# **CS 255 Business Requirements Document**

## **System Components and Design**

### **Purpose**

* The primary purpose of this project is to develop a robust, scalable system for DriverPass, a newly established enterprise founded by Liam, with the strategic objective of revolutionizing driver training and significantly improving the pass rates for students undertaking their driving tests at the Department of Motor Vehicles (DMV). DriverPass has identified a critical market gap, noting that over 65% of applicants fail due to inadequate preparation. The client seeks a comprehensive digital platform that integrates online practice exams, interactive learning modules, and optional on-the-road training sessions to address this need. This system aims to enhance customer service efficiency, streamline administrative operations, and provide seamless account management for a diverse user base, including students, certified instructors, IT personnel, and management.
* The client envisions a user-centric, secure, and adaptable system that can evolve with the company’s growth. This includes ensuring accessibility across multiple devices, robust data protection, and the ability to incorporate future enhancements such as advanced analytics or additional training modules, aligning with DriverPass’s long-term business goals.

### **System Background**

* DriverPass intends to address the prevalent issue of high driving test failure rates by implementing a sophisticated system that offers online educational resources, including practice exams tailored to DMV standards, and optional in-person training with certified instructors. This initiative seeks to bridge the gap between traditional study methods and comprehensive preparation, thereby increasing student success rates and customer satisfaction.
* The proposed system will be a web-based application supported by a robust backend infrastructure, including a relational database to manage user profiles, course materials, training schedules, and financial transactions. Key components will include a secure authentication layer, a content management system for course updates, a scheduling module for on-the-road training, and integration with an external payment processor to handle course fees, ensuring a holistic solution that meets operational and financial needs.
* The system will require collaboration among multiple stakeholders, necessitating a user interface designed for students, instructors, and administrators, alongside a secure network connection to support real-time data synchronization and transaction processing.

### **Objectives and Goals**

* The system must enable students to access a suite of online practice exams, with the objective of completing a minimum of 10 tests per user, each providing immediate, detailed feedback to track progress and identify areas for improvement, measurable through a progress dashboard updated in real-time.
* It should facilitate the scheduling of on-the-road training sessions, allowing students to book with available instructors, with a target of accommodating at least 50 sessions per month, supported by a calendar interface that ensures efficient resource allocation and minimizes scheduling conflicts.
* The platform must provide advanced administrative functionalities, enabling IT personnel to monitor user activity and system performance through comprehensive reports, and allowing management to upload and update course content, with goals to process user data changes within 24 hours and reflect content updates within 48 hours to maintain relevance and accuracy.
* Performance and security objectives include ensuring all user interactions are processed within a 5-second response time and implementing multi-layered security protocols to safeguard sensitive user data, aligning with industry standards for financial and educational systems.

## **Requirements**

### **Nonfunctional Requirements**

#### **Performance Requirements**

* The system shall be deployed as a web-based application, compatible with major browsers such as Google Chrome, Mozilla Firefox, and Safari, with a performance target of loading all pages and processing user actions within 5 seconds to ensure an optimal user experience and minimize wait times.
* System updates, including the addition of new course materials, security patches, or feature enhancements, shall be scheduled monthly with automated deployment processes overseen by IT staff, ensuring stability and allowing for manual intervention if issues arise during updates.

#### **Platform Constraints**

* The application must support cross-platform compatibility across Windows, macOS, and Linux operating systems, leveraging a framework such as React to ensure consistent performance, catering to a broad user demographic including students and instructors.
* The backend infrastructure shall utilize a relational database management system, such as MySQL or PostgreSQL, to efficiently store and retrieve user data, course content, and training schedules, with provisions for scalability to handle increasing user volumes.

#### **Accuracy and Precision**

* User identification shall be achieved through unique login credentials, including case-sensitive email addresses and passwords, ensuring precise authentication and preventing duplicate accounts.
* The system shall automatically notify administrators via email alerts within 5 minutes of detecting suspicious activities, such as five consecutive failed login attempts, to enable rapid response to potential security threats.
* Practice test results shall be calibrated to align with DMV standards, maintaining an accuracy margin of ±1%, with periodic validation conducted quarterly by IT and management to uphold educational integrity.

#### **Adaptability**

* The system shall support dynamic user role management, allowing IT administrators to add, remove, or modify roles (e.g., student, instructor, admin) via a configuration interface without requiring code modifications, enhancing operational flexibility.
* It must automatically adapt to platform updates, such as browser or operating system patches, with a manual override option for IT to apply custom updates, ensuring long-term compatibility and resilience.
* Administrative access shall include full privileges to edit course content, user profiles, and system settings, with role-based access controls to prevent unauthorized changes, supporting future expansions like multilingual support.

#### **Security**

* User authentication shall require a unique email and password combination, encrypted using industry-standard algorithms like bcrypt, with an optional two-factor authentication (2FA) feature using SMS or email codes to enhance security.
* All data exchanges between the client and server shall be secured with HTTPS and SSL/TLS encryption, protecting sensitive information such as payment details and personal data from interception or tampering.
* In the event of a brute-force attack, the system shall lock the account after five failed login attempts for a 15-minute period, and provide a secure password reset link via email to the registered address, ensuring account recovery without compromising security.

### **Functional Requirements**

* The system shall validate user credentials during login by cross-checking email and password against the database, ensuring secure access and logging successful attempts for audit purposes.
* The system shall deliver online practice exams with real-time feedback and a progress tracking feature, allowing students to review scores and revisit weak areas after each test.
* The system shall provide a scheduling module for students to book on-the-road training sessions with available instructors, including conflict checks and confirmation emails.
* The system shall enable instructors to update training session statuses (e.g., completed, canceled) and submit detailed feedback to students, accessible via their dashboards.
* The system shall allow management to upload new course materials and practice test questions, with a version control system to track changes and ensure content accuracy.
* The system shall generate detailed reports for IT to monitor user activity, system performance metrics, and security logs, downloadable in PDF format for review.
* The system shall send automated confirmation emails to students upon successful registration, course enrollment, and training session bookings, enhancing user engagement.

### **User Interface**

* The student interface shall feature an intuitive dashboard displaying practice exam access, progress metrics, and a training scheduler, optimized for web browsers on desktops, tablets, and mobile devices with responsive design to ensure accessibility.
* The instructor interface shall provide a dedicated portal for managing training schedules, updating session statuses, and submitting feedback, tailored for tablet and desktop use with a focus on usability during on-the-road sessions.
* The administrative dashboard shall offer management and IT a secure, browser-based platform to oversee user accounts, update course content, and analyze reports, with role-specific views to streamline tasks and enhance decision-making.
* Interaction with the interface shall primarily occur through a web browser, supported by a responsive layout that adapts to various screen sizes, ensuring a consistent experience across devices.

### **Assumptions**

* It is assumed that all users possess reliable internet access and own compatible devices (e.g., smartphones, laptops, or tablets) to interact with the web-based system effectively.
* The system assumes the availability of an existing payment gateway (e.g., Stripe or PayPal) for processing course fees, to be integrated by DriverPass’s financial team.
* It is assumed that a sufficient number of certified instructors will be available to conduct on-the-road training, with schedules coordinated to avoid significant conflicts or overbooking.

### **Limitations**

* The initial budget constraint limits the inclusion of advanced features such as AI-driven personalized learning paths or virtual reality training modules, focusing instead on core functionalities.
* Time limitations may delay the implementation of multilingual support, with the initial rollout restricted to English content, pending further funding and development cycles.
* Resource constraints, including a small development team of five members, may restrict the scope of concurrent feature development, potentially delaying non-critical enhancements like real-time chat support.

### **Gantt Chart**

