# 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

* The client, DriverPass, requires the development of a secure, role-based web portal that provides both administrative tools and student driver training services. The platform will serve as a single point of entry for all user roles (Owner, Admin, Instructor, Student, Guest), with tailored access that enables each to perform their specific functions effectively.   
  Consolidating activities such as scheduling, testing, course material delivery, regulatory information, and system monitoring, the portal will streamline operations and improve overall training experiences.   
  This system is intended to strengthen DriverPass’s market share by attracting prospective students through improved customer success rates.

### System Background

* DriverPass has noticed a significant trend in the success/fail rate of student drivers due to inadequate preparations. To address this need, DriverPass wants to design a system that offers a combination of in-person and online services. The system should include online courses, practices tests, scheduling in-person lessons, and administrative tools to deliver up-to-date materials to its clients. The current system for scheduling lessons, registering new students, and tracking progress is inefficient. To address the current challenges, a cloud-based system with role-based access will consolidate administrative tasks, instructional materials, and regulatory information into a single platform for streamlined access.
* **Current Issues:**

1. Inefficient scheduling and appointment tracking.
2. No centralized system for registration, package selection, tracking progress, or payment methods.
3. Lack of synchronization with current DMV systems for material/policy updates.
4. Insufficient communication tools between administrators, instructors, and students.

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| **Component** | **Use** |
| Cloud Hosting and Security | Reduce IT requirements, scalable, automated backup and security. |
| Scheduling/Reservation System | Online booking, appointment modification(cancel/confirm/reschedule), assignment to fleet vehicle. |
| Administrative Tools | Role-based account management, password retrieval, customer and personnel tracking/management. |
| Customer Registration and Records | Secure collection of personal data and payment information; pick-up and drop-off location. |
| Course Catalog and Course Management | Support for flexible training packages with ability to enable/disable or augment in the future. |
| DMV Integration | Connect with current systems to maintain an up-to-date regulatory policy and notification system for policy changes. |

The transition from the current system to a streamlined digital platform will improve communication and efficiency between staff, instructors, and students. This system will promote greater scalabilty for DriverPass and support their goal of business growth through higher student success 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?*

* The objective of the DriverPass system is to deliver a secure role-based portal that supports both students and the organizational operations. Success will be measured through defined outcomes that are organized into four tables, each detailing the accessibility of the system components by role.
* Additionally, the project must meet specific infrastructure requirement, namely secure cloud-based hosting and database storage. The system must be hosted in a cloud environment with automated backup and recovery management, and supported by a centralized database to maintain student records, scheduling data, and testing history with role-based access policies in place.
* The following tables define the role-specific access rights that the system must support, specifying what each user type can view and/or manage within the remote platform.

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| **Role: Owner** | | | |
| **Component** | **View** | **Edit/Manage** | **Success Criteria** |
| Business KPI & Financials | Yes | Yes | Owner can view revenue, pass rates, and utilization metrics; data can be exported to CSV/XLSX without errors. |
| Packages & Pricing | Yes | Yes | Owner can enable/disable packages and adjust pricing; changes are immediately visible once submitted. |
| Reports & Audit Logs | Yes | Yes | Owner can generate and export reports; all actions (create modify/cancel) appear in logs with timestamps and entityID. |
| Compliance (DMV) | Yes | None | Owner can confirm DMV updates are current; update dates are visible in the system within 24 hours of release. |
| System Health & Usage | Yes | None | Owner can view usage statistics (active users, bookings) and confirm uptime metrics. |

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| **Role: Administrator** | | | |
| **Component** | **View** | **Edit/Manage** | **Success Criteria** |
| User Accounts & Roles | Yes | Yes | Admin can create, disable, and reset accounts; role permissions are enforced correctly. |
| Scheduling & Reservation | Yes | Yes | Admin can override/edit bookings; changes are logged with timestamps and appear in audit reports with entityID. |
| Packages/Course Management | Yes | Yes | Admin can enable/disable packages; update descriptions; package rules (hours/included components) are enforced automatically. |
| Student Records | Yes | Yes | Admin can update student details securely; payment data remains encrypted and protected. |
| DMV Updates Integration | Yes | Yes | Admin receives notifications of DMV updates within 24 hours; new content is applied to student materials correctly. |
| Reports & Audit View | Yes | Yes | Admin can generate/export reports (CSV/XLSX); activity logs match user actions without discrepancy. |
| Security/Data Policies | Yes | Yes | Admin can set password policies, backup and recovery schedules; settings should apply without disrupting live view. |

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| **Role: Instructor** | | | |
| **Component** | **View** | **Edit/Manage** | **Success Criteria** |
| Personal Schedule | Yes | None | Instructor can see assigned lessons, students, and vehicle; schedule updates appear in real time. |
| Lesson Execution | Yes | Yes | Instructor can mark lessons complete; 2-hour duration is enforced automatically. |
| Lesson Notes & Feedback | Yes | Yes | Instructor can add comments after lessons; students can view notes upon submission. |
| Student Progress | Yes | None | Instructor can view student history (sessions, scores); access excludes payment data. |
| Availability Preferences | Yes | Yes | Instructor can update availability; changes affect scheduling options for Students upon submission. |

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| **Role: Student** | | | |
| **Component** | **View** | **Edit/Manage** | **Success Criteria** |
| Registration & Profile | Yes | Yes | Student can create/update profile and reset passwords securely via email (Add SMS compatibility). |
| Package View, Purchase, and Balance | Yes | None | Student can view package details accurately; hours remaining visible; payments process securely using compliant gateway (SSL/TLS, PCI DSS). |
| Scheduling & Reservation | Yes | Yes | Student can book, cancel, or modify lessons only in 2-hour blocks; remaining hours deduct automatically and accurately. confirmation notification sent within 1 minute of submission. |
| Online Courses & Practice Tests | Yes | None | Student can access course content 24/7; practice test attempts, scores, and status (not taken/in-progress/failed/passed) are tracked and updated accurately. |
| Progress & Lesson History | Yes | None | Student can see previous sessions, instructors notes, and upcoming lessons; records remain accurate. |
| Pickup/Drop-off Locations | Yes | Yes | Student can view and edit location; system validates that pickup and drop-off match. |

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| **Role: Guest** | | | |
| **Component** | **View** | **Edit/Manage** | **Success Criteria** |
| Course Catalog & Packages | Yes | None | Guest can browse available services; no login required. |
| Contact & Registration | Yes | Yes (Limit) | Guest can submit initial registration requests; no access to records. |
| Policies & FAQs | Yes | None | Guest can view DriverPass & DMV policies, summaries, and FAQs; content displays without errors and is up to date. |

## Requirements

### Nonfunctional Requirements

#### 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?*

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| **Requirement** | **Rationale** |
| * Distributed web-based environment compatible with mobile devices and major browsers (Chrome, Firefox, Safari, etc). | * The cloud-based environment should be platform independent so that customers, instructors, and staff can access DriverPass from any device or operating system without additional software. Support for major browsers will ensure reliability, accessibility, and reduce technical barrier for end-users. |
| * Fast responsiveness and operation times; < 2 to 5 seconds with up to 500 simultaneous users. | * The cloud-based environment should respond quickly to operations such as scheduling, creating reservations, and accessing materials. This will prevent bottlenecks under increased user loads. |
| * Maximum system availability (goal 99.5% uptime). | * Maximum uptime will ensure customers, instructors, and staff can access the system content or administrative tasks as required without unexpected downtime. |
| * Biweekly and quarterly system updates, or fixes. | * This will ensure the system is secure and improves user experiences, while keeping the environment aligned with business goals. An update schedule will also reduce downtimes and minimize disruptive redployments. |

#### 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?*

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| **Requirement** | **Rationale** |
| * The platform must support Windows, macOS, Linux, iOS, and Android. | * Broad platform compatibilty will allow users to interact with the system from their preferred operating system. This will greatly reduce barriers to system access via modern browsers; no native application requirement. |
| * DriverPass deployment will be supported by containerization tools (e.g., Docker, Kubernetes) in order to run on a Linux-based cloud environment. | * Utilizing containerization will ensure DriverPass can be consistently deployed on most cloud servers. This will make updates, scaling, and stability easier to manage without tying the system to a specific cloud provider. |
| * DriverPass requires a relational database management system (e.g., PostgreSQL or MySQL) in order to store and maintain operational data. | * The database will ensure reliable access to core operational data, supporting accurate record-keeping, and preventing redundancy or conflicts. |
| * The platform must support the generation and export of administrative data, such as activity logs and audit information, into formats like CSV, PDF, or XLSX. | * Export and reporting capabilities (supported by the relational database) will allow the owner and administrators to review operational data, and perform offline analysis. This will keep the DriverPass system aligned with business goals. |
| * DriverPass should integrate with industry-standard communication services such as email (SMTP/API) and SMS gateways to support notifications, password resets, and account alerts. | * Provider-agnostic support for both email (SMTP or RESTful API) and SMS will ensure users can receive updates in their preferred format. This supports critical functions like scheduling reminders, password recovery, and security notifications, aligning with business goals and improving overall user engagement. |

#### 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?*

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| **Requirement** | **Rationale** |
| * DriverPass must identify users by unique email/password, with each user assigned a distinctive role (Owner, Administrator, Instructor, Student, Guest). | * Unique credentials will ensure proper access levels. Email logins are case-insensitive to reduce user errors, while passwords remain case-sensitive for security purposes. Role-based permissions prevent privilege overlap and promotes accountability. |
| * The platform will preserve case formatting for personal information (e.g., names, addresses) but will treat system login identitifiers (emails/usernames) separately. | * Preserving case sentitivity for user input will help promote professional and accurate records, and reduce problems for users for future re-use. |
| * DriverPass will prevent scheduling conflicts through rigorous verification (on the back-end) to avoid double bookings of instructors and fleet vehicles. | * Enforcing scheduling integrity will promote operational accuracy, avoid customer complaints, and smooth allocation of both instructors and vehicles for testing purposes. |
| * The system must maintain accurate audit logs of create, update, and delete actions for sensitive records (users, login credentials, reservations and packages). | * Enforcing detailed audit logs will allow administrators to verify user actions. This will promote accountability and help resolve issues quickly. |
| * Administrators will be notified of critical issues such as repeated login attempts, account deactivation, reservation conflicts, and system outages. | * Proactive notifications will enable IT staff and owner(s) to respond quickly to security issues, operational problems, and minimize downtime while maintaining the system’s reliability. |

#### 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?*

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| **Requirement** | **Rationale** |
| * Authorized users must be able to add, remove, or modify user accounts and credentials through the DriverPass interface without the need for code changes. | * This will provide flexibility and promote quick onboarding or revocation of users (e.g., new clients or staff changes), aligning with business requirements. |
| * Authorized IT users will have full role and permission management, including the ability to disable or reassign instructors and vehicles. | * This enforcement will promote the principle of least privilege allowing for the tight control and access of system resources and tools. |
| * Training packages, schedules, and reservation rules (e.g., operating hours, included lessons/tests, in-person instruction blocks) must be configurable through the admin interface. | * The interface must allow authorized staff to adapt and edit offered packages to support evolving customer needs and state regulated testing requirements. This will reduce the need for any major system reworks and redeployments. |
| * The system must be standards-compliant with modern browsers to ensure ongoing accessibility and compatibility as updates to Chrome, Firefox, Safari, etc. are pushed. | * This will protect the usability of the system as browsers evolving, reducing the need for frequent retooling of primary system components. |
| * APIs and services must support version control to allow for future enhancements without breaking existing functionality. | * This will support the long-term adaptability of the system as it scales. Ensuring smooth integration of new features while maintaining stability for existing users. |

#### 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?*

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| **Requirement** | **Rationale** |
| * The system must enforce unique email standards per account and login credential complexity standards for passwords. | * Strong authentication minimizes unauthorized access risks to sensitive customer and business data; complexity standards should include unique email per account and password complexity rules (at least one capital letter, one number, and one special character). |
| * Multi-factor authentication must be supported for high access accounts/roles (Owner, Administrator, Instructor). | * MFA provides an additional layer of security to prevent interception of credentials or unauthorized access the sensitive information, such as login credentials or scheduling data. |
| * Client-server traffic must utilize TLS encryption to maintain secure connections. | * Data in transit should be encrypted to prevent interception and/or tampering with sensitive information by man in the middle attacks. |
| * Administrative server access must be restricted to secure SSH methods with key-based authentication. | * Restricting server-level access to secure protocols ensures only authorized IT personnel can edit the infrastructure. This will help protect the system from intrusion or credential theft. |
| * Accounts should be temporarily blocked after a determined amount of failed login attempts are executed. Administrators should be alerted promptly of suspicious activity. | * Lockouts and alerts can protect against brute-force “hacking” attempts. This will allow IT staff to respond quickly to suspicious or fraudulent activity, protecting system and user account integrity. |
| * Passwords must be stored using one-way hashing and salts (unique string), and password reset must be time-limited using single-use tokens delivered via preferred notification methods (SMS or email). | * Fortified storage of sensitive credentials will prevent leaks, while reset protocols ensure users can recover accounts safely should they forget their login credentials. |
| * The system should automate logging of processes in an immutable way for authentication events, permission/role changes, and data modifications. | * Accurate and secure logging ensures accountability and provides a detailed trail for analysis of security incidents. This can be especially important for meeting secure data storage regulations. |

### 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.”*

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| **Requirement** | **Rationale** |
| * The system shall allow customers to register, purchase training packages, and schedule lessons or driving tests online. | * Enables the primary DriverPass service model to conveniently offer accessible booking for customers without requiring in-person appointments. |
| * The system shall provide customers with access to course content, including study materials, instructional videos, and driving guides. | * Ensures customers can independently prepare for in-person driving lessons, reinforcing core concepts and increasing flexibility in user experience. |
| * The system shall allow customers to take online practice tests that simulate state regulated driving exams. | * Provide preparational materials and simulated testing environments to help students gauge readiness for exams. This will boost confidence before attempting credentialed exams. |
| * The system shall display student progress (completed lessons, practice test results, and hours accumulated) on their dashboards. | * This will improve transparency, support self-paced courses, and allow instructors/administrators to monitor completion progress. |
| * The system shall provide administrators and instructors with tools to view and manage schedules, assigned fleet vehicles, and student reservation requests. | * This ensures instructors can manage their workload and availability efficiently, minimizing scheduling errors and burnout. |
| * The system shall allow administrators to add, edit, or disable user accounts as necessary without code changes. | * This will support secure and flexible management of user access or personnel changes quickly. |
| * The system shall allow IT officers and the Owner to configure training packages and pricing (e.g., available packages, available hours, test types, and availability). | * Provides adaptability as business requirements and customer needs evolve over time. Also, aligns with DMV mandated regulatory changes for course materials and instruction hours. |
| * The system shall prevent scheduling conflicts, ensuring instructors, vehicles, and time slots are not over-booked. | * Protects the integrity of reservations, maintains fair operating practices, and avoids operations disruptions. |
| * The system shall generate notifications for customers, instructors, and pertinent staff of scheduled lessons, cancellations, or schedule changes through SMS or email. | * This will keep all relevant parties informed of upcoming events, minimizing no-shows and filling communication gaps. |
| * The system shall integrate with a secure third-party payment service to allow customers to purchase training packages online. | * Using an established merchant, reliable processing of financial transactions will be upheld by DriverPass. This feature should also provide timely transfers to the primary business account in order to avoid gaps in financial reporting. |
| * The system shall allow administrators to generate detailed reports of key business metrics, activity logs, and financial summaries as necessary. | * Accurate reporting supports operational logistics and oversight used for business analysis, strategic planning, and increased customer retention. Reports should be generated in compatible formats, such as CSV, XLSX, and PDF. |
| * The system shall maintain and automate logging operations of user actions, configurations edits, and reservations changes. | * This provides accountability and supports auditing and reporting functions for dispute resolution or business metric analysis. |
| * The system shall provide users with secure password recovery protocols using time-limited tokens delivered via email or SMS. | * Ensures account recovery is safe and timely with user-friendly communication in order to reduce IT support intervention. |

### 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.)?*

**Interface Needs**

The DriverPass user interface should be designed to provide a clear, secure, and responsive experience for all user types. This will ensure features are acccessible and interactions with core system functions are efficient.

* **Consistency:** Navigation should be simple, labels should be clearly visible, and layouts should be consistent across page views (i.e., navigation bar at the top, topics clearly listed by type, etc.).
* **Role-based View:** Each role should have access to their respective content without any access or view of irrelevant information (i.e., customers should not see administrative modules).
* **Accessibility:** The interface should support modern accessibility technology, such as screen readers, colorblind compatibility modes, keyboard navigation, focus states, and descriptive alternative texts.
* **Search Options:** Quick search component should be visible from all views with role-specific filters to ensure authorized access to content (Owner, Admin, Student, Instructor).
* **Notifications:** Account notifications should be visible though the dashboard.
* **Scheduling View:** The calendar should be visible, and display upcoming in-person lessons, key events/deadlines, clear labeling, and color coded by category.
* **Log View (Owner/Admin ONLY):** Activity logs should be accessible for authorized staff in plain language, including date, timestamp, and user who initiated the logged activity.

**Users**

All user types should have a customized dashboard view in order to streamline their access to specific tools and/or responsibilities. The interface provides all core DriverPass services including lesson scheduling, package management, online test resources, and administrative tools in a unified platform.

**Owner**

* + High-level view of business and platform metrics (sales activity, platform utilization, pass/fail rates).
  + Package configuration and pricing view. This should include enable/disable options, availability, and operating hours.
  + Ability to export detailed reports in a preferred format (CSV, PDF, XLSX).

**Administrator**

* User and role management view (add, delete, modify, disable).
* Audit activity logs and security events (failed logins, role changes, unauthorized access).
* Adjust system settings, such as operating hours, availabilities, and reservation slot length.

**General/Office Staff**

* Create and modify student reservations, assigned instructors, and fleet vehicle assignments.
  + Handle general scheduling, reservations, appointments, no-shows, and modify waitlists.
  + Student directory look up and ability to print/export schedules.

**Instructors**

* Access to all necessary teaching resources and forms.
* Moderate control of personal schedule (availability), assigned students, and fleet vehicle requests.
* View of assigned students course progress, lesson completion, and ability leave notes regarding specific lessons or in-person sessions.

**Students**

* Register/login access and account preferences, including personal details and notification preferences (SMS/email).
* View/purchase available packages using third-party payment system.
* Access to study materials, course progression view, and practice tests available through purchased packages. This view should also display used and remaining purchased hours available.
* View all current company policies and DMV regulations or FAQs.
* Ability to submit in-person lesson requests, and view current status of submitted requests.
* Calendar view for upcoming deadlines scheduled in-person lessons.

**Interactions**

* The DriverPass platform will be primarily accessible through modern web browsers (Chrome, Firefox, Safari, etc.), on Windows, macOS, Linux, iOS, and Android devices. All functionality is available through these browsers without the need for a native application.
* The platform design should be responsive and mobile-friendly. Buttons and components should be touch compatible.
* Users will be authenticated using login credentials at the point of entry, with additional security and optional multi-factor authentication for administrative users using TLS (HTTPS) standards.
* Users will additionally interact with the system through notifications, which should include links that open to the relevant pages.
* The system should maintain session persistence and consistent performance across browsers ensuring users can switch devices without data loss.

### 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?*

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| **Assumption** | **Rationale** |
| * The DriverPass facility and remote users have reliable internet connectivity. | * DriverPass is a cloud-based platform requiring a consistent internet connection to access essential lessons, resources, scheduling, and administrative tools. |
| * Users have access to compatible devices (desktop, laptop, smartphone or tablet). | * The system is designed for browser-based access. Users must have compatible and capable devices that can run up-to-date browsers to fully utilize platform features. |
| * DriverPass personnel are committed to actively engaging with platform features, and reporting/record-keeping. | * Successful implementation of the digital platform relies on staff engagement to fully utilize scheduling, record maintenance, and coordination between students, instructors, and administrators. |
| * DriverPass personnel receive adequate training on platform features and role-based tools. | * Proper onboarding and training are required to ensure staff can operate platform tools effectively and securely. |
| * Third-party integrations, such as payment processing, notifications, and DMV-regulated documentation remain functional and up-to-date. | * The system relies on external services to handle transactions, notifications, and regulated content. Continued integrations ensure resources remain accurate, compliant, and operational (formatted). |

### 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?*

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| **Limitation** | **Rationale** |
| * Customization Boundaries (Technology Constraint) | * DriverPass is designed with configurable options for training packages, schedules, and user permissions. Deeper software or interface customization will be restricted to maintain consistency and stability. |
| * Third-party Dependency (Technology and Resource Constraint) | * DriverPass depends on external services for core features like payment processing, notification delivery, and DMV-regulated resources. The platform’s performance and availability are partially dependent upon these providers’ reliability and update cycle. |
| * Data Migration (Time and Resource Constraint) | * Incorporating existing data or physical copy records into the DriverPass platform may require additional time or manual review. Differences in legacy data format could introduce complexity during initial deployment. |
| * Concurrent User Capacity (Technology and Budget Constraint) | * System optimization will be tuned for moderate operational loads. Handling above average numbers of simultaneous users may require additional infrastructure scaling. This increased scaling, provided by the cloud host, may incur additional fees. |
| * Budget and Resource Allocation (Budget and Time Constraint) | * DriverPass development and maintenance will be limited by available business funding, staffing, and time constraints. Future enhancements, integrations, or performance modifications may depends on resource availability beyond the initial deployment phase. |

### 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.*

