# 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 purpose of this project is to develop a comprehensive online system for DriverPass that supports delivering online education, scheduling, managing student progress and company operations. This system will address challenges that are commonly posed by traditional driving programs by providing an integrated yet suer friendly solution for all types of users.*

*The system’s core features will need to include:*

* **Student Registration and Scheduling:** Allow students to register, schedule lessons, access online classes, complete practice tests, and track their progress.
* **Real-Time Tracking:** The system will provide real time tracking of students, for which student is assigned to which driver, car, lesson time, to ensure clear scheduling/accountability.
* **Role Based Access:** The system will be able to manage access permissions for all different types of users (admin, secretaries, instructors) to manage appointments, view or update lessons, interact with customer data when appropriate.
* **Offline Data Access:** The system will support data access online with offline report downloading to ensure flexibility for staff and students.
* **Reporting:** The system will track/audit user activities like scheduling and cancellations to ensure accountability.
* **DMV Compliance:** The system will integrate with DMV updates to reflect any changes to driving regulations in order to remain compliant.
* **Security:** The system will ensure cloud based security to protect sensitive data.

By interpreting these features the system will be able to streamline operations, reduce any inefficiencies, and provide an overall better experience for all users (Interaction Design Foundation, n.d.).

### 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?*

*The background of the system is provided to establish the context of the current system. We can outline the challenges that DriverPass currently faces in its daily operations. The current system in place relies on outdated practices such as manual scheduling and separate tools for education or progress tracking. This approach is resulting in some inefficiencies and challenges the how they can manage large volumes of students, lessons, and scheduling.*

*The current System Challenges are:*

* **Manual Scheduling:** students must manually book either by calling the office or visiting in person. This can cause scheduling problems.
* **Separate Learning tools**: Any educational content is not integrated or online which can make it hard for students to track progress. Without being aware of how they are doing, it can make it difficult to prepare for their DMV test.
* **Limited Management:** With the current system there is no centralized system in place to track student data, lesson schedules, driving schedules, locations, etc. This is creating a gap in their operational visibility.
* **No DMV Integration:** With their current system, it is not connected to the DMV, so it is difficult to ensure accuracy with up to date rules/regulations.

*Potential System Enhancements:*

*With the new system we can address these issues by providing a comprehensive, cloud based platform, and several key features that include (Amazon Web Services, 2023):*

* **Cloud Based System:** The system will be cloud hosted to provide flexibility, scalability, and real time synching. This also helps ensure more efficient maintenance as it will not be done directly by DriverPass.
* **Online Education and Practice**: Students will have access to online courses that are DMV compliant. They will also have access to practice exams with up to date current regulations.
* **Customizable Driving Packages**: The system will offer three different packages, tailored to different student needs:
  + **Package One**: Six hours in a car with an instructor that is divided into three lessons
  + **Package two:** Eight hours in a car with an instructor and an in-person lesson that goes over DMV rules/policies.
  + **Package three:** Twelve hours in a car with an instructor, an in-person lesson going over DMV rules, and full access to online materials.
  + The system will also need to include flexibility to disable or modify the different packages.
* **Real-Time scheduling**: The system will allow students to book, cancel, or reschedule lessons. There will also be tracking capabilities to show which instructor and vehicle are assigned to each lesson to prevent any conflicts.
* **Activity Logging**: The system will provide tracking for scheduling, cancellations, or modifications for accountability purposes.
* **DMV Integration**: The system must be connected to the DMV to allow for real time updates regarding any changes in regulations, driving rules, and practice. This is to ensure that there is constant compliance in the materials provided.
* **Role Based Permissions**: The system will be able to differentiate between different roles such as students or instructors to grant the appropriate access to different features.
* **Data Access**: The system will allow staff to access and download reports like student progress, scheduling history, and ensure seamless auditing.

We are addressing these challenges to ensure that the new system will provide Driver Pass with the tools necessary to improve their operational efficiency, enhance customer experience, and stay compliant with DMV rules/regulations.

### 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?*

*The goals of this system is to have high level outcomes where the objectives and measurable actions that are needed to achieve those goals.*

*Goals:*

* **Improve Operational Efficiency:** To streamline scheduling, lesson management, and tracking features for all types of users.
* **Enhance Student Experience:** To provide students with easy access to course materials, scheduling, and progress tracking.
* **Compliance:** To maintain up to date information from the DMV about their regulations to ensure that the course materials are reflective of the most up to date information (W3C, 2018).
* **Maintaining Data Security:** To ensure a secure cloud based database with the flexibility for offline access.

*Objectives:*

1. **Improve Operational Efficiency:** 
   1. Provide a real-time scheduling tool that allows students to book and modify lessons online
   2. Track any student progress, drivers, and vehicles to ensure appropriately designated resources.
   3. Provide a reporting system to enable easy tracking of user activities like scheduling, cancellations, or modifications.
2. **Enhance Student Experience:** 
   1. Develop an online learning portal so that students have access to course content such as exams or lessons and to track their progress.
   2. Provide role based access to that the appropriate user only has access to features that are pertinent to their role. I.e. Students will have access to learning materials and scheduling features, while staff will have access to see who schedules when, editing materials, etc.
   3. Have some sort of activity log to proactively track student progress and scores.
3. **Compliance:** 
   1. Provide real time updates from the DMV to ensure that all course materials are up to date.
   2. Make sure that the system is able to track compliance with DMV rules and generate any reports as necessary.
4. **Maintaining Data Security:** 
   1. Be able to store data securely in the cloud so that there is ease of access while still protecting the data against any unauthorized users.
   2. Provide offline access to allow users to download materials and work on reports even when they are not connected to the internet.

## 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 platform must operate as a cloud-hosted web-based system that is designed for high traffic usage across different times of day. This is to ensure that there is consistent user access at any point- day or night. There are some important requirements needed to meet the stakeholder and customer needs.

* **Load Time**: For any pages or critical functions (I.e. student login, lesson scheduling, course content access, progress tracking) there is a need to consistently load in under 2 seconds. This would include high volume times such as exam times or influx of registrations.
* **System Uptime**: DriverPass must also achieve at least 99.9% uptime that is supported by load balancing and automated failover systems (Amazon Web Services, 2023). This is to ensure that there is uninterrupted service to learning or admin access.
* **Update Cycle**: The system will need to receive bi weekly updates, bug fixes, and security patches. It will be helpful to have zero downtime strategies that include rolling or blue-green deployment to preserve the requirement of system uptime during these changes (Amazon Web Services, 2023).

#### 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?*

Platform limitations can restrict user access, slow development, and increase costs. DriverPass has a need to be flexible and universally accessible. This has to be true for multiple device types and environments in order to allow for a continuously seamless experience.

* **Supported Platforms**: There needs to be full compatibility across Windows, macOS, iOS, and Android devices. The users must also be able to access the software through all major browsers. This includes Chrome, Safari, Firefox, and Microsoft Edge.
* **Infrastructure Model**: DriverPass will be hosted in a cloud-based SaaS environment to provide horizontal scalability and centralized access management (Microsoft, 2020).
* **Backend Technologies**: This system will need to use a secure and scalable database. It needs to be capable of handling large volumes of scheduling, instructional content, and user tracking with low latency().
* **Third Part Integrations**: With the required APIs it will enable live DMV data syncing, compliance checks, and connections to learning tools. It would also need reporting platforms to streamline any operations while maintaining content accuracy.
* **Policy Syncing:** The system will routinely pull updated rules using API integration, licensing criteria, and regulatory changes directly from relevant DMV sources.
* **Content Validation**: Instructional material, testing prep, and course modules must auto-update or flag outdated content when new regulations are detected.

#### 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 level of accuracy and precision in a system helps to build trust among the users while ensuring consistent operations. If there were any misidentifications of users, incorrect data entry, or failure to notify system errors can all lead to major disruptions. The DriverPass system must be designed to safeguard data integrity while proactively addressing potential issues.

* **User Identification:** Each user will need to be authenticated through unique credentials such as email or student ID. When you pair this with multi-factor authentication without needing major changes to the development.
* **Input Control:** All login credentials and sensitive inputs have to be case sensitive while validating server-sided in order to prevent any access errors or false submissions.
* **System Monitoring:** All user interactions that include login attempts, scheduling changes, and course progress will need to be logged/timestamped for the purpose of security/audits.
* **Administrative Alerts:** There will need to be detection for an system errors, access violations, and brute-force attempts to notify the admins. This enables real-time investigations and resolutions.

#### 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?*

A sustainable system needs to evolve with technology, user needs, and policy updates. A system that is adaptable ensures that the DriverPass remains useful and responsive. This will then provide support for fast role changes, adjustments, or any technical upgrades. This would happen without needing major changes to the development (Microsoft, 2020).

* **User Configuration:** Providing a role based admin dashboard that provides any administrative personnel to add, remove, or modify users/permissions. This can be done quickly and securely.
* **Feature Management**: Admins will have access to enable, disable, or even customize features. This could be driving packages or learning modules. This would be done through configuration panels rather then re releasing the software.
* **Admin Access Tools**: IT staff will have more privileges to manage diagnostics, view system logs, enforce any policy changes or generate reports without compromising platform stability.

#### 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 an essential piece to any project. This is especially true for educational platforms that store sensitive personal and academic data. DriverPass will need to comply with federal and internal standards. It will also need to protect data during transmission, guard against any unauthorized access, and offer recovery protocols.

* **Authentication Requirements**: A log in process that is secure and utilizes 2FA such as SMS verification, authenticator apps, or push notifications. This needs to be in place for all users with unique role based permissions.
* **Encryption Standards**: Sensitive data that includes student records, test scores, scheduling history, and any DMV materials will need to be encrypted using encryption techniques (OWASP, 2023).
* **Threat Detection**: If there is a brute force log in attempt detected the account should immediately lock. Then a security alert should be sent with secure recovery options for the user.
* **Password Recovery**: A workflow must allow for users to complete identity authentication for account recovery.
* **Offline Content Accessibility**: Different content like progress reports or learning materials can be downloaded for secure offline access. This helps to support users who may have limited connectivity while protecting data privacy through encrypted files.

### 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.”*

DriverPass is an educational system that’s purpose is to support students who are preparing for their DMV driving tests. To ensure students receive proper training hands on or on paper, the system must offer differentiated access, flexible scheduling, secure data handling, and engaging learning tools.

* **User Role Management**: The system must support multiple user roles like Administration, IT, Secretary, and Student. Each of these roles will need to have their own unique permissions. For example the IT support will have full access for password resets but students will only have access to course materials and testing.
* **Account Access and Security**: The system will allow users to access data online and download certain materials for offline use. For example, the Administration will be able to access customer data and generate reports with internet connectivity.
* **Appointment scheduling**: The system will allow users to schedule, modify, or cancel any driving lessons online or by phone.
* **Package selection**: They system will allow users to choose specific packages and time slots. For example students can reserve a 2-hour driving lesson tied to their package.
* **Lesson tracking and activity log**: They system will record who created, modified, or cancelled appointments while also generating an activity report. For example, admin can generate reports that show what type of user and who scheduled a lesson for what time.
* **Communication tools**: The system will include a messaging interface for students, instructors, and admin users. For example, students will receive an alert for any upcoming scheduled lessons.
* **Course material**: The system will deliver online educational content that includes DMV policy guidelines. For example, students will have access to test materials with progress indicators showing test status.
* **Assignment submission**: The system will store instructor feedback and driving performance logs for students to view. For example, Driver notes will include comments and time stamps from each lesson.
* **Gamification features**: The system will include visual progress indicators, badges, and milestone to encourage learning competition. For example, students can earn achievement badges for completing a course.
* **Calendar integration**: The system will integrate a calendar that is visible on the student dashboard to manage lesson schedules, deadlines, and live classes. For example, Students can view any upcoming driving appointments.
* **DMV compliance**: The system will receive updates and notifications from DMV sources to keep training material current. For example: When DMV changes testing requirements, instructors and students will get alerts and updated documents.

### 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.)?*

In order to support a diverse user base and ensure there is seamless access to essential services, the DriverPass system must offer a user interface that is **intuitive, accessible, responsive, and role specific.** The interface should be optimized for use across multiple devices and platforms but also accounting for the specific actions and responsibilities of each user group. The primary goal is to enhance usability and efficiency for all stakeholders. This includes students, administrative staff, and IT personnel all while promoting engagement and reducing system errors.

**User Types and Needs**

* **Student Users**: These users require access to interactive learning materials, appointment scheduling tools, real-time progress tracking, and secure communication with instructors and administrative staff.
* **Administrative Users**: These users manage back-end operations such as lesson scheduling, customer support, account updates, and internal reporting. Their interface must support batch processing, data editing, and alert systems.
* **IT and System Administrators**: These users require access to diagnostic tools, user management, security logs, and system analytics. Their interface must prioritize control, auditability, and stability.

**Access Modes**

* **Mobile Devices**: Interfaces must be responsive and touch-friendly, supporting Android and iOS smartphones and tablets for users managing tasks on the go.
* **Web Browsers**: Full-featured functionality must be available on major browsers including Chrome, Safari, Firefox, and Microsoft Edge, ensuring cross-platform compatibility.
* **Interaction Types**: The interface will support both touchscreen and traditional mouse/keyboard inputs to accommodate desktop, laptop, and mobile users.

**Role-Based Interface Features**

* **Students**:
  + Schedule and manage driving lessons.
  + Access DMV-compliant learning modules and practice tests.
  + Track performance through visual indicators (e.g., progress bars, scores).
  + Communicate securely with instructors or staff through an internal messaging system.
* **Administrators**:
  + Add, edit, or remove student records.
  + Assign instructors and vehicles to lessons.
  + View and generate scheduling or progress reports.
  + Send automated reminders or custom messages to users.
* **IT/Admins**:
  + Configure system settings and enforce access policies.
  + Monitor logs and activity audits for security or troubleshooting.
  + Assign user roles and permissions.
  + Integrate DMV updates and system patches.

**Design Principles**

* **Accessibility**: Interfaces will be designed in accordance with standards to ensure usability for users with disabilities.
* **Localization**: Multilingual support will be added to accommodate non-English-speaking users or regional DMV variants.
* **Real-Time Synchronization**: Changes made by any user will reflect in real time across all connected interfaces.
* **Guided Navigation**: help, tooltips, and onboarding tutorials will be included to assist new users and minimize learning curves.

### 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 of this project aims to address the core requirements that have been outlined by DriverPass stakeholders but there are several assumptions made about user behavior and infrastructure that have not been previously stated.

* **User access to devices and internet**: There is the assumption that all users will have access to internet enabled devices. This could be smartphones, tablets, or computers with web accessibility. Any of the offline features are for temporary disconnection rather than long term offline use.
* **Digital literacy**: We are assuming that there is a baseline level of digital literacy across all users. Students are expected to understand basic functions like how to log in, navigating the system, schedule lessons, and take tests. The administrators should have common knowledge of web based tools for managing those appointments, generating reports, and modifying any user data.
* **DMV Integration**: The system will assume that the DMV will provide APIs or data feeds that are accessible, updated, and compatible with DriverPass’s infrastructure. If there were any delays this could affect synching.
* **Security awareness**: Users are expected to follow basic security protocols like safeguarding their log in credentials. Also assumed that admin will have proper access controls that don’t bypass any of the intended features.
* **Technical infrastructure**: It will be assumed that there is consistent and reliable cloud hosting that is able to handle any spikes in system usage. Particularly in times of enrollment periods and any DMV testing deadlines.

### 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?*

Even with trying to aim for a robust yet scalable solution, The DriverPass system design faces certain constraints across technical, operational, and resource related areas.

Technical Limitations:

* **DMV System Integration Challenges**: With a dependency on using external systems such as DMV APIs does pose a risk related to changes in endpoints, data availability, or authentication protocols. If there are frequent changes on the DMV side is could cause delays for DriverPass.
* **Limited offline Functionality**: The system is mostly cloud based which means that user with intermittent or even limited internet access will experience some reduced functionality.
* **Real**-time lag: Some features like live lesson rescheduling or DMV imports can experience some delays due to the communications between the modules.

Resource Constraints:

* **Staffing for customer support**: Response times for user inquirers can be affected during high-demand periods. This could be during mass registration events.

Temporal Constraints:

* **Feature Freeze**: In order to ensure that the system stability during critical DMV testing cycles, no new features will be released or modified. This limits flexibility in responding to real time user feedback.

Budgeting limitations:

* **Marketing outreach limitations**: with a limited budget allocated for outreach, there is limitations to promotions or partnerships.

### 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

AI-generated content may be incorrect.

References:

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W3C. (2018). Web Content Accessibility Guidelines (WCAG) 2.1. https://www.w3.org/TR/WCAG21/