Dr. Sulaiman Al Habib Pharmacy

Prince Sultan University

Department of Computer & Information Sciences

Introduction to Software Engineering

Phase 1: Project proposal

- **Problem statement and scope:**

This project's vision is to create an application for Dr. Sulaiman Al Habib Pharmacy to sell personal care items and medication online. Through this application, Al-Habib aims to acquire new customers and turn them into loyal customers, increase revenue by 40% within 6 months, and decrease the long lines and overcrowded rush hours they receive on a daily basis. The purpose of this project is to set a list of the prioritized functional requirements needed to implement the Al-Habib pharmacy application.

- **Goal and Objectives:**

This software desires to gain new customers and decrease the overcrowded customers in the rush hours they get every day. The application will help customers to get their medical or non-medical products without going there physically. Since this pharmacy does not have a lot of branches, that may cause some problems for the customers in need and the pharmacy may lose a customer. By making this software, not only the customers will benefit from it, but also Al-Habib pharmacy will receive more and more customers and orders from a lot of areas, and their reputation will increase.

- **Motivation:**

Since Covid-19 the immunities of the general public have decreased and their need for pharmacies is larger than ever. It also showed us that having a large number of people in the same place at once especially when they're seeking medical attention increases the risk of

infections and is overall unhygienic and harmful. Therefore, having a way where the customer conveniently orders their prescriptions and other miscellaneous products to be delivered to their house will be extremely beneficial, especially from a well-respected company such as dr. Sulaiman Al Habib medical group.

- **Contribution:**

To give the patients and frequent customers of Dr. Sulaiman Al Habib pharmacy a platform to easily purchase their prescribed medications and everything else the Dr. Sulaiman Al Habib pharmacy offers. Due to the inconvenience of being in the queue in person and to minimize the number of customers in the locations at a given time.

Phase 2: Project scope and Work Plan

- **Project schedule and milestones:**

Phase1	Project proposal
Phase2	Project scope and Work Plan

Phase3	Requirements Elicitation and Documentation
Phase4	Software Design
Phase5	Prototype

- **Project schedule and milestones:**

Task Name	Duration	Start	Finish	Predecessors
Project Development	42 Days	19/9/2022	31/10/2022	

Planning	7 Days	19/9/2022	26/9/2022	
Requirements collection meeting	3 Days	19/9/2022	22/9/2022	
Communication with stakeholders	2 Days	22/9/2022	24/9/2022	Requirements collection meeting
Documentation and requirements closure	2 Days	24/9/2022	26/9/2022	Communication with stakeholders

Design	10 Days	26/9/2022	6/10/2022	**Planning**
Back end software database design	5 Days	26/9/2022	1/10/2022	Documentation and requirements closure
Front end software design	3 Days	1/10/2022	4/10/2022	Back end software database design
Design specifications	2 Days	4/10/2022	6/10/2022	Front end software design
Implementation	9 Days	6/10/2022	15/10/2022	**Design**

Facial recognition collection	3 Days	6/10/2022	9/10/2022	Design specifications
Facial recognition configuration	3 Days	9/10/2022	12/10/2022	Facial recognition collection
Hardware installation	3 Days	12/10/2022	15/10/2022	Facial recognition collection
Testing	6 Days	15/10/2022	21/10/2022	**Implementation**
Perform software testing	2 Days	15/10/2022	17/10/2022	

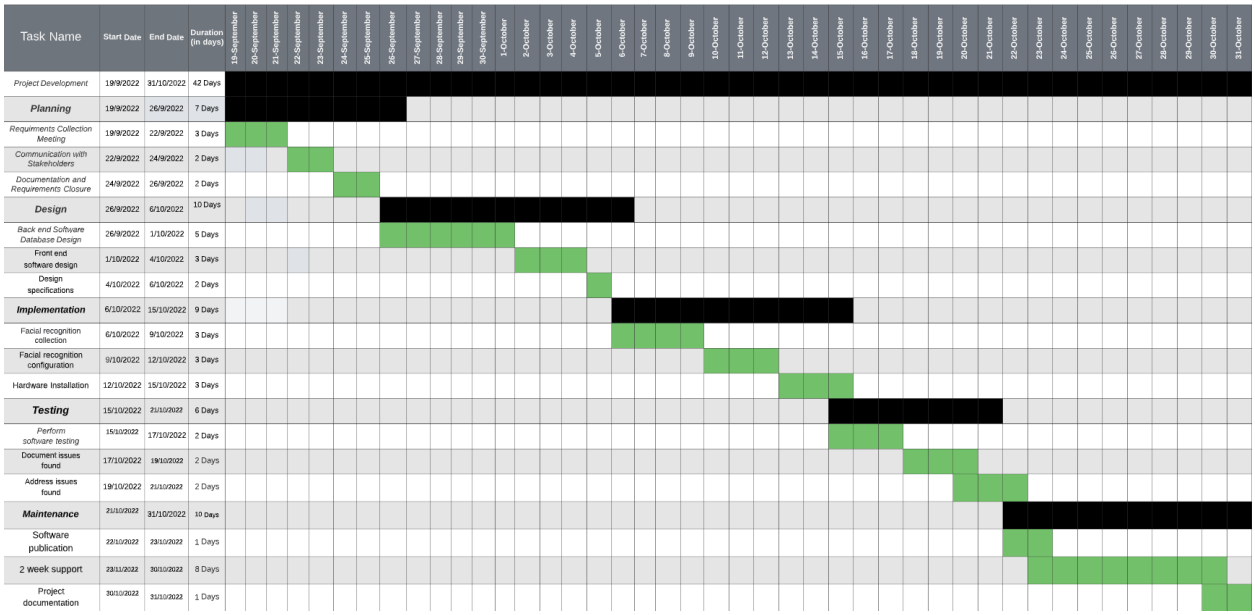
Document issues found	2 Days	17/10/2022	19/10/2022	Perform software testing
Address issues found	2 Days	19/10/2022	21/10/2022	Document issues found
Maintenance	10 Days	21/10/2022	31/10/2022	**Testing**
Software publication	1 Days	22/10/2022	23/10/2022	Address issues found
2 week support	8 Days	23/11/2022	30/10/2022	Software publication
Project documentation	1 Days	30/10/2022	31/10/2022	2 week support

- **Team Organization:**

Name	Tasks
Samia Abu Theeb	- Risk management analysis - Gantt chart - Project schedule and milestones
Sara Alrayes	- Project schedule and milestones

	- Team organization - Risk management analysis
Sara Alhargan	- Gantt chart - Risk management analysis - Project schedule and milestones

- **Gantt Chart Determination:**



Task Name	Start Date	End Date	Duration (in days)
Project Development	19/9/2022	31/10/2022	42 Days
Planning	19/9/2022	26/9/2022	7 Days
Requirments Collection Meeting	19/9/2022	22/9/2022	3 Days
Communication with Stakeholders	22/9/2022	24/9/2022	2 Days
Documentation and Requirements Closure	24/9/2022	26/9/2022	2 Days
Design	26/9/2022	6/10/2022	10 Days
Back end Software Database Design	26/9/2022	1/10/2022	5 Days
Front end software design	1/10/2022	4/10/2022	3 Days
Design specifications	4/10/2022	6/10/2022	2 Days
Implementation	6/10/2022	15/10/2022	9 Days
Facial recognition collection	6/10/2022	9/10/2022	3 Days
Facial recognition configuration	9/10/2022	12/10/2022	3 Days
Hardware Installation	12/10/2022	15/10/2022	3 Days
Testing	15/10/2022	21/10/2022	6 Days
Perform software testing	15/10/2022	17/10/2022	2 Days
Document issues found	17/10/2022	19/10/2022	2 Days
Address issues found	19/10/2022	21/10/2022	2 Days
Maintenance	21/10/2022	31/10/2022	10 Days
Software publication	22/10/2022	23/10/2022	1 Days
2 week support	23/11/2022	30/10/2022	8 Days
Project documentation	30/10/2022	31/10/2022	1 Days

- **Technical Environment:**

Due to the ease of access from tablets, laptops, and phones running different operating systems, Al-Habib pharmacy will be both a website and an application. This means that there will be a range of web application development tools, technical environments, and programming languages.

- Programming languages: HTML will be used for the front-end construction of the website due to its dependability and user-friendliness, and PHP (Hypertext Preprocessor) will be used for the backend development of the website due to its total cross-platform compatibility.

- Because it is designed specifically for PHP but also supports front-end languages, PhpStorm is the Integrated Development Environment that will be improved. It has simple navigation, all the required testing and debugging tools, and quick refactoring.

- Database management: The MySQL database is the one that the website may utilize. Data about events and event hosts will be managed using MySQL.

- Web services: ClickPost provides a variety of capabilities, such as NDR management to lower RTOs and returns management to lower losses during reverse logistics. It makes sure that offered estimated delivery dates are accurate and enables prompt customer communication of real-time tracking.

- **Risk management and analysis:**

Risk	Probability	Effects	Strategy
Failure in verifying insurance	Moderate	Serious	Staying in constant communication with HMG for any updated insurance plans and companies
Operational (improper implementation)	Low	Serious	continuously having team meetings
Technical (failure of	Low	Serious	Training all the members to meet

functionality)			**the requirements**
Unstructured Plan	**Low**	**Serious**	**Prioritize the requirements**
Changes in user and functional requirements	**Moderate**	**Serious**	**Updating the new requirements**
Insufficient funds	**Moderate**	**Serious**	**Proper finance distribution and management**
Programmatic Risks	**Low**	**Serious**	**Follow the government guidelines**

Phase 3: Requirements Elicitation and Documentation

- **Functional and non-functional requirements:**

• Functional requirements:

1- The system shall allow the user to create an account.

2- The system shall allow the user to log in if they have an account.

3- The system shall allow the user to continue as a guest.

4- The system shall allow the user to search for products.

5- The system shall allow users to choose the pick-up option from nearby pharmacies.

6- The system shall allow the user to choose the delivery option.

7- The system shall allow the user to schedule an appointment with a pharmacist.

• **Non-functional requirements:**

1. performance Requirements

1.1 The system shall accommodate 600 users during the peak usage time window of 8:00am to 12:00 pm local time, with an estimated average session duration of 10 minutes.

1.2 All application pages generated by the system shall be fully downloadable in no more than 5 seconds.

1.3 The system shall not move any item from the cart ,unless the user wants to remove it .

1.4 The system shall display confirmation messages to users within 5 seconds after the user submits order information to the system.

2. Safety Requirements

2.1 The system shall allow a special safety packaging for medicine orders .

2.2 The system shall reject any medicine order without prescription.

3. Security Requirements

3.1 The system shall lock a user's account after three consecutive unsuccessful login attempts within a period of five minutes.

3.2 All network transactions that involve financial information or personally identifiable information shall be encrypted.

3.3 All patients' information shall be secured.

4. Software Quality Attributes

4.1 Usability: the system shall be easy to use for children and elderly.

4.2 Robustness: If the connection between the user and the system is broken prior to an order

being either confirmed or canceled, the System shall enable the user to recover an incomplete order.

4.3 Availability: The System shall be available to users for 24 hour.

4.4 Portability: Modifying the iOS version of the application to run on Android devices shall require changing no more than 10 percent of the source code.

5. Business Rules

5.1 Only users who have Auditor access privileges shall be able to view transaction histories.

- **Use Case Diagram:**

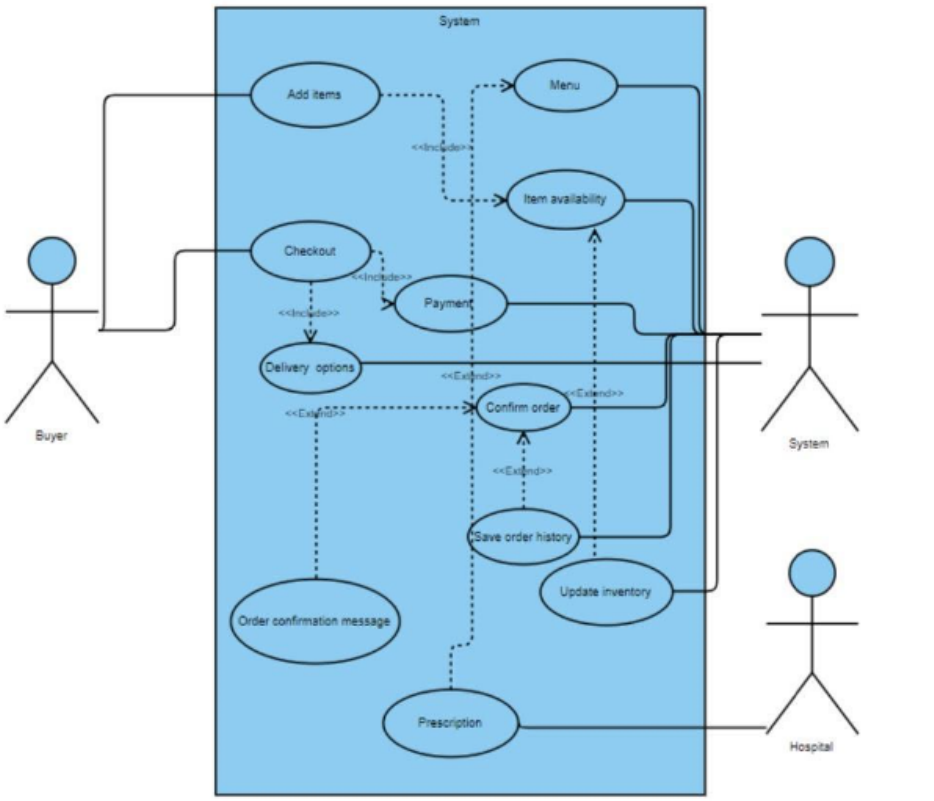


Figure 9: Create an order use case diagram

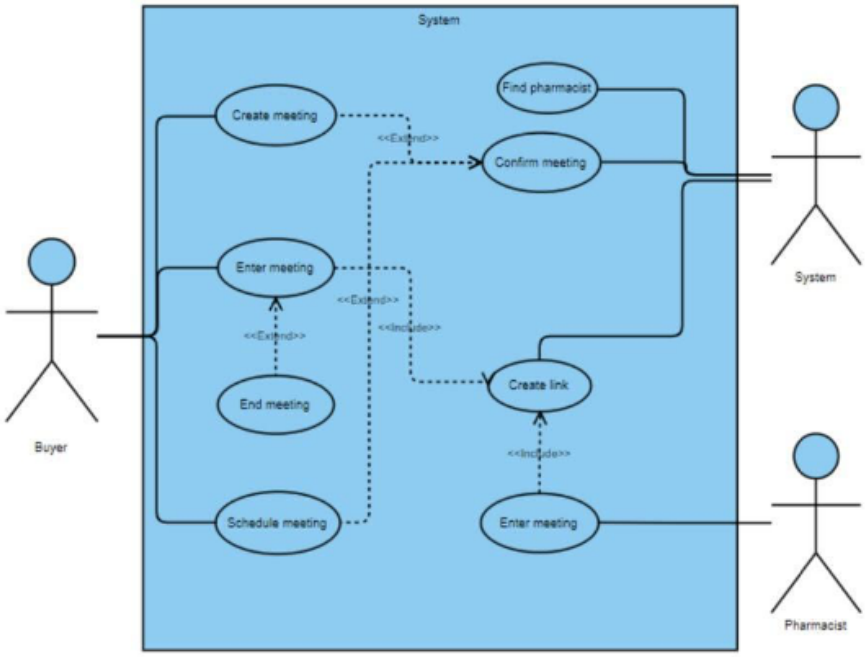
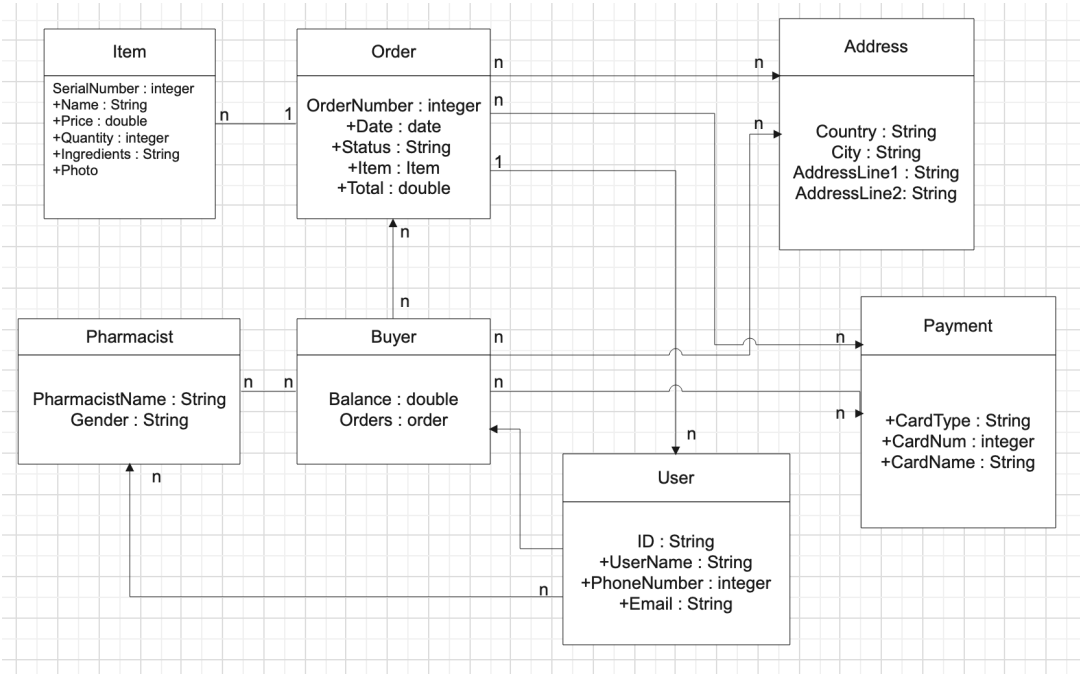


Figure 10: Meet a pharmacist use case diagram

- **UML Class Diagram:**


Item
SerialNumber : integer
+Name : String
+Price : double
+Quantity : integer
+Ingredients : String
+Photo
Order
OrderNumber : integer
+Date : date
+Status : String
+Item : Item
+Total : double
Address
Country : String
City : String
AddressLine1 : String
AddressLine2: String
Pharmacist
PharmacistName : String
Gender : String
Buyer
Balance : double
Orders : order
Payment
+CardType : String
+CardNum : integer
+CardName : String
User
ID : String
+UserName : String
+PhoneNumber : integer
+Email : String
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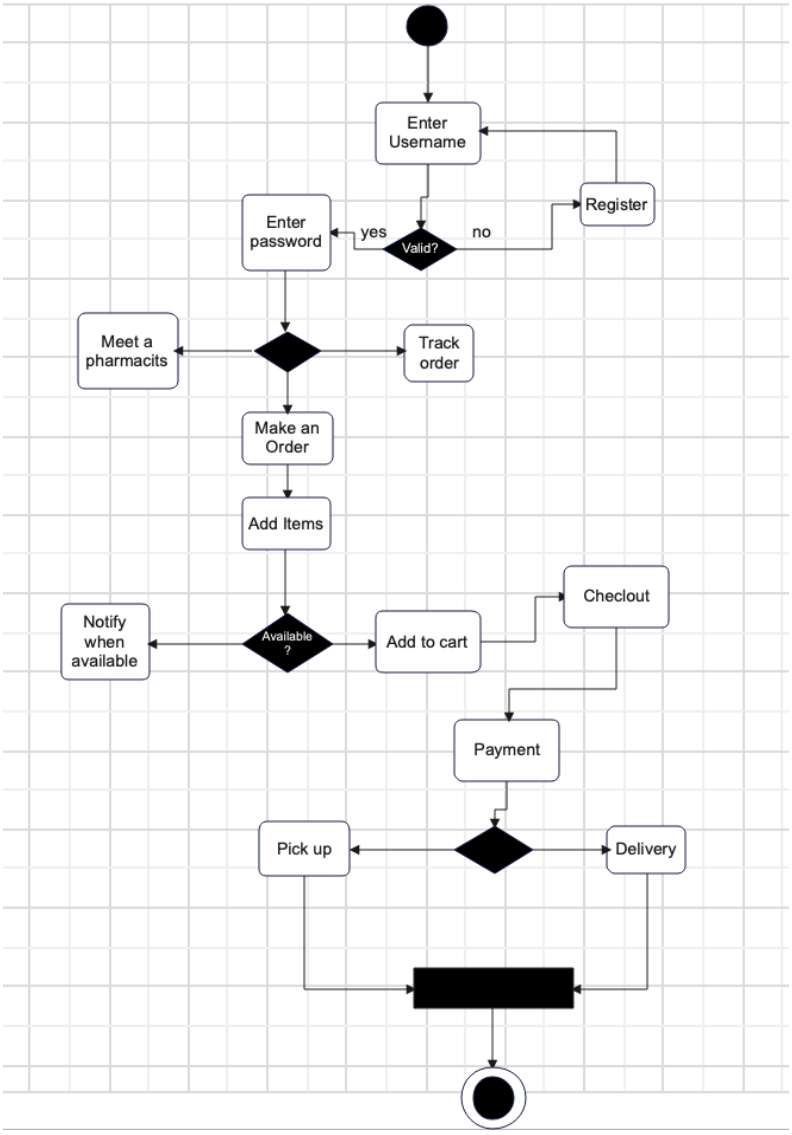
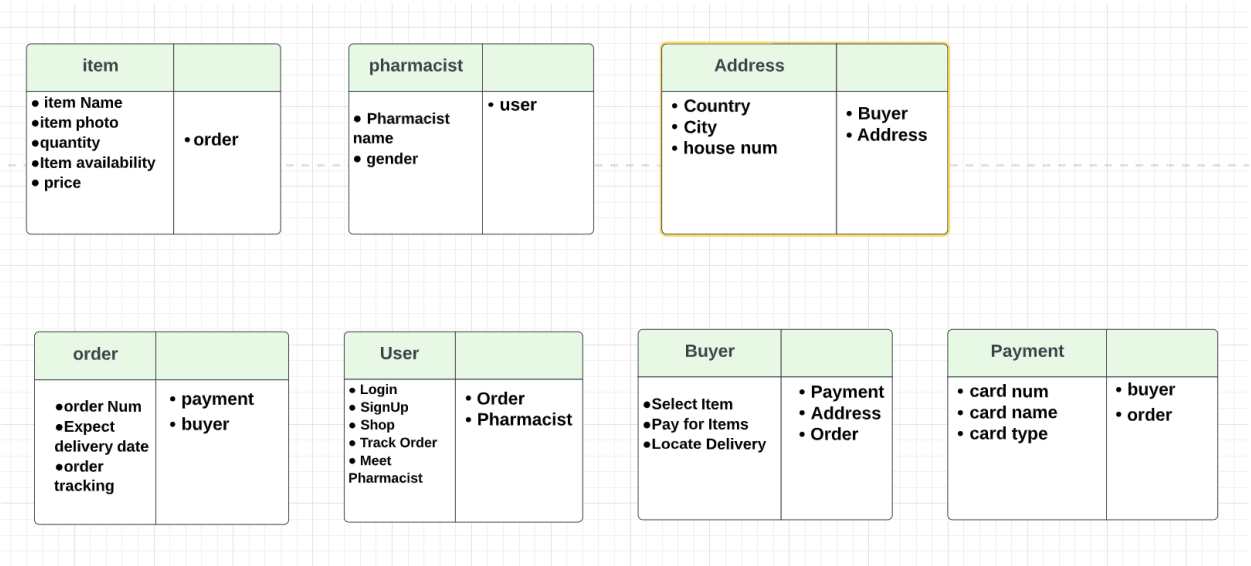
- **Activity Diagram:**



Phase 4: Software Design

- **CRC:**



- **Software Architecture Design:**
- **Architectural Genre:**

Al Habib pharmacy application has three genres, Communication, medical and financial; the system provides infrastructure for transferring and managing data, connecting users and for presenting data at the edge of an infrastructure, and it includes a contact with pharmacists, and it also provides the infrastructure for transferring money and other securities and their management.

- **Architectural Style:**

The architectural style for our software is a Thin Client 2-Tier architecture. In thin client 2-tier architecture, the client only has access to the presentation layer, where the data layer resides in the server. This architecture has many benefits. Such as, security, the sensitive information is centralized and secured in the corporate cloud. Also, it has easy management that reduces time spent by IT deploying, updating and managing employee computers. Lastly, it is affordable and reduces cost to run and maintain.

- **Fundamental concepts:**

1- Abstraction:

Abstraction's major objective is to keep implementation details hidden from the user in order to reduce complexity. The interface between the user and the system they are working on is made simpler via abstraction. This has been demonstrated by using the programming language "php," which offers various functions that allow users to know what they are doing without knowing the specifics of how they are doing it.

2- Hiding:

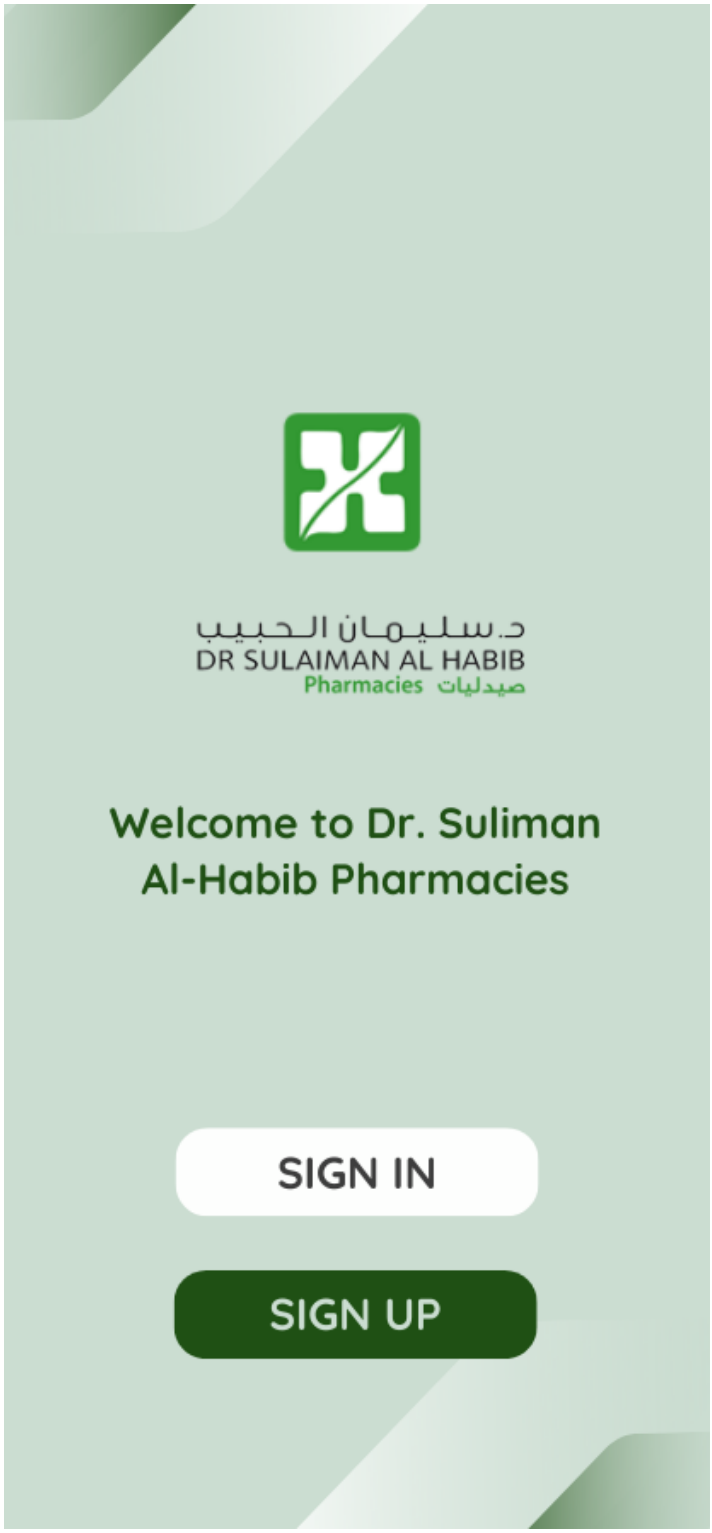
Each module/function in the system hides the internal details of its processing operations when employing the information hiding strategy, and modules can only communicate with one another through clearly specified interfaces. Information hiding may be applied to hide data structure, internal linking and the specifics of how the classes and interfaces that manage it are implemented, character codes and information about how they are used and a few machine-dependent details include shifting, masking, and others.

3- Functional independence:

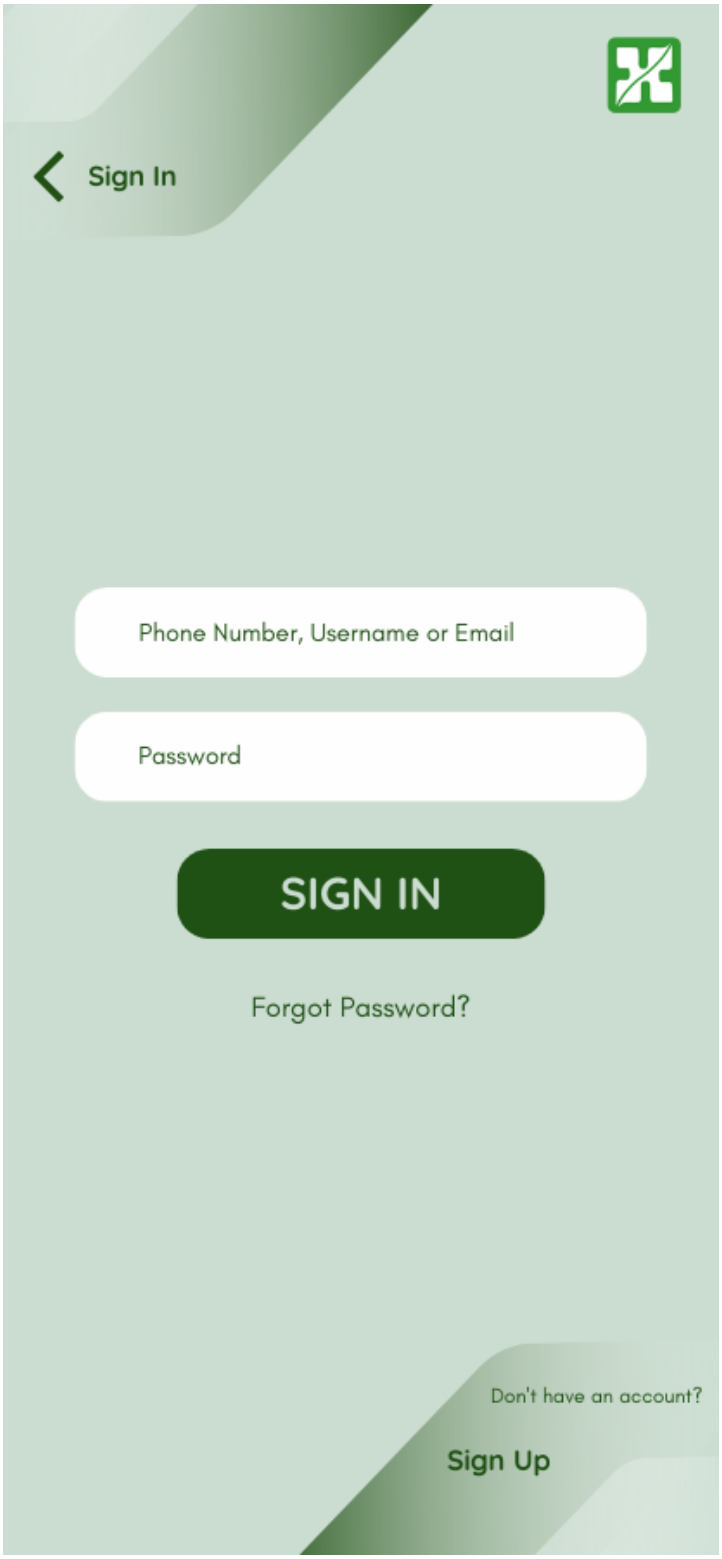
Functional independence is a key to good design, and design is the key to software quality. And that is being applied when a module focuses on a single task and is able to accomplish it with minimal\interaction with other modules. Functional independence has the significant benefit that errors in one of its modules won't affect the others. That is what we achieved in our program since each module on this website works on a specific feature separately as one task without assistance from other classes or modules.

Phase 5: Prototype

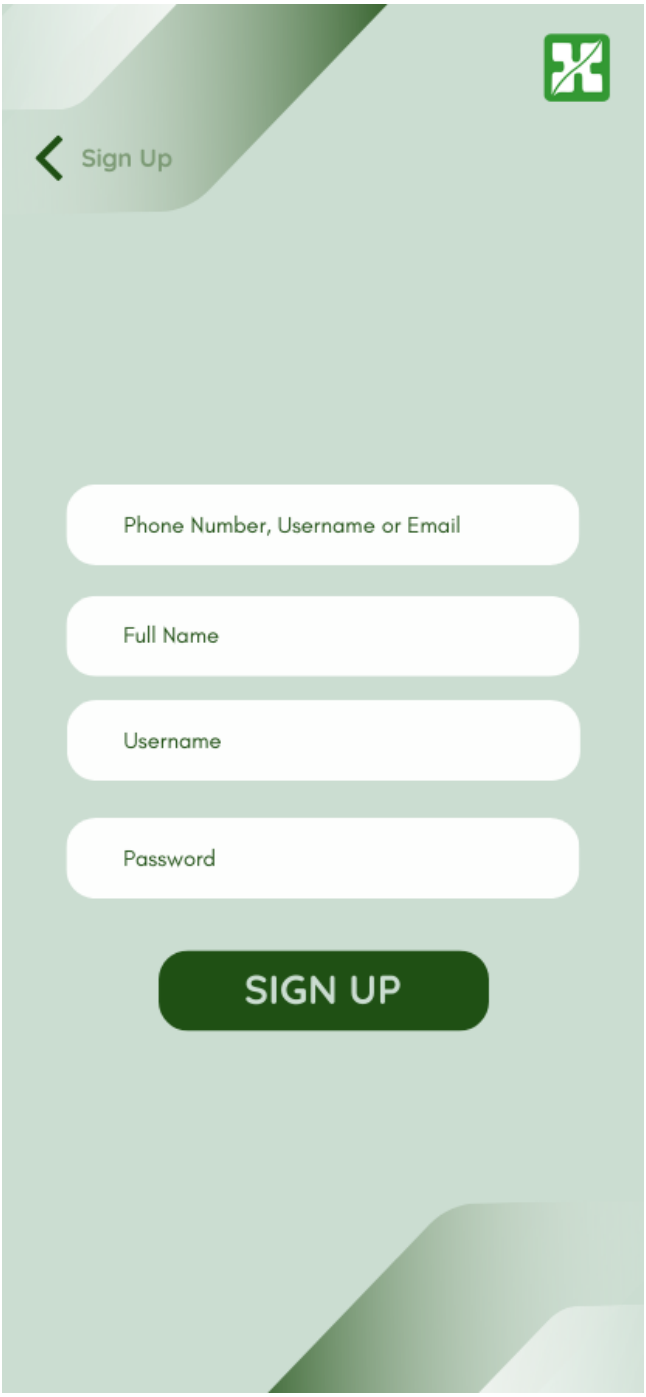
First page : When the user first enters the application, it will automatically display this Welcomepage. They can choose to sign in if they have already registered an account, or Sign up if they haven't.



Second page: If they click on Sign in, this sign in page will show up for them to get their required information. They can choose whether they want to sign in using their Email Username or Phone number in the first field, and Password in the second.

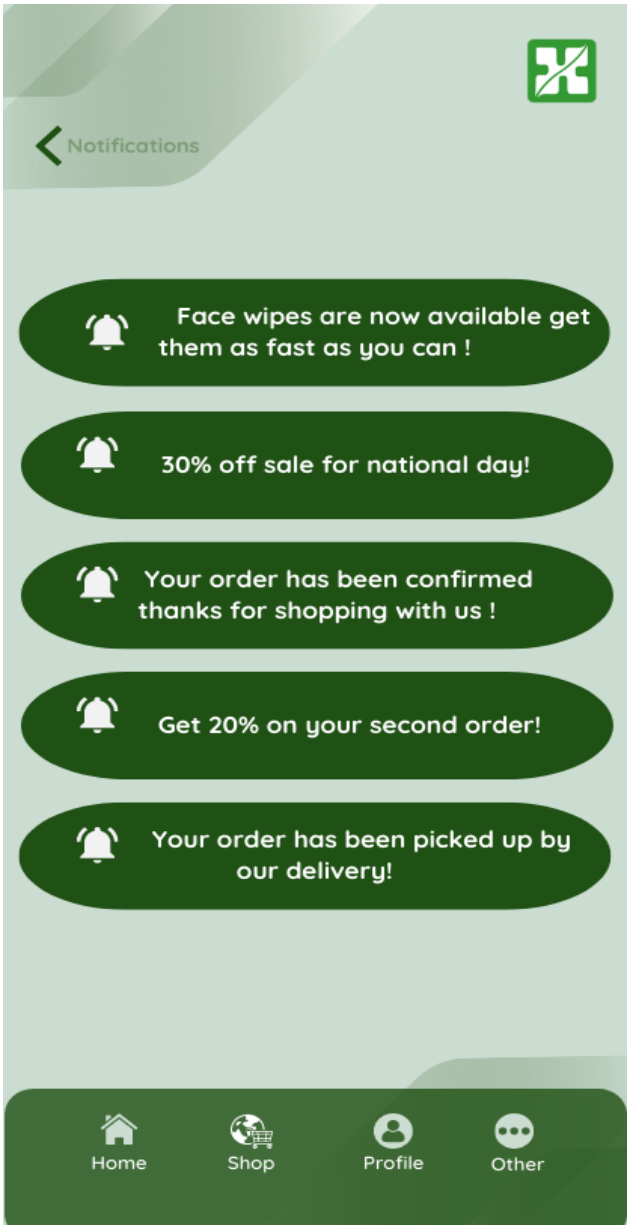


Third page: If they click on Sign up, this sign up page will show up for them to fill out their required information. Such as, Email, Password and Mobile number.



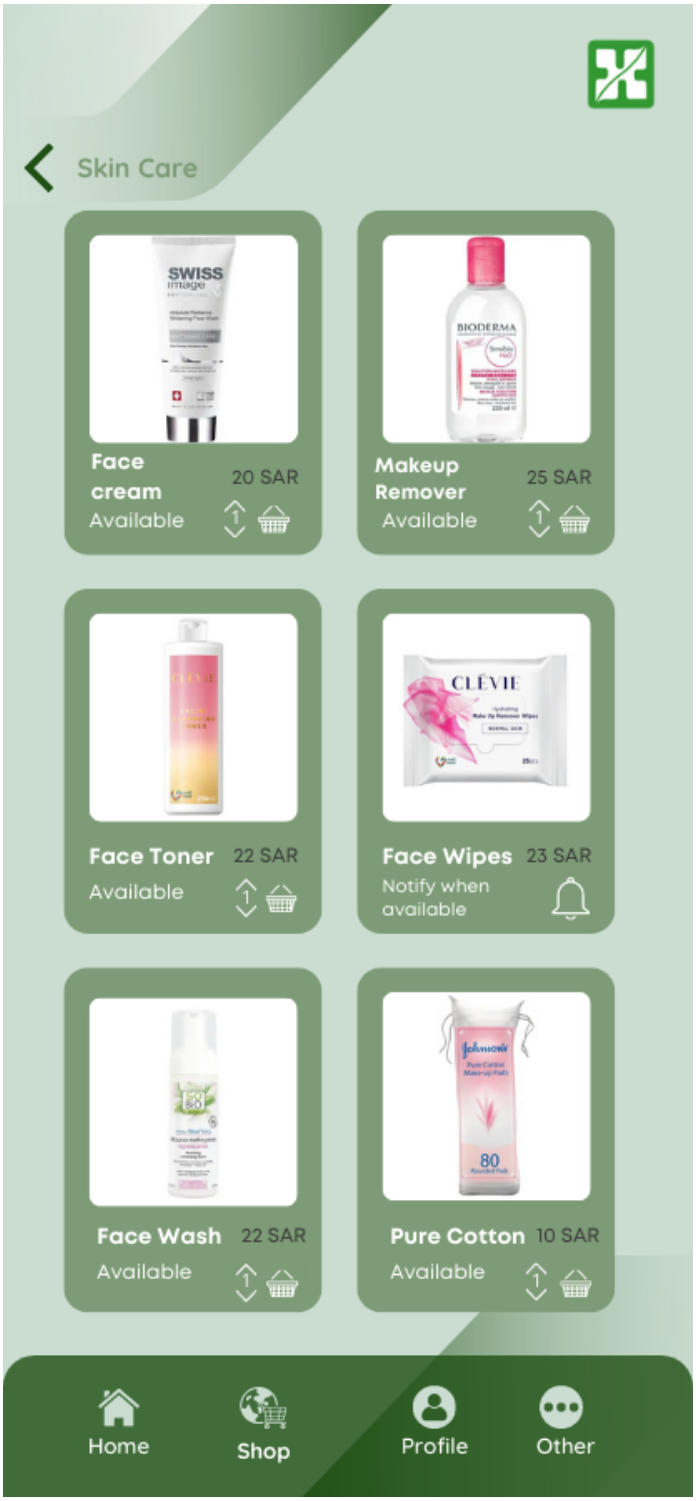
Fourth Page: When the user clicks on Home, this page will provide them with a selection of services. Like, Shop, track order, meet pharmacist or notifications.

Fifth Page: If they log in/sign up, and click on notifications they will find the newest release,offers and the order situation.

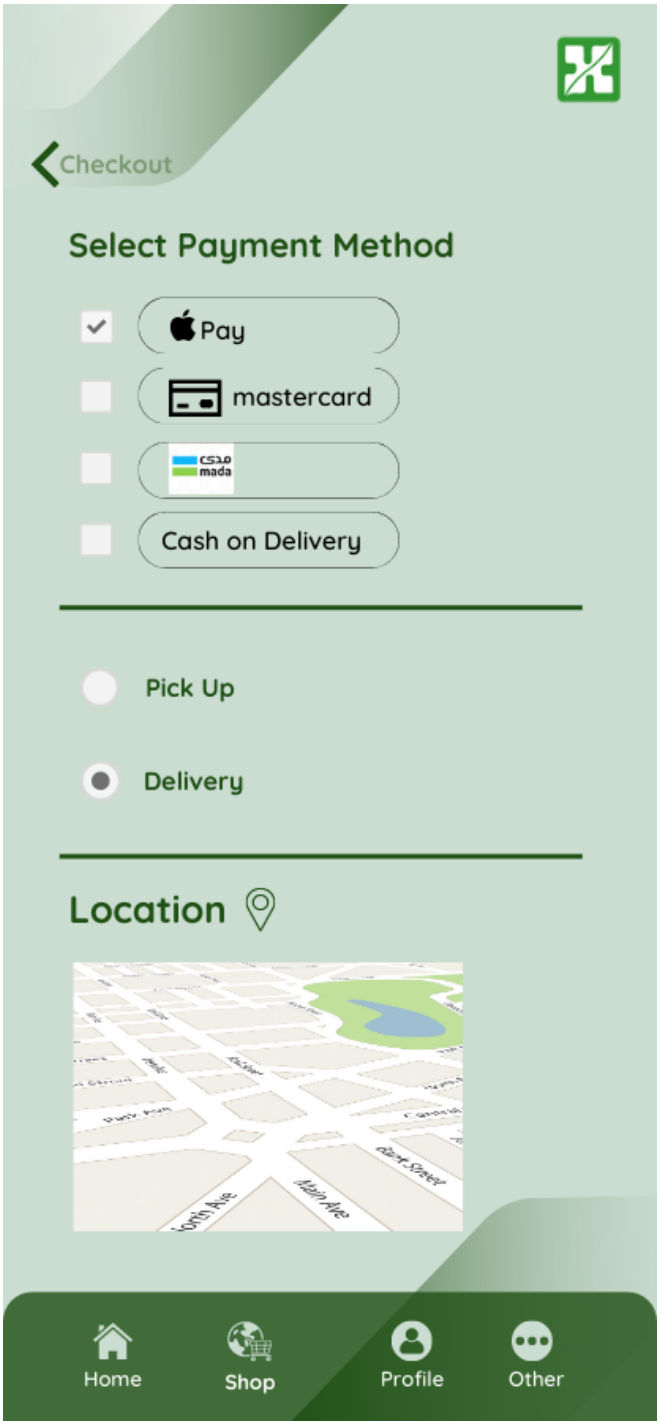


Sixth Page: If they click on the shop page, they will find all the categories that are provided by the pharmacy.

Seventh Page: If they click on one of the categories they will find the related products.

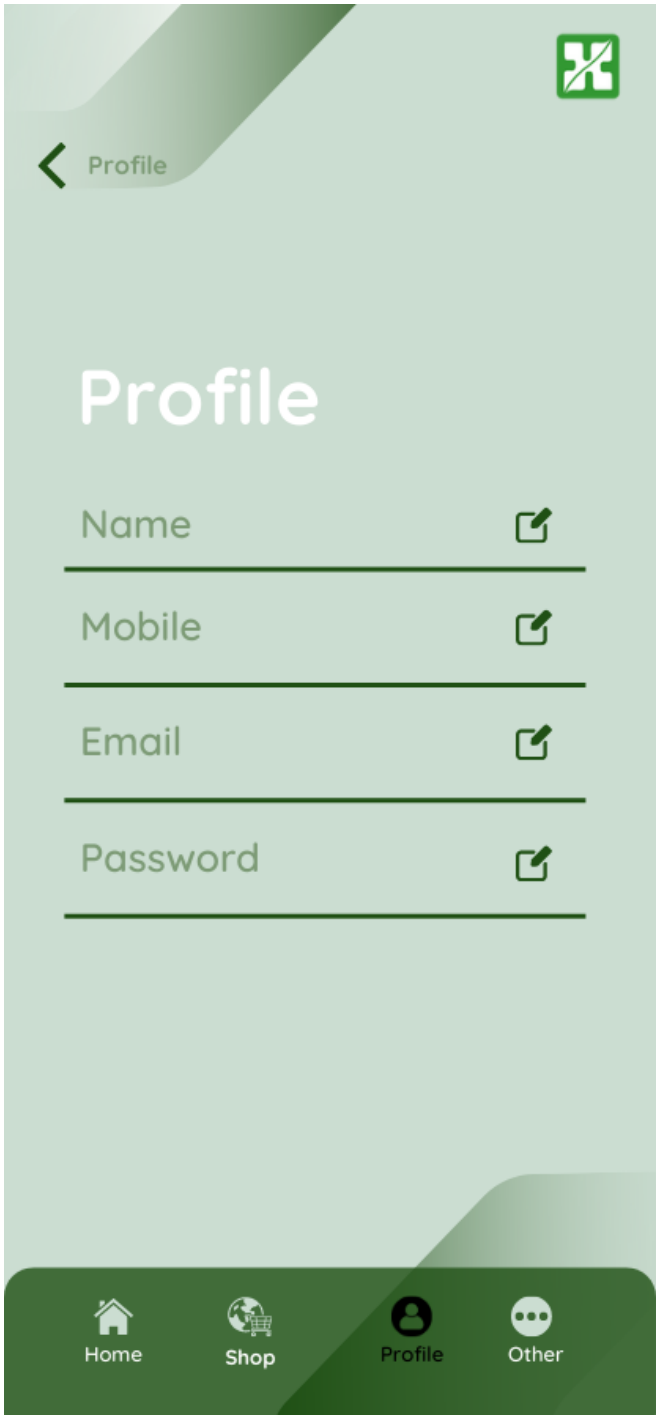


Eighth Page: If they place an order they follow up by the checkout page where they will pay and complete the location information .

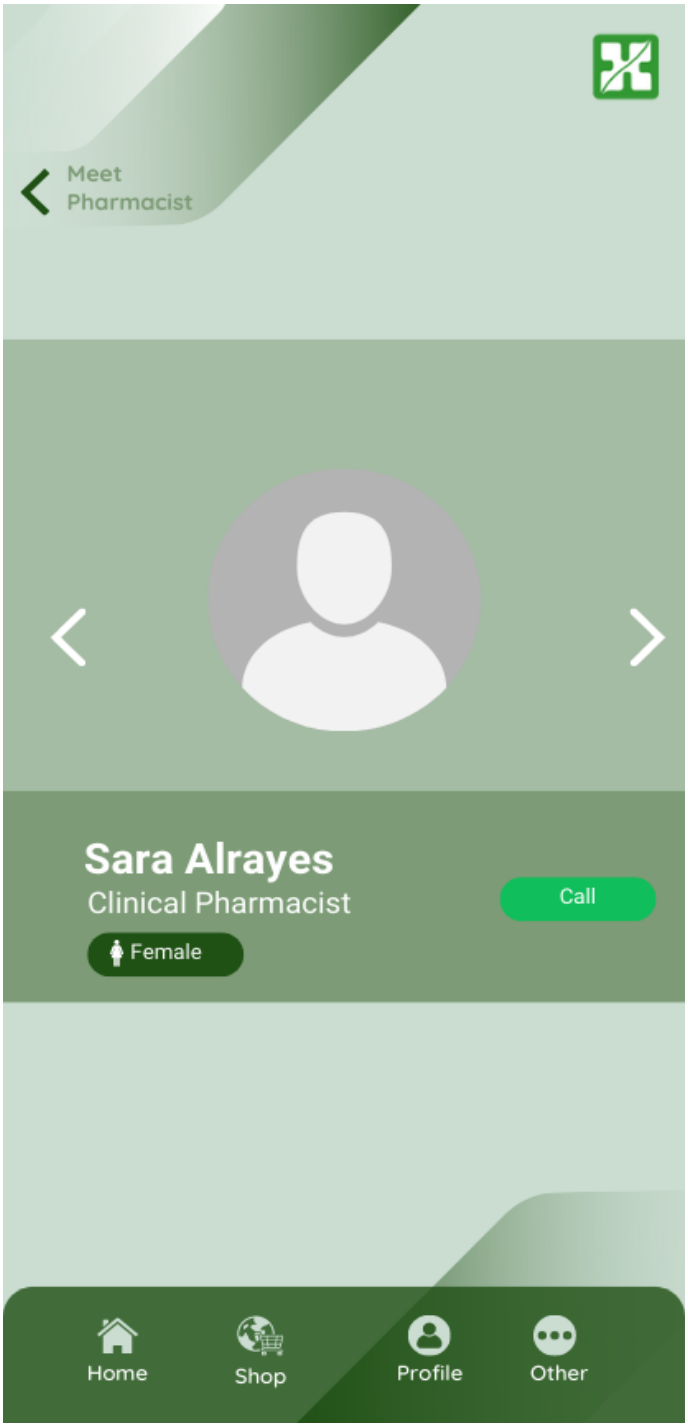


Ninth Page: If the user wants to check her/his order, this page will appear and provide them the status of the order, the items and the quantity.

Tenth Page: If they click on profile they will find all their information to edit.



Eleventh Page: if they click on meet a pharmacist they can have an immediate call with one of the associating pharmacists.



ACM CODE OF ETHICS

The way we went about working on this project was extremely seamless because of our adherence to our ethics regarding the responsibilities and the mutual respect and understanding given to each other.

Some examples of codes we followed are:

3.1 Ensure that the public good is the central concern during all professional computing work.

3.5 Create opportunities for members of the organization or group to grow as professionals.

2.3 Know and respect existing rules pertaining to professional work.

1.5 Respect the work required to produce new ideas, inventions, creative works, and computing artifacts.

2.2 Maintain high standards of professional competence, conduct, and ethical practice.