**CS255: System Analysis and Design**

**Project One: Business Requirements Document**

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## 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 purpose of this project is to build a system for the client, DriverPass, to provide driving lessons for people attempting to pass their driver’s license test.
* The client is DriverPass, owned by Liam.
* The system that DriverPass is asking us to implement is online software that can handle reservations and online lessons.
* DriverPass wishes for this system to be web-based and cloud-based.

### 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, notes that many people fail their driver’s license exam and believes he has a solution to the problem.
* DriverPass wants to provide online lessons and in-person driving lessons for people who wish to earn their driver’s license.
* Liam and his IT officer, Ian, have engaged us to design and build a system to help them realize this goal.
* The system will need to be able to gather data from customers, book appointments for in-person driving lessons, link the online lessons, etc. The details are discussed in greater detail in the following Objectives and Goals section.

### 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?*

* Liam and Ian have provided a list of requirements for the initial iteration of the project, broken into the following sections:
* Directory service:
  + The client needs to be able to apply role-based properties for various users.
  + Users should be able to make and modify their user account as well as schedule, modify or cancel sessions.
  + Office employees should be able to perform the same functions the users can do online, except by gathering the information in-person or over the phone.
  + System needs to log activity for review.
* Data collection and storage:
  + End-user information includes the following:
    - Name
    - Address
    - Phone number
    - State
    - CC number
    - Expiration Date
    - Security Code
    - Pickup/drop-off location
    - Service level (package selection)
  + Reservation information includes the following:
    - Driver
    - Car
    - Appointment time
    - Duration (at implementation, default is two hours)
* Visual Interface - The client has a specific visual design, including:
  + Online Progress section
    - Test name
    - Time taken
    - Score
    - Status
  + User Information section
  + Driver notes (such as the following):
    - Lesson Time
    - Start Hour
    - End Hour
    - Driver Comments
  + Driver photo
  + User photo
  + Contact information for both user and company
  + (Mockup provided by Liam)
* Miscellaneous other requirements:
  + System needs to allow any package to be disabled (future implementation may allow for modification).
  + System needs to monitor for changes implemented by the DMV.
  + The client wishes to have access to the data from anywhere.
  + The client wishes to have Security and Backup handled by third-party means.

## 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?*

* This system will be web-based as per the client’s request. The administrative side should be an application that can easily apply the data to our cloud-based data management (this could also be web-based but doesn’t strictly have to be). The system should be lean enough to operate without interruption on a standard cell-based internet connection, including video streaming.
* The system needs to be updated because of the following:
  + Changes are made by the DMV.
  + Packages are disabled (or altered in future iterations).
  + Technical changes may be required when browsers are updated.
  + Standard maintenance updates.

#### 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 is web-based, so we should ensure compatibility with the main browsers: Edge, Chrome, Firefox, Safari.
* The customer wishes to have backup and security managed by a cloud-services provider.
* A records system will need to be implemented in whichever cloud service we engage for the backup and security services.
* A third-party payment processing solution should be engaged for taking payment information and processing payments.

#### 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?*

* All users will login to the system. A database stored in the cloud will allow access to the system based on credentials stored there, in the same way Active Directory would work in a local system.
* Administrative users will be given a profile and access through the IT team.
* Customers will create a user profile and access their information from there.
* Administrative users should perform multi-factor authentication to access sensitive information. Three failed login attempts should lock the account and a report filed with the system administrator.
* Customers should be prompted to change password or verify account details on three unsuccessful login attempts.

#### 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 system should begin with the ability for users to update their own information, both customers and administrators.
* Customers should be able to add/remove/modify their own information.
* Administrators should be able to add/remove/modify anyone’s information.
* These features should be available at launch. Updates should not change the basic functionality of these features.

#### 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 customer should have a username and password to login with SSL.
* An administrator should have a username and password to login with SSL, as well as a correct prompt from a soft token (SMS text code or soft token would be sufficient).
* Administrator accounts should be locked after three failed attempts.
* Customer accounts should be locked after five failed attempts, with a prompt to verify account and change password based on security questions.
* Customers can update passwords after correctly answering three security questions provided during account creation.
* Alternatively, a customer can have password reset by an administrator after showing proper ID at physical location.

### 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 allow customers to create/remove/modify a profile.
* The system shall allow customers to make reservations.
* The system shall allow customers to watch learning videos and take online assessments.
* The system shall allow administrators to create/remove/modify customer or other user profiles.
* The system shall allow administrators to view reservation logs.
* The system shall give a detailed status report to the customer.
* The system shall allow the customer to make payments and view payment history.
* The system shall notify customers of upcoming driving reservations, payment due dates, and any customer-affecting changes to the system.

### 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 first functional item of the interface should include a welcome message and a prompt to login to the system.
* The different users are customers, administrators, and system administrators.
* The interface will be accessed by web browser.
* Customers should be able to create, modify, or delete their profile.
* Customers should be able to see their status, as depicted in the interview document and described in detail in the Goals and Objectives section.
* Administrators should be able to create, modify, or delete customer accounts.
* Administrators should be able to see the schedule of driving events and see where available appointments are.
* System administrators should be able to create, modify, or delete all accounts.
* System administrators should be able to view logs of any changes made to any accounts.

### 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?*

* Assumption: the regular user will be able to use a standard, web-based application to take assessments, watch videos, make payments, etc.
* Assumption: Any potential customer who wants to take advantage of our service has a smart phone or computer capable of handling our web-based application.
* Assumption: 10 cars and drivers with two-hour windows will be sufficient for the local system. Scalability for future locations is not considered here.

### 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?*

* Limitation: The system is specifically created for one local market, leading to a scalability concern if future expansion into a different market is desired.
* Limitation: The system cannot operate without sufficient internet bandwidth and cannot function at all offline.
* Limitation: Third-party reliability; database, security, and payment processing rely on a third party to be up and operational.

### Gantt Chart

*Please include a screenshot of the GANTT chart that you created with Lucidchart. Be sure to check that it meets the plan described by the characters in the interview.*

*A screenshot of a project

Description automatically generated*