Southern New Hampshire University

CS 255 Business Requirements Document

System Components and Design

Purpose

- The client is DriverPass, and they are a new company trying to provide comprehensive driver training services for students preparing for DMV driving test.
- The purpose of this current project is to design and specify a system that can manage DiverPass's operations, such as learning (online learning specifically), practice test, and scheduling in person driving lessons for the student.
- The system should allow all users at DriverPass to manage customer information, select different training packages, change scheduling, and track the user's activity.
- The main proposed goal is for DriverPass to provide students with all the tools necessary to better prepare for their DMV driving exams, which are commonly failed.
- The system should allow administrators to access data both online and offline, for example, the ability to download certain information for offline work from the database.

System Background

- DriverPass is attempting to solve a societal problem; there are high rates of failure for individuals taking their driving exams at the DMV.
- DriverPass is trying to fill this gap in current education by providing improved driver training to students by using online learning, practice exams, and on-the-road lessons alongside a trained instructor.

- DriverPass wants us to create a system that will manage all the aspects of this training service, making it accessible and efficient for company administration, employees, and their customers.
- According to the CEO's requests, the system will need components for:
    - User management with different roles for different people (Permission system).
    - Customer registration and profile editing.
    - Training package management (Enabling and disabling packages)
    - An online learning platform with courses and practice tests.
    - A scheduling system for booking, managing, and tracking in person driving lessons, including matching a driver with a student for car rides.
    - Reporting capabilities (Student progress or activity for instance).
    - Secure data management, specifically payment/personal information (Secure cloud integration)
    - Integration of a notification system for DMV updates to alter the courses as the DMV requirements change.
- DriverPass explicitly wants a web-based application histed in the cloud to minimize their internal IT needs for maintenance, backup, and security. (Need to choose a cloud hosting service that can meet these needs)

Objectives and Goals

- The system must provide a secure meaning of role-based login (IT officers, boss, driving instructor, secretaries, students).
- The system must allow the IT Officer to manage all the user's accounts, including activities such as password resets or access revoking.
- The system must allow customers to manage their account including automated password reset.
- The system must manage different training packages (Such as packages 1,2, and 3, potentially more in the future), and allow administrators to activate and deactivate at will.
- The system must provide an online learning environment (only package 3 can access) containing all the course materials and practice tests
- The system has to track and display the student's progress on online practice tests, showing all associated data (score, progress, status, time taken, name, etc.).
- The system must track driver's notes and comments for each driving lesson, and notes should be available to both students and staff.
- The system logs a user's actions of significance (reservation, changes, cancellation, etc.)
- The system must allow administrators (Liam specifically) to generate and view activity reports, as well as download said reports for offline working.
- The system must include a means by which the staff will be notified of an update in processes from the DMV.
- The system must be hosted in the cloud; security and backups are reliable and automated.
- The system has to have an interface equipped to handle all user needs for registration and display pages for test progress and driver notes as per the client's sketch.

Requirements

Nonfunctional Requirements

Performance Requirements

- The system must be accessible from any computer or mobile device with an internet connection through web browsing.
- The system should allow authorized users to access data online from any location, as well as the ability to download materials and reports for offline analysis.
- The system must be reliable and should ensure that technical problems are kept to a minimum, both for a smooth user experience and to lessen the technical needs.

Platform Constraints

- The system must, as the client has specifically requested, be a web-based application hosted on a third-party cloud platform. Choices like GCP, AWS, Azure, etc.
- The chosen provider for cloud applications must be responsible for managing the system backups and the underlying platform security for all backend processes or transactions.
- The system must be able to generate and export reports in a format that can be opened in standard Office Suite software, such as Google Sheets, Microsoft Excel, LibreOffice, etc.

Accuracy and Precision

- The system must use input validation to ensure that the data integrity remains intact. The data entered must be properly sanitized for type and formatting constraints.
- All user actions related to reservations, for instance, creation, cancellation, modification, must be accurately logged with a timestamp and the identity of the user who altered them in order for a system administrator to access this information later.
- The system shall uphold the requested business rule that driving lesson drop-off and pick-up locations must be the same.

Adaptability

- The system must allow for administrative action enabling specific training packages, disabling packages, and updating these in customer registration without changing
- The IT Officer must have the highest level of permission in order to have the ability to add, modify, and block user accounts and access rights as changes in staff happen.
- The system must be capable of both receiving and integrating updates in the DMV's rules, policies and sample questions from the official course in order to have DriverPass' course content remain as relevant and up to date as possible.

Security

- The system must enable some level-based control via assigning specific permission roles. Different permissions must be given to distinct user types like Owner, IT Officer, Secretary, and Student.
- The system has to securely handle sensitive information and store it for a short period of time (the larger storage should be managed and maintained via cloud infrastructure). However, the system must still be able to handle personal details securely during transactions, credit card data for instance.
- A feature must be included that allows customers to automatically reset their passwords if they happen to forget them.
- The IT Officer rule requires full administrative access over all user accounts to manage them properly and securely.
- The system shall limit the number of user sign-in attempts within a short period of time. Cloud service limitations will allow for query filtering and Captcha challenges if spammed.

Functional Requirements

- The system shall validate user credentials upon login.
- The system shall allow customers to create and manage only their own accounts.
- The system shall provide an automated password reset system for customers using their stored contact information.

- The system shall allow customers and secretaries to schedule, modify, and cancel two-hour on-road driving lessons from the online platform.
- The system shall track and associate one specific driver with a distinct car and specific person with each lesson once scheduled.
- The system shall provide customers who purchase the third tier “Package Three” with access to an online learning module with course materials and practice tests.
- The system shall display a student’s online test progress to both the student and system administrators including test name, time taken, score, and statuses such as pass/fail or in progress.
- The system shall log all user actions related to reservations and associate the user with their credentials and actions for each modification or update.
- The system shall generate printable activity reports based on the user action logs.
- The system shall receive notifications of the DMV rules, policy updates, and test changes. These should be made available to system administrators immediately.

User Interface

- The system will have several types of users: the Owner (Liam), the IT Officer (Ian), a Secretary, Students (customers), and Drivers.
- The interface must be a web-based application accessible from both desktop and mobile devices easily. The interface should be made easy to navigate on mobile devices.
- Students will use the interface to schedule lessons, take practice tests, review course materials, view progress on tests, and see notes from driving teachers.

- The Secretary will largely use the interface to schedule appointments for customers.
- The IT Officer will need top level administrative access to the interface in order to manage all user accounts and access rights, including staff and students.
- The Owner will need access to the system to view and download reports for offline work.

Assumptions

- It is an essential assumption that all the system users will have consistent access to the internet in order to use the system, as it is web-based.
- The system's design assumes that the DMV will provide a public, standardized, and accessible method (something like an API or automated service) to notify of test changes and send compliance updates.
- It is assumed in the system that customer credit card transactions will be processed through a secure, third-party payment system to ensure the system complies with security standards. This was not specifically detailed in the interview, but a cloud hosting service will not offload this responsibility, they will only store the associated data securely.
- The system is being designed with the assumption that the initial number of 10 cars and drivers is a starting point and that the system must be scalable and practice scalable programming practices in order to handle the potential future growth of the DriverPass business.

Limitations

- The initial version of the system will not allow a non-developer to add or remove training modules. This functionality must be given to Class Users through a GUI interface, which requires far more developer intervention and time.
- The system requires an active internet connection for all data modifications, despite the need for offline work capabilities, it is impossible to interact with the web application without internet.
- The project is largely constrained by the fact that the development timeline established during the schedule planning meeting will take time to execute fully and establish a minimum viable product to work with.
- The system's performance and uptime are completely dependent on the third-party cloud service provider. There are also limitations associated with service level agreements, and rate limits are a possibility if traffic is too high.

Gantt Chart