Southern New Hampshire University

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CS 255 System Analysis and Design
Business Requirements

Southern New Hampshire University

CS 255 Business Requirements Document

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?

- The client, DriverPass, wants to design a system that can provide resources to students to help them better prepare for and pass their driving test.

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?

- There is currently a lack of quality resources available to student to help them prepare for their driver's test, as a result, many students fail their driving test.

- DriverPass would provide a learning platform for student to schedule hands-on on-the-road training, take online classes and practice test.

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?

- General:
    - Online access to data (PC and mobile) with the ability to download reports and data.
    - Track changes to data, notes, and appointment schedule by user.
    - Must allow connection to DMV to receive updates to rules, policies, and sample test questions.
    - Must meet all security requirements for handling personal data and payment information.
    - Package Options
        - Package One:
            - Six hours in a car with a trainer.
        - Package Two:
            - Eight hours in a car with a trainer.
            - In-person lesson where we explain the DMV rules and policies.
        - Package Three:
            - Twelve hours in a car with a trainer.
            - In-person lesson where we explain the DMV rules and policies.
            - Access to our online class with all the content and material, including practice tests.
    - Appointment Scheduling
        - Date and time in two-hour increments with an available driver/car.

        - Pick-up and drop-off locations (currently must be the same).
- Design:
    - Logo displayed on middle top of page.
    - Online Test Progress – Displays all test available to the student.
        - Shows name, time/date taken, score and test status.
            - Test Status options: not taken, in progress, failed, passed.
    - Student information
        - Name, address and contact information for the student – Link to contact student directly via email/text.
    - Driver Notes
        - Section will include notes from driver from on-the-road training sessions.
        - Fields needed for each note entry: Lesson Time, Start Hour, End Hour, and Driver Comments
    - Special needs
        - Any special accommodations needed for the student.
    - Driver Photo
    - Student Photo
    - Input Form Page
        - Used by student (or secretary) to complete or update registration information.
    - Contact Us Page

- User Roles and functionality:
    - Admin (Liam and Ian):
        - Ability to download reports.
        - Ability to reset students' passwords upon their request.
        - Disable driving package options if they want to suspend a package offering.
            - Future Objectives: Ability to add additional packages.
    - User (Secretary):
        - Ability to schedule/modify/cancel driving appointments for the student.
            - Needs to be able to select date and time (two-hour time blocks), pick up and drop off location (drop off location must be the same as pick up)
        - Ability to Register student on their behalf:
            - Information collected upon registration: first and last name, address including state and zip, email, phone number, payment information (credit card number, expiration date, and security code)
    - ~~o~~ User (Driver):
        - Can add or edit notes they have added on the Drivers Notes page.
    - User (Student):
        - Ability to Register:
            - Information collected upon registration: first and last name, address including state and zip, email, phone number, payment information (credit card number, expiration date, and security code)
        - Ability to reset password online.
        - Ability to select a driving package.
            - Content access is based on package level selected.
        - Ability to schedule/modify/cancel driving appointments.

- Needs to be able to select date and time (two-hour time blocks), pick up and drop off location (drop off location must be the same as pick up).

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?

- System is web-based via the cloud.
- System should be reliable with load time of no more than two seconds.
- System should have a good uptime record and be reliably available for use with extremely minimal interruptions to services.
- Data retrieved from the DMV should update as information is updated in their system.

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?

- System should be accessible through all mainstream PC and mobile web browsers to ensure availability to the largest audience.
- UI should be designed to be adaptable based on user platform (PC/Mobile)
- Backend will require an authenticated database with changes tracking to store:
    - Scheduling data and packages.
    - Resources for online classes and practice tests/test progress.
    - Student profile/payment information, photo, special needs, and notes.
    - Driver profile information, and photo.

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?

- Users will be distinguished by a unique username with password-protected accounts.
- Usernames and passwords will be case-sensitive for added account security.
- System functionality for each user will be based on the user role defined authorization levels that are assigned upon account creation.
- System administrator should be notified of DMV updates.

- System administrator should be notified of any critical or lost connection errors immediately and should receive a daily report of any system errors that occurred.

Nonfunctional Requirements Cont.

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?

- System will allow creation, modification of removal of user accounts and profile information by customers for their own account.
- System will allow creation, modification of removal of user accounts and profile information by administrator for customer, driver, and staff accounts.
- IT and Administrator users should have access to download reports, disable available packages, and reset customer account passwords.

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?

- The Principle of Least Privilege (PoLP) concept should be utilized to ensure all users have access only to the specific data, resources and application needed for their role.
- To ensure secure communication all network requests shall be made through HTTPS.
- The system will meet all security requirements for handling personal data and payment information.
- All user accounts are password-protected with a unique username.
- User accounts will be locked after three failed log-in attempts.
- Account can be unlocked through the online system via email or by contacting system administrator for a password reset.

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."

General:

- The system shall meet all security requirements for handling personal data and payment information.
- The system shall require the following information to create a student user account first and last name, address including state and zip, email, phone number, payment information (credit card number, expiration date, and security code.
- The system shall validate user credentials (username and password) when logging in.
- The system shall lock user credentials after three failed login attempts.
- The system shall allow users to reset their passwords through the online system.
- The system shall track all changes made to data, including notes and appointments by user.
- The system shall track and report appointment availability and all scheduled appointments.
- The system shall link to the DMV database to receive updates to rules, policies, and sample test questions.

User based:

- The system shall allow top-admin and IT users to reset user passwords.
- The system shall allow top-admin and IT users to download reports and data.
- The system shall allow top-admin and IT users to disable package offerings available.

- The system shall allow for student user creation and profile modification and deletion by administrative users when the required information (see above) is provided.
- The system shall allow administrative users to schedule, modify and cancel driving appointments on the student's behalf.

- The system shall allow driver users to create, modify and delete driver notes from the system.

- The system shall allow student user registration when the required information (see above) is provided.
- The system shall allow student user to schedule, modify and cancel driving appointments.
- The system shall allow student users to select a driving package.
- The system shall allow student users to interact with content and material, including practice tests, based on package level selected.
- The system shall track student users' test progress and status.

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.)?

- The User Interface is a web and mobile browser application. The User Interface will have a Main UI page with various sections that users can interact with based on the system privileges available for their user account type.

    - Main UI Page – This will be the first page that users will see upon logging in. The page will show the company logo, student online test progress, driver notes, student profile information, special need requests, and photo of the driver (if assigned) and student.
    - Account Registration/Profile Page – Input form where student (or administrator on students' behalf) can create/modify student information (first and last name, address including state and zip, email, phone number, payment information (credit card number, expiration date, and security code.)
    - Package Content, Materials and Test Page – Allows students to interact with all content, materials and test based off of the users package level select.
    - Reservations Page – Allows student's and administrative users to schedule driving appointments by providing availability and prompting for needed information.
        - Date and time in two-hour increments with an available driver/car.
        - Pick-up and drop-off locations (currently must be the same).
    - DriverPass Contact Page – Contains contact information for DriverPass.

- System privileges by user account type:

    - DriverPass Owner (top-admin):
        - Full access to create, modify, and delete all user accounts and system access privileges, including password resets.
        - Access to disable package availability.
    - IT users:
        - Full access to create, modify, and delete all user accounts and system access privileges, including password resets.
        - Access to disable package availability.
    - DriverPass Secretary (admin):
        - Access to create, modify, and delete student user accounts and reset user passwords.
        - Access to create, modify and cancel appointments.
    - Student:
        - Access to create, modify, and delete own account and reset password.
        - Access to create, modify and cancel own appointments.
        - Access to learning materials based on package level selection.

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?

- Customizable packages/adding and removing modules will be addressed in a future update.
- Funding for the system build is in place.
- It is assumed that the DMV has interface or API in place to interact with system to receive updates to rules, policies, and sample test questions.
- It is assumed that users will have:
    - Access to the internet.
    - An up-to-date, mainstream browser on a functional PC or mobile device.
    - An email address for account creation and password resets.

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?

- Currently packages are not customizable and only the three pre-defined package selections will be available.
- System must be ready for delivery by May 9th.
- The system is a cloud-based web-application, as such internet access will be required to access and use the UI. Additionally, data cannot be modified or updated while offline as this could result in duplicated data.
- If DMV interface does not exist and may not be able to auto-update content.

Gantt Chart