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?

- DriverPass wants to create a web application to assist people in preparing for their driving test
    - Online classes, practice tests, and on-the-road/behind-the-wheel training with licensed instructors
- Users will make appointments based on "packages", explained by the owner of DriverPass, Liam:
    - **Package One:** Six hours in a car with a trainer
    - **Package Two**: Eight hours in a car with a trainer and an in-person lesson where we explain the DMV rules and policies
    - **Package Three**: Twelve hours in a car with a trainer, an in-person lesson where we explain the DMV rules and policies—plus access to our online class with all the content and material. The online class also includes practice tests.
- The on-the-road hours are split into 2-hour reservations which users can make online, via phone call, or in-office
- Users' test progress and driver notes are tracked and displayed in the application

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?

- Liam, the owner of DriverPass, claimed in the interview, "I noticed that there is a need for better driver training. So many people fail their driving tests at the DMV. I want them to be able to take online classes and practice tests. My company will also provide them with on-the-road training if they wish"
- The general purpose of this systems will be to assist people in getting their driver's license with online and in-person resources. DriverPass wants to create an accessible resource to support those struggling to get their license.

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?

- Database
    - Users
        - First and last name, address, email, phone number, city, state, zip code, etc.
        - There needs to be an input form that both users and staff can use to add to the database
    - Reservations
        - Time slots for on-the-road lessons with instructors
        - Time, day, car, assigned Driver
- System activity log

    - Track when the database is modified: new users or reservations
- User roles
    - Users of different roles will have access to different functions of the application
    - For example, only the Administrator can reset and block any account (User or Employee), and Employees can access the database to add users and reservations directly
- App has multiple pages
    - User, test, and reservation information display
        - (See image from transcript p. 4)
        - Online test progress, Driver notes (lesson time, start and end hour, and driver comments), user information, special needs, driver photo, and student photo
    - Input form
        - User sign-up, asking for relevant information (See Database -> Users)
        - "Employee" role users can also add users from this page
    - "Contact Us" page
        - Include contact information for DriverPass
        - "Employee" role users can find contact information for user
    - Online course and practice tests (could be included in information display page)
- Reservations
    - Users can make reservations online, via phone call, or in-office
- Package-based appointments with the ability to disable certain packages to disallow users from selecting it
    - Package One
        - Allocate 6 on-the-road hours (3 2-hour reservations) to user
    - Package Two
        - 8 on-the-road hours (4 2-hour reservations) and in-person lesson
    - Package Three
        - 12 on-the-road hours (6 2-hour reservations), an in-person lesson, and access to the online class
- Notify system when department of motor vehicles (DMV) updates their rules, regulations, or testing procedures

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?

- Runs on a web-based application
- Should have fast, consistent performance to support users switching between multiple classes, programs, or tests
- Time-sensitive details like time slots for “on-the-road" training need to be kept up to date
- The system needs to update its test information to match DMV rules, policies, and sample questions

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?

- The system should support the most popular operating systems: Windows, Linux, MacOS, etc.
- A database(s) of user accounts, tests, classes, instructors, and packages is needed to support the application

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 accounts will have IDs distinguishing them; these can be a string of numbers like “123456”
- The administrator needs to be notified of problems like a user forgetting their password so that they can reset it for their account
- Administrators also need to be notified when a user changes their information or a reservation they made
    - The admin wants to “be able to print an activity report and figure out who is responsible” when something goes wrong

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?

- The IT admin and secretary can make changes to the user database through the interface without changing code
- The IT admin is in charge of maintaining the system, so they need access to user accounts for things like resetting passwords or locking accounts
- The system can adapt to platform updates by having a cloud-based back-end, thus meaning that only the front-end client would potentially need to be changed

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?

- A user accounts consists of first name, last name, address, email address, phone number, state, and the number, expiration date, and security code of their credit card
- Encryption is a great to secure the transfer of sensitive information—ensuring that things like passwords or credit card details are always stored encrypted
- "brute force" hacking attempts should alert the admin and lock the account, or at least the ip address attempting the login, until the user whose account it is is contacted. They can then either confirm that it was them or change their password
    - A feature like two-factor authentication would help with this: i.e. sending a text the user's registered phone number asking for confirmation that they were the one attempting to log in
- Users that forget their password can contact the admin through email or a "forgot your password?" link in the application to notify the IT administrator
    - The admin can then access their account and reset its password

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 manage a database(s) of user accounts, classes, tests, and driving instructors
- New users can be added to the system through an input form available to customers and secretary staff
- The system shall let users schedule on-the-road sessions with instructors
    - Including updating or canceling these reservations
    - Drivers can leave notes about each session which are kept in the user's account
- The system is notified when the DMV updates their regulations, policies, sample questions, etc.
- The system has practice tests accurate to past DMV written exams
- Users can have different levels of authorization—i.e. student and administrator:
    - Administrators can access user accounts to lock them or reset their password
- The system shall allow administrators to export a spreadsheet or csv of reports

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 UI is browser-based and supported on mobile devices and computers
- Students and administrators will use the interface
    - Administrators can access student accounts to see and change information
    - The main page for a student's account shows information in separate boxes or areas: online test progress, user information (first and last name, address, email, etc.), driver notes, special needs, driver photo, and student photo

- All users have access to an input form for adding users to the system

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?

- Users have stable internet access and devices which support the most popular operating systems and browsers
- Users have phone numbers and email addresses
- Users live in the United States
- Supporting multiple languages wasn't explicitly mentioned in the interview, so it's assumed that users understand the language that the application is in

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, there are no plans for supporting multiple languages
- Password reset and account locking are manual processes currently which would be difficult with a larger number of users
- Server maintenance and updates could restrict users from accessing their accounts; worst case, downtime could prevent someone from connecting with their instructor before their reservation
- Adapting the system to DMV updates requires more attention because, if practice tests and classes are created manually, it will add to server downtime each time the DMV updates their policies

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Gantt Chart

DriverPass