Southern New Hampshire University

CS 255 Business Requirements Document

System Components and Design

Purpose

- The client is Liam, the owner of DriverPass
- The purpose of the project is to build a comprehensive training and scheduling system for driving students which offers online classes and practice tests, enables scheduling of on-the-road training sessions, and integrates with DMV updates and maintains regulatory compliance

System Background

- The problem that DriverPass wants to fix is the many people who fail DMV driving tests due to poor preparation. Existing services do not combine online learning, practice, and on-the-road instruction in one place.
- The different components needed for the system are:
    - Student registration and scheduling
        - Registered with personal and payment info
        - Book, cancel, and modify driving appointments either online or via phone with secretary
        - Select from three different training packages (6, 8, or 12 hours)
        - Schedule 2-hour sessions with a car and trainer
    - User Roles
        - Admin (Liam): Full access, reports accessible online
        - IT Officer (Ian): Full account control, password resets, and system maintenance
        - Secretary: Create/manage appointments for students
        - Students: Manage appointments, take classes, view progress
    - Online learning and practice tests:
        - Track test status: not yet started, in progress, failed, or passed
        - Show test name, time taken, score, and completion status
    - Driver notes and lesson logs:
        - Display lesson times, trainer, and feedback/comments
    - Security and tracking:
        - Role-based access control
        - Activity tracking: who made, canceled, or modified reservations with an email alert for Liam
    - Data access and reporting:
        - Accessible from any internet-connected device
        - Downloadable data reports (e.g. In Excel).
    - DMV Compliance
        - Interface with DMV for rule/test updates
        - Receive notifications of changes
    - Web-Based Interface and Cloud Hosting
        - Cloud-based for easy access and management
        - Minimal local IT management

Objectives and Goals

- System Capabilities upon completion:
    - Online and offline access to data (read-only offline)
    - User Account Management (login, password reset, role-based permissions)
    - Student Registration Process (Form for entering student and payment info, tied to student account)
    - Package management (Offer three training packages w/ the ability to disable packages)
    - Appointment Scheduling
        - Booking System that tracks student, driver, car, and time
        - Reservation tracking and conflict avoidance
    - Online Course Platform
        - Practice tests with progress tracking and results
    - Lesson Log and Driver Comments
    - Automated reports (generate and download activity logs and summaries)
    - System Security (Activity auditing and modification tracking)
    - Cloud hosted (cloud-based infrastructure for reliability and backup)
    - DMV Syncing (Ability to receive updates from the DMV and notify users of new requirements or guidelines)
- Measurable tasks for System Design:
    - Create detailed use case and activity diagrams
    - Design user interface mockups and class diagrams
    - Develop and test database integration
    - Implement business logic layer (role rights, security)
    - Conduct system testing before delivery
    - Schedule client approval meetings and final sign off

Requirements

Nonfunctional Requirements

Performance Requirements

- **The system needs to run as a web-based application, accessible through standard web browsers, and hosted on cloud infrastructure to minimize technical maintenance**
- The web application should be supported on both desktop and mobile devices to maximize user flexibility
- The system should load pages within 3 seconds under normal network conditions
- Database queries should execute within 2 seconds for standard operations
- Online practice tests should provide immediate feedback upon completion

Platform Constraints

- The system will be platform-agnostic, running through any web browser running on any operating system (Windows, macOS, iOS, Android, Unix)
- The back-end will use cloud-based infrastructure which will contain the database with multiple tables to hold user data

Accuracy and Precision

- Users will use their email or a username alongside a password to designate unique login credentials
- Emails are case-agnostic while usernames will be case sensitive, and users may use either to login to their accounts
- Role-based access control to differentiate between the various users of the system
- The system will inform the admin automatically for database errors, and appointment conflicts
- The system will also inform the owner based on the events he requested notifications for

Adaptability

- Administrators will have a section of the application that allows them to add, modify, or remove user accounts without having to change the code of the application
- If or when the owner decides to offer additional or disable existing packages, he will be able to through the interface (enable/disable packages, as well as delete existing packages or add new packages with new parameters)
- User roles and permissions shall be configurable through administrative controls
- The system will adapt to browser updates through responsive design
- Cloud platform updates will be handled transparently by the hosting provider
- DMV integration will accommodate new data formats through configurable mapping
- IT admin will have full system access including user account management
- Password reset capabilities will be available to IT staff
- System logs and activity reports shall be accessible to authorized personnel

Security

- User will log in with email/username and password combination, with multi-factor authentication for administrative accounts
- All data transmission will use SSL/TLS encryption (HTTPS)
- Credit card information shall be processed through PCI-compliant payment gateways
- Personal information shall be encrypted in the database
- To address brute force hacking attempts, accounts will be temporarily locked after 3 failed login attempts
- Password reset functionality will use secure email verification
- User sessions will timeout after 30 minutes of inactivity
- Administrative accounts will require additional verification for sensitive operations

Functional Requirements

- The system shall allow customers to register for driving lesson packages online
- The system shall validate and store customer information (name, address, phone, and payment details)
- The system shall validate user credentials when logging in
- The system shall process payments securely through integrated payment gateways
- The system shall generate and maintain customer accounts with unique login credentials
- The system shall track all user activities including reservations, modifications, and cancellations
- The system shall generate activity reports showing user actions and timestamps
- The system shall automatically sync with DMV systems to receive policy and test updates
- The system shall notify administrators when DMV updates are available
- The system shall allow customers to schedule 2-hour driving lessons online
- The system shall display available time slots based on instructor and vehicle availability
- The system shall allow customers to modify or cancel existing reservations
- The system shall assign specific instructors and vehicles to each appointment
- The system shall track pickup and drop-off locations for each lesson
- The system shall prevent double booking of instructors and vehicles
- The system shall send confirmation emails for all reservation activities
- The system shall offer three predefined training packages with different hour allocations
- The system shall track package progress and completion status for each customer
- The system shall provide access to online classes and practice tests for applicable packages

User Interface

- The system shall provide a web-based interface accessible through standard browsers
- The interface shall be responsive and functional on both desktop and mobile devices
- Navigation shall be intuitive with clear menu structures and user workflows
- Each user shall have specific interfaces for their necessary functions:
    - Customers: registration forms, lesson scheduling, progress tracking, practice tests
    - Secretary: customer management, appointment scheduling, payment processing
    - IT Officer: User account management, system maintenance, security settings
    - Owner: Business reports, package management, system oversight
- The system shall display test progress with status indicators (not taken, in progress, failed, passed)
- Instructor feedback shall be displayed in tabular format with lesson times and comments
- Forms shall include validation with clear error messaging
- Contact information and support options shall be readily accessible

Assumptions

- Users have access to devices with internet connectivity and modern web browsers
- Customers possess valid email addresses for account verification and communications
- Users have basic computer literacy for web-based application navigation
- Business operates during standard hours with appointment-based scheduling
- DMV provides electronic notifications for policy and test content updates
- Reliable internet connectivity is available for cloud-based operations
- Payment processing services maintain high availability and security standards
- Cloud hosting providers ensure adequate uptime and disaster recovery capabilities

Limitations

- Package customization requires developer intervention and cannot be performed by end users
- Initial system scope does not include real-time vehicle GPS tracking (could be a beneficial safety feature for parents)
- Integration with third-party scheduling systems is not supported
- Advanced reporting and analytics features are limited to basic activity tracking
- Project completion is due on May 10th
- Cloud hosting and third-party service costs may limit advanced feature implementation
- System complexity is limited based on current team expertise and available development tools
- DMV system integration is dependent on their available APIs and cooperation
- System requires internet connectivity for all functions, and only has data viewing capabilities offline
- Customer support limited to business hours for phone-based assistance
- Scalability constrained by chosen cloud infrastructure and database design
- Multi-language support not included in initial development scope

Gantt Chart