# CS 255 Business Requirements Document Template

## System Components and Design

### Purpose

The purpose of this project is to help our client build a website for future drivers to practice the written portion of the driving test, sign-up to take in-person classes that dive deeper into the DMV rules and policies, and to assist them with driving tests to prepare them to pass their Department of Motor Vehicles (DMV) tests. As a company, we will also ensure the security of the website is prestige. Our client, DriverPass, want their system to provide practice tests for users, the ability to schedule driving time with one of their ten drivers, and to be able to make, change or cancel existing appointments they set up.

### System Background

Our client, DriverPass, want their system to provide the owner, Liam, to be able to download the reports and some of the information for offline studying, his IT officer, Ian, to be able to have access over all accounts to be able to reset someone’s password if they forget it, and his secretary needs access to the ability to set appointments for users. Liam also wants users to be able to make, change, or modify their appointments online, by calling in, or by coming by the office. He wants them to have the ability to choose between 3 packages, and he would like to be able to disable a package if he no longer wants users to have access to it. Liam would like for users to be able to see the practice tests they’ve taken, their scores, and the tests in progress. He would also like the drivers to be able to log lesson times, the start and end time, and any notes taken when they were with the student driver. Lastly, he’s like notifications from the DMV when they have new practice tests available or if something has changed.

### Objectives and Goals

## In the system analysis phase, our objectives are to make the system cloud-compatible, allowing it to run on a cloud server for enhanced scalability and accessibility. Additionally, we aim to provide the personnel at DriverPass with a system that streamlines their focus on the core business activities. To achieve this, we plan to implement user sign-in and account creation functionalities for the three available packages. Moreover, specific access permissions will be granted to Liam, Ian, and Liam's secretary, enabling them to perform their job responsibilities effectively. Security profiles will be set up for each of them to ensure data confidentiality and integrity. To ensure robust data storage and availability, correct access points will be established in the cloud. As a security measure, we will implement hashing protocols to protect users' information from unauthorized access or tampering. A password criterion will be enforced to encourage users to create strong and hard-to-guess passwords, enhancing the overall system security. The website's design will align with the outline provided by DriverPass to ensure a cohesive and user-friendly interface.

## In terms of goals, we plan to have a sign-off from DriverPass by March 10th, following successful requirements meetings to ensure compliance with their expectations. Once confirmed, we will proceed with building the interface and connecting it to the database, ensuring smooth data retrieval and storage. The development of business logic, as outlined in the previous section, will be undertaken to ensure all essential functionalities are implemented accurately. Thorough testing will be conducted to verify the system's functionality and security, ensuring a reliable and robust system for end-users. Our goal is to deliver the fully functional system to DriverPass by May 9th, meeting all specified objectives and requirements. By adhering to this timeline, we aim to provide DriverPass with a secure, efficient, and user-friendly system that aligns with their business needs.

## Requirements

### Nonfunctional Requirements

#### Performance Requirements

The system for DriverPass needs to run in a web-based environment. Liam specifically mentioned that the system should run off the web, preferably over the cloud. This ensures accessibility from anywhere and allows users to access it online and offline. In terms of system speed, there is no specific mention of an exact performance requirement. However, since it is an online system, it is reasonable to assume that the system should be responsive and provide a smooth user experience. Fast response times are crucial to ensure users can make reservations, access information, and perform actions without delays or frustration. Regarding system updates, Liam expressed the need to stay compliant with the DMV's rules and policies. This indicates that the system should be updated whenever there are changes or updates from the DMV to ensure the tests and practice materials provided by DriverPass remain current and accurate. However, the exact frequency of updates is not specified in the interview, so it would be essential for the development team to establish a process for monitoring and implementing updates as needed.

#### Platform Constraints

The interview transcript does not explicitly mention specific platforms like Windows or Unix for the system to run on. However, since Liam mentioned that the system should run off the web and preferably over the cloud, it suggests that the system should be platform-agnostic and accessible from various devices and operating systems with internet connectivity. As for the back end, there is a mention of building the database tables and linking them to the interface. This indicates that a database is required to support the application. The interview does not specify the type of database to be used, so the development team would need to determine the most suitable database management system (e.g., MySQL, PostgreSQL, MongoDB) based on the application's requirements and expected data volume. Additionally, for the system to work efficiently and securely, there may be a need for other back-end tools such as a web server, application server, and security protocols to handle user authentication, data processing, and communication between the front-end and the database. These specifics would be addressed during the system design and development phases.

#### Accuracy and Precision

To distinguish between different users, the system will likely implement a user authentication mechanism. This can be achieved through username-password combinations, email-based login, or even multi-factor authentication (MFA) for added security. Each user will have unique credentials, and upon logging in, the system will identify and authorize them based on their role and permissions. Regarding input case-sensitivity, the interview transcript does not explicitly mention whether the input is case-sensitive or not. Typically, case-sensitivity in user input depends on the specific requirements of the application. For some fields, case-insensitivity might be preferred (e.g., email addresses), while for others, case-sensitivity might be necessary (e.g., passwords). The system should inform the admin of a problem immediately or as soon as possible, especially in critical situations that require urgent attention. For example, if there's a technical issue that affects the availability of the system, the admin should receive an alert promptly. Similarly, if there's a security breach, unauthorized access, or suspicious activities detected, the system should trigger notifications to the admin to address the problem promptly and take appropriate actions to mitigate risks and protect sensitive data. The system can utilize various monitoring tools, logs, and automated alerts to notify the admin of potential issues or anomalies.

#### Adaptability

The interview transcript does not explicitly mention whether the system allows for user management (add/remove/modify) without changing code. However, it is a common requirement for many applications to have a user management system that allows administrators to add, remove, and modify user accounts without making changes to the underlying code. This can be achieved by implementing a user management module or using an existing identity and access management (IAM) solution. Regarding platform updates, the system should be designed to be adaptable and compatible with different platforms. If the system is built using standard web technologies, it should be relatively straightforward to adapt to platform updates. Web-based applications are generally platform-independent and can run on various operating systems and devices with modern web browsers. Ensuring compliance with industry standards and best practices in software development can help maintain compatibility with platform updates. The IT admin will require full access to the system's administration and configuration settings. They should have permission to manage user accounts, handle security configurations, access logs and monitoring tools, and perform other administrative tasks necessary to maintain the system's health, security, and functionality. The admin's access level might be higher than regular users to perform tasks that require system-wide changes and configurations. Implementing role-based access control (RBAC) can help ensure that the IT admin has appropriate access levels based on their responsibilities within the organization.

#### Security

To log in, users will need to provide their credentials, such as a username and password. The system will verify these credentials against a database of user accounts to authenticate the user and grant access. To ensure a secure connection and data exchange between the client and the server, several measures can be taken. Implementing SSL/TLS encryption ensures that the data transmitted between the client and the server is encrypted, safeguarding it from unauthorized access during transmission. Using the HTTPS protocol further ensures that all data exchanges are encrypted and secure. Secure authentication mechanisms, such as multi-factor authentication (MFA), can be employed to add an extra layer of security to the login process. This can involve requiring users to provide additional verification, such as a one-time code sent to their mobile device, in addition to their password. Passwords should be stored securely using strong cryptographic hashing algorithms to protect them from being compromised. Even if the password database is breached, the actual passwords should remain secure and unusable by unauthorized parties. In the event of a "brute force" hacking attempt, where an attacker repeatedly tries different username and password combinations, the system can take preventive measures. It can implement account lockout or temporary suspension after a certain number of failed login attempts within a specified time frame. This helps protect the user's account from unauthorized access attempts. If a user forgets their password, the system should provide a secure password recovery or reset process. This process may involve sending a password reset link to the user's registered email or phone number, asking security questions, or using multi-factor authentication to verify the user's identity. The password reset process should be well-protected to prevent unauthorized access to the user's account by malicious actors.

### Functional Requirements

The system shall validate user credentials when logging in, ensuring only authorized users have access. It will provide online driver training classes and practice tests for customers to enhance their driving skills. Customers will be able to schedule driving lessons by selecting specific dates and times that suit their convenience. The system will offer different packages for driving lessons, including Package One, Package Two, and Package Three, each with varying hours of training and additional features. To enable online registration, the system will capture essential customer information, including their first name, last name, address, phone number, state, and credit card details. In case customers forget their passwords, a secure password recovery process will be implemented to facilitate password reset. The system will have distinct user roles, such as administrator (Liam), IT officer (Ian), and secretary, each with specific access rights and permissions tailored to their responsibilities. User activities, such as reservations, modifications, and cancellations, will be tracked and logged to create an activity report for auditing purposes. To ensure compliance with the Department of Motor Vehicles (DMV) rules and policies, the system will connect to the DMV for updates and notifications on driving test requirements and changes. The user interface will be designed to be user-friendly and visually appealing based on Liam's sketch. The system will be cloud-based, providing a secure and reliable platform for operation, with minimal technical issues and robust backup and security measures. To accommodate future changes, the system will be designed with scalability and flexibility, allowing for potential customization of packages without requiring extensive code changes. Measures will be implemented to prevent data redundancy when accessing data offline or online from different devices. The system will promptly inform the administrator of any problems or errors to facilitate quick resolution. High-speed performance will be maintained to ensure a seamless user experience and efficient data processing. A secure data exchange mechanism will be employed, using SSL/TLS encryption, to protect data during transmission between the client and server. In the event of "brute force" hacking attempts on user accounts, the system will incorporate account lockout or temporary suspension mechanisms to enhance security. User passwords will be stored securely using strong cryptographic hashing algorithms to safeguard sensitive information and prevent unauthorized access.

### User Interface

The interface for the DriverPass system needs to be user-friendly, visually appealing, and easy to navigate to cater to its diverse user base. The primary users of the interface include customers, Liam (the administrator), Ian (the IT officer), and the secretary. Customers should access the interface through web browsers on both desktop and mobile devices. They need to create accounts, log in, view available driving lesson packages, schedule lessons, monitor their progress, and access training materials and practice tests. As the owner and administrator, Liam requires access to the interface from various devices to efficiently manage the system. He should be able to oversee customer reservations, view activity reports, manage package pricing, and receive notifications about system updates and status. Ian, the IT officer, needs access to maintain and update the system. He should have full access to manage user accounts, reset passwords, and address technical issues. The secretary needs access to the interface to schedule appointments for customers who call or visit the office. They should be able to efficiently manage reservations and coordinate with customers. The interface will be web-based, accessible through standard web browsers on desktops and mobile devices. Customers can log in to their accounts from any device with an internet connection, and the interface will adapt to different screen sizes for optimal user experience. The interface will be designed with responsive web design principles to ensure a seamless interaction regardless of the user's device. Customers will interact with the interface by clicking on buttons, filling out forms, and selecting options to make reservations, access training materials, and manage their accounts. Liam, Ian, and the secretary will have more extensive capabilities within the interface, allowing them to manage system settings, user accounts, and reservations efficiently. The interface will offer a user-friendly and consistent experience to all users, facilitating easy navigation and interaction with the system's features.

### Assumptions

In the design provided earlier, some specific aspects were not explicitly addressed, including the detailed layout and visual design of the interface, the specific programming languages and technologies to be used, and the implementation of certain security measures. Additionally, the design did not delve into the specifics of user authentication, session management, and error handling mechanisms. Several assumptions were made in the design about the users and technology environment. First, it assumes that users, including customers and the secretary, possess basic computer literacy to navigate the web-based interface, create accounts, and manage their profiles effectively. Second, the design assumes that users will have access to an internet connection, as the system heavily relies on online functionality. Mobile device compatibility is also assumed, implying that the web interface will be optimized for use on various devices, such as smartphones and tablets. Moreover, the design assumes that DriverPass already has the necessary infrastructure, servers, and hardware in place to support the web-based system. It also assumes that users are familiar with standard web browsers and their basic functionalities to access the interface. The design further presupposes the implementation of appropriate security protocols to safeguard sensitive user information, such as encryption for data transmission and secure storage of passwords. Regarding administrative responsibilities, the design assumes that Liam, as the system administrator, possesses a clear understanding of his role and will utilize the interface to manage the business efficiently. Lastly, the system design anticipates future scalability, with the ability to accommodate additional features and users as the business expands. To ensure the effectiveness of the design and its alignment with DriverPass's specific needs and technological capabilities, validation with DriverPass and potential end-users will be crucial. Gathering regular feedback and conducting thorough testing will help refine the design and make necessary adjustments based on real-world usage and requirements.

### Limitations

In the system design presented, several limitations can be identified. Firstly, the design does not address the support for multiple languages or localization features, which could be a limitation for DriverPass if they intend to cater to a diverse customer base that speaks different languages. Secondly, the design assumes that users will have stable internet connectivity, which might be a limitation for customers residing in areas with unreliable or limited internet access. This could potentially hinder their ability to access the online services consistently. Another limitation lies in the assumption of users possessing basic computer literacy. If the target user group includes individuals who are less familiar with technology or have limited experience with web-based applications, additional training or support may be required to ensure seamless adoption of the system. As for resource limitations, the design does not address potential constraints in terms of server capacity and scalability. If the system experiences a sudden surge in user activity or growth, it may strain the existing infrastructure and require additional investment in server resources. Regarding time and budget constraints, the design may need to be adapted to accommodate a realistic timeline and financial resources available for development and implementation. There may be limitations on how quickly the system can be fully developed and deployed. Lastly, the design assumes the availability of certain technologies and tools to support the system, such as cloud hosting and databases. If these technologies are not readily accessible or require significant investment, it could pose limitations on the implementation of certain features or functionalities. To overcome these limitations, a thorough assessment of DriverPass's specific requirements, budget, and technological capabilities will be essential. Prioritizing features based on critical needs and considering alternative solutions that align with available resources will help optimize the system design and development process. Regular communication with DriverPass throughout the development cycle will enable the team to address potential challenges and constraints proactively and ensure the final system meets their needs effectively.

### Gantt Chart

A white sheet with colorful boxes

Description automatically generated