Southern New Hampshire University

CS 255 Business Requirements Document Template

Complete this template by replacing the bracketed text with the relevant information.

This template lays out all the different sections that you need to complete for Project One. Each section has guiding questions to prompt your thinking. These questions are meant to guide your initial responses to each area. You are encouraged to go beyond these questions using what you have learned in your readings. You will need to continually reference the interview transcript as you work to make sure that you are addressing your client's needs. There is no required length for the final document. Instead, the goal is to complete each section based on your client's needs.

Tip: You should respond in a bulleted list for each section. This will make your thoughts easier to reference when you move into the design phase for Project Two. One starter bullet has been provided for you in each section, but you will need to add more.

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 create a system for our new client, DriverPass.
- At a high-level, DriverPass wants their system to provide driver training through online classes and practice tests. Furthermore, the system should be able to support the ability for customers to opt-in for on-the-road training as well.

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?

- DriverPass wants the system to provide driver training through online classes and practice tests. Furthermore, the system should be able to support the ability for customers to opt-in for on-the-road training as well.
- The problem that DriverPass wants to fix is a void in the market for driver training to help people pass their driving test at the DMV.
- The different components needed for the system are:
    1. Provide access to data online from anywhere at anytime.
    2. Support different levels of security access based on an employee's role.
    3. Allow tracking of user's activity in the system.
    4. Customer or secretary can create a customer account online.
    5. Customers can make and modify their driving lesson reservation online.
    6. Customer accounts contain personal information and up-to-date scheduling and driver information.
    7. Ability to track drivers and cars.
    8. Manage driving packages and display the options for customers to select.
    9. Customers can reset their password.
    10. Get notifications whenever the DMV has new rules, policies, or sample test questions.
    11. Backup and security is done over the cloud.
    12. The system's user interface matches Liam's sketch.
    13. A page that displays DriverPass' contact information.

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?

- Below is a list of what the system should be able to do when it is completed along with the measurable tasks needed:
    1. Allow Liam, the owner, to access data online from any computer or mobile device at anytime.
        - Measurable task: Ability to download reports that can be worked on outside of the office using Excel.
    2. Handle different types of security access based on role type.
        - Measurable tasks: Liam and Ian, the IT officer, should have full access to all accounts so they can reset them if someone forgets their password or block an account if someone is let go. On the other hand, the secretary should not have full access and only be able to create and modify appointments in the system.
    3. Allow tracking of user's activity in the system.
        - Measurable tasks: Liam can see the name and information of the account that made a reservation, canceled a reservation, and modified a reservation last. This should be applicable across all reservations. Liam can print an activity report that displays all of this information.
    4. Allow the customer or DriverPass' secretary to create a customer account online.
        - Measurable task: The system contains a page with an input form where either the customer or secretary can enter the following customer information:
            - First name
            - Last name
            - Address
            - Phone number
            - Email address
            - Credit card information with card number, expiration date, and security code
            - Desired pick up location
            - Desired drop off location (should be the same as the pick up location for each customer)
    5. Allow customers to make and modify their driving lesson reservation online.
        - Measurable tasks: Customers can make reservations online using their account. They can opt-in for the day and time that they want to take each two-hour lesson. They also can cancel and modify appointments online.
    6. Display customer collected information and up-to-date scheduling and driver information in customer accounts.
        - Measurable tasks:
            - Each customer account should contain the collected personal information detailed in #4 above.
            - All appointment types (made online, via phone, or in-person) are displayed on the user account in the system along with their status (active or cancelled). Any assigned driver should also be listed in the customer account.
    7. Ability to track drivers and cars.
        - Measurable tasks: Identify the driver accounts in the system. Identify registered cars for the driving lessons in the system. Visibility in the system to track which customer account is matched up with which driver and car at what time.

8. Manage driving packages and display the options for customers to select.
    - Measurable tasks:
        - Display the following package information to customers:
            - 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 DriverPass explains the DMV rules and policies
            - Package Three: Twelve hours in a car with a trainer, an in-person lesson where DriverPass explains the DMV rules and policies, and access to DriverPass' online class with all the content and material. The online class also includes practice tests.
        - The system should be able to tell the customer how many two-hour driving session is left based on the package that they selected, and then allow the customer to schedule based on the amount of remaining sessions.
        - Packages can be disabled by Liam so that no more customers can register for it.
9. Allow customers to reset their password.
    - Measurable task: Customer is presented with the option to reset their password if they forget it. The system should have step-by-step instructions to guide customers through this resetting process.
10. Send out notifications whenever the DMV has updated their webpage with new rules, policies, or sample test questions.
    - Measurable task: A notification is triggered to Liam and Ian when the DMV webpage has been updated with new rules, policies, or sample test questions.
11. Backup and security is taken care of over the cloud.
    - Measurable tasks: The system can be run over the cloud so that data backup and security are not done through the hardware at DriverPass.
12. Display a user interface (UI) that matches Liam's sketch.
    - Measurable task: The UI contains the following:
        - Company logo - Located at the center top of the page
        - "Online Test Progress" section - Located on the left top side of the page underneath the logo. This section should display any test that the customer has in progress and/or completed. Furthermore, this section should display the test name, time taken, score, and status. The status should be one of the following for each test: "Not taken", "In progress", "Failed", or "Passed".
        - "Customer Information" section - Located on the top right side of the page underneath the logo. This section should display the customer's personal information such as first name, last name, address, phone number, email address, etc.
        - "Special Needs" section - Located in the middle right side of the page underneath the "Customer Information" section.
        - "Student Photo" section - Located on the bottom far right side of the page underneath the "Special Needs" section.
        - "Driver Photo" section - Located on the bottom right side of the page underneath the "Special Needs" section and to the left of the "Student Photo" section.
        - "Driver Notes" section - Located on the bottom left side of the page underneath the "Online Test Progress" section. This section contains the following table:

Lesson Time	Start Hour	End Hour	Driver Comments

13. Display a contact page to the customers with information on how they can contact DriverPass.
    - Measurable task: The contact page is visible to customers and contain the following information on DriverPass:
        - Office's address
        - Hours of operation
        - Phone number
        - Email address

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?

- The system needs to run in both a web-based and application or mobile environment to provide users the ability to access the system from anywhere at anytime.
- The system should response to each customer input or interaction within two seconds in order to provide a smooth customer experience for the user.
- The system should be updated with new customer input, such as displaying confirmed driving lesson reservations, every 30 seconds to provide the most up-to-date data for users.

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 run on a Windows platform for the web-based environment and be available on both an Android and iOS platform for the mobile environment.
- The system will not contain an in-house back end database. However, the system needs to be connected to the cloud in order to backup data. Moreover, the system shall be synced with the DMV database in order to receive alerts when there are changes to the DMV's rules, policies, or sample questions. We will be using an application programming interface (API) that contains the Representational State Transfer (REST) software architect to secure the connection between the DriverPass system and these external systems (the cloud and DMV databases). API provides a standard to follow in order to communicate with external systems. Coupling API with REST results in a RESTful API that provides the system with scalability, flexibility, and independence (Amazon Web Services, n.d.).

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?

- The different users will be distinguished by their specific user access level. The system will contain four access levels: admin, IT, secretarial, and customer. The admin-access level will be assigned to the owner, IT-access level will be assigned to the IT officer, and secretarial-access level will be assigned to the secretary. These three access levels will be assigned by our company and available to access the system at launch. The customer-access level will be automatically assigned to each customer account that is created in the system.
- The input is case-sensitive in order to increase security. There will be a note that communicates this case-sensitivity on every page that requires user input. This messaging helps to increase ease of use and reduce errors for users. Furthermore, the system will have an informative feedback feature for incorrect inputs. More specifically, this means that users who submit incorrect inputs will be provided with feedback to recheck their input for case-sensitivity and try again.
- The system should log all user activities, including the username of who logged into the system, the date and time stamp of the log-in, and the internet protocol (IP) address of the log-in. Each unsuccessful log-in attempt will be carefully documented. The system will block any user attempts from logging into the system for 30 minutes after three unsuccessful attempts within 30 minutes. The admin-user and IT-user should be informed whenever there are six unsuccessful log-in attempts coming from the same IP address within a 24 hours timeframe.

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?

- You can make changes to the user without changing code. The admin-access level shall be able to add more IT or secretarial access levels to the system, which is convenient when new employees join the DriverPass company. The customer-access level is the access level for DriverPass' customers, and a customer is automatically assigned with this access level when they create an account in the system.
- The system will adapt to platform updates automatically when Microsoft pushes new updates to their operating system. This ensures that the DriverPass system is always operating on the newest version of the platform.
- The IT-access level needs to have access to maintain and modify the system, and modify and remove accounts in the system.

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 username and password is required for the user to log in.
- The RESTful API mentioned in the Platform Constraints section above can help secure the connection or data exchange between the client and server. Moreover, authentication and secured encryption methods can further secure the exchanges between the DriverPass system and external systems.
- Accounts should be locked if there is a brute force hacking attempt. In addition to the details on unsuccessful log-in attempts mentioned in the third bullet point of the Accuracy and Precision

section above, the system will also lock the account after six unsuccessful log-in attempts within a 24-hour period. The only way that the user can get the account unlocked at this point is to contact DriverPass. An admin or IT access levels can unlock locked accounts. The system will document brute force hacking attempts by filing the IP address. An IP blacklist will be used and continuously updated to protect DriverPass from known attacks (Fortinet, n.d.).

- The user will have the option to reset their password if they forget it. Moreover, the admin and IT access levels will also be able to reset the password of any account type in the system.

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 access to data online from any computer or mobile device at anytime.
- The system shall allow an admin or IT-access level to reset the password for any account in the system.
- The system shall allow an admin or IT-access level to block any account from accessing the system.
- The system shall allow an admin-access level to track user activities in the system.
- The system shall allow creations of customer online accounts.
- The system shall allow creations of driving lesson reservations.
- The system shall allow modifications of driving lesson reservations.
- The system shall display customer-collected information, up-to-date scheduling, and driver information in each customer's account.
- The system shall allow those with an admin or IT-access level to track drivers and cars.
- The system shall allow an admin-access level to disable driving packages.
- The system shall display driving packages.
- The system shall allow available driving packages to be selected.
- The system shall allow each user the ability to reset their own account password.
- The system shall provide notifications whenever DMV has updated their webpage with new rules, policies, or sample test questions.
- The system shall display the user interface (UI) that includes company logo and "Online Test Progress", "Customer Information", "Special Needs", "Student Photo", "Driver Photo", and "Driver Notes" sections (as depicted in the owner's sketch).
- The system shall display DriverPass' contact information to customers.
- The system shall provide online practice tests to customers.
- The system shall provide online classes to customers.

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 needs of the interface are to display the following:
    - The log-in page.
    - The log-out page.
    - A user activity tracking page that displays who made a reservation, who canceled it, and who modified it last. This page shall contain an export option in order for reports to be downloaded.

- A sign-up page where the customers or secretary can create an online account profile for the customer.
- An online reservation page where the customers or secretary can schedule the customer's driving lessons using the customer's account information.
- A page that displays the driving packages and their details.
- A page that walks users through how to reset their password.
- A page that allows those with an admin or IT-access level the ability to send an email to any user to reset their password.
- A page that allows those with an admin or IT-access level the ability to block any existing account from accessing the system.
- A page that displays all blocked accounts.
- A page that contains practice tests.
- A page that contains the contents of the online classes.
- A page that displays DriverPass' contact information.
- A page that displays DriverPass' registered driver information, any current car and student assigned to them, and the schedule of the driving lessons.
- A homepage that includes the following based on the owner's provided design:
  - Company logo - Located at the center top of the page.
  - "Online Test Progress" section - Located on the left top side of the page underneath the logo. This section should display any test that the customer has in progress and/or completed. Furthermore, this section should display the test name, time taken, score, and status. The status should be one of the following for each test: "Not taken", "In progress", "Failed", or "Passed".
  - "Customer Information" section - Located on the top right side of the page underneath the logo. This section should display the customer's personal information such as first name, last name, address, phone number, email address, etc.
  - "Special Needs" section - Located in the middle right side of the page underneath the "Customer Information" section.
  - "Student Photo" section - Located on the bottom far right side of the page underneath the "Special Needs" section.
  - "Driver Photo" section - Located on the bottom right side of the page underneath the "Special Needs" section and to the left of the "Student Photo" section.
  - "Driver Notes" section - Located on the bottom left side of the page underneath the "Online Test Progress" section. This section contains the following table:

Lesson Time	Start Hour	End Hour	Driver Comments

- The users of the interface are the customers, owner, IT officer, and secretary.
- There are certain tasks that all users must be able to do through the interface, and there are certain tasks that only certain users can do based on their access level. Here is the breakdown:
  - All users:
    - Log in.
    - Log out.

        - Reset personal password.
        - View their account profile.
    - Admin-access level (owner):
        - View customer information that includes name, address, contact information, status of any online test, any noted special needs, photo, up-to-date driving lesson reservations, any assigned driver, and any comments the driver left along with the times of the lessons.
        - View and download a user activity tracking report.
        - Reset any account's password.
        - View and disable driving packages.
        - Block any existing account access.
        - Track drivers, their assigned cars, their assigned student, and the schedule of the driving lessons.
        - View notifications whenever the DMV has updated their webpage with new rules, policies, or sample test questions.
        - View notes the driver left and times of the scheduled lessons.
    - IT-access level (IT officer):
        - Reset any account's password.
        - Block any existing account access.
        - View customer information that includes name, address, contact information, status of any online test, any noted special needs, photo, up-to-date driving lesson reservations, any assigned driver, and any comments the driver left along with the times of the lessons.
        - Track drivers, their assigned cars, their assigned student, and the schedule of the driving lessons.
        - View notifications whenever the DMV has updated their webpage with new rules, policies, or sample test questions.
        - Maintain and modify the system.
    - Secretarial-access level (secretary):
        - Create an online account for customers.
        - View how many two-hour driving sessions are left based on the package that the customer selected, and then make reservations for driving lessons based on the amount of remaining sessions using customer's online account information.
        - View customer collected information and up-to-date scheduling.
    - Customer-access level:
        - Create online account.
        - View how many two-hour driving sessions are left based on the package that they selected, and then make reservations for driving lessons based on the amount of remaining sessions using their online account. They can opt-in for the day and time that they want to take each two-hour lesson.
        - View driving lesson reservations.
        - Modify driving lesson reservations.
        - View and complete practice tests.
        - Access the content of online classes.
        - View DriverPass' contact information.
        - View homepage designed by the owner and described above.
- All user access types can interact with the interface on any computer or mobile device.

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?

- The things that were not specifically addressed in the design above are:
  - The cloud database that will be used to backup and secure the system.
  - The type of secured authentication and encryption methods that will be utilized.
- The assumptions that are made in the design about the users or technologies that they have are:
  - All users have internet access.
  - All users have access to a mobile device or computer.
  - All users have a way to be contacted. I.e. A phone number or email address.
  - Drivers will be vetted and hired by the owner outside of the system.
  - Customers have a working credit card.
  - A list of registered drivers and cars will be entered into the system manually by DriverPass.
  - The driver notes will be entered into the system manually by DriverPass.

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?

- The system design has the following limitations:
  - It will not be accessible if the user does not have internet access.
  - It will not be accessible if the user does not have a mobile device or computer.
- The following is a list of enhanced user experience features that are currently not in scope due to the lack of resources, time, budget, and/or technology:
  - A driver portal for DriverPass' approved drivers. These drivers would be able to create an online account and be assigned a driver-access level in order to view their driver profile, details of upcoming and previous scheduled driving lessons, and their assigned car. Moreover, drivers can fill out notes on the driving lessons online and these notes can automatically display under the "Driver Notes" section that is currently scoped to display in the system.
  - An online communication channel, such as a chat box, where customers can get in touch with DriverPass. This provides a more convenience way for customers to contact the company, especially if they are already doing other task in the system.
  - A chat room where customers and their assigned driver can chat within a pre-set time frame, such as an hour before the scheduled driving lesson starts up until 10 minutes after the start time. This provides an easy, private, and secured way for the customer and their assigned driver to communicate without having to share either user's personal contact information. This option is helpful for instances where either party is running late or cannot find each other at the starting location.
  - The ability for the owner to customize driving packages by adding or removing modules.

Southern New Hampshire University

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.

DriverPass System's Gantt Chart

Task	Duration (Days)	Owner	Dependency	Week 1 (22 - 29 Jan)	Week 2 (30 Jan - 6 Feb)	Week 3 (7 - 14 Feb)	Week 4 (15 - 22 Feb)	Week 5 (23 Feb - 2 Mar)	Week 6 (3 - 10 Mar)	Week 7 (11 - 18 Mar)	Week 8 (19 - 26 Mar)	Week 9 (27 Mar - 3 Apr)	Week 10 (4 - 11 Apr)	Week 11 (12 - 19 Apr)	Week 12 (20 - 27 Apr)	Week 13 (28 Apr - 5 May)	Week 14 (6 - 13 May)
1. Collect requirements	14	Sam & Jennifer	N/A	22 Jan - 4 Feb													
2. Create use case diagrams	8	TBA*	1	N/A	N/A	11 - 18 Feb											
3. Build activity diagrams for each use case	23	TBA*	1 & 2	N/A	N/A	N/A	15 Feb - 9 Mar										
4. Research user interface designs	9	Toni & Clark	1	N/A	N/A	N/A	N/A	27 Feb - 7 Mar									
5. Build class diagram	9	John	1	N/A	N/A	N/A	N/A	1 - 9 Mar									
6. Get customer approval	2	Sam & Jennifer	1 - 5	N/A	N/A	N/A	N/A	N/A	10 - 11 Mar								
7. Build interface	12	TBA*	6	N/A	N/A	N/A	N/A	N/A	N/A	12 - 24 Mar							
8. Link DB to interface	9	TBA*	7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	24 Mar - 3 Apr						
9. Build business logic	22	TBA*	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5 - 27 Apr				
10. Test system	11	TBA*	9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	27 Apr - 7 May		
11. Deliver system	2	TBA*	10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8 - 9 May
12. Sign-off meeting	2	Sam & Jennifer	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	9 - 10 May

***TBA = To Be Announced**

Legend

- Complete
- On track
- In trouble
- Needs immediate attention

References

Amazon Web Services. (n.d.). *What is RESTful API?*. Retrieved October 7, 2022, from https://aws.amazon.com/what-is/restful-api/#:~:text=RESTful%20API%20is%20an%20interface,applications%20to%20perform%20various%20tasks

Fortinet. (n.d.). *What Is a Brute Force Attack?*. Retrieved October 9, 2022, from https://www.fortinet.com/resources/cyberglossary/brute-force-attack