# Cb,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?*

* The client for this project is DriverPass, a company focused on helping students prepare for and pass their driving tests. The primary objective of this project is to create an online system that significantly enhances the learning experience for students. DriverPass envisions this system with several key functionalities: providing online practice exams that mimic the real driving test, offering scheduling and management tools for on-the-road driving lessons, and managing users, including students, instructors, and administrators. Additionally, the system must ensure secure data handling and access across multiple devices and integrate with DMV updates to provide the latest rules and practice questions. The goal of DriverPass is to improve the pass rate of students taking driving tests, enhance their overall learning experience through structured and accessible training resources, and streamline administrative tasks and scheduling for instructors and students.

### 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 wants the system to provide a comprehensive and effective way for students to prepare for their driving tests. The main problem they aim to address is the high failure rate among students, which exceeds 65%, mainly because many students only study previous tests without engaging in practical training. DriverPass requires a system that offers a blend of theoretical and practical training to fix this, improving students' chances of passing their driving exams. The primary objective of this initiative is to develop an internet-based platform to enhance students' educational journey. DriverPass aims to incorporate various essential functionalities into this system, including simulated practice exams mirroring real driving tests, tools for organizing and overseeing on-road driving sessions, and robust user management capabilities catering to students, instructors, and administrators alike. To address these needs, the system must include several components. First, it should offer online practice exams that simulate the format and content of actual driving tests, helping students familiarize themselves with the test structure and question types. Second, it needs tools for scheduling and managing on-the-road driving lessons, including calendar integration, reminders, and rescheduling options. Third, it should feature robust user management capabilities, handling the profiles and activities of students, instructors, and administrators with appropriate access levels and permissions. The system must also ensure secure data handling, with encryption and access across multiple devices. Lastly, the system should integrate with DMV updates to provide the latest rules, regulations, and practice questions, ensuring the training material is always current.

### 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?*

* When completed, the DriverPass system should be able to significantly enhance student preparedness by providing comprehensive practice exams that closely mimic the actual driving test, covering all relevant topics and question types. The system should simplify scheduling by enabling straightforward booking and managing driving lessons, allowing students to book, reschedule, and receive lesson reminders effortlessly. It should also support effective user management by ensuring students, instructors, and administrators have appropriate permissions and tools. Furthermore, the system must prioritize data security by implementing strong security measures such as encryption and secure access protocols. Lastly, it should maintain compliance with DMV regulations by integrating regularly updated information to ensure the training material remains current and accurate. First, the development of online practice exams involves designing and implementing a database of questions that simulate the driving test. This includes creating a user interface for taking practice exams, incorporating features for tracking student progress, and providing feedback. Second, scheduling and management tools need to be developed, including a calendar system for booking and managing driving lessons. This also involves implementing notification systems for lesson reminders and changes and providing a dashboard for instructors to manage their schedules and student progress. Third, user management features must be created, including secure login and registration processes for students, instructors, and administrators. Users should be able to manage their profiles, update personal information, and track progress. A role-based process should be used to ensure that the appropriate permissions are granted. Additionally, robust data security measures, including encryption, two-factor authentication, and other security authentication measures, are essential for sensitive user data, and regularly updating security features to protect them from imminent threats is essential. Finally, DMV integration requires developing an API to pull the latest rules and practice questions from the DMV. The system should be able to automatically update its database with new information and provide notifications to users when significant updates occur. By including these tasks in the system design, the DriverPass system will be well-equipped to meet its objectives and deliver a high-quality training experience for students.

## 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 DriverPass system must function properly in several environments to ensure broad accessibility and smooth operation. The system ought to operate through the web, accessible via contemporary web browsers on desktops and mobile devices alike. It should also be accessible as a mobile app for iOS and Android platforms, enabling users to use the system while on the move. Regarding system performance, the platform should deliver swift response times, ensuring that page loads and interactions take place within 2 seconds to maintain a smooth user experience. This includes ensuring practice exams and lesson scheduling tools operate without noticeable delay, allowing users to complete tasks and receive feedback quickly. Regarding updates, the system should be updated regularly to incorporate new features, improve performance, and address any security vulnerabilities. Minor updates should be deployed bi-weekly to ensure the system remains current with user needs and technological advancements. Major updates, including significant feature additions or overhauls, should be planned quarterly to ensure thorough testing and integration. By meeting these performance requirements, the DriverPass system will provide a responsive, reliable, and up-to-date platform for users to prepare effectively for their driving tests.

#### 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 must operate seamlessly across multiple platforms to ensure maximum accessibility and functionality.In particular, the system must be compatible with major operating systems, including Windows, macOS, and Linux for desktop users. For mobile users, the system should work on iOS and Android platforms. In addition, the web-based version must be accessed via modern web browsers such as Chrome, Firefox, Safari, and Edge. A robust relational database management system (RDBMS) will be needed to store and manage user data and generate test questions, study protocols, and other information required in the system backend. Qualified RDBMS Examples include MySQL, PostgreSQL, or SQL Server. The applicant may be able to control more identical users with the use of all-round technologies combined with the use of auth or jwt (Jwt) or jwt If we put the use of Son web tokens, besides the scalability and redundancy, maybe the system will require the use of cloud services such as AWS, Google Cloud Platform, or Microsoft Azure. The DriverPass system has become more versatile and secure by overcoming these platform limitations, and it can support various user environments and backend requirements.

#### 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?*

* The system will distinguish between users by implementing unique user identifiers such as usernames or email addresses, which will be stored in the database. Each user will have a unique profile that includes their role (student, teacher, administrator) and access. Role-based role control (RBAC) will ensure that users can only access the services associated with their roles. For example, students can plan lessons through practice tests, while teachers can manage programs and track student progress. User input, such as usernames and passwords, will be case-sensitive to enhance security and ensure accurate data handling. All user input will be validated and sanitized to prevent errors and security vulnerabilities like SQL injection. The system should be designed to notify employees of critical events, such as security breaches or other failures, through email notifications or admin dashboard alert systems. Regular system health checks and logs will be implemented to monitor performance and detect anomalies. The system should immediately alert the admin if predefined thresholds are exceeded for issues like server load, database errors, or unauthorized access attempts. Additionally, administrators should receive periodic reports summarizing system performance, user activity, and potential problems that may require attention. By addressing these aspects of accuracy and precision, the DriverPass system will maintain high data integrity, security, and reliability standards, ensuring a smooth and secure user experience.

#### 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 system should allow administrators to add, remove, and modify user accounts without requiring code changes.This can be achieved through a user-friendly admin interface that provides comprehensive user management capabilities. Admins should be able to update user roles, reset passwords, and manage permissions through this interface. The system should be designed to adapt to platform updates, such as new versions of operating systems, web browsers, and mobile platforms. This can be facilitated by using responsive design principles and adhering to web standards. Regular maintenance and testing should be conducted to ensure compatibility with the latest platform updates.Additionally, using modular architecture and APIs can help isolate components that may need updates, minimizing the impact on the overall system. IT administrators need comprehensive access to the system to manage its functionality and ensure smooth operations.This includes system settings, user management tools, security settings, and access to configuration information. IT experts must be capable of displaying system performance, troubleshooting troubles, and creating updates or patches as needed. Data must be subsidized and restored to make certain facts integrity and recovery at some stage in a device failure. Meeting these flexibility needs will make the DriverPass system more flexible, resilient, and capable of keeping up with technological advances, providing users with a future-proof, trustworthy solution.

**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 are required to log in using a unique username or e-mail deal paired with a strong password. To beautify security, multi-aspect authentication (MFA) must be implemented, requiring customers to affirm their identification via a secondary technique, including a mobile tool or e-mail verification. The connection between patron and server should be secured through HTTPS with SSL/TLS encryption to safeguard facts during transmission. All touchy statistics, including personal credentials, must be encrypted in transit and at rest. In addition to encryption, it is crucial to stick to stable coding practices to save you vulnerabilities like SQL injection and pass-site scripting (XSS). To counter brute force attacks, the device should enforce account lockout mechanisms after a fixed variety of unsuccessful login tries. For instance, after five failed login tries, an account is probably briefly locked for a targeted duration (e.g., 15 minutes). CAPTCHA mechanisms must also be implemented to distinguish between human customers and automated bots. A robust password-healing system is essential in case users neglect their passwords. This entails sending a time-sensitive password reset link to the user's registered email address, directing them to a steady web page where they can create a new password. This hyperlink expires speedily to prevent unauthorized entry. By implementing these comprehensive security measures, the DriverPass system ensures user data protection and maintains the platform's overall security.

### 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 is designed to validate user credentials during the login process. It will offer an interface where students can take online practice exams that closely simulate the actual driving test. The program will allow students to plan and manage driving lessons on the road. Teachers can access tools that help them organize their programs and track student progress. Administrators can manage users by adding, removing, and modifying user accounts and roles. The system will send email notifications to users on essential events, such as comments and password resets. It will also generate student performance reports, outlining progress and highlighting improvement areas. The system will use HTTPS with SSL/TLS encryption to ensure secure communication. Users will have the option to reset forgotten passwords safely via an email link. To protect against brute force attacks, the system will temporarily lock accounts after multiple unsuccessful login attempts and use CAPTCHAs to distinguish between users between roles and automated bots at login, besides adding Multi-Factor Authentication (MFA) to strengthen the security of the login process. Sensitive data, which the user certificates included, shall be protected during delivery and at rest. The system will undergo regular updates to introduce new features and apply necessary security patches.

### 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.)?*

* Students will need to access online practice exams that mimic the real driving test. They should be able to navigate questions and receive immediate feedback on their performance easily. Students should be able to plan and organize driving lessons at their own pace, including checking available time, taking lessons, and accessing reminders. The interface should also provide students with progress-management tools that will track their performance over time and identify areas for improvement. They will be able to. Instructors will need access to a scheduling system to manage their availability and effectively view their lesson schedules. The interface should allow instructors to track and document student progress, including logging student performance during driving lessons and providing feedback. Instructors should also be able to communicate with students through the interface, confirming lesson details or providing additional instructions. Administrators must have robust tools for managing user accounts and roles effectively, including adding, removing, and modifying tasks as necessary. The interface should also support administrators in monitoring system performance, accessing system logs, and receiving notifications for critical updates or issues. Administrators need reporting tools to generate and review student and instructor performance reports. To ensure widespread accessibility, the system's interface will be crafted to operate seamlessly on both mobile devices and desktop browsers. It will prioritize responsive design principles to deliver a cohesive and intuitive experience across various devices and screen dimensions. Moreover, the interface will be compatible with standard web browsers, including Chrome, Firefox, Safari, Brave, and Edge, as well as mobile platforms like iOS and Android.

### 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 design does not specifically address accessibility features for users with disabilities, such as considerations for screen readers, keyboard navigation, and color contrast adjustments. The design does not detail the data backup and recovery processes to ensure data integrity and availability in case of system failures or data loss. Scalability considerations for future expansion are not discussed, and the design does not specify how the system will handle increasing users and data as DriverPass grows. The design also does not address the need for multiple language support or localization for users from different regions. Furthermore, it does not mention any integrations with third-party services, such as payment gateways for lesson payments or social media platforms for user engagement. Lastly, the design does not include plans for user training and ongoing support to help users navigate and utilize the system effectively. Several assumptions were made in the design. The system operates under the assumption that all users possess modern devices and current web browsers that meet its requirements, alongside reliable internet connectivity. It also assumes users have a fundamental level of technical skill to efficiently use the system for booking lessons and managing schedules without extensive guidance. Moreover, users are expected to adhere to security best practices, like setting robust passwords and safeguarding their login details. Additionally, users are assumed to engage with the system appropriately, such as regularly monitoring their schedules and promptly responding to notifications. Lastly, it is assumed that platform and system updates will be managed effectively without causing significant downtime or disruption to the users. Acknowledging these unaddressed issues and assumptions can further refine the design to ensure a more comprehensive and user-friendly system that meets the diverse needs of all DriverPass 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?*

* Every system design has inherent limitations, and the DriverPass system is no exception. In terms of system design, there are several limitations to consider. The initial design falls short in incorporating accessibility features for users with disabilities, potentially limiting usability for some students. Moreover, the absence of detailed data backup and recovery plans poses a risk to data integrity and availability during system failures. Scalability issues are also overlooked, which could become problematic as the user base and data volume increase. Additionally, the lack of internationalization features means the system might not be easily adaptable for non-English-speaking users or those in different regions. Lastly, not including third-party integrations like payment gateways could restrict the system's functionality and user convenience. Regarding resources, time, budget, and technology, there are several limitations as well. Budget constraints may limit the ability to implement all desired features, such as advanced security measures, comprehensive user training programs, and extensive third-party integrations. Time constraints could impact testing thoroughness and the system's overall quality. Resource limitations, including the availability of skilled developers and IT personnel, could affect the pace and quality of the project. Technological limitations, like compatibility problems with different devices and platforms, might restrict the system's accessibility and performance. Acknowledging these constraints allows for better management of the design and development process, ensuring that the key features of the DriverPass system are prioritized and implemented efficiently within the given resources, time, and budget.

### 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.*

