



Software Engineering Project



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Task Table

	Rana Alsaedi	Batul Mrkn	Manar Almatrafi	Jenan Ibrahim	Manar Hakami
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The background of the page features a repeating pattern of stylized, overlapping tropical leaves in shades of teal, white, and light green, creating a sense of depth and texture.

Chapter 11

Project Proposal

4.1.1.Scope

Taafi is a unique version of health applications with many features that focus on the medical aspect of dealing with medications in particular.

We plan to introduce our application to hospitals, pharmacies, and patients. Our main goal is to provide a simple, quick, and easy-to-use software that improves the patients' recovery and healing process. Similarly, we aim to provide a solution that streamlines this process and improves patient outcomes.

What makes **Taafi** special is the ability to have a completely self-managed healing journey by the patient where they will be able to view all stages of treatment under the supervision of a doctor. It also allows doctors to check the patient's previous medications and alerts them if one of the medications conflicts with any other that the patient is currently taking.

The inspiration for our health application stems from the need to simplify the process of managing medications for patients and doctors alike. With many patients requiring medication management in their homes, it can be challenging to keep track of dosages, alternatives, and communication with healthcare providers. However, by making medication management easier and more accessible, we hope to empower patients to take control of their health and improve their overall quality of life.

4.1.2. System Specifications

I- What is the software idea?

An application that acts as a portal between patients and hospitals when it comes to medications. It has all medications that the patient takes categorized appropriately. Doctors can view patients' profiles and see all medications that are currently in use so that the doctor does not prescribe a medication that will react badly with anything in use. The doctor has the option of adding new medications and the dosage for them. They can also add/view any scans or tests that the patient has had, as well as all illnesses that the patient was previously diagnosed. Moreover, our application provides each medicine and its exact substitutes (**the only difference is brand name, not ingredients**) as well as a list of all side effects and purpose of use. It can also show all nearby pharmacies that sell the medicine and/or its exact substitute. It also has an option for which a patient can choose, if they took an overdose medicine, they simply enter how much they have taken and the application will determine the risk factors, if it is life-threatening, it would notify nearby hospitals, otherwise, it would give the side effects and the right action for it (Ex. Skip next dose).

It can also connect patients and doctors through a chat option if the patient has any questions or side effects that they are unsure about with the option of taking pictures (Ex. For rashes). It can also advise certain lifestyle or diet changes in case a patient has a clinical illness. The patient can get notified by the application in case of any recalls, price changes, or new substitutes. It can notify patients of any new updates and alerts from the SFDA.

2- What are the user categories?

Patients, hospitals, pharmacies, and doctors.

Patients: The age range to use the application is +16, in addition to the possibility of adding younger children by their guardians as beneficiaries.

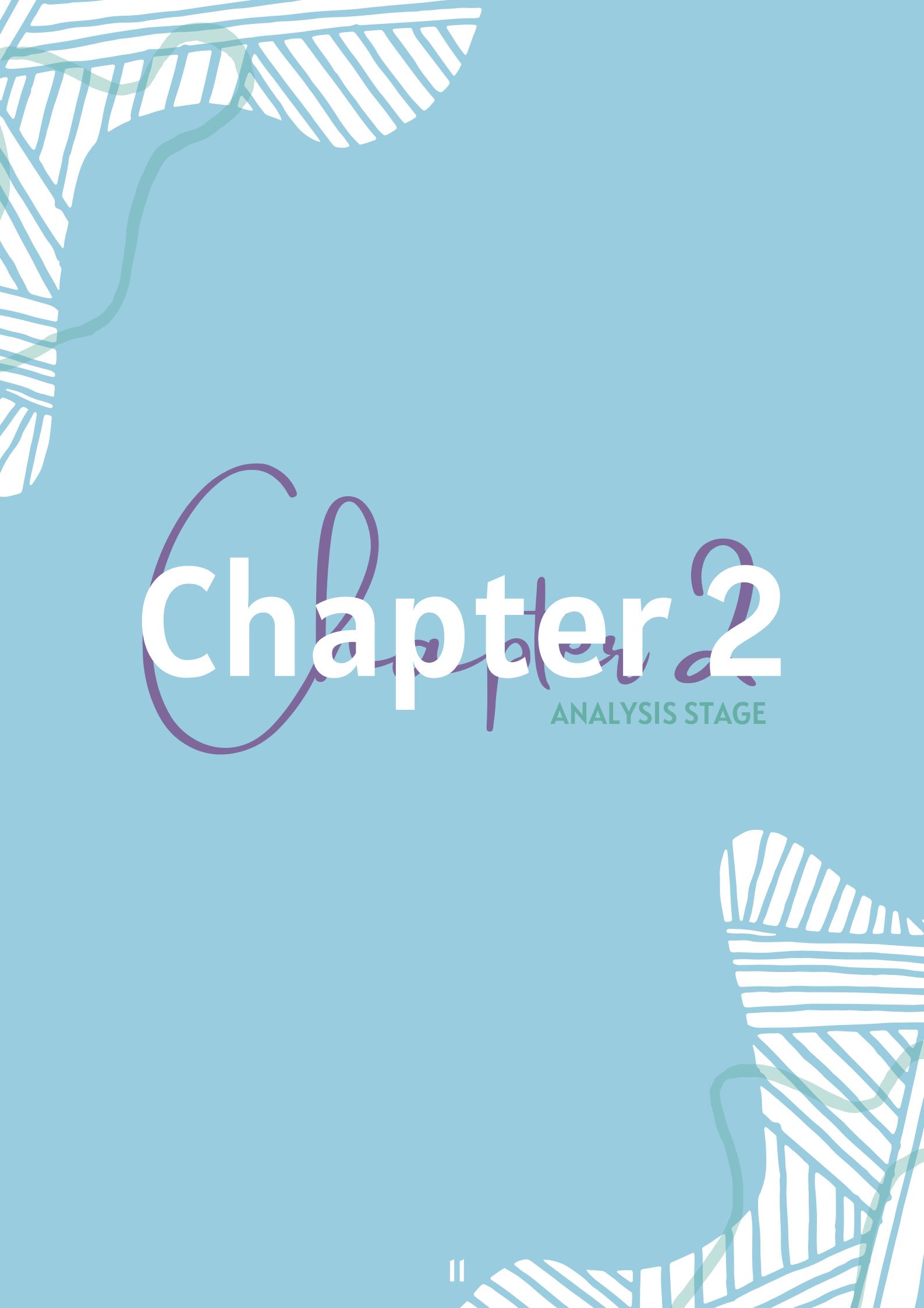
Hospitals: Must be a registered hospital in the city.

Pharmacies: Must be a registered pharmacy in the city.

Doctors: Must have a valid medical license.

3- How are you going to gather the information about your project?

We will conduct a survey. The reason for that is because we want to reach as many people as we could, since the idea is for the vast majority of people if not all!



Chapter 2

ANALYSIS STAGE

5.1. System Requirements

5.1.1 Functional Requirements

Patient

- SET OVERDOSE
- CHATBOT
- CHAT WITH A DOCTOR
- SET REMINDER
- VIEW PROHIBITIONS
- VIEW RECOMMENDATIONS

Doctors

- ADD PATIENT
- CHAT WITH A PATIENT
- VIEW PATIENT

- SIGN UP
- VERIFICATION
- LOG IN
- EDIT INFORMATION
- VIEW HEALTH RECORD
- SEARCH MEDICINE
- ADD MEDICINE
- VIEW MEDICINE
- SEND ALERT
- VIEW HOSPITALS
- VIEW PHARMACIES
- PHARMACIES PURCHASE

For short we will put these icons:

- Functional for the patients:
inside a green rectangular
- Functional for the doctor:
inside a purple rectangular
- Functional for both (doctor and patients):
inside a blue rectangular

5.1.1.1 SIGN UP

User requirements:

The user shall be able to create a new account and their data will be saved.

System requirements:

- The System at first will ask whether the user is a doctor or a patient and then display a form like interface so users can enter their data (name, national identification number, email, password, confirmation of the password, date of birth, phone number, User identification, User gender and city).
- Name: The name must contain (first name - last name).
- National ID: It must contain 10 digits only.
- Email: It must be unique and not match any other patient or doctor's email in the database. It must contain the @ sign followed by Hotmail, Gmail, etc., followed by .com.
- Minimum length: The password must be at least 8 characters long.
- Complexity: The password must contain a combination of uppercase and lowercase letters, numbers, and special characters (!@#\$%^&*).
- No personal information: The password cannot contain personal information, such as the user's name, username, or birthdate.
- No common words: The password cannot contain common words or phrases, such as "password" or "123456".
- No reuse: The user must not be allowed to reuse their previous passwords.

5.1.1.1 SIGN UP

System requirements:

- Date of birth: The user must be at least 16 years old, and the date of birth format should be day-month-year, as the days range from 1-31 according to the month, and the months range from 1-12
- The year is calculated as follows: Current year – 16
- phone number : It must be unique and not match any other patient or doctor's phone number in the database also It should contain only 9 digits plus 966
- User identification: The user shall be a patient or a doctor
- The system must contain two different interfaces for patients and doctors to access the features allowed to them
- City: The person must be a resident of the Kingdom of Saudi Arabia
- User gender: The person must specify if he is male or female
- (D)-License: The doctor must provide their license to be approved.
- After the verification the System will now save the data of the user in a database.
- The user now can enter the application with full access

5.1.1.2 VERIFICATION

User requirements:

The user shall be able to enter a verification code.

System requirements:

- Entering the code: The system must provide a field for the user to enter the verification code
- Token validation: The system must check if the entered code matches the submitted code
- Navigation: If the icons match, the system directs the user to the main interface, whether it is a patient or a doctor. If the codes do not match, the system will display an error message and prompt the user to enter the correct code.
- By implementing these system requirements, the application can ensure that users can securely register and verify their accounts. The verification code helps to ensure that the user's phone number is valid and prevents unauthorized access to the user's account.
- The validation and navigation features help to ensure the security and privacy of user data by preventing unauthorized access to the system. Additionally, the data storage feature ensures that user information is securely stored and can be accessed when needed.

5.1.1.3 LOG IN

User requirements:

The users will be able to login and enter the application with their saved data

System requirements:

- The system must have a login method to authenticate users if a previous account exists and ensure that only authorized users can access the application's features.
- User Authentication: The system shall provide a secure login system that authenticates users using their user ID and password. The login form shall be displayed to the user and include fields for user ID and password. Separate user interfaces shall be provided for patients and clinicians, with fields specific to each user type. The system shall authenticate the user by checking the entered user ID and password against the database. If the user enters an incorrect password three times, the system shall lock the account for a specified period of time for security purposes. If the user enters incorrect login credentials, the system shall display an error message stating "Incorrect login credentials! Please verify the information entered."

5.1.1.3 LOG IN

System requirements:

- **Navigation:** If the user enters the correct user ID and password, the system shall navigate the user to the main interface.
- **Verification:** If the user's account requires verification, the system shall display a verification form to the user which includes fields for entering the required information. Once the user enters the required information, the system shall verify the account and navigate the user to the main interface.
- By implementing these system requirements, the system can ensure that users can securely authenticate their accounts and log in to the application.
- The authentication process helps to ensure the security and privacy of user data by preventing unauthorized access to the system.
- The verification feature helps to prevent fraudulent account creation and ensures that the user's account is valid. Additionally, the separate user interfaces for patients and clinicians ensure that the appropriate information is collected for each user type.

5.1.1.4 EDIT INFORMATION

User requirements:

The users can be able to edit any information (personal or medical) that has been stored.

System requirements:

- The system will be able to change medicines or their dosage for patients if the doctor wanted to. and that is because they are connected together and the same for the patient.
- Any data that is saved in the database about a specific user will show up in this interface.
- The system will show up an interface for the user with all their saved data and the user will be able to edit these data by clicking on the proper icon that matches what he/she wants to change.
- The system will be able to take the written values and compare them to some pattern for each variable.
- if the user wants to edit something, the entered data must match the pattern that is provided for each variable.
- if the pattern was correct the data will be changed and it will be loaded into the database
- if the user was trying to change his\her phone number verification steps must happen.
- if the user changed his\her password the system won't allow them to log in unless they use the new password.

5.1.1.5 VIEW HEALTH RECORD

User requirements:

The doctor and patient can view and edit all medical and health information of that specific patient.

System requirements:

- The system interface will show up with a list of the health history of this user with all the illnesses, diseases, the medicines they have ever taken, and every single detail a doctor has ever entered about this specific user.
- This user's file will be connected with each doctor they ever visited so in the future when they visit a new doctor he\she will be able to view the health state of the patient in a single file.
- This health information will be arranged by date at first, the newest will show at first, and the oldest will show at last but the doctor can use a search engine and write some keywords so the system will show only the details they need.
- As long as a doctor adds something to this user's file, the user won't be able to edit it in any form. Only the doctor can correct or edit any information.

5.I.I.6 SEARCH MEDICINE

User requirements:

The users will be able to search up a medicine.

System requirements:

- The system will show information about the medicine and view all drugs with the same formula but different trade mark.
- The system will take the entered medicine name by the user and search up the medicines database that it is connected with and if a match was found the system will show all the details about this specific medicine.
- The system will also inform the user if there were some medicines that have the same formula of what they have entered.
- If the entered value didn't match any pattern in the database a ("This medicine was not found in our database please try again and make sure your spelling is correct".) message will be displayed in the interface.
- If there is no alternative in the database, the system will display the message ("No alternative").
- as long as the search method is needed to do this function the search method must be fast.
- If the user searches for some medicines repeatedly it will be loaded in the cache so it won't take a long time to find it next time.

5.1.1.7 ADD PATIENT

User requirements:

The doctor will be able to add patients and their data.

System requirements:

- The system will ask the doctor to add the patient's ID.
- If the ID was correct the doctor can view all their information.
- The system will show up a message (Are you sure you want to add this file?) with some of the details about the user -> name, ID, phone number.
- The system shall make sure that the doctor is adding the right patient by calling their saved number or using the chat. or simply if the patient visited the doctor's office they just can make sure that this is the right file. the system will send a message (Doctor "some-name" is trying to connect with you, do you want to accept this connection?) to the patient after the doctor confirm this patient. if the verification was done successfully the system will take the health file of that specific patient and add it to the patients section in the doctor's page. the doctor's information will be updated in the database. the doctor will now have full access to the user's medical record.

5.1.1.8 ADD MEDICINE

User requirements:

The doctors/patients shall be able to add medicines and dosage.

System requirements:

- The system should allow adding a medicine if there isn't any conflict with other medicines.
- Otherwise, the system should appear a message for the doctor/patient that there is a conflict and they can't add this medicine.
- If there is a medicine conflict the system should show if there are any similar medicine the patients can take with no conflict with any other medicines they have.

5.1.1.9 SET OVERDOSE

User requirements:

The patients shall be able to tell when they take an overdose.

System requirements:

- The system will ask the patients if they really have taken an overdose and should allow users to control the number of extra doses by clicking on a button, which should enable them to adjust the number of doses by increasing or decreasing it.
- The system will let the patients talk to their doctors to know what to do, only if it was something the patient can deal with!
- Otherwise, the system should send an alert to the nearest hospital for the patients and to the ambulance.

5.1.1.10 VIEW MEDICINE

User requirements:

- Doctors will be able to view all medicines that patients are taking now and used to take before and whether they are expired or not, and also patients themselves can view it.

System requirements:

- The system should store all of the medications that patients are using now and have used before.
- The system should have sections for medicines:
 - 1: Medicines that patients have taken before but not anymore.
 - 2: Medicines that patients are taking right now.
 - 3: Medicines that patients stop taking due to bad side effects.
 - 4: Medicines that have expired.
- The system should show when did patient take every single medicine, and for How long the patient has used it.

5.1.1.11 CHATBOT

User requirements:

- Patients will be able to view some pre-answered questions that might be enough for them.

System requirements:

- The system shall allow accessing the chatbot.
- The system should have a chatbot that can provide automatic responses to simple questions. For example: the temperature of the medicine.
- The system should have a speaker button with every answer so that the patient can read the answer or hear it.
- If the patients ask the chatbot something that it doesn't know its answer then the chatbot will ask the patients if they want to chat with their registered doctors for detailed and more accurate answer.

5.1.1.12 CHAT WITH A DOCTOR

User requirements:

Patients will be able to chat with their registered doctors.

In emergency cases, the patient can contact the doctor on duty if the registered doctor does not respond.

System requirements:

- The system shall allow communicating with the doctor 24/7.
- The system shall show two chat choices: regular questions/urgent questions.
- The system will inform the doctor by a red sign notification that this chat is urgent.
- The system will send a notification to the patient when the doctor enters the chat.
- The system shall allow the patient to send text messages or images to explain his condition more clearly.
- The system will allow patients with vision problems to communicate with doctors via voice notes.

5.1.1.13 CHAT WITH A PATIENT

User requirements:

Doctors will be able to chat with their registered patients.

System requirements:

- The system will send a notification to the doctor when the patient enters the chat.
- The doctor may send the patient any important requests for blood tests, or x-rays that must be done before the next appointment.
- The system will allow the doctor to read and respond to the patient's questions by text messages or voice notes for patients with vision problems.

5.I.I.14 SEND ALERT

User requirements:

The user shall receive alerts in emergencies.

System requirements:

- The system must be able to send alerts to doctors if any medicines conflict with previous medicine before adding a new one.
- In addition to alerts from the Saudi Food and Medicine Administration while recalling a medicine.
- The system should have a dedicated ALERT center or bell icon on the side user profile page to display all alerts and updates.
- The system will allow these alerts to reach the patient's phone lock screen and top screen as well.

5.1.1.15 SET REMINDER

User requirements:

The users allwos to receive reminders about when to take or stop their medication.

System requirements:

- The system should send reminders after the doctor prescribes the medicine for the patient, by means of notifications that appear to the patient at the time when the patient should take the medicine.
- These reminders should reach the patient's phone on the lock screen and top screen as well. All reminders should appear on the side screen of the app with a bell alert on the user's profile page so that they can explore all the reminders.
- When the system sends a reminder of the date of taking the drug, the user must click on the button until the correct sign appears and a notice next to it (the first dose has been taken).
- The system will send a reminder to stop using the medicine and pass it on to the completed medicines Completed medications will be displayed in a distinct gray color at the end of the treatment period recommended by the doctor.
- The system sends notifications every 10 minutes while not taking the dose. Until the user confirms that he has completed this dose by clicking on the button to complete, and pressing the square to confirm it was taken.

5.1.1.16 VIEW PROHIBITIONS

User requirements:

The users will be able to view all prohibited foods and medications based on their health status and medications

System requirements:

- The system will analyze the user's medical history and prescribed medications to identify any foods or medications that are prohibited by the physician.
- The system will display a list of prohibited items with an explanation of why they are not recommended to the user.
- The system will allow the user to filter the list by category (such as food and medicine) and search for specific items.

5.I.I.17 VIEW HOSPITALS

User requirements:

Users will be able to view all nearby hospitals only in case of emergency

System requirements:

- The system will use the user's GPS or address to display a map of nearby hospitals in case of emergency.
- The system should be able to make the user able to filter hospitals based on distance, ratings, and emergency services provided.
- The system will show the opening and closing times of each hospital and the services they provide.
- The system will allow the user to get directions to the hospital from their current location.
- In case of emergency, the user can press the "أسعفي" / "SOS" button to request rapid intervention and transfer to the hospital via the Saudi Red Crescent service.
- The system will send an emergency alert to the hospital about the patient's arrival and a summary of their previous medical condition to help the hospital prepare for their arrival.

5.1.1.18 VIEW PHARMACIES

User requirements:

Users will be able to view all nearby pharmacies to search for a specific medicine.

System requirements:

- The system will use the user's GPS or address to display a map of nearby pharmacies.
- The system will allow the user to search for a specific medicine and the system will show the pharmacies that have it in stock.
- The system will display the name, address, and contact information for each pharmacy.
- The system will allow the user to filter pharmacies based on their distance, ratings, and availability of the desired medicine.
- The system will show the opening and closing times of each pharmacy to help the user plan their visit.
- The system will allow the user to get directions to the pharmacy from their current location.
- The system will allow the user to save their preferred pharmacies for future reference.

5.I.I.19 BUY MEDICINE

User requirements:

Users will be able to buy medicine from a nearby pharmacy.

System requirements:

- The system shall ask the user for a valid payment option (card) or to pay at the pharmacy.
- The system will provide a list of over-the-counter drugs and medications that are available for each pharmacy.
- The system will allow the user to search manually or by keywords for such medications.
- The system will display the price and quantity of every item.
- The system will allow the user to have a "shopping cart" to which multiple items can be added if they wish to buy more than one item.
- The system will provide the option to change the quantity of any item they wish to order.
- The system will allow the option to choose the preferred day and time for delivery/pickup.
- The system will give the option to confirm their order before it is placed.
- The system shall notify the user of further information regarding their orders, such as preparation or if it is ready to be picked up.

5.I.I.19 BUY MEDICINE

System requirements:

- The system will verify the user's payment information, including the card number, expiration date (in the form of month and year), and CVV (3 digits), before processing the order.
- The system will not allow the user to purchase prescription medication online without a valid prescription from their doctor.
- The system will allow the user to choose between home delivery or pickup at the pharmacy.
- If the user chooses home delivery, the system will ask for their contact information and provide an estimated delivery time. The user will also be asked to provide their delivery address, including the name of the neighbourhood, street, nearby landmarks, and any other relevant information.
- If the user chooses pickup at the pharmacy, they will receive a notification when their order is ready for pickup.
- The system will make sure that the user will receive a receipt for their purchase, either in paper form at the pharmacy or via email if they choose home delivery.
- The system will keep a record of the user's purchase history for future reference.

5.I.I.20 VIEW PATIENT

User requirements:

The doctor shall be allowed to the Prescription Management

System requirements:

- The system should have a feature that allows doctors to record and manage prescriptions for their patients.
- This feature should include the ability to add, modify, and delete prescriptions.
- The system will allow the doctor to view all medications that the patient is currently or has recently used.
- The system will allow the doctor to view all lab results and imaging reports.
- The system will warn the doctor if a medication that was added reacts badly with another medication that the patient is taking or their interferes with their lifestyle (diabetes, heart problems, etc).

5.1.1.21 VIEW RECOMMENDATIONS

User requirements:

Users can view some health recommendations based on their health status to improve their lifestyle.

System requirements:

- The system shall have access to the patients basic medical data without interfering with their privacy, such as age, sex, any clinical illnesses, and lifestyle factors (diet and exercise habits).
- The system shall have the ability to analyse all given data to generate personalized recommendations.
- The system recommendations shall be displayed neatly with the ability to prioritize more important info at the top.
- The system will be simple, easy to read bullet points where the user can scroll down to view more recommendations, or click on a recommendation to learn more about it.

5.1.2 Non-Functional Requirements

5.1.2.1 Security

- safe login and users data cannot be hacked.

- The application should have robust security features to protect user data and prevent unauthorized access.
- The application should have secure payment processing to protect users' financial information and prevent fraudulent activities during the purchase of medicines. It should comply with industry standards for secure payment processing, such as Payment Card Industry Data Security Standard (PCI DSS), and use encryption to secure all transactions.
- The application should also have measures in place to prevent unauthorized access to payment information and ensure the integrity of financial transactions.

5.1.2.2 Efficient

Doctors must respond in 1 hour or the patient will be connected to another doctor.

5.1.2.3 Compatibility

The system should be compatible with different devices and operating systems, such as iOS and Android.

5.1.2.4 Performance

The system should be fast and responsive, with minimal loading times and smooth navigation, it should also be optimized for performance and able to handle large amounts of data and traffic without slowing down.

5.1.2.5 Reliability

The system should be reliable and stable, with minimal crashes or errors. The system should be able to recover quickly from any failures or errors and ensure the continuity of service.

5.I.2.6 Scalability

The system should be scalable and able to handle increasing traffic and user data as the user base grows. The system should be designed to scale up or down with changing user demands and requirements and process large amounts of data, up to several terabytes.

5.I.2.7 Integration

The system should be able to integrate with other healthcare systems and databases to provide seamless user experience and access to relevant information. It should support common healthcare data exchange standards, such as [HL7](#) and FHIR.

5.I.2.8 Accessibility

The system should be accessible to users with disabilities, such as visually impaired users or users with mobility impairments. It should comply with accessibility standards, such as [WCAG 2.I.](#)



underlined words in red are links for pages of related topics.
For more information please check pages 82 -41-42

5.I.2.9 Usability

The system should be easy to use and navigate, with a user-friendly interface and clear instructions.

5.I.2.10 Availability

The system should be available 24/7 to users without any interruptions or downtime.

5.I.2.11 Privacy

The system should ensure the privacy of user data and comply with applicable privacy laws and regulations.

5.I.2.12 Maintainability

The system should be easy to maintain and update, with clear documentation and well-organized code. It should have a low mean time to repair (MTTR) and support continuous integration and deployment.

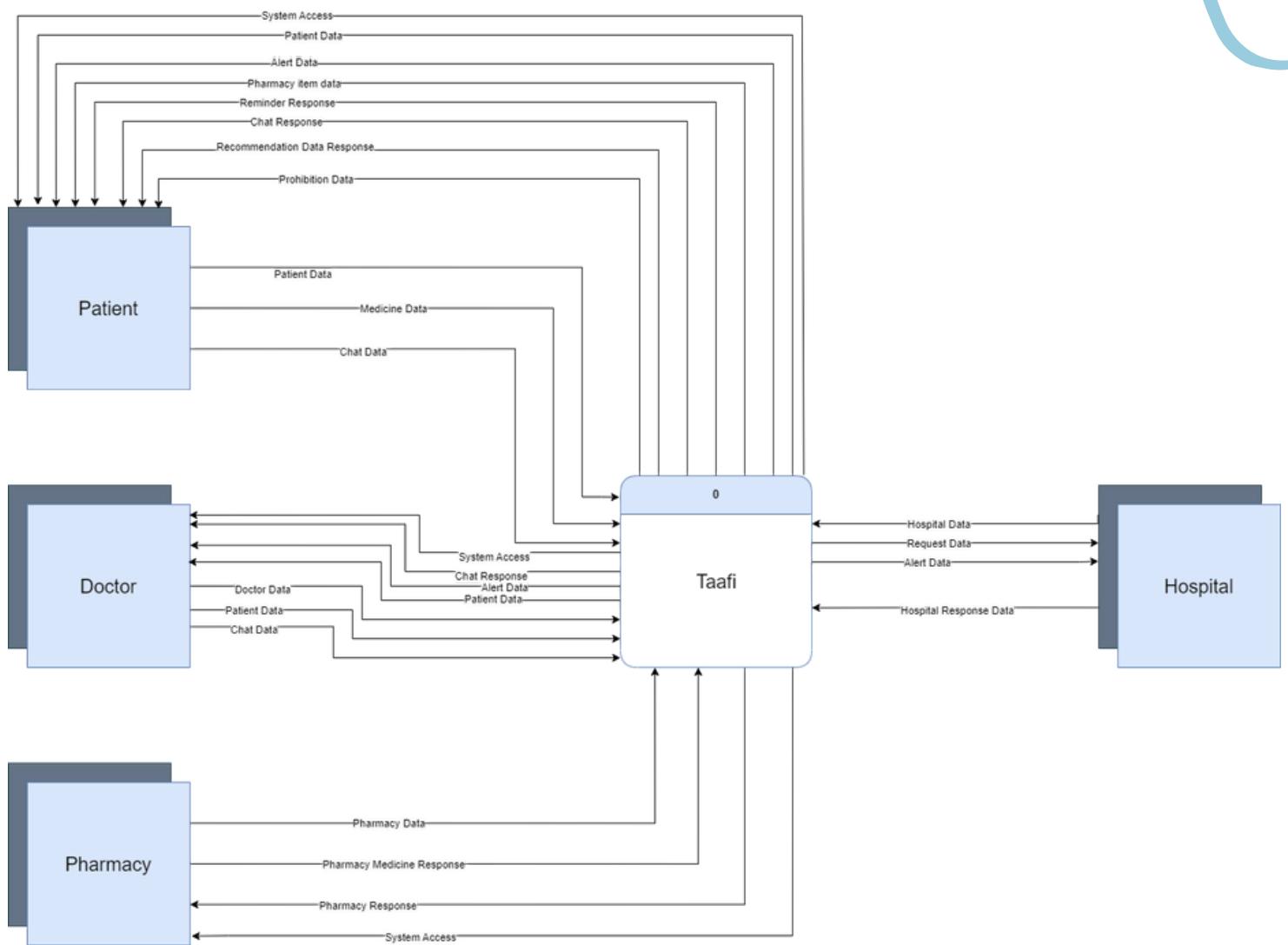


**underlined words in red are links for pages of related topics.
For more information please check pages I2 -42-43**

5.2. System Models

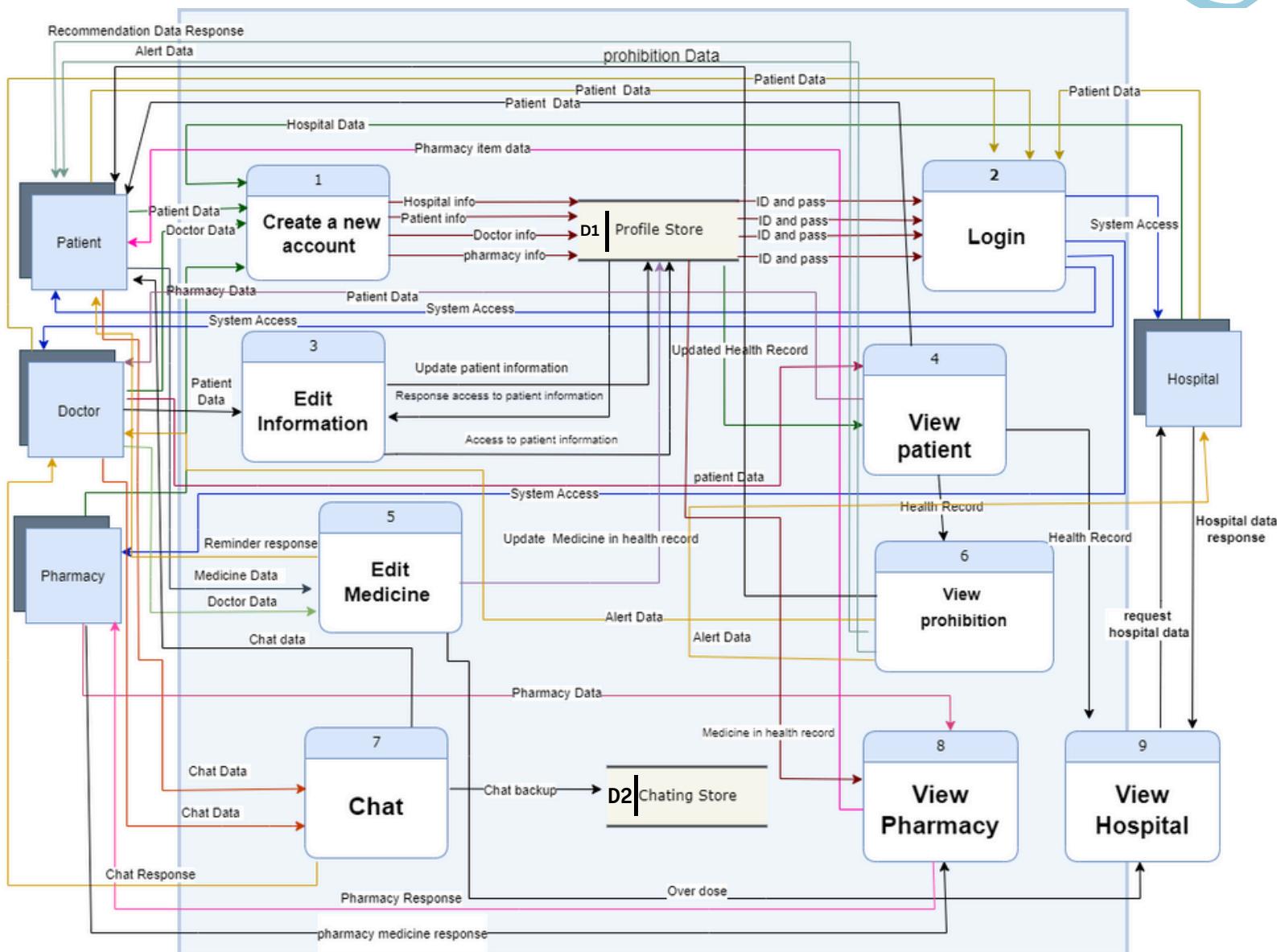
5.2.1. Context Flow Diagram (level 0)

Application used: Draw.io



5.2.2. Data Flow Diagram (Level 1)

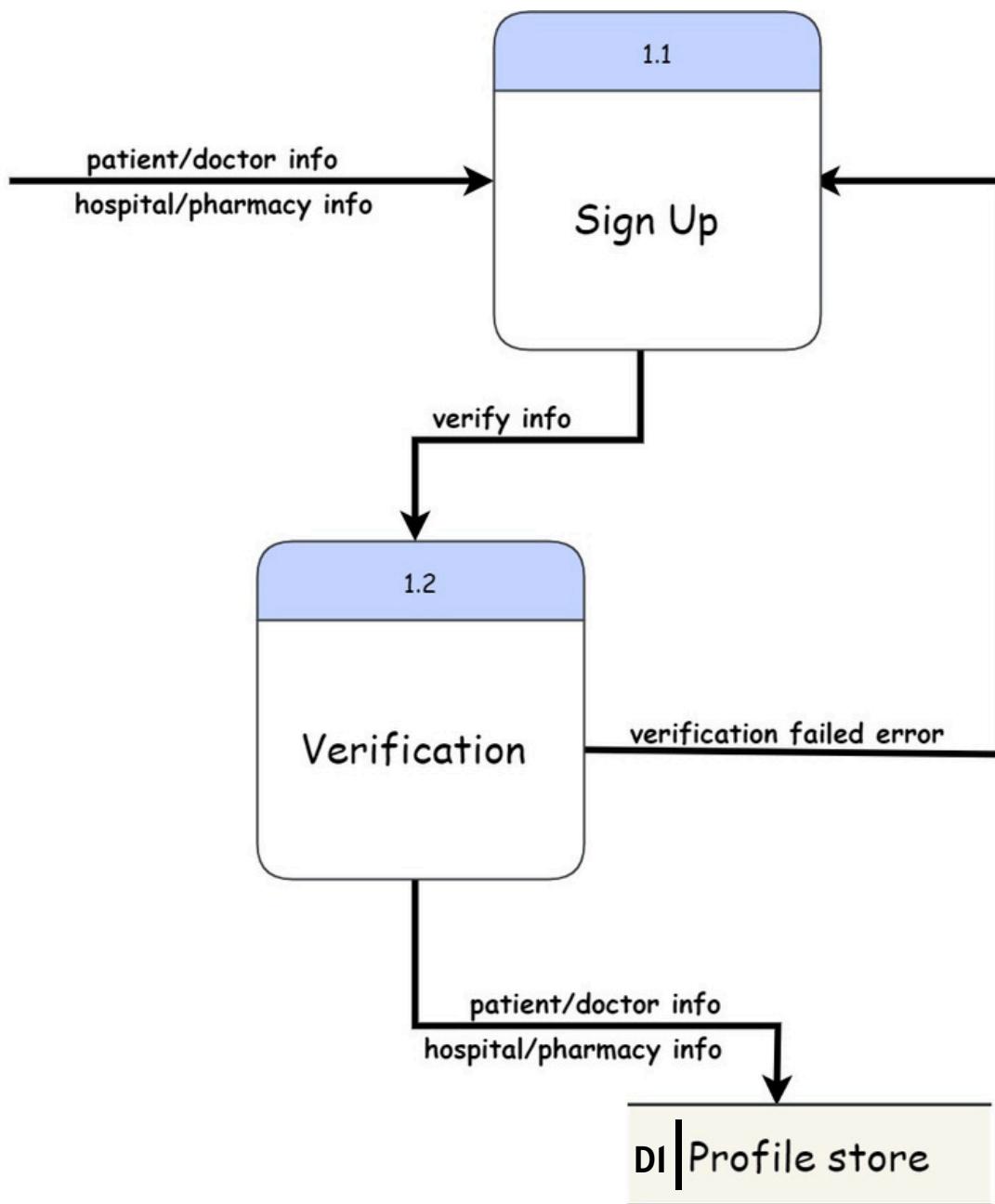
Application used: Draw.io



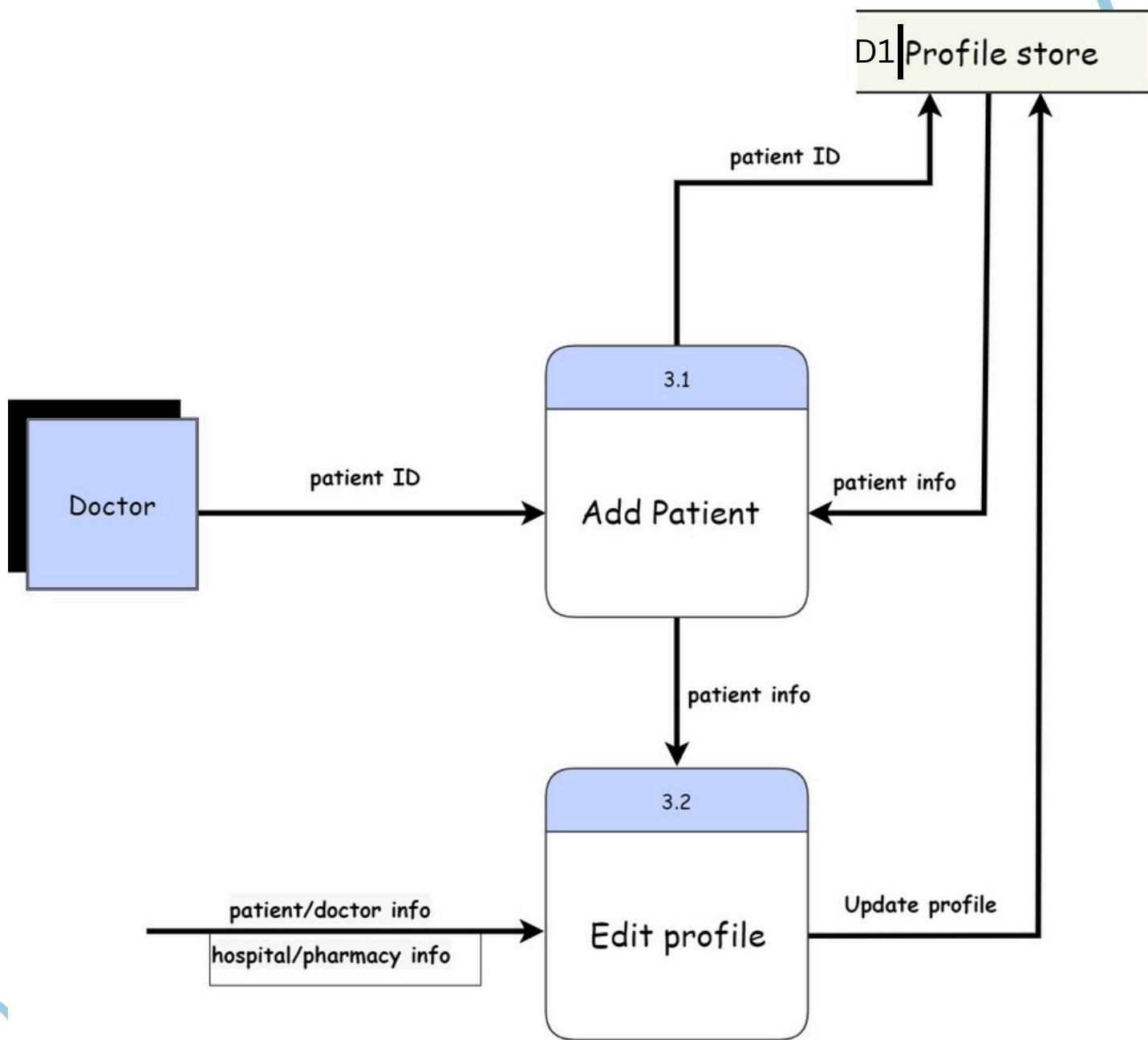
5.2.3. Child Diagram (Level 2)

Application used: Draw.io

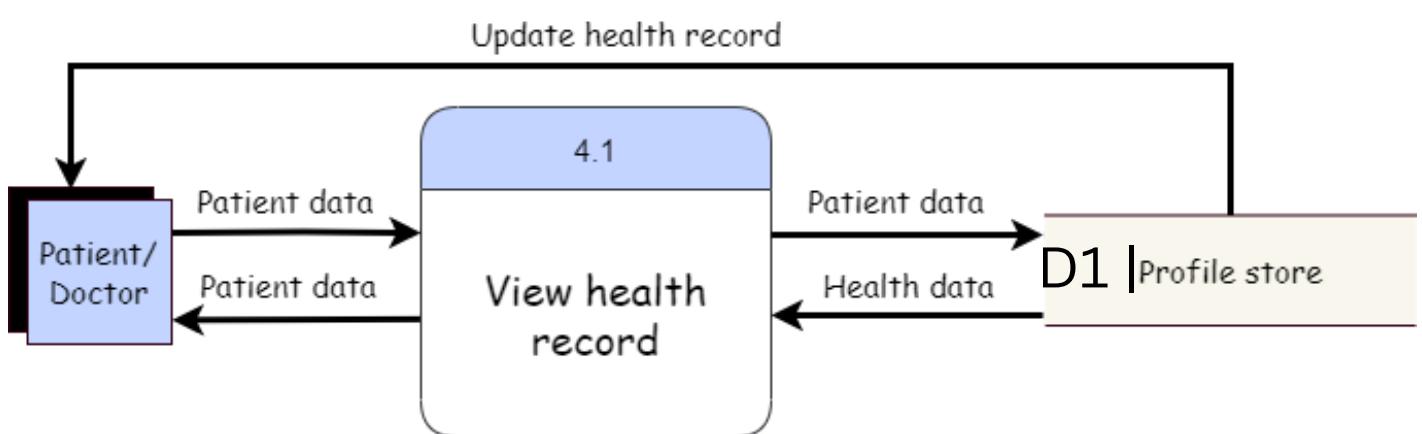
Create account process



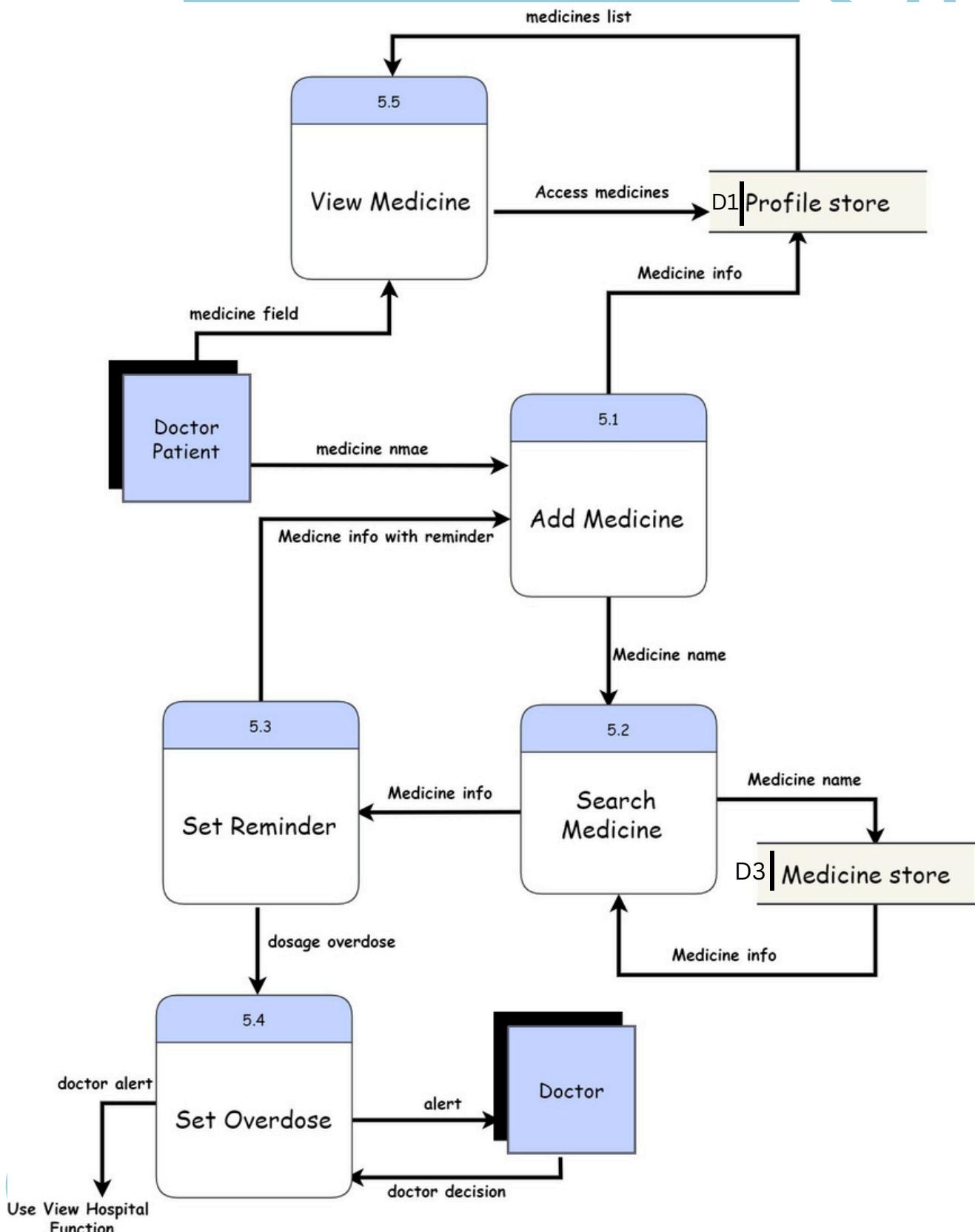
Edit Information process



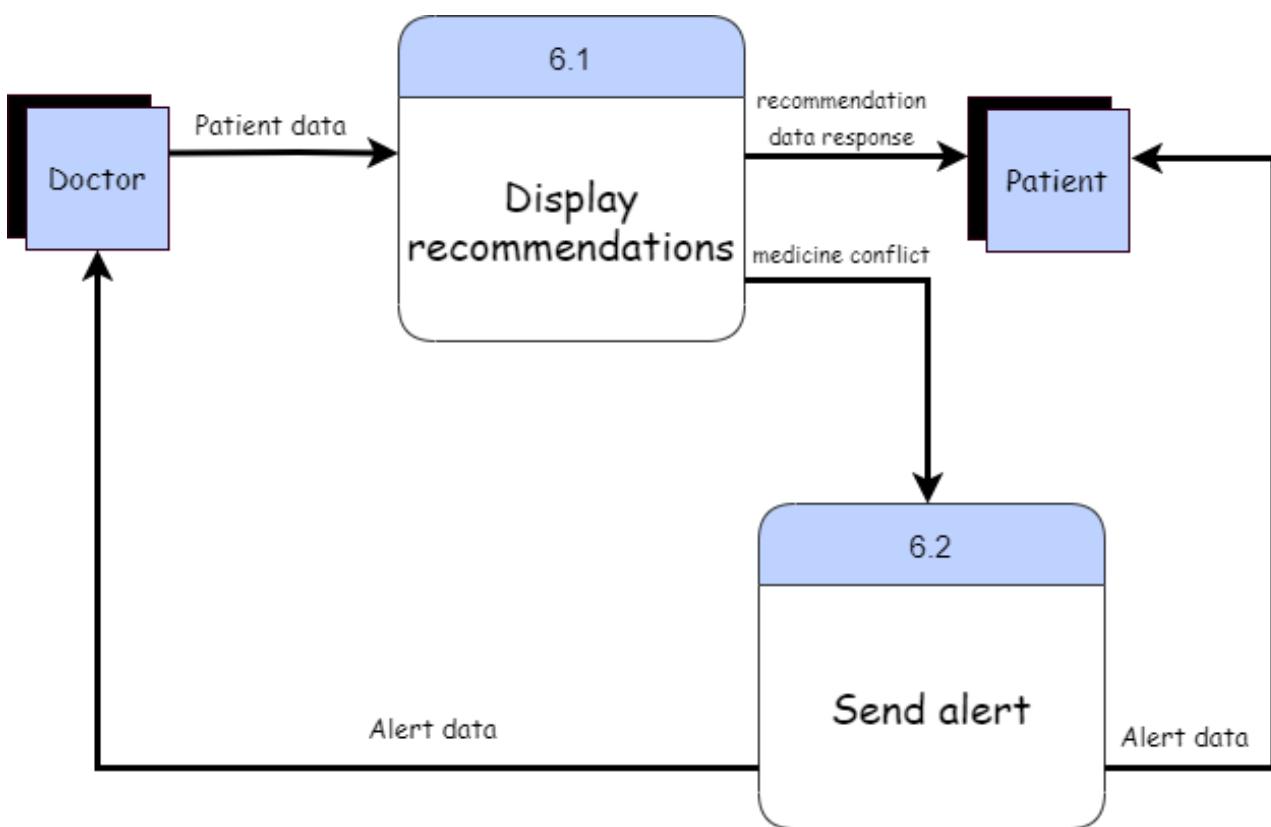
View patient process



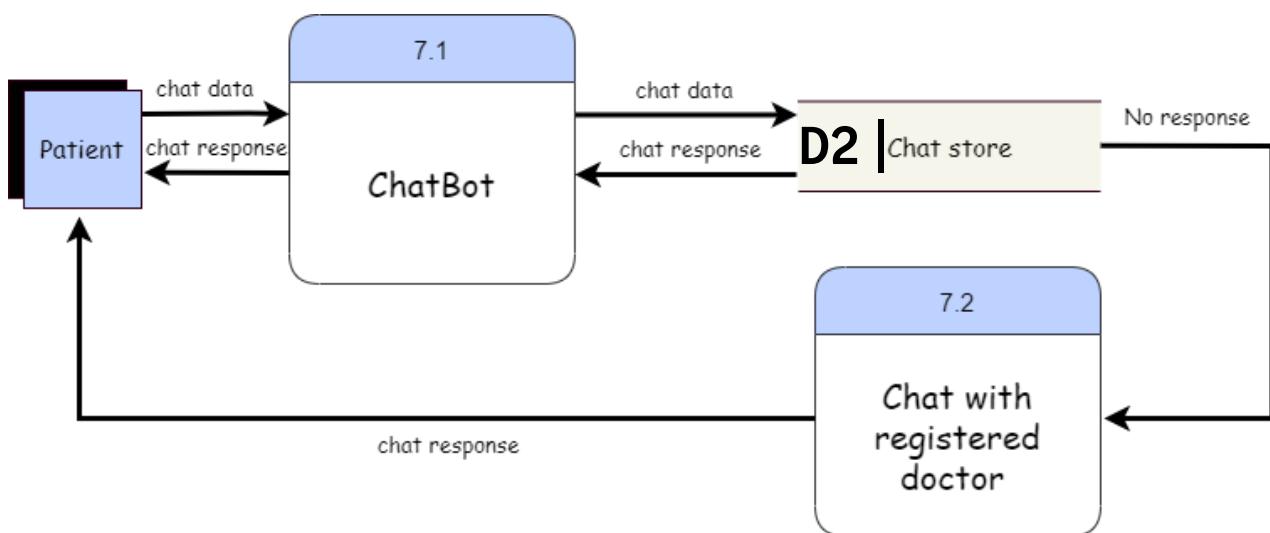
Edit medicine process



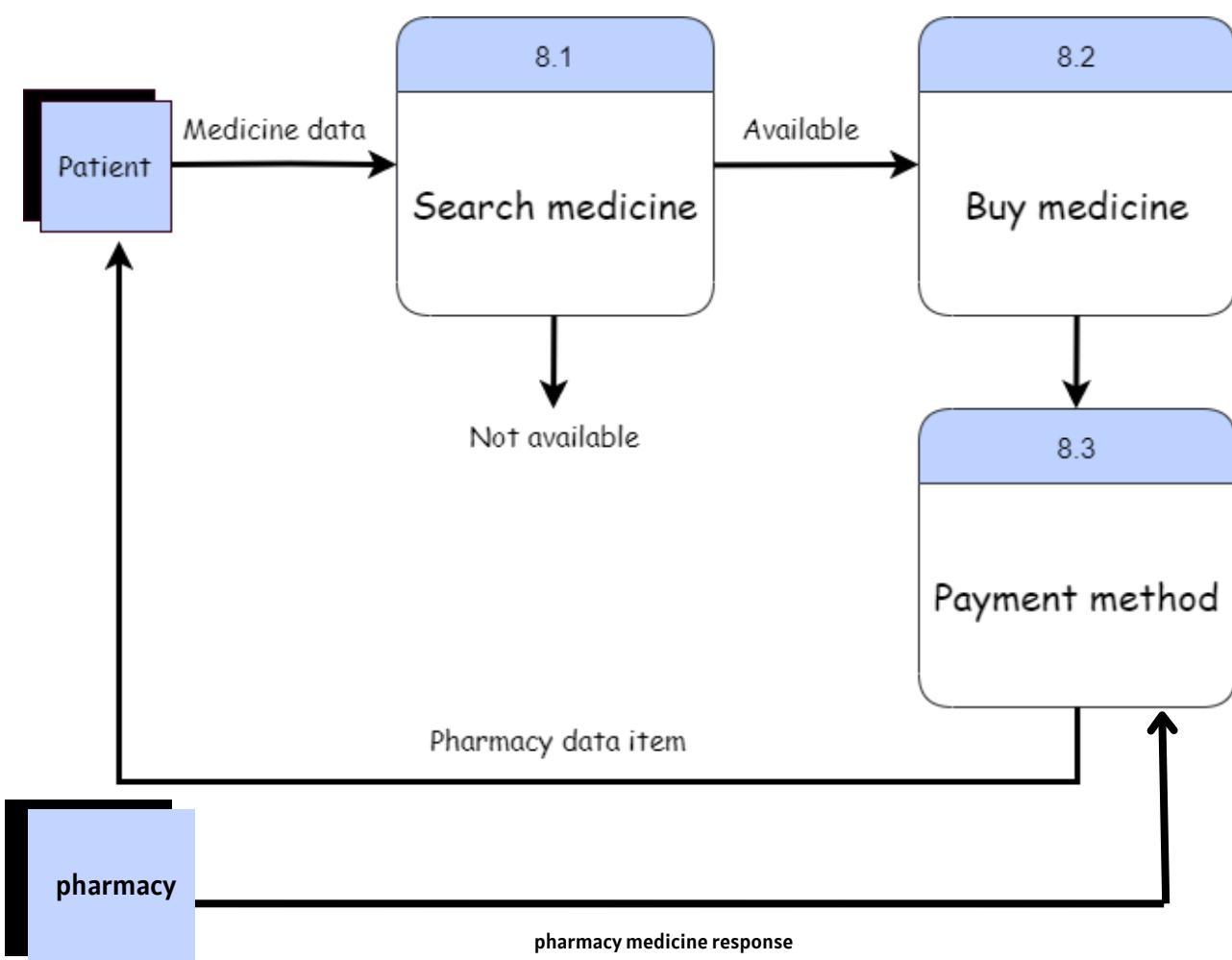
View prohibitions process



Chat process

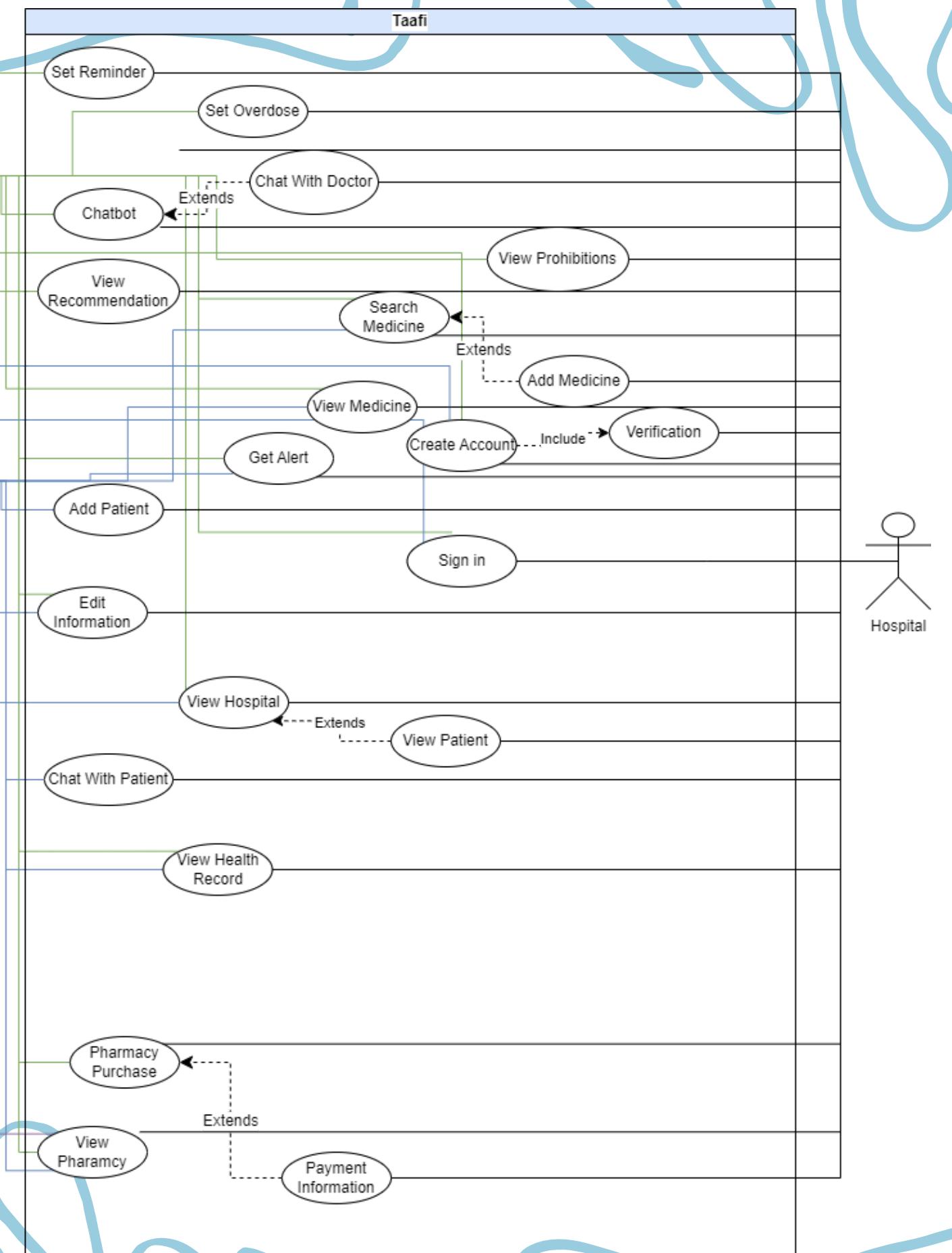


View pharmacy process



5.2.4. Use Case Diagram

Application used: Draw.io



5.2.5. Use Case Scenarios

Sign up

Actors	Patient, Doctor, Pharmacy, Hospital
Description	<p>1. All users must create an account to access the system.</p> <p>2. The user must enter all required personal information to sign up.</p> <p>3. If the user is a doctor:</p> <p>3.I he/she must provide their license to be approved.</p> <p>4. The account will be successfully created and all the users information is stored in the data base.</p>
Data	<p>Patient info : (Name, National ID, Email, Password, Date of birth, City, Gender).</p> <p>Doctor info : (Name, National ID, Email, Password, Date of birth, City, Gender, Medical License).</p> <p>Pharmacy info: (Pharmacy Name , Pharmacy ID)</p> <p>Hospital info: (Hospital Name, Hospital ID)</p>
Pre-condition(s)	None
Output	User's account is successfully created and the user can access the system.
Comments	To create a new account in Taafi the user's age must be 16+.
Created by	Jenan Ibrahim

Verification

Actors	Patient, Doctor, Pharmacy, Hospital.
Description	<p>I. The user must enter the verification code.</p> <p>2. The system must check if the entered code matches the submitted code.</p> <p>2.1 If the icons match, the system directs the user to the main interface, whether it is a patient or a doctor.</p> <p>2.2 If the codes do not match, the system will display an error message and prompt the user to enter the correct code.</p>
Data	Verification code.
Pre-condition(s)	The user finished signing up.
Output	Account verified.
Comments	None.
Created by	Rana Alsaedi.

Login

Actors	Doctor, Patient, Pharmacy and Hospital.
Description	<ol style="list-style-type: none">1. Users must enter their ID and password.2. System will check if what the user entered is the same as what is in the database.3. If user enters an incorrect password 3 times then : 3.1 the system will lock the account for a specified period of time otherwise, user will access their account.
Data	ID and password.
Pre-condition(s)	Signing up.
Output	System Access.
Comments	Separate user interfaces will be provided for patients and clinicians, with fields specific to each user type.
Created by	Manar Hakami.

Edit information

Actors	Doctor, Patient, Hospital, Pharmacy
Description	<p>1. The system will display to the user all personal information they have entered.</p> <p>2. Users will be able to change the value of the information they want to edit.</p> <p>3. If users want to change their password, they must go through the verification steps.</p> <p>4. The system will give the doctor access so they can edit the medicine of their patients.</p> <p>5. If the entered value did not match the proper pattern specified for each field:</p> <ul style="list-style-type: none"> 5.1 The user will be asked to enter the value again with the proper pattern. 5.2 And 5.1 will be repeated until the user enters the proper pattern. <p>1. After entering whatever the user wants to change, they will be asked to confirm these changes.</p> <p>2. The system will save the changed value in the database.</p>
Data	Personal data, Medical data, Dosages.
Pre-condition(s)	The user should already have created an account in the system.
Output	Information will be edited and saved in the database.
Comments	The access that the system gives to the doctors will only allow them to change the medical information of the patients and not the personal ones.
Created by	Batul Moneer Mrkn

View Health record

Actors	Doctor, Patient, Hospital
Description	<ol style="list-style-type: none"> 1. This is the part where the system will allow the doctor to edit the medical information of the patient. 2. Patients and hospitals will be only allowed to view the health record and not edit it. 3. The system will keep everything the doctors have ever entered in the patients health record. 4. The medical record information will be sorted from newest to oldest. 5. After entering whatever the doctor wants to add, they will be asked to confirm it. 6. If the doctor does not confirm then: <ol style="list-style-type: none"> 6.1 It will not be saved and will ask for confirmation 7. The system will save added values in the database.
Data	Medical data, Dosages, Radiographs, Examinations.
Pre-condition(s)	The Patient must have an account and must be connected with a doctor.
Output	The health record will be updated and saved in the database.
Comments	None
Created by	Batul Moneer Mrkn

Search Medicine

Actors	Doctor, Patient, hospital
Description	<p>I. The user will be able to search the medicine by entering its name.</p> <p>2. The system will display all details about the entered medicine name by the user and the alternatives if it was found in the medicine database.</p> <p>3. If the medicine name was not found in the database then:</p> <ul style="list-style-type: none"> 3.1 A message will be displayed telling the user that there is no such medicine. 3.2 The system will suggest the user best matches 3.3 The system will ask the user to enter the medicine name again. <p>I. If the medicine name was found but there was no alternatives the system will notify the user</p>
Data	Medicine data.
Pre-condition(s)	The user must have an account in taafi to access the medicines.
Output	The system will display the medicine that the user is looking for.
Comments	Any blocked or no more in use medicine will not appear in the search.
Created by	Batul Moneer Mrkn

Add Patient

Actors	Doctor, hospital
Description	<p>1. The system will allow the doctor to add the patient by their ID.</p> <p>2. When the doctor add a valid ID and the patient accept this connection, the doctor will be able to view the patients information and health record.</p> <p>3. If the user ID was not found then:</p> <ul style="list-style-type: none"> 3.1 The doctor will be notified that he/she entered an invalid ID 3.2 The doctor will be asked to enter the ID again. <p>1. When the connection is successfully established between the doctor and patient they will also be able to use the chat.</p> <p>2. The doctor will able to add as many patients as he/she wants.</p>
Data	Patient data.
Pre-condition(s)	The user must have an account in taafi and must be signed up as a qualified doctor.
Output	The doctor will access the patients information and then be able to edit their medical record.
Comments	None
Created by	Batul Moneer Mrkn

Add Medicine

Actors	Doctor and Patient , hospital
Description	<p>1. Patient/Doctor can add a medicine if there is not any conflict.</p> <p>2. System will show if there are any similar medicine with no conflict .</p> <p>3. If there is any conflict then:</p> <p>3.1 system won't accept that medicine.</p> <p>3.2 The user will be notified of the conflict</p>
Data	Medicine data.
Pre-condition(s)	User must be logged in.
Output	The medicine in health record will be updated.
Comments	None.
Created by	Manar Hakami.

View medicine

Actors	Doctor and Patient, hospital
Description	<p>1. Patient/Doctor can see all the medicines that patient used to take.</p> <p>2. They can also know when Patient used to take it and for how long.</p> <p>3. If there is no medical and health record for the patient then :</p> <p>3.1 The patient or the doctor will not be able to view the medications, and an alert will be displayed that there is no data</p>
Data	Access medicine.
Pre-condition(s)	User must be logged in
Output	Medicine list.
Comments	None.
Created by	Manar Hakami.

Chatbot

Actors	Patient,Hospital
Description	<ol style="list-style-type: none">1. Patient can ask the chatbot and have a quick answer.2. If there wasn't any response from the chatbot then: 2.I the system will let the patient talk to their registered doctor.
Data	Chat data.
Pre-condition(s)	User must be logged in.
Output	Chat response.
Comments	None.
Created by	Manar Hakami.

Chat with a doctor

Actors	Patient, Doctor, Hospital
Description	<p>1. user will have two chat choices: regular chat and urgent chat.</p> <p>2. If the user wishes to have a normal chat:</p> <p> 2.1 The system will send a notification to the patient when the doctor enters the chat.</p> <p> 2.2 Then the patient will be able to send text messages or images to explain his condition more clearly. Moreover, patients with vision problems can communicate with doctors via voice notes.</p> <p>3. If the user wishes to have an urgent chat:</p> <p> 3.1 The system will inform the doctor by a red sign notification that this chat is urgent.</p> <p> 3.2 Then steps 2.1 and 2.2 will be repeated.</p> <p> 3.3 If the registered doctor did not respond within an hour, the patient can contact the doctor on duty.</p>
Data	Doctor Name, Patient info, chatting data (image, text, etc..)
Pre-condition(s)	Login & Add Patient.
Output	Answers to all the patient's questions.
Comments	None.
Created by	Jenan Ibrahim

Chat with a patient

Actors	Patient, Doctor, Hospital
Description	<ol style="list-style-type: none"> 1. The doctor will choose a patient from his added patients. 2. The system will send a notification to the doctor when the patient enters the chat. 3. The doctor may send the patient any important requests for blood tests, or x-rays. 4. The system will allow the doctor to read and respond to the patient's questions by text messages or voice notes for patients with vision problems. 5. If he sends any important requests should be stored in the chat information 6. If a specified period has passed for the patient to not respond then : 6.1 Notification will be given in the chat
Data	Doctor Name, Patient info, chatting data
Pre-condition(s)	Login & Add Patient.
Output	Responds for all doctor's requests.
Comments	None.
Created by	Jenan Ibrahim

Send Alert

Actors	Patient, Doctor, Hospital
Description	<ol style="list-style-type: none"> 1. The system should have an ALERT bell icon on the side of the user's profile page to display all alerts and updates. 2. The system will send an alert to the doctor if any new medicines conflict with previous ones. 3. If there is no alert regarding medicines conflict then : 3.1 The system will send an alert to both doctor and patient if the Saudi Food and Drug Administration posts an announcement about any medicine. 4. these alerts will appear on the patient's phone lock screen and top screen as well.
Data	Patient's Health Record
Pre-condition(s)	Login, Add Medicine
Output	Alert notifications
Comments	None
Created by	Jenan Ibrahim

Set reminder

Actors	patient ,hospital
Description	<p>1. After the doctor enters the patient's medical data into the health record, reminders will arrive.</p> <p>2. System sends a reminder notification to the patient's phone at the scheduled time for the first dosage of medication</p> <p>3. Notification appears on lock screen and top screen</p> <p>4. Patient clicks on the button to confirm medication has been taken.</p> <p>5. If patient does not click on the button then:</p> <p>5.1 system sends another reminder notification each 10 minutes</p> <p>6. When medication end date is reached, system sends a reminder notification to the patient to stop taking the medication</p> <p>7. If Patient clicks on the button to confirm medication has been stopped then :</p> <p>7.1 Completed medications are displayed in a distinct gray color at the end of the treatment period recommended by the doctor.</p> <p>8. If patient does not click on the button then:</p> <p>8.1 system sends another reminder notification each 10 minutes</p>
Data	<ul style="list-style-type: none"> • Patient Data • Patient's Health Record
Pre condition(s)	<ul style="list-style-type: none"> • Patient have to create an account before. (log in and patient data) • The doctor inserts a prescription that contains the medication (Patient's Health Record)
Output	Reminders to take or stop medication.
Comments	<ul style="list-style-type: none"> • The system should allow for medication details to be edited or deleted if necessary • The system should be able to handle multiple medications and dosages for each patient
Created by	Manar Almatrafi

View prohibitions

Actors	patient, hospital
Description	<p>1.The system analyzes the patient's medical history and prescribed medications to identify any prohibited foods or drugs.</p> <p>2.The system displays a list of prohibited items for the patient, including the reason why they are not recommended.</p> <p>3. The list can be filtered by category (food, medicine).</p> <p>4. The patient can search for specific items in the menu.</p> <p>5. The patient can view the details of each prohibited item by clicking on it in the list.</p> <p>6. If the patient does not click on the details of the ban, then:</p> <p>6.I He will not be able to see the prohibited details, and a red mark will appear to confirm that he has not pressed it.</p> <p>7. The patient's can add his own notes or comments on each prohibited substance.</p>
Data	<ul style="list-style-type: none"> • patient medical history and prescribed medications • List of prohibited items with reason and category • patient notes or comments on prohibited items • patient actions and preferences (Patient's Health Record)
Pre-condition(s)	<ul style="list-style-type: none"> • Patient have to create an account before.(log in and patient data) • The doctor inserts a prescription that contains the medication. (Patient's Health Record)
Output	<ul style="list-style-type: none"> • List of prohibited items with reason and category displayed to the user • User's notes or comments on prohibited items saved in the system
Comments	The system should provide an easy and intuitive user interface for filtering and searching the list of prohibited items.
Created by	Manar Almatrafi 74



View hospitals

Actors	patient , hospital
Description	<p>1. In the event of an emergency, the user can press the ("اسعفني" / "SOS") button on the application.</p> <p>2. The system sends an emergency alert to the nearest hospital about the patient's arrival and a summary of his previous medical condition.</p> <p>3. Notify the Saudi Red Crescent and send an ambulance to the user's location.</p> <p>4. If the user specifies his location, an ambulance will come to transport the user to the chosen hospital for treatment, and if he does not specify, then:</p> <p>4.1 The system will ask for confirmation of the location or the user's desire to go on their own</p> <p>5. The hospital receives an emergency alert and a summary of the user's medical condition, in preparation for his arrival.</p> <p>6. The system updates the user's medical record and prescribed medications based on his treatment in the hospital.</p>
Data	<ul style="list-style-type: none"> • patient location or address and Health Record (Patient data) • information about hospitals. (hospital data)
Pre-condition(s)	Log in ,Patient data , hospital data
Output	<ul style="list-style-type: none"> • List of prohibited items with reason and category displayed to the user • User's notes or comments on prohibited items saved in the system • User's actions and preferences updated in the system • Notifications sent to the user when new prohibited items are identified (request to hospital and response from hospital)
Comments	The system should be regularly updated with the latest hospital information and emergency services and new medicine from hospital.
Created by	Manar Almatrafi

View pharmacies

Actors	patient , pharmacy , hospital
Description	<p>1. The system displays a map of nearby pharmacies to the patient.</p> <p>2. The patient can search or Buy for a specific drug by name if it was previously registered for him.</p> <p>3. If it was not previously registered at the time:</p> <p>3.1 It will not be displayed or found</p> <p>4. If the drug was previously registered, then:</p> <p>4.1 The system shows the patient the pharmacies that contain the required medication.</p> <p>4.2 The system displays the name, address and contact information of each pharmacy.</p> <p>5. The patient can filter pharmacies based on distance, ratings and availability of the required medication.</p> <p>6. The system shows the opening and closing times of each pharmacy to help the patient plan his visit.</p> <p>7. The user can choose a pharmacy and get directions to it from his current location.</p> <p>8. The user can save his favorite pharmacies for future reference.</p>
Data	<ul style="list-style-type: none"> • patient location or address • Map of nearby pharmacies • Name, address, and contact information for each pharmacy • Opening and closing times of each pharmacy • User's preferred pharmacies <p>(Patient data , hospital data,pharmacies data)</p>
Pre-condition(s)	log in - patient data - pharmacies data
Output	The pharmacies and all information about them will be shown to the patient so that he can search or order later
Comments	The system should be regularly updated with the latest pharmacy information and medicine availability.
Created by	Manar Almatrafi 76



Buy medicine

Actors	Patient, Doctor, Pharmacy,Hospital
Description	<p>1. system will provide a list of over-the-counter drugs and medications that are available for each pharmacy.</p> <p>2. The user can search manually or by keywords for medications.</p> <p>3. The system will display the price and quantity of every item.</p> <p>4. The user will have a "shopping cart" to which multiple items can be added if they wish to buy more than one item.</p> <p>5. The user can change the quantity of any item they wish to order.</p> <p>6. If user proceeds to check out:</p> <p>6.1 The user must input their location first.</p> <p>6.2 The user must choose the desired branch.</p> <p>7. The user will confirm their order before it is placed.</p> <p>8. The system will notify the user of further information regarding their orders, such as preparation or if it is ready to be picked up.</p>
Data	Medicine Data, Location of their pharmacy or delivery, Pharmacy Data, Patient's full name.
Pre-condition(s)	Payment, if delivery is chosen. Must be logged in.
Output	The patient will get a receipt and receive their order.
Comments	None.
Created by	Rana Alsaedi

View patient

Actors	Patient, Hospital, Doctor
Description	<ol style="list-style-type: none">1. Doctors will record and manage prescriptions for their patients.2. Doctors will be able add, modify, and delete prescriptions.3. The doctor will view all medications and lab and imaging results that the patient has.4. If doctor adds new medicine:<ol style="list-style-type: none">4.1 If the medication that was added reacts badly with another medication with their lifestyle: The doctor will be warned.4.2 If the medication does not react to anything: It will be successfully added.
Data	Patient Health Record. Medicine Data.
Pre-condition(s)	Must be logged in.
Output	Medicine modified successfully,
Comments	None.
Created by	Rana Alsaedi.

View recommendation

Actors	Patient, Hospital
Description	<ol style="list-style-type: none"> 1. The patient will be able to view personalized recommendations to their needs. 2. The system will display the recommendations neatly with the ability to prioritize more important info at the top. 3. If the user interacts with the interface: <ol style="list-style-type: none"> 3.1 Scroll down to view more recommendations. 3.2 Click on a specific recommendation to learn more about it.
Data	Patient Data. Latest Medical practices and advice Data.
Pre-condition(s)	Must be logged in.
Output	List of recommendations.
Comments	If the patient's health record is empty, the recommendations will be more generalized.
Created by	Rana Alsaedi

Set Overdose

Actors	Patient, Hospital.
Description	<p>1. After patients enter that they took an overdose the system will check first if the patient can deal with that extra dose or does he/she needs to speak with a doctor.</p> <p>2. If the situation is dangerous:</p> <p>2.1. The system will alert the patient's doctor to contact the patient.</p> <p>2.2. An ambulance will be sent to the patient</p>
Data	Medicine dosage.
Pre-condition(s)	Must be logged in.
Output	Chat with doctor or alert hospital.
Comments	The patient is responsible for entering the correct amount of dose.
Created by	Jenan Ibrahim

Payment

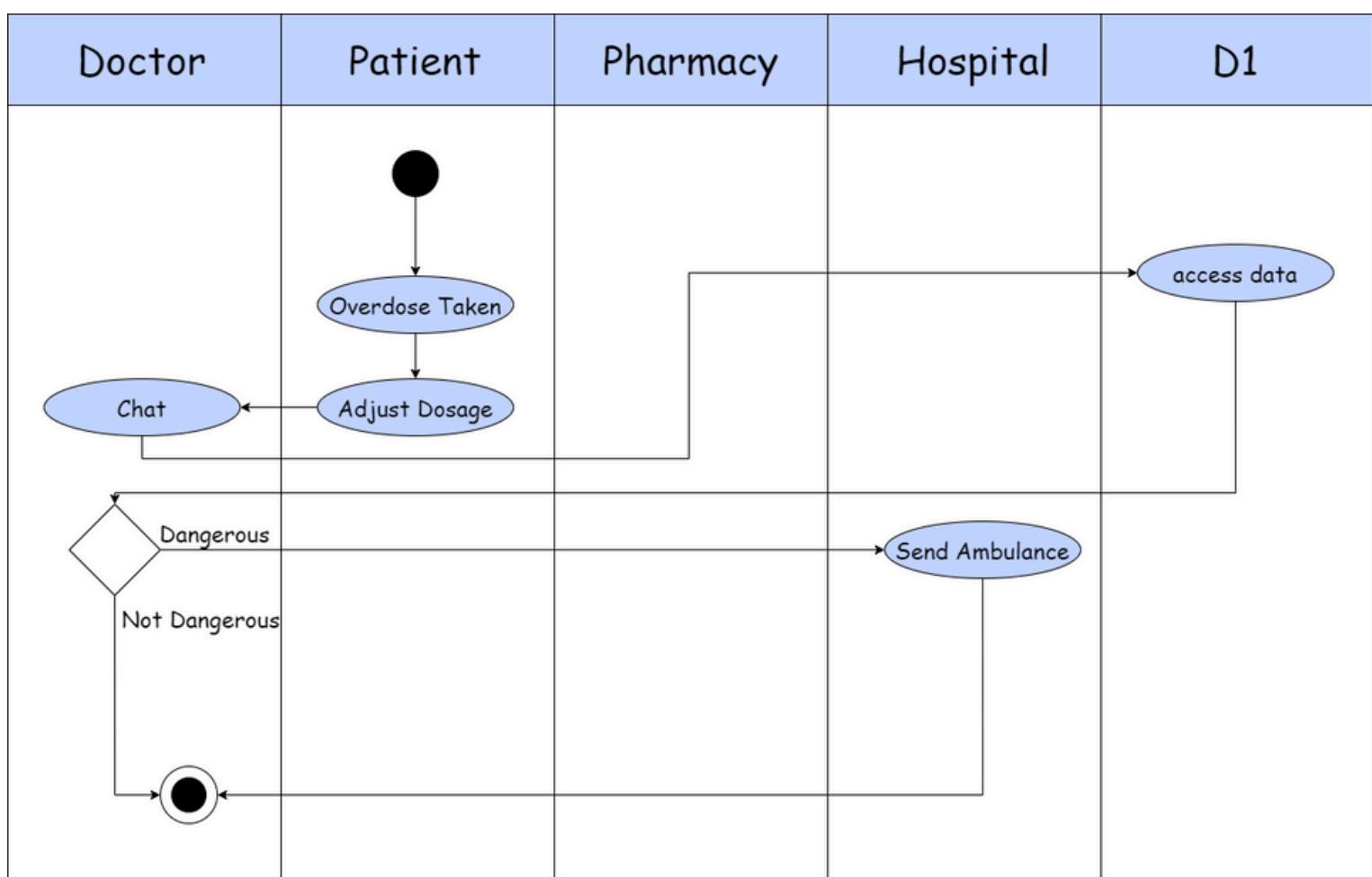
Actors	Patient, Hospital, Pharmacy
Description	<p>1. After the patient chooses a delivery time, the system will give the patient a choice to buy using credit card.</p> <p>2. The system will display the following data fields that the patient needs to fill out:</p> <p>Cardholder Name - Card Number - Experation date (MM/YY) - CVV.</p> <p>4. Once the patient fills it out, the order will be confirmed.</p> <p>5. If any field does not match then: The system will display an alert for the modification</p>
Data	Patient Data, Credit Card
Pre-condition(s)	<p>Must be at the last stage of placing an order.</p> <p>Must be logged in.</p>
Output	Order will be placed.
Comments	None.
Created by	Rana Alsaedi,

5.2.6. Class Diagram

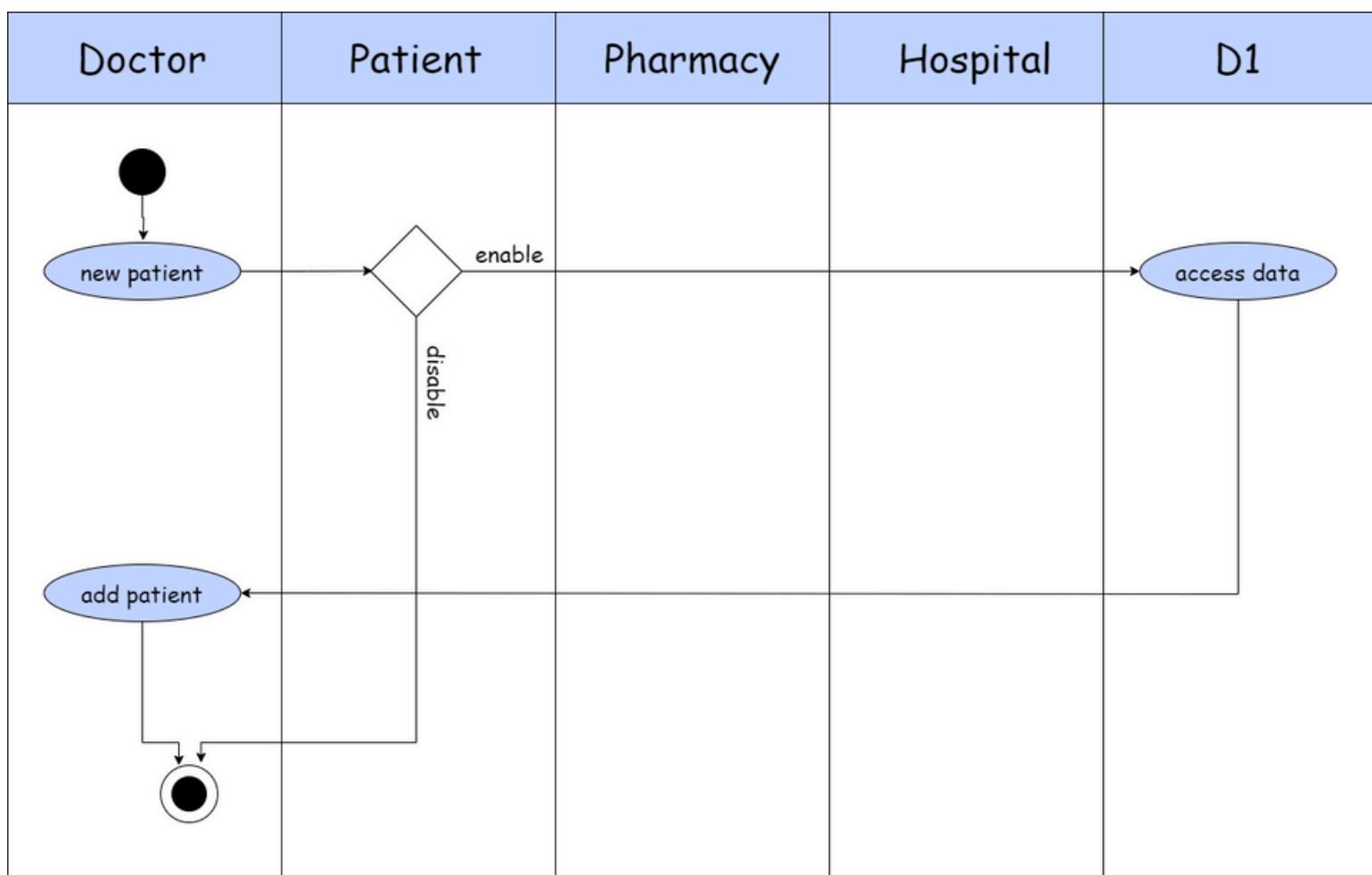


5.2.7. Activity Diagram

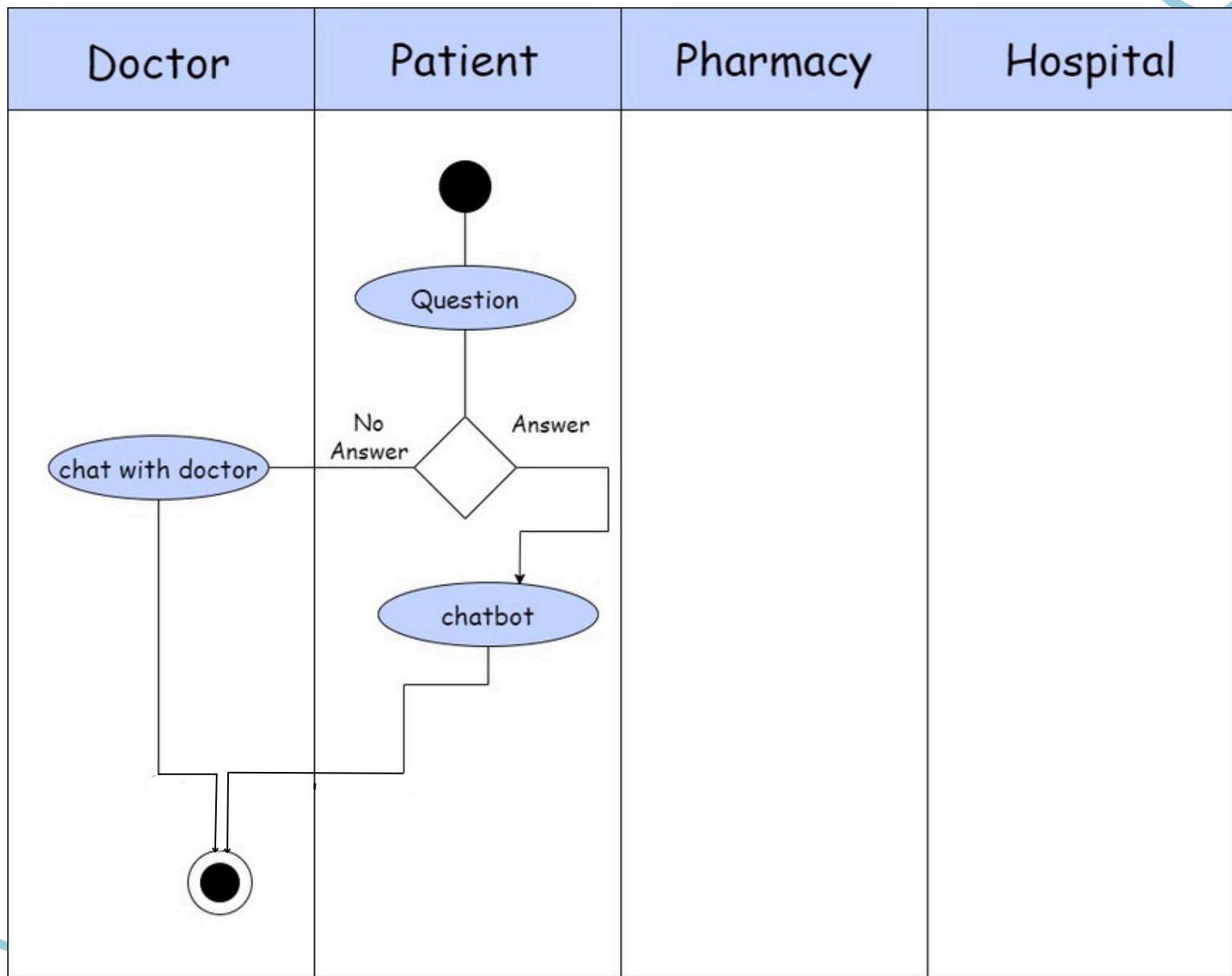
Set Overdose



Add Patient

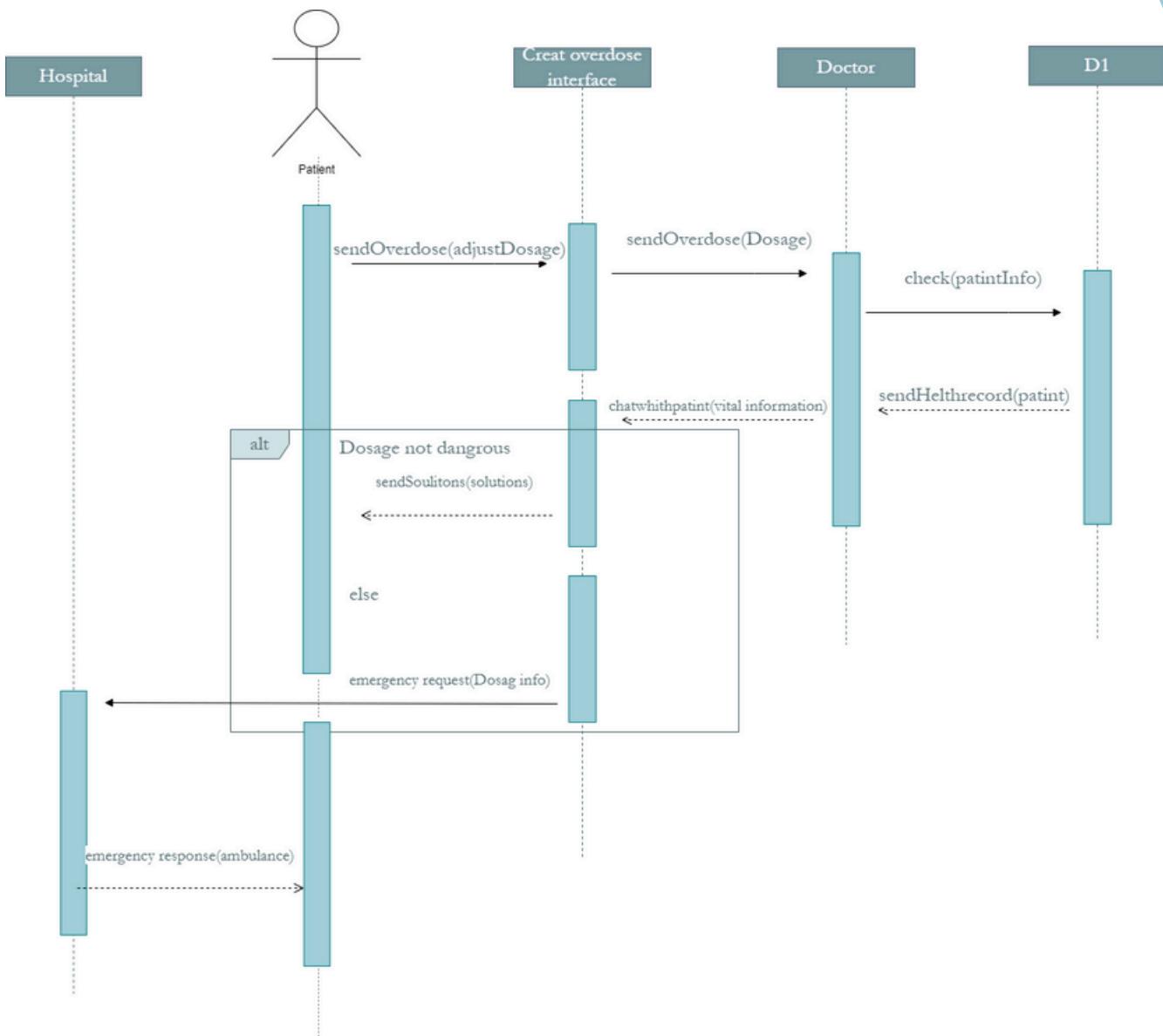


Chatbot

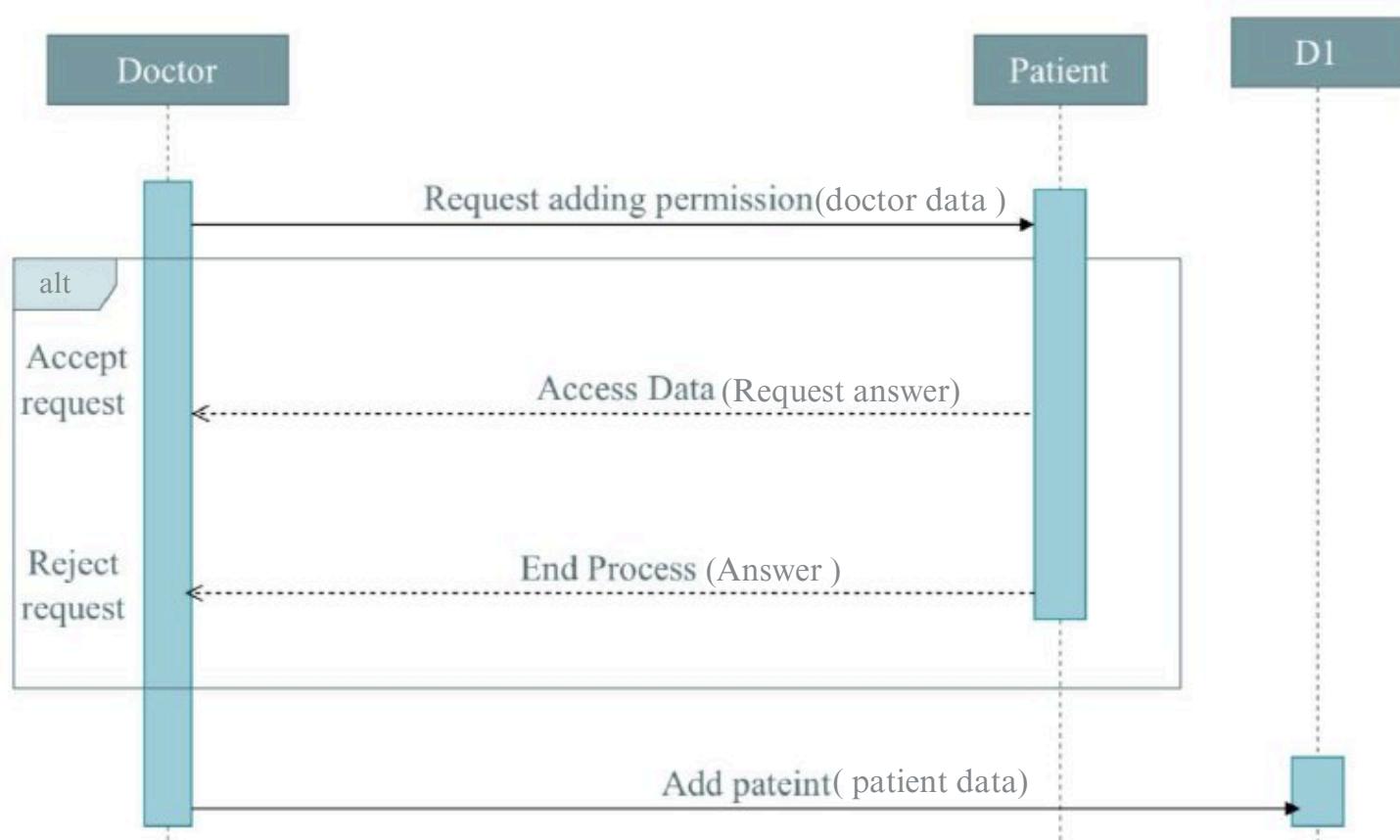


5.2.8. Sequence Diagram

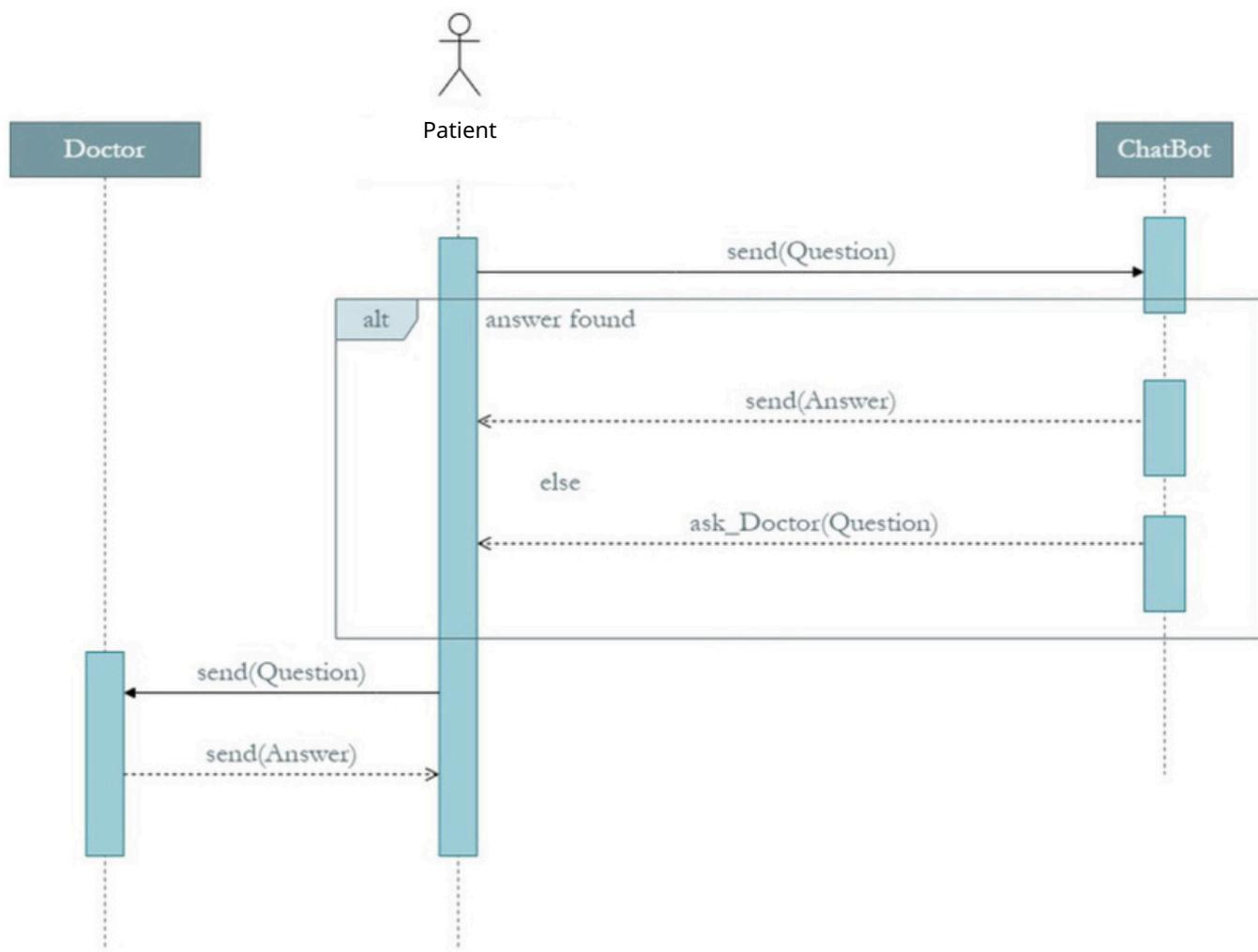
Set Overdose

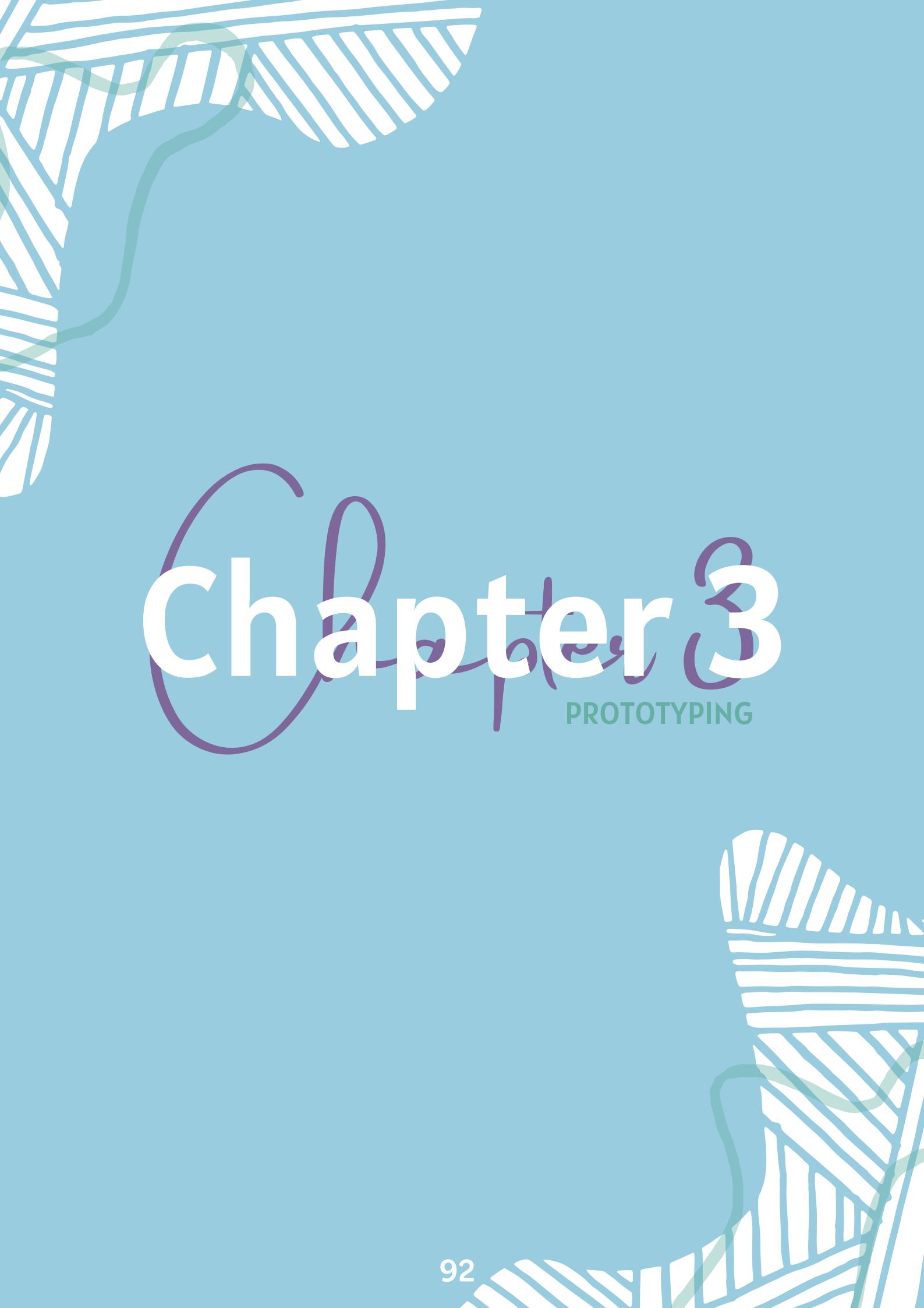


Add Patient



Chatbot



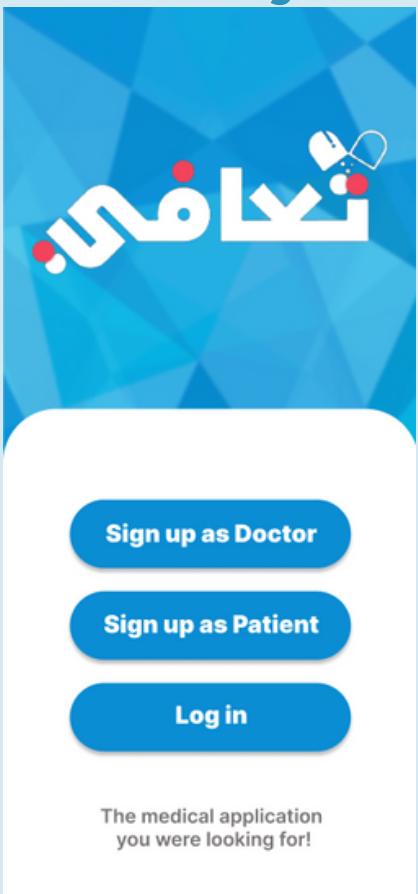


Chapter 3

PROTOTYPING

6.1.GUI Prototype

First Page



Patient sign up

The Patient sign up screen has a light blue background with a white header section. It features a circular profile icon at the top. Below it are seven input fields: 'First name' and 'Last name' (in separate boxes), 'ID', 'Email', 'Phone number', 'Date of birth', 'City', 'Gender', and 'Password'. A large blue 'Sign in' button is located at the bottom right of the input area.

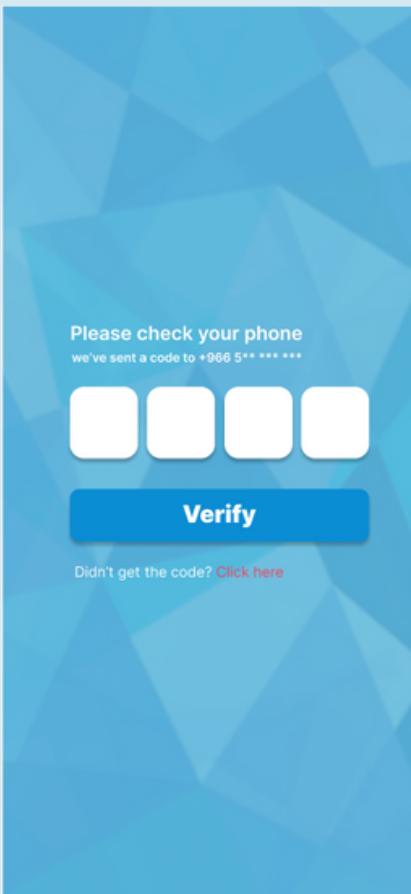
Doctor sign up

The Doctor sign up screen is similar to the Patient sign up screen but includes additional fields. It features a circular profile icon at the top. Below it are ten input fields: 'First name' and 'Last name' (in separate boxes), 'ID', 'Email', 'Phone number', 'Date of birth', 'City', 'Gender', 'License', and 'Password'. A large blue 'Sign in' button is located at the bottom right of the input area.

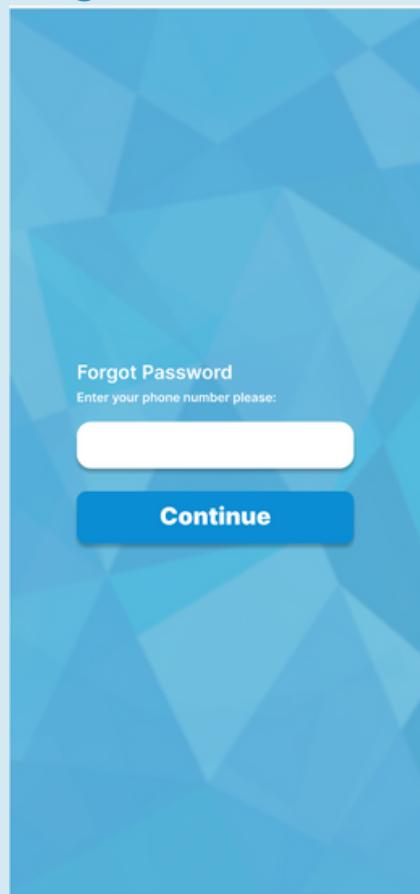
Log in

The Log in screen has a light blue background with a white header section. It features a circular profile icon at the top. Below it is a 'Member Login' section with two input fields: 'ID' and 'Password'. To the right of the 'ID' field is a small person icon. To the right of the 'Password' field is a lock icon. A large blue 'Log in' button is located at the bottom right. Below the 'Log in' button, the text 'Forgot the Password? [Click here](#)' is displayed.

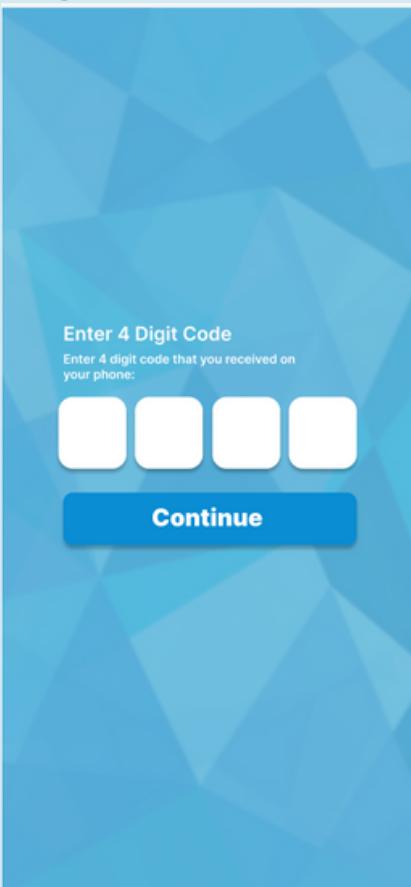
Verifacation



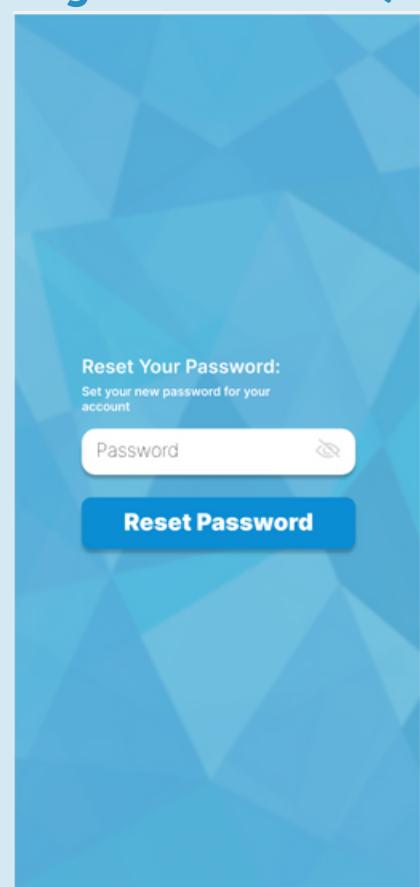
Forgot Password(1)



Forgot Password(2)



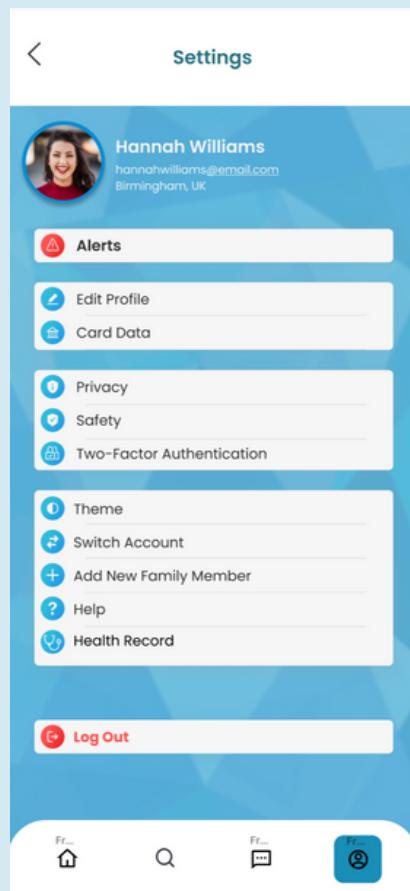
Forgot Password(3)



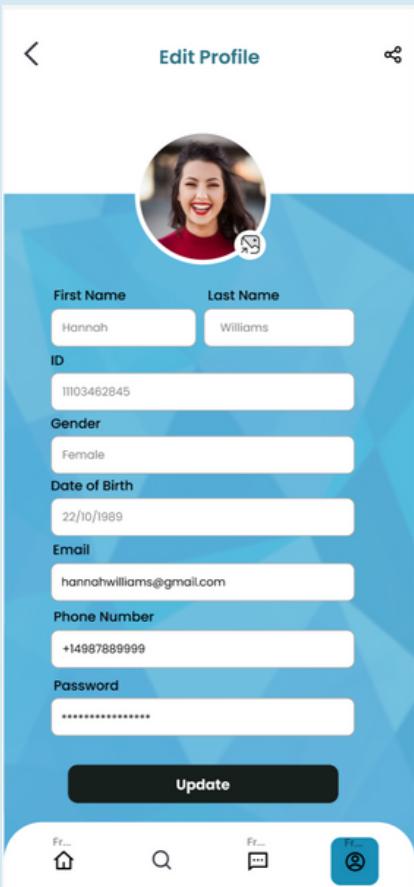
Home



Settings



Edit information



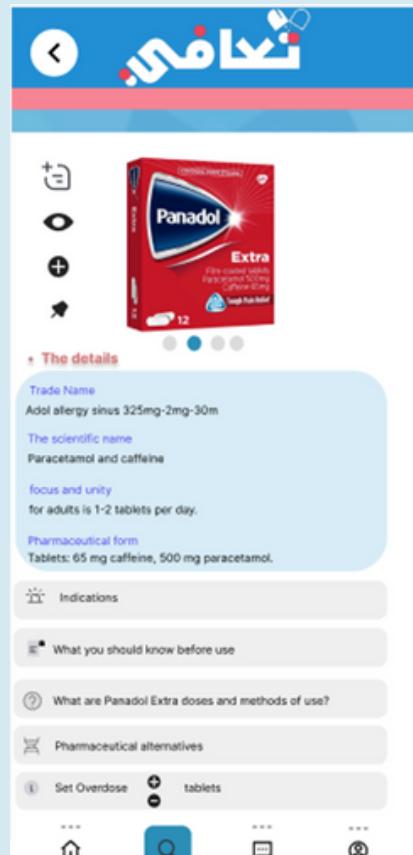
View Health Record



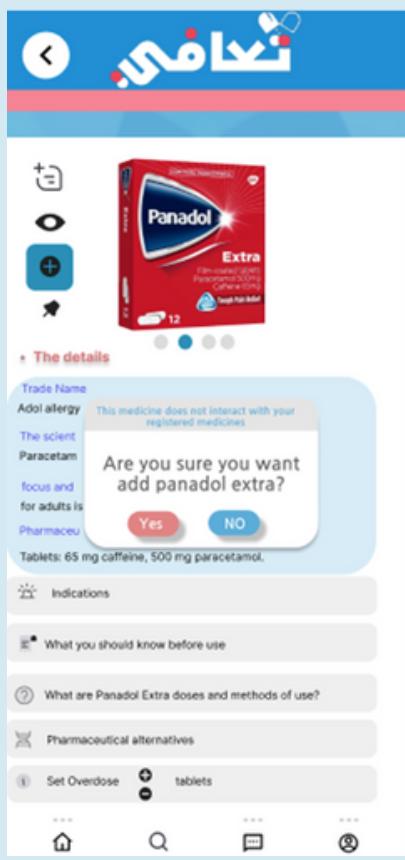
Search Medicine



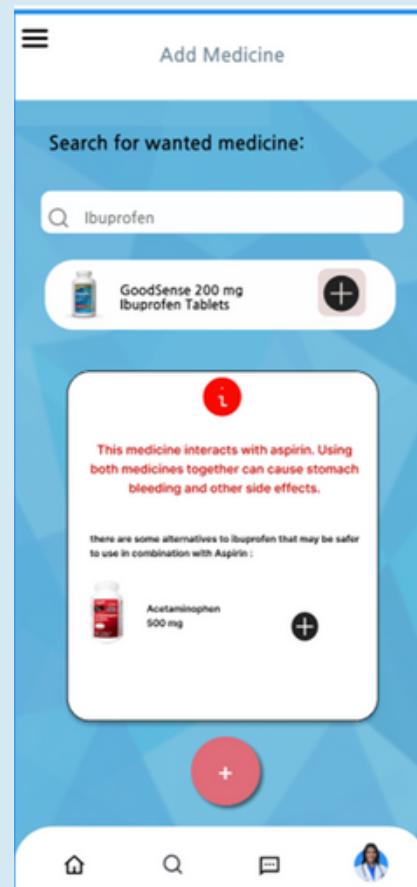
Search Medicine



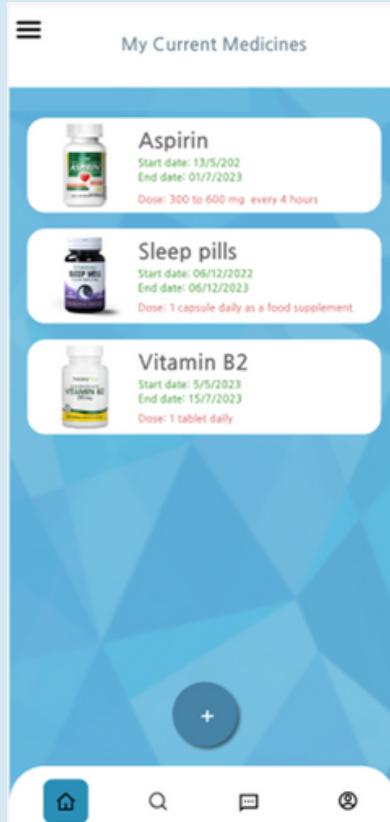
Patient Add Medicine



Doctor Add Medicine



Patient View medicine



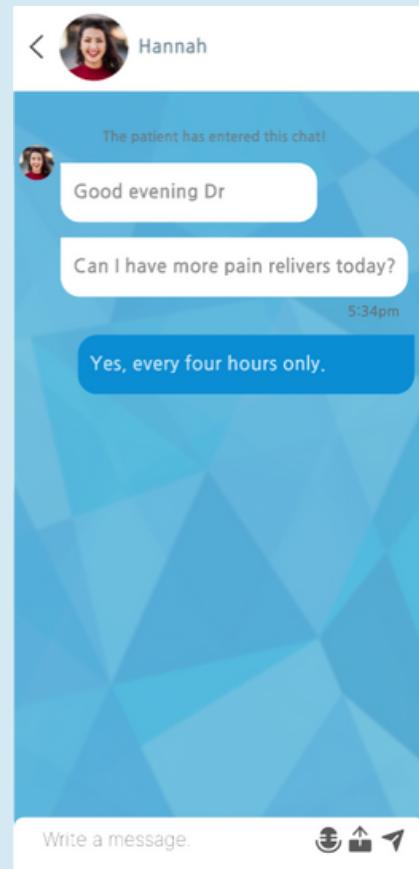
Doctor View medicine



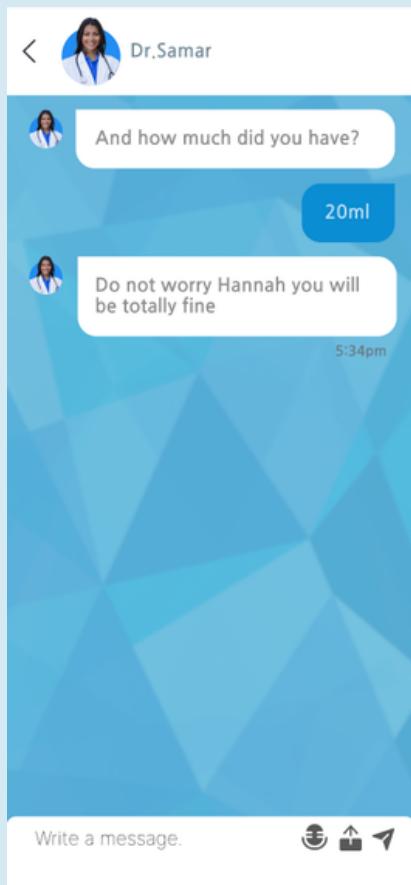
Doctor View medicine



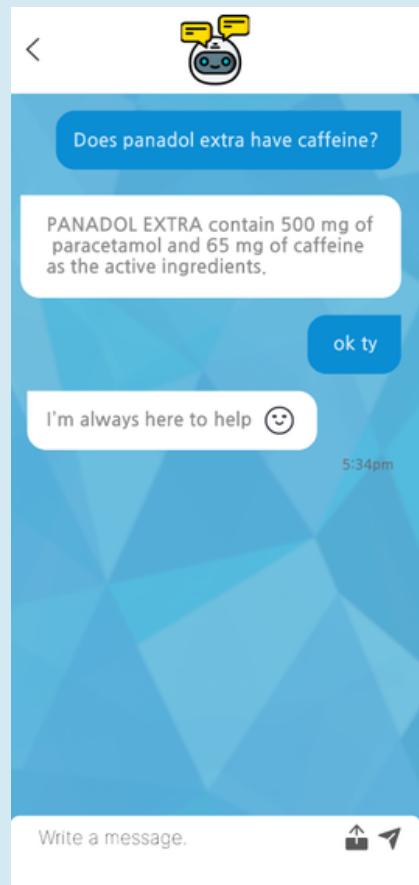
Doctor Chat with patient



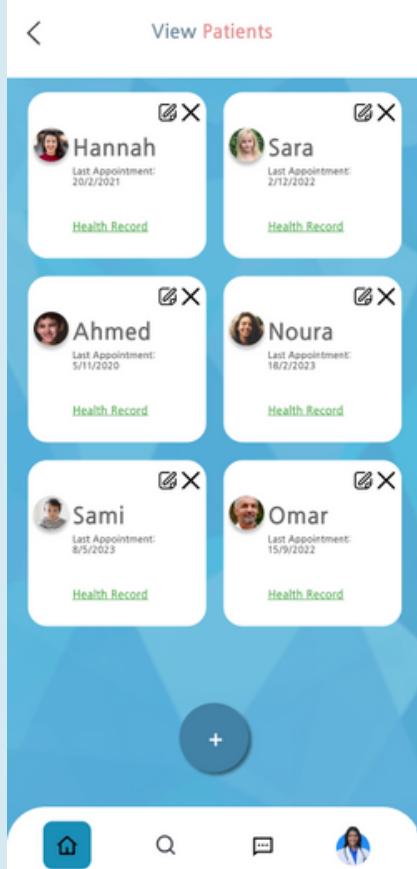
Patient chat with a doctor



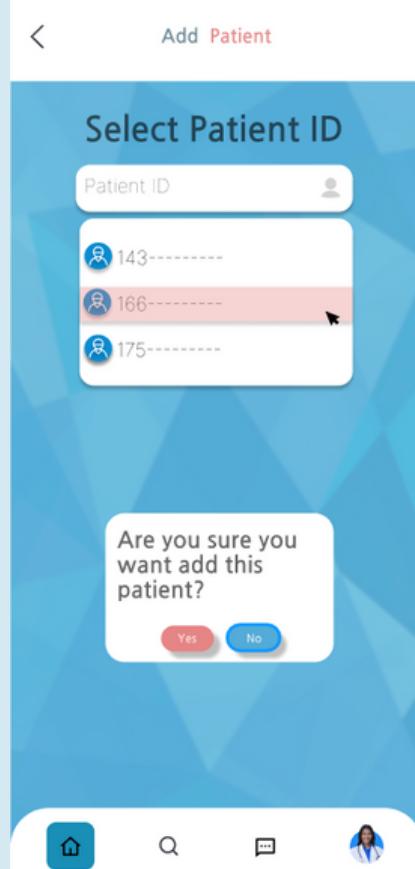
chatbot



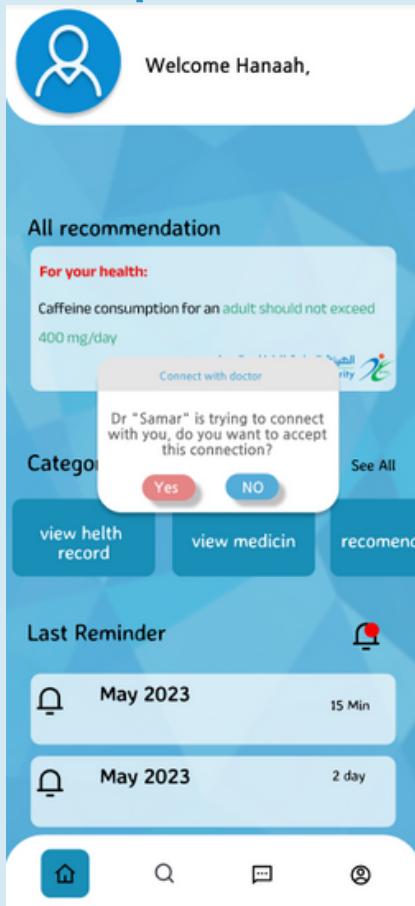
Doctor view patient



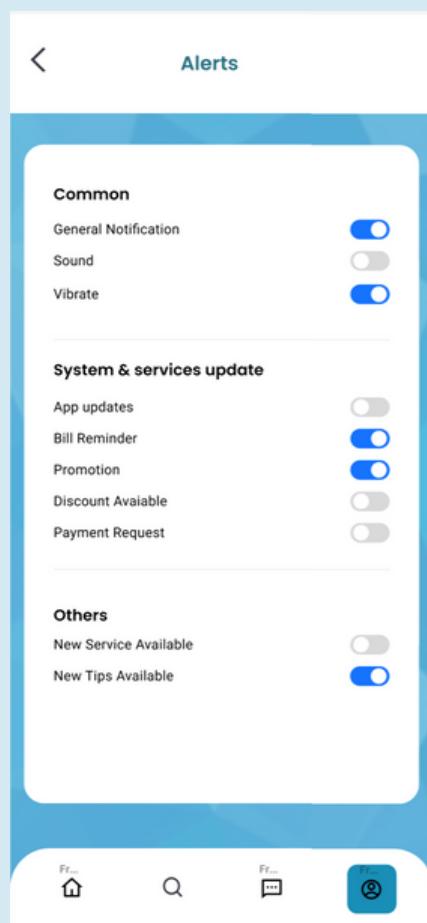
Doctor add patient



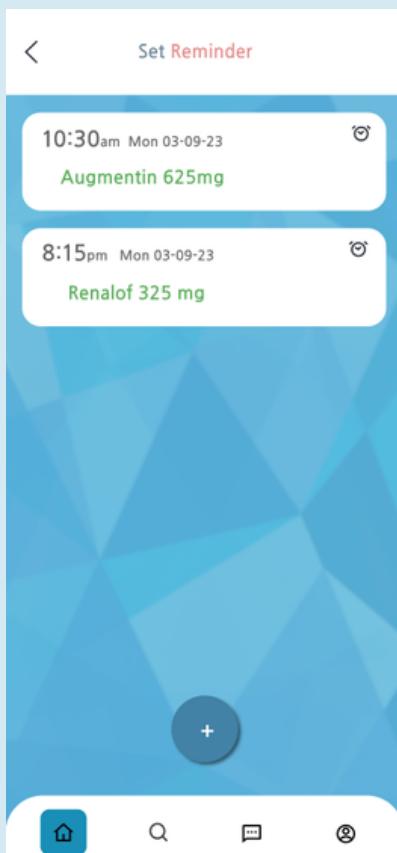
Add patient (2)



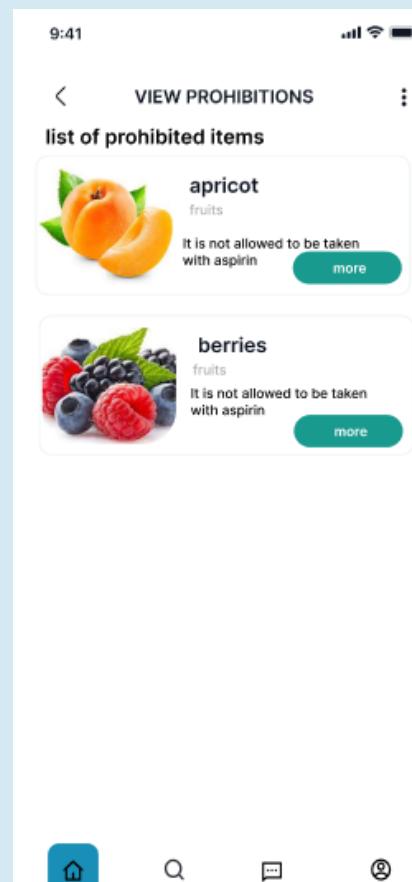
Alerts



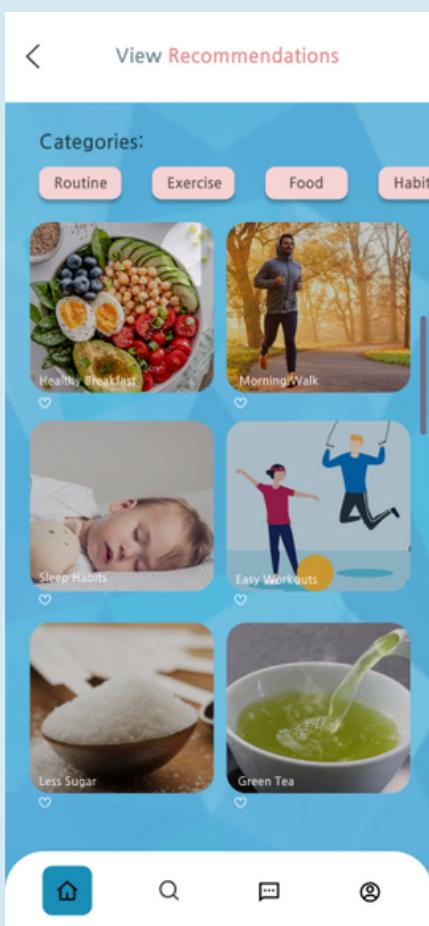
Set Reminder



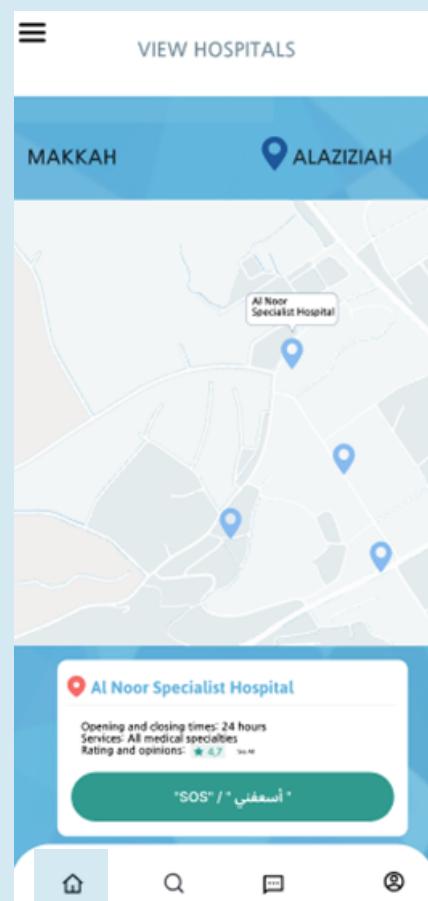
View Prohibitions



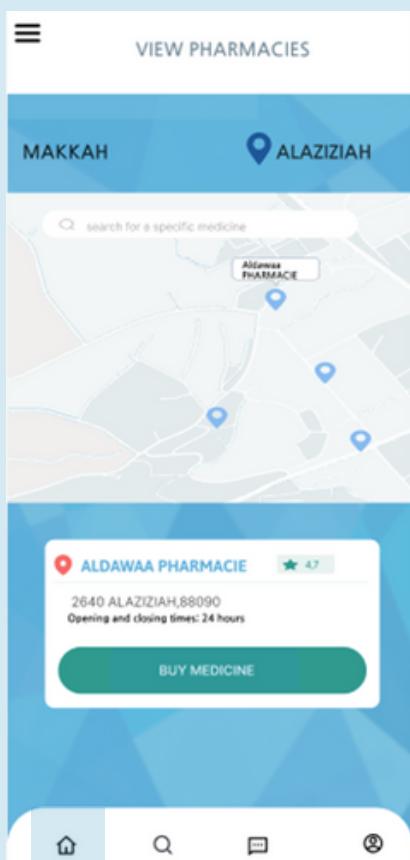
View Recommendations



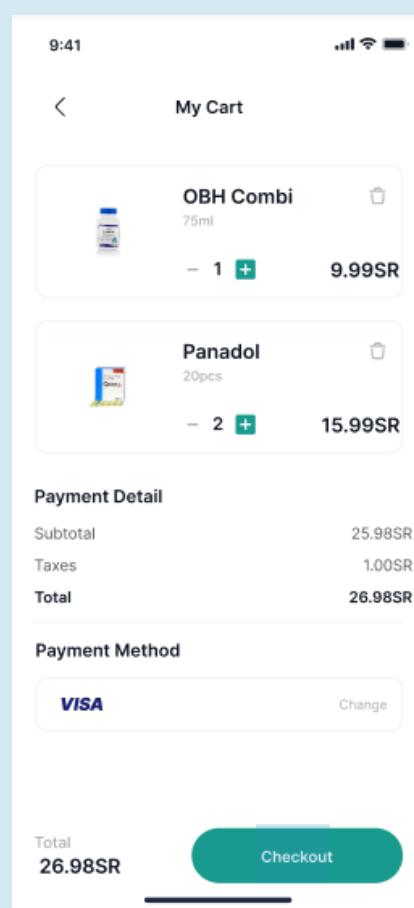
Doctor and patient View Hospitals



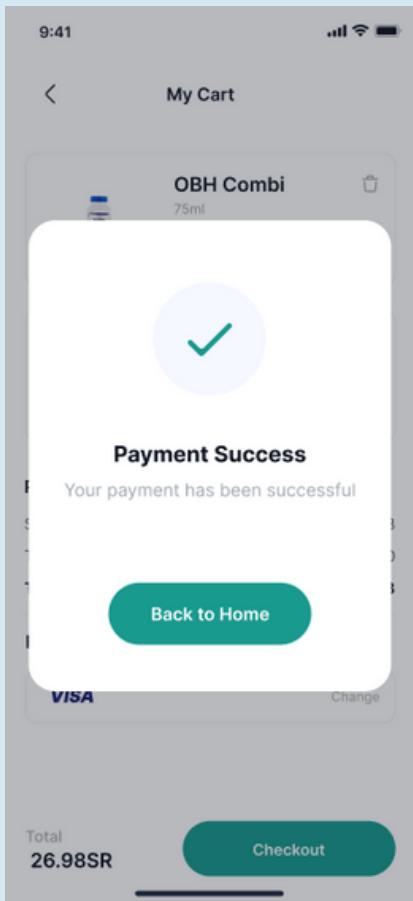
Doctor and patient View Pharmacies



Buy Medicine



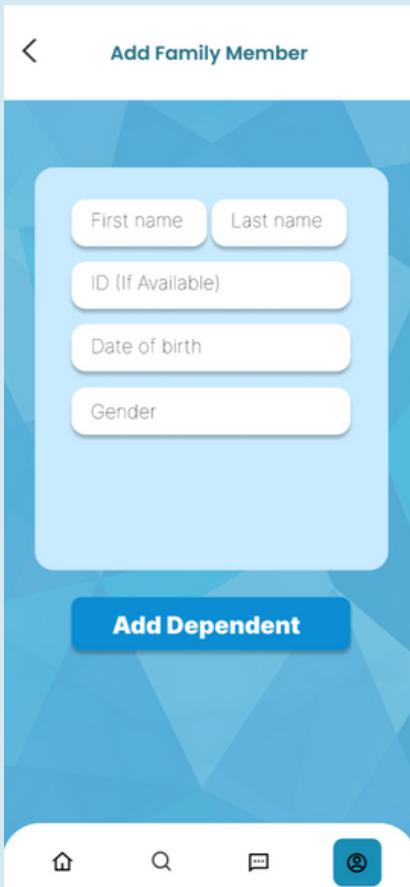
Buy Medicine (2)



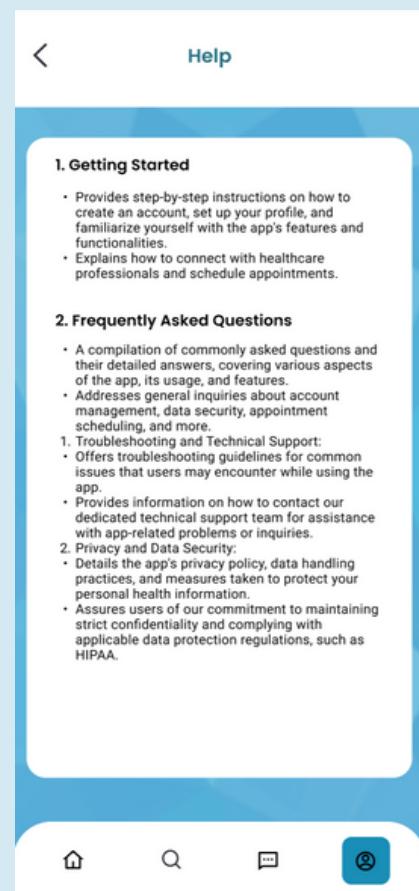
Add Card | Edit Card



Add Family Member



Help



Privacy Policy

Privacy Policy

1. Types data we collect

- Additional Profile Information. Such as gender, preferred language(s), city, and personal description. Some of this information as indicated in your account settings is part of your public profile page and will be publicly visible.
- Information About Others. Such as a payment instrument belonging to another person or information about a co-traveler. By providing us with personal information about others,

2. Use of your personal data

If you provide us with your contacts' information, such as your friends or co-travelers, we may process this information to: (i) facilitate your referral invitations, (ii) share your trip details and facilitate trip planning, (iii) detect and prevent fraud, and (iv) facilitate your requests or for any other purpose you authorize.

3. Disclosure of your personal data

Where you provide consent, we share your information as described at the time of consent, such as when authorizing a third-party application or website to access your Airbnb account or participating in promotional activities by Airbnb partners or third parties. Where permissible under applicable law, we may use certain information about you, such as your email address, that we share with social media platforms after de-identifying it to generate leads, drive traffic to Airbnb, or otherwise promote our products and services.

Safety

Safety

1. EMERGENCIES

Taafi is not intended to be used during emergency situations. If you or someone else is in immediate danger, experiencing a medical emergency, or requiring urgent medical attention, please disregard the app and contact emergency services by dialing 911 (or the applicable emergency number in your country) without any delay. Promptly seeking assistance from qualified emergency medical personnel can make a significant difference in ensuring your safety and well-being.

2. App Limitations

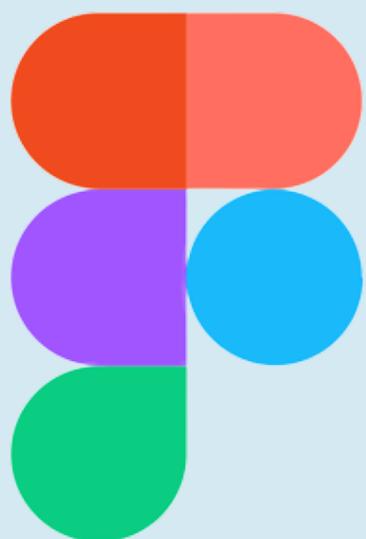
While the [Health App Name] aims to provide reliable information and connect you with healthcare professionals, it may not be suitable for managing critical or time-sensitive medical situations. The app's features are designed to assist with non-emergency medical inquiries, advice, and general health information. It is essential to recognize the limitations of the app and exercise judgment in determining when immediate professional medical assistance is required.

3. Trusting Medical Professionals

Please be cautious and vigilant when engaging with individuals who claim to be healthcare professionals outside the [Health App Name]. Always rely on the authorized communication channels provided within the app to interact with healthcare professionals. The app provides a secure environment that enables effective communication, protects your privacy, and ensures the authenticity and qualifications of the healthcare providers.



6.2. Software Used



Figma

Link for the interactive interfaces:

[https://www.figma.com/file/dVHa6E0UighajnbQCr59UT/Taafi?
type=design&node-id=0%3AI&t=RtPuEM9Xlxxpt6jh-I](https://www.figma.com/file/dVHa6E0UighajnbQCr59UT/Taafi?type=design&node-id=0%3AI&t=RtPuEM9Xlxxpt6jh-I)

Appendix



We have conducted a survey for our application (Taafi), to gather feedback from both patients and doctors on the services we provide. The questionnaire was designed to assess their opinions on the services provided by our application and to receive any suggestions they may have.

The responses we received were overwhelmingly positive, with many respondents agreeing with the services we offer. This feedback has been invaluable to our team, as it confirms that we are on the right track in delivering the basic functionalities we had identified earlier. Based on the feedback we received, we will adopt these functionalities as our Functional Requirements, and we will continue to work hard to ensure that our application meets the needs and expectations of our users.

Note: click on the word survey to check our questionnaire.



Thank You