uninterrupted access. In terms of system speed, the system is expected to efficiently retrieve data from external sources, process transactions promptly, and generate reports in a timely manner. Frequent synchronization with DMV data sources ensures up-to-date training materials and test requirements. Additionally, software updates will be managed carefully to address bugs, enhance security, and improve performance while minimizing disruption to system operations.

#### 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 DriverPass system is designed to be versatile and platform-agnostic, ensuring accessibility across various operating systems, including Windows, Unix, macOS, Linux, and more. In its backend architecture, the system relies on essential tools and services. A robust Database Management System (DBMS) is required to efficiently store and manage user data, reservation records, and training materials. Popular DBMS options like MySQL, PostgreSQL, or cloud-based solutions such as Amazon RDS are considered to meet scalability and data management needs. Additionally, a web server, such as Apache HTTP Server or Nginx, is essential for serving web pages and handling user requests within the web-based environment. Programming languages like Java, Python, or JavaScript (Node.js) may be utilized for server-side scripting and application logic, with the choice depending on specific development requirements. The system's integration with external data sources, such as the DMV, may involve the use of APIs, and cloud infrastructure, such as Amazon Web Services (AWS) or Microsoft Azure, can enhance scalability and security. Development frameworks and libraries are employed to streamline backend development, and robust data storage and backup solutions ensure data integrity and disaster recovery. These components collectively underpin the DriverPass system's core functionalities and contribute to its reliability and efficiency.

#### 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?*

In the DriverPass system, user distinction is achieved through unique identifiers, such as usernames or email addresses, which are case-insensitive to ensure a user-friendly experience. This approach allows users to access the system with ease while preventing ambiguity. Role-based access control is enforced, with each user type, including customers, IT officers, and secretaries, assigned specific roles and access permissions upon account creation. For security purposes, the system maintains case sensitivity for sensitive data like passwords, enhancing protection against unauthorized access.

The system is designed to notify the admin of problems or issues under specific conditions. Critical errors, such as database failures or security breaches, trigger immediate notifications to ensure prompt resolution. Additionally, the system alerts the admin in cases of anomalies or suspicious activities, ensuring proactive security measures. User-reported issues are also promptly communicated to the admin for resolution, while scheduled reports may summarize system performance and usage statistics. The timing of notifications varies based on the problem's severity and urgency, with critical issues requiring immediate attention and less urgent matters reported periodically or upon user request. Continuous system monitoring and proactive detection mechanisms further contribute to timely admin intervention and effective issue resolution.

#### 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 adaptability of the DriverPass system is critical for accommodating changes in user management and platform updates. It should ideally offer a user-friendly interface for administrators, particularly the IT admin, to make user-related modifications such as adding, removing, modifying, or deactivating user accounts without necessitating changes to the underlying code. This can be facilitated through an admin dashboard or control panel designed for efficient user management tasks. To adapt to platform updates, the system should prioritize compatibility and responsiveness, regularly monitoring and testing against evolving web browsers and operating systems. By adhering to web standards and responsive design practices, the system ensures seamless performance across various devices and screen sizes. The IT admin, with elevated access and privileges, plays a crucial role in system adaptability by overseeing user management, database maintenance, software updates, server configurations, monitoring, security management, and platform compatibility. Empowering the IT admin with these responsibilities ensures the system remains flexible, secure, and capable of addressing changing user needs and technological advancements.

#### 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?*

Security is a paramount consideration in the DriverPass system, and it encompasses various aspects to safeguard user accounts, data exchange, and user access:

For user login, the system requires a combination of a username or email address and a password, with the option of implementing multi-factor authentication (MFA) for an additional layer of security. To secure the connection and data exchange between the client and the server, Secure Sockets Layer (SSL) or Transport Layer Security (TLS) protocols are utilized, ensuring that all transmitted data is encrypted and protected from interception by unauthorized parties.

To thwart brute force hacking attempts, the system enforces an account lockout policy, temporarily suspending user accounts after a certain number of failed login attempts. The duration of the lockout progressively increases with each subsequent failure, and users are promptly notified of the lockout. CAPTCHA challenges may also be introduced to deter automated attacks.

In cases where users forget their passwords, a secure "Forgot Password" functionality is in place. Users can initiate a password reset by providing their registered email address. The system then generates a time-limited token and sends it to the user's email. Upon clicking the reset link, users can create a new password, with the token validation ensuring the security of this process.

These comprehensive security measures collectively create a robust framework within the DriverPass system, safeguarding user accounts, data exchanges, and access while ensuring a high level of protection against potential security threats.

### 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 functional requirements for the DriverPass system are designed to encompass a comprehensive set of features and capabilities, ensuring the system's effectiveness and security. The system shall begin by authenticating users through validation of their credentials, including username or email address and password, with the option to implement multi-factor authentication (MFA) for enhanced security. Users can create new accounts by providing necessary registration details, and a "Forgot Password" functionality enables password resets via secure email links. Role-based access control distinguishes user roles, granting authorized users administrative access to manage accounts.

To secure data exchange, the system employs SSL/TLS encryption and supports a web-based environment accessible across various platforms and devices. Responsive design ensures a consistent user experience, and integration with external data sources such as the DMV keeps training materials and regulations up-to-date. The system offers user-friendly interfaces for online driver education resources, facilitates lesson scheduling, generates activity reports for auditing, and sends notifications to administrators regarding critical issues or anomalies. Account lockout policies deter hacking attempts, and secure account recovery processes assist users in regaining access to their accounts in case of forgotten passwords. These functional requirements collectively define the system's capabilities, aligning with the client's vision for an efficient and secure driver training platform.

### 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 user interface for the DriverPass system serves the needs of various user categories, offering a user-friendly, efficient, and accessible experience. The primary users of the interface are customers, who seek driver training services. Customers can securely log in through web browsers or mobile apps, accessing a dashboard to schedule driving lessons, view available trainers and cars, and track their progress in online classes and practice tests. They have the flexibility to modify or cancel appointments, update personal information, and reset passwords when necessary, with accessibility on both web browsers and mobile devices. IT officers, responsible for system maintenance and user account management, require an administrative dashboard accessible via web browsers. They manage user accounts, monitor system performance, generate activity reports, and receive critical issue notifications. Secretaries, who oversee appointment scheduling, interact with the interface through web browsers to efficiently manage customer appointments, assign trainers and cars, and update customer information. The interface caters to the specific needs of each user category, ensuring seamless interaction and functionality for customers, IT officers, and secretaries across various platforms and devices.

### 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?*

In the design of the DriverPass system, several assumptions underlie its functionality and user interactions. It is assumed that users possess a basic level of digital literacy and have consistent internet connectivity to access the system. The interface is designed to be responsive, catering to various devices, from desktops to mobile phones. Users are expected to be aware of password security best practices. Administrative roles for IT officers and secretaries are assumed to be well-defined and understood. The system's ability to integrate with external data sources, like the DMV, is assumed without specifying the integration mechanisms. Data privacy and compliance are expected but not detailed explicitly. User notification preferences and performance optimizations are mentioned but not elaborated upon. Users' access to help resources or customer support is presumed without specifying the extent of support services. These assumptions provide a foundation for the initial design, but their validation through user testing and ongoing assessments will be crucial to ensuring the system's effectiveness and user satisfaction.

### 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?*

The system design for DriverPass, while comprehensive, is not without its limitations. The complexity of the system, driven by security measures like multi-factor authentication and role-based access control, may pose challenges in terms of development and usability. Resource constraints, including limitations in time, budget, and available technology, may impact the system's development and scalability. Integration with external data sources could introduce technical challenges, and maintaining regulatory compliance may require ongoing resources. User proficiency assumptions may not hold true for all users, necessitating user training and support. Additionally, the user interface design, while responsive, may not fully align with all user preferences and needs. Addressing these limitations will require careful project management, flexibility, and a commitment to ongoing assessment and improvement as the system evolves to meet the needs of its users.

### 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.*

<https://lucid.app/documents/view/fc6137d9-a8e1-4878-9850-baf5579a178f>

A gantt chart with multiple colors

Description automatically generated