# Hawkins Business Requirements Document

Complete this template by replacing the bracketed text with the relevant information.

This template lays out all the different sections that you need to complete for Project One. Each section has guiding questions to prompt your thinking. These questions are meant to guide your initial responses to each area. You are encouraged to go beyond these questions using what you have learned in your readings. You will need to continually reference the interview transcript as you work to make sure that you are addressing your client’s needs. There is no required length for the final document. Instead, the goal is to complete each section based on your client’s needs.

**Tip:** You should respond in a bulleted list for each section. This will make your thoughts easier to reference when you move into the design phase for Project Two. One starter bullet has been provided for you in each section, but you will need to add more.

## System Components and Design

### Purpose

*What is the purpose of this project? Who is the client and what do they want their system to be able to do?*

* Client and Problem: The client is DriverPass, and the purpose is to solve the high driving test failure rate (over 65%) by providing comprehensive, integrated online and practical training.
* Core System Purpose: To design and develop a web-based system that automates and manages all core business operations.
* Key Functionality:
  + Provide customers access to online classes, course content, and practice tests.
  + Manage scheduling for two-hour driving lessons, allowing customers and the Secretary to make, modify, and cancel reservations.
  + Track and match a customer to a specific driver, car, and time for each lesson.
  + Allow staff to access data and download reports from any device.
  + Ensure accountability via activity tracking that logs all changes to reservations.
  + Support compliance by connecting with the DMV to receive updates on rules and sample questions.
  + Allow the owner to disable or enable pre-defined training packages.

### 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?*

* Problem to Fix: The system must reduce the high driving test failure rate (over 65%) caused by students only studying previous exams, by providing integrated online and practical training.
* Core System Goals (What it must do):
  + Provide online education (classes and practice tests) and track customer progress.
  + Manage reservations (schedule, modify, cancel) for two-hour driving lessons by both customers and the Secretary.
  + Ensure accurate resource allocation by matching customers with a specific driver and car.
  + Allow staff to access and download business data remotely.
  + Implement an activity log for accountability and tracking changes.
  + Ensure external compliance by connecting with the DMV for rule updates.
  + Provide administrative control to disable or enable training packages.
* Key System Components Needed:
  + Customer Portal (for student interaction and booking).
  + Scheduling and Resource Module (to coordinate lessons, drivers, and cars).
  + Data and Reporting Module (for storage, reports, and activity logs).
  + Security and User Management Module (to handle roles and access rights).
  + DMV Integration Module (for external compliance updates).
  + Administrative Interface (for owner and IT staff control).

### 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?*

* Core Objective: The system shall function as a centralized platform to support DriverPass's operational model, simplifying operations, improving the customer experience, and ensuring compliance.
* Scheduling and Resource Allocation:
  + Allow Customers (online) and the Secretary (internal) to schedule, modify, and cancel two-hour driving lessons.
  + Correctly match a customer to a specific driver and car (from the 10 available resources) for each lesson.
* Authentication and Accountability:
  + Implement Role-Based Access Control (RBAC) to manage access for all user types.
  + Generate a printable Activity Report that logs the user, date, and type of action for every reservation change.
  + Allow staff to access and download data and reports (e.g., in Excel format) from any computer or mobile device.
* Compliance and Administration:
  + Establish a connection with the DMV to receive notifications regarding updates to rules or sample questions.
  + Provide an interface for the Owner to disable or enable any of the three current training packages.
* Training and Progress Tracking:
  + Deliver online classes and practice tests.
  + Accurately display a customer's online test progress (including score and status).
  + Store and display Driver Notes for each lesson, including start hour, end hour, and driver comments.

## 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?*

* Operating Environment: The system must run as a web-based application hosted over the cloud.
* Accessibility: It must be accessible online from any computer or mobile device for both customers and staff.
* Speed and Concurrency: The system must maintain high availability and be highly responsive, supporting concurrent users (e.g., for testing and scheduling) without performance degradation.
* Data Integrity Constraint: Data modification and updates must be executed only when a user is online to prevent data redundancy and maintain consistency.
* Update Frequency (External): The system must receive and process compliance updates from the DMV integration immediately upon release, with a timely notification to staff to ensure content remains current.

#### 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?*

* Operating Environment: The system must run as a web-based application hosted over the cloud.
* Backend OS Preference: Linux is the preferred operating system for the backend due to its stability, security, and cost-effectiveness.
* Cloud Platform Preference: Azure is the preferred cloud platform for deployment, hosting, and managing services.
* User Access: The system must function universally across standard web browsers on various computers and mobile devices.
* Required Backend Tools:
  + Database Management System (DBMS): A high-performance, scalable database (e.g., Azure SQL Database or PostgreSQL) to store all relational data (reservations, financials, scores).
  + Authentication and Authorization Service: A robust service (e.g., Azure AD) is mandatory to enforce Role-Based Access Control (RBAC) across the four user types and handle password resets.
  + Reporting Tools: Specialized tools are required to generate the activity and driver notes reports, with the capability to export data in Excel-compatible formats.
* Integration: DMV integration will be handled through a dedicated API call.

#### 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?*

* User Distinction (Accuracy):
  + Achieved via Role-Based Access Control (RBAC), which precisely defines privileges for four user types:
  + Activity tracking will precisely log the user responsible for the last change to any record, ensuring accountability.
* Input Case Sensitivity (Precision):
  + High-security inputs like passwords must be case-sensitive.
  + Lower priority data (e.g., names, addresses) should be treated as case-insensitive for searching/lookups to improve usability, but input data should be maintained consistently.
* Admin Problem Notification (Alerting): The system shall inform relevant administrators immediately in the following scenarios:
  + Compliance: Alerts sent to relevant staff upon receiving DMV updates (new rules/questions).
  + Security: Notification sent to the IT Officer for security issues (e.g., repeated failed logins, suspected data integrity problems).
  + Operational: Immediate alert sent to the Secretary/Owner if a reservation conflict (e.g., double-booked car or driver) is detected.

#### **Adaptabil**ity

*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?*

* User and Role Adaptability:
  + Changes to user accounts (add, remove, modify roles/permissions) must be possible without changing core code.
  + This is achieved by implementing a Role-Based Access Control (RBAC) system managed via the Administrative Interface.
  + The system must support business adaptability by allowing the owner to disable or enable training packages using a configuration tool.
* Platform Adaptability:
  + Adaptability is inherent in the cloud-based, web application design (e.g., Azure/Linux).
  + The cloud platform provides built-in flexibility for scaling and managing necessary OS and browser updates without service interruption.
* IT Admin Access (Adaptability/Control):
  + The IT Officer requires the highest level of administrative access (full control).
  + This access includes the crucial ability to reset any user's password and block access for any account (e.g., terminated 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?*

* User Login Requirements:
  + Requires a valid username and a case-sensitive password.
  + Must enforce strong password policies.
  + Login is followed by Role-Based Access Control (RBAC) authorization for staff.
* Securing Data Exchange:
  + All communication between the client and the cloud server must be secured using SSL/TLS encryption.
  + This ensures all sensitive data (credentials, credit card details, test scores) is protected in transit.
  + The cloud provider handles basic network security and foundational encryption protocols.
* Brute Force Countermeasures:
  + The system must temporarily lock the account after a defined number of consecutive failed login attempts.
  + The system should ideally throttle or block the originating IP address to halt automated attacks.
  + The IT Officer must be immediately notified of any suspected brute force activity or unauthorized access attempts.
* Password Recovery:
  + The system must offer a secure, automated self-service recovery process (e.g., via a time-sensitive reset link sent to email/mobile, leveraging multi-factor authentication).
  + The IT Officer retains the administrative right to perform a manual password reset for any account, especially for staff or in case of automated process failure.

## **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 shall allow new customers to register by capturing their first name, last name, address, phone number, and state.
* The system shall allow a customer to schedule, cancel, or modigy a two-hour driving lesson online using their account.
* The system shall allow the Secretary to schedule, cancel, and modify driving lessons for customers who call or visit the office.
* The system shall identify and assign a specific driver and car to each confirmed driving lesson reservation.
* The system shall track and display the customer's online test progress, including test name, time taken, score, and status.
* The system shall record and associate Driver Comments with the corresponding student .
* The system shall implement activity tracking to record the user who last made a reservation, cancellation, or modification with the specific record.
* The system shall be able to generate and allow for the printing of an activity report based on the tracking logs.
* The system shall connect to the DMV to receive notifications and updates regarding new rules, policies, or sample test questions.
* The system shall provide an input form for customers/Secretary to enter detailed student and pickup/drop-off location information.
* The system shall provide a password reset function that allows customers to automatically reset a forgotten password.

### 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 and Interaction:
  + The UI must prioritize maximum accessibility and clarity.
  + It must be a web-based application that is fully responsive across standard web browsers on both computers and mobile devices.
  + The design requires distinct interfaces to accommodate both public-facing customer self-service and internal administrative functions.
  + Key components include a clear display for online test progress (name, time taken, score, status), a structured table for Driver Notes (lesson times and comments), a detailed input form for student information, and a Contact Page.
* User-Specific Functions:
  + Customer (Portal): Register, log in, manage personal information, schedule, modify, and cancel their lessons, and access online classes and practice tests.
  + Secretary (Admin Interface): Manage customer accounts, and manually schedule, modify, and cancel appointments for call-in/in-person customers.
  + Owner (Admin Interface): View all business data, generate reports, and access configuration controls to disable or enable training packages.
  + IT Officer (Admin/Security Interface): Maintain system security, including the ability to reset passwords and block access for any account, utilizing the highest level of administrative control.

### 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?*

* Business and Operational Assumptions:
  + Resource Structure: It's assumed that all 10 cars are permanently assigned one-to-one with a dedicated driver, which simplifies the resource allocation logic.
  + Location Consistency: It's assumed that the customer's drop-off location will always be the same as their pickup location.
  + Scope Limitation: The full ability to customize packages (e.g., changing lesson components) is treated as a future feature, and the current system only requires the simple ability to disable or enable existing packages.
  + Data Integration: We assume the DMV provides compliance updates (rules, questions) in a structured, machine-readable format suitable for automatic system processing.
  + Scheduling Accuracy: It's assumed the Secretary's administrative interface will always reflect real-time resource availability accurately.
* User and Technology Assumptions:
  + Digital Literacy: We assume customers possess adequate digital literacy to use the web-based interface for self-service tasks like registration, testing, and reservation management.
  + Connectivity: It's assumed that both staff and customers have access to reliable internet connections and modern web browsers, which is essential for complying with the constraint that data modification must occur only when the user is online.
  + Payment Handling: We assume a secure third-party payment gateway will be integrated to handle credit card processing, as this sensitive task is outside the core application's immediate development scope.
  + Staff Competency: We assume employees possess or can be trained to acquire the necessary technical knowledge to effectively utilize the administrative tools provided for system management and security monitoring.

### 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?*

* System Design Limitations (Functionality and Adaptability):
  + Data Access Constraint: Users cannot modify or update data unless they are online, restricting operational flexibility for staff with poor connectivity.
  + Limited Customization: The owner is restricted to only enabling or disabling existing training packages; structural changes (like modifying hours or components) require costly developer intervention.
  + Scope Exclusion: The design strictly excludes any future features or desired enhancements, limiting the initial system's capability.
  + DMV Integration: The system only receives notifications from the DMV; it does not automatically update course material, requiring mandatory manual staff action.
* Project Resource and Constraint Limitations:
  + Time Constraint: The tight, condensed development schedule (January to May) means any delay, especially in the customer approval phase, will critically push back the entire implementation timeline.
  + Resource Dependency: The project has a high dependency on a limited number of personnel performing simultaneous, critical tasks, creating potential bottlenecks.
  + Technology Reliance: The system is constrained by its reliance on the customer's browser and internet connection, which are factors outside the client's control.
  + Budget Implication: The reliance on the Azure cloud and the intensive staffing requirements imply a substantial project cost, limiting the feasibility of scope changes.

### 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.*

