

# **TITLE**

Optimizing Doctor Availability and Appointment Allocation in Hospitals through Digital Technology and AI Integration



# DESCRIPTION

- **Checking Hospitals Nearby:** In this stage, the hospitals nearer to our locality are shown based on the requirements we enter in search
- **Checking Doctors Availability:** After getting a list of hospitals in the suggestion box, it is up to the patients to select the doctors based on the availability. Here we select the doctors to consult who is available.
- **To check the Waiting list of Patients:** After checking the doctors availability we can also use this option to check the waiting list of Patients to the concerned doctor whom we proceed
- **Booking Appointment:** After checking all these we will book an appointment with the concerned doctor through this app
- **E-Pharmacy:** E-Pharmacy is an online system that provides a platform for customers to purchase medicinal drugs and E-services online, allowing the customer to receive medicines/services in the comfort of their homes within a short time.
- **Blood Donation:** This is designed to connect passionate donors with those in urgent need of blood. Whether you're a regular donor or considering it for the first time, our user-friendly interface provides seamless access to nearby blood drives, donor registration, and real-time alerts about critical shortages.
- **Basic medications through Chatbot:** Apart from the above 6 stages, this is the unique stage where patients can get suggestions or information through chatbots.

# DESCRIPTION

- We built our prototype in **proto.io**.
- We created our User Interface as a working model.

## PARAMETERS:

\* Our proposed solution aligns with the legal requirements and standards of the healthcare industry are validated.

\*Our solution addresses real user pin points and provides tangible benefits to both healthcare providers and patients.

\*Conducted usability testing and gathered feedback from potential users to assess the user interface's intuitiveness and ease of use.

\*Our design facilitates seamless navigation and efficient appointment scheduling process and other features in our app.

\*Our solution avoids biases and discriminatory practices, promoting fairness and equity in appointment allocations.

\*Ensured seamless integration to facilitate the exchange of data and information between the appointment scheduling system and other hospital applications.

\*Gathered feedback before going to start implementation in an early stage, used to identify the areas for improvement.

\*Implementing an iterative updates and refinements based on user feedback, ensuring continuous enhancement of the solution.

# PROTOTYPE

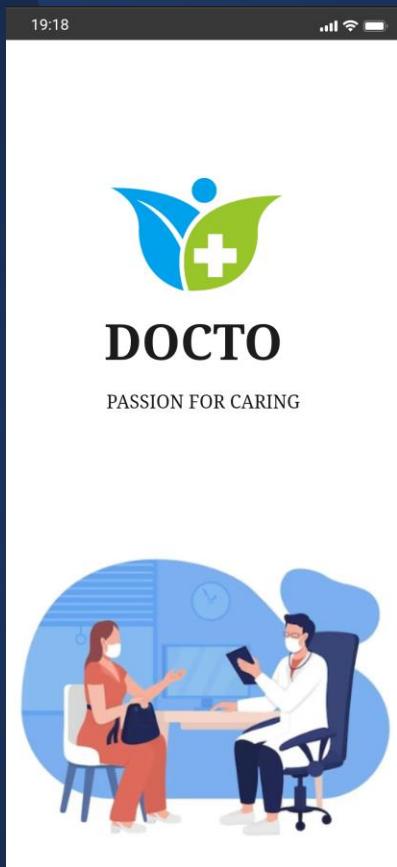
- App name : DOCTO



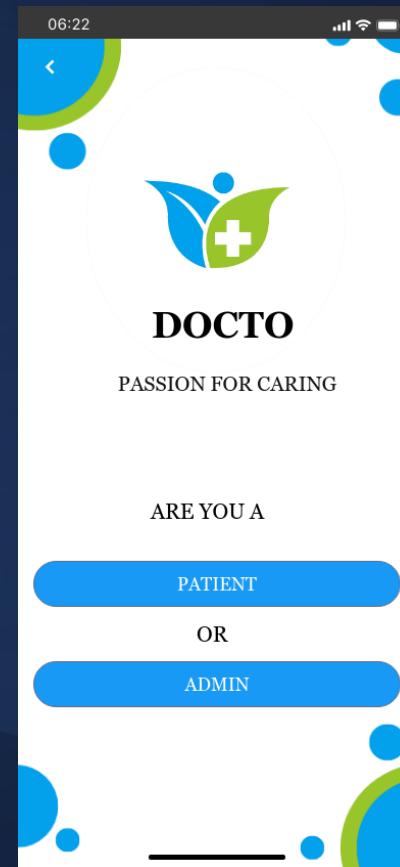
- Logo design :

- Prototype Explanation Video Link : <https://youtu.be/2OOOpbe3rsVg?si=ZYKjGW8OA3TkRQ21>

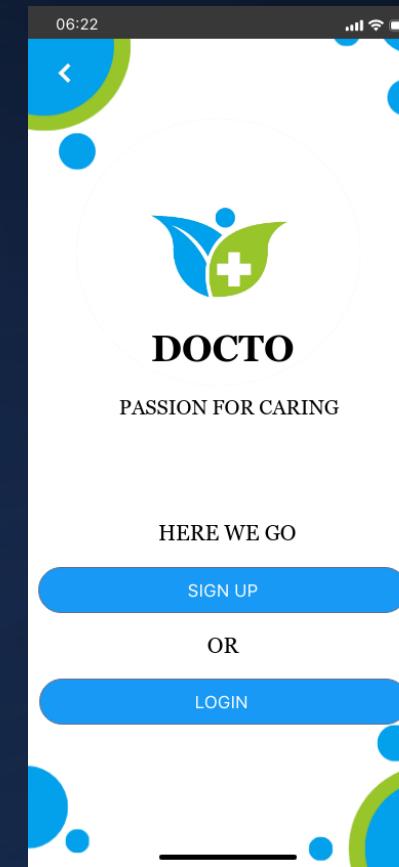
# PROTOTYPE(Patients)



Onboarding

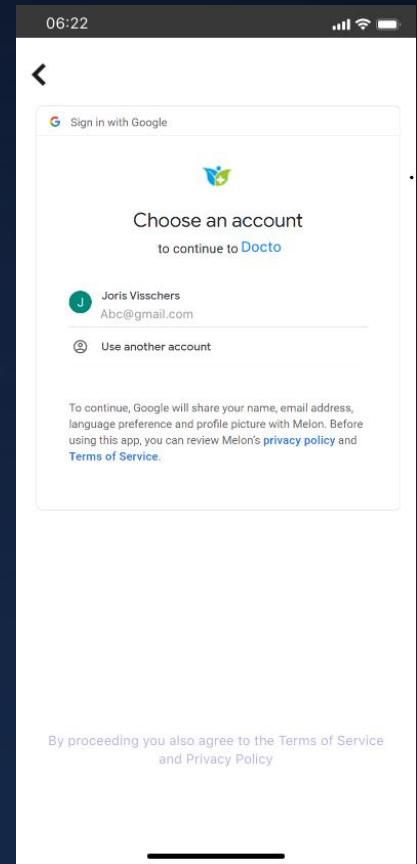
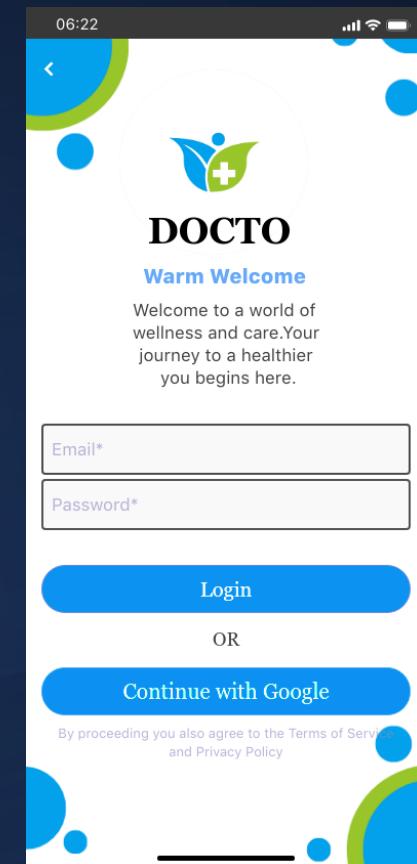
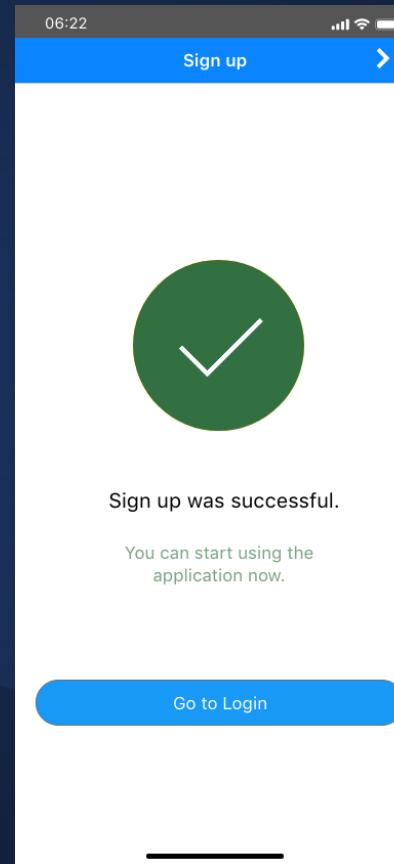
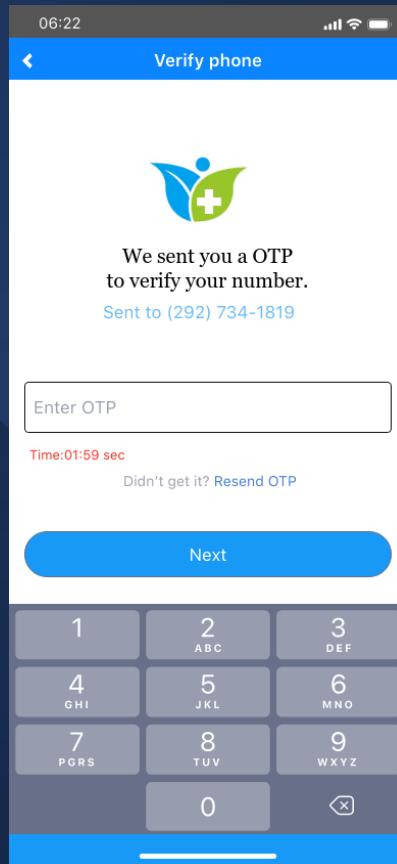
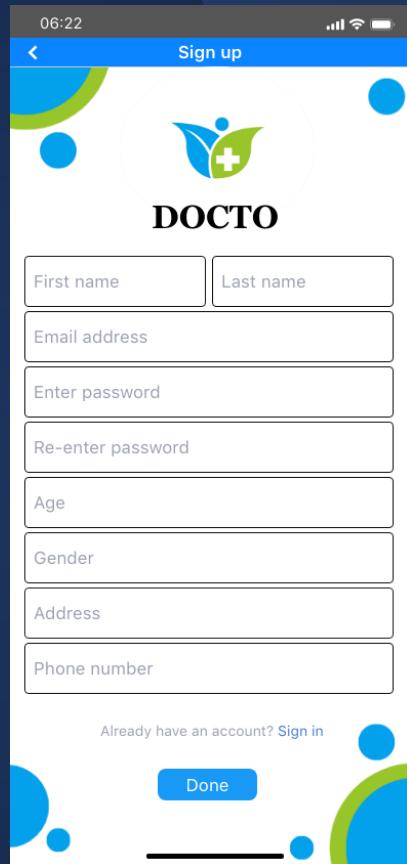


Authentication



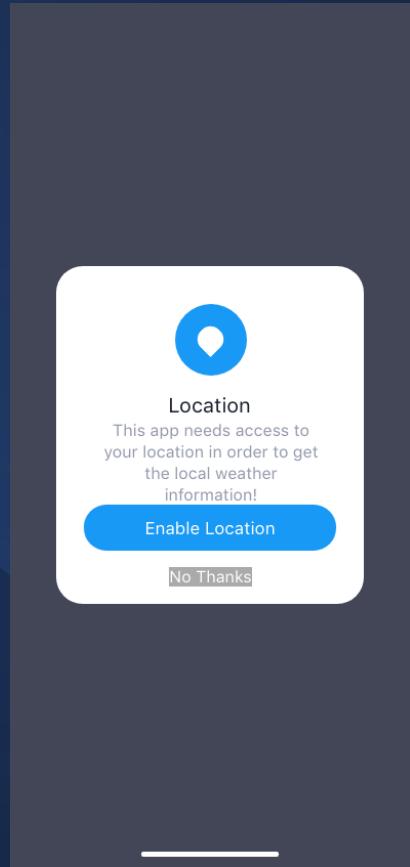
Create account or login

# SIGN UP AND LOGIN FOR PATIENTS:





Welcome page



Enable location notification



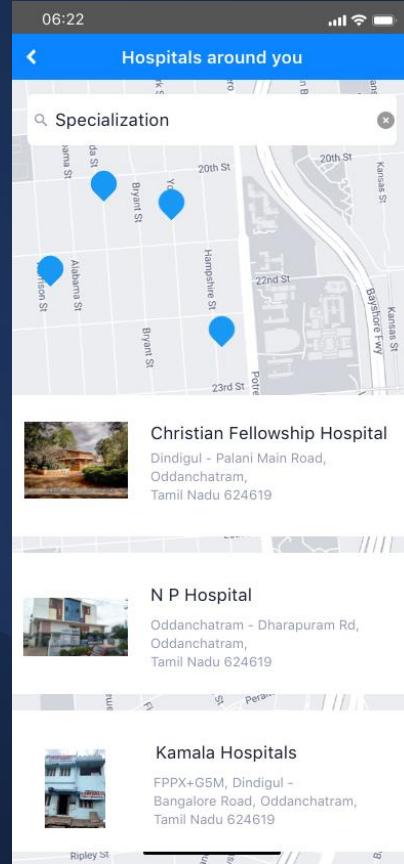
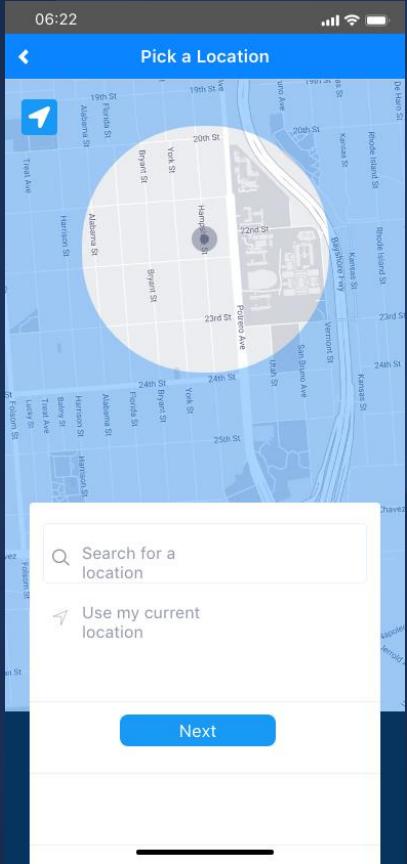
Home page

After authentication process user will be able to see a welcome page and then user need to enable their location to find nearby hospitals in the locality. Finally a home page will be displayed to the user.

### **Major features in home page:**

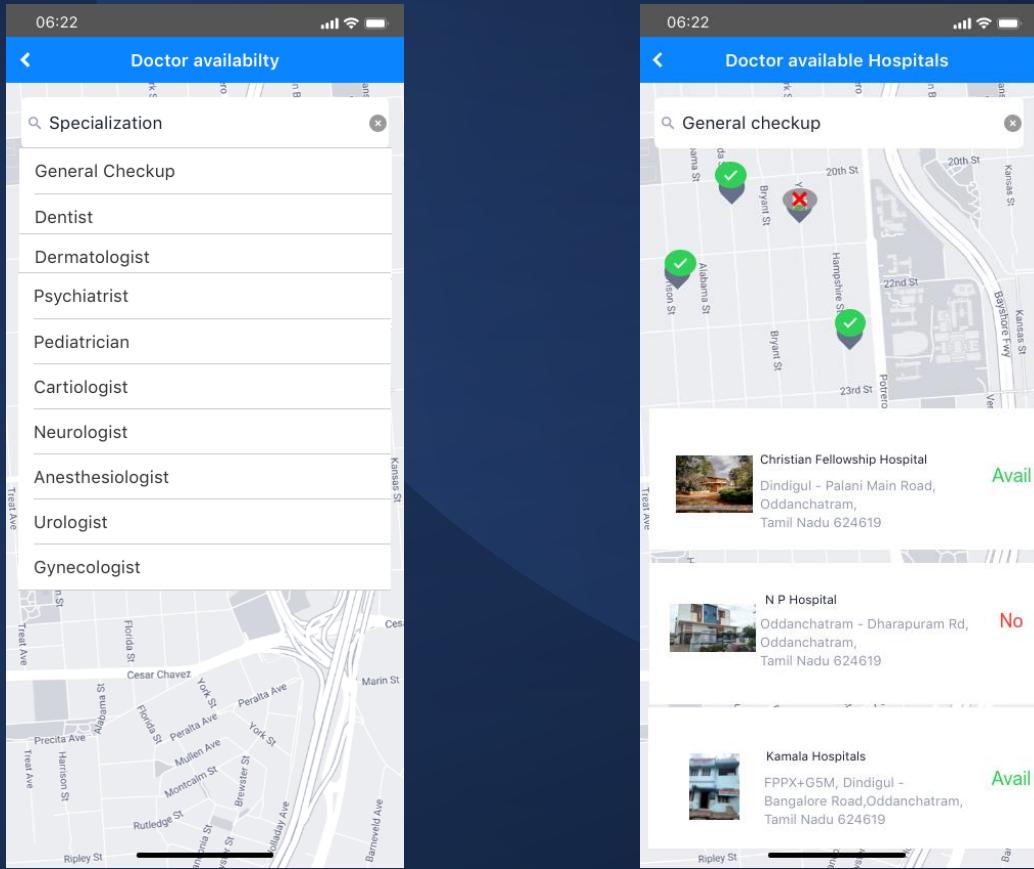
1. Checking nearby hospitals
2. Doctor availability
3. Patient waiting list
4. Book appointments
5. E-Pharmacy
6. Blood Donation
7. What's app bot (chatbot)
8. Translation

# CHECKING NEARBY HOSPITALS



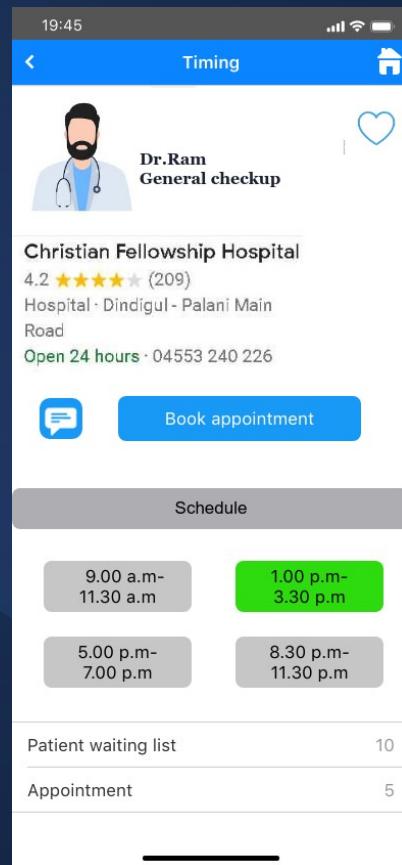
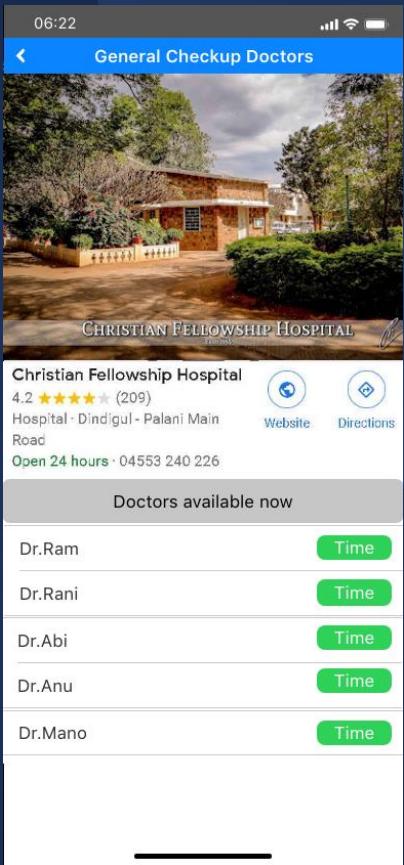
- In this stage, the hospitals nearer to our locality are shown based on the user search.
- We can use either our current location or we can enter a new location similar to their nearest location.
- Next the selected area will be highlighted in the Map region and enlist all the hospitals nearby with their address locations.

# DOCTOR AVAILABILITY



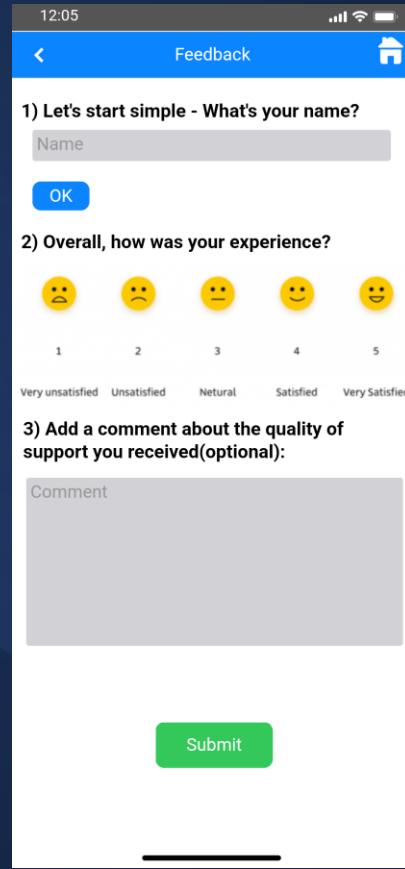
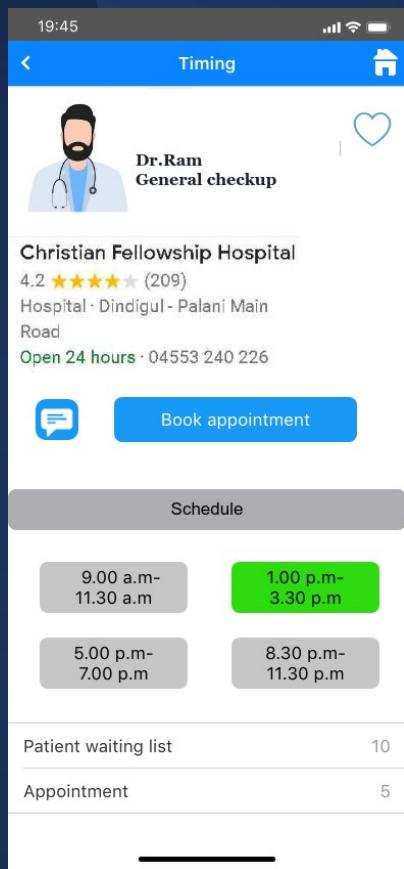
- After getting a list of hospitals showed up in the suggestion box, it is up to the patients to select the doctors based on the availability. Here we select the doctors whoever available for consultation.
- After choosing the hospital and a specialization of a doctor will be shown in green color. We need to click avail button for further proceedings

# PATIENT WAITING LIST



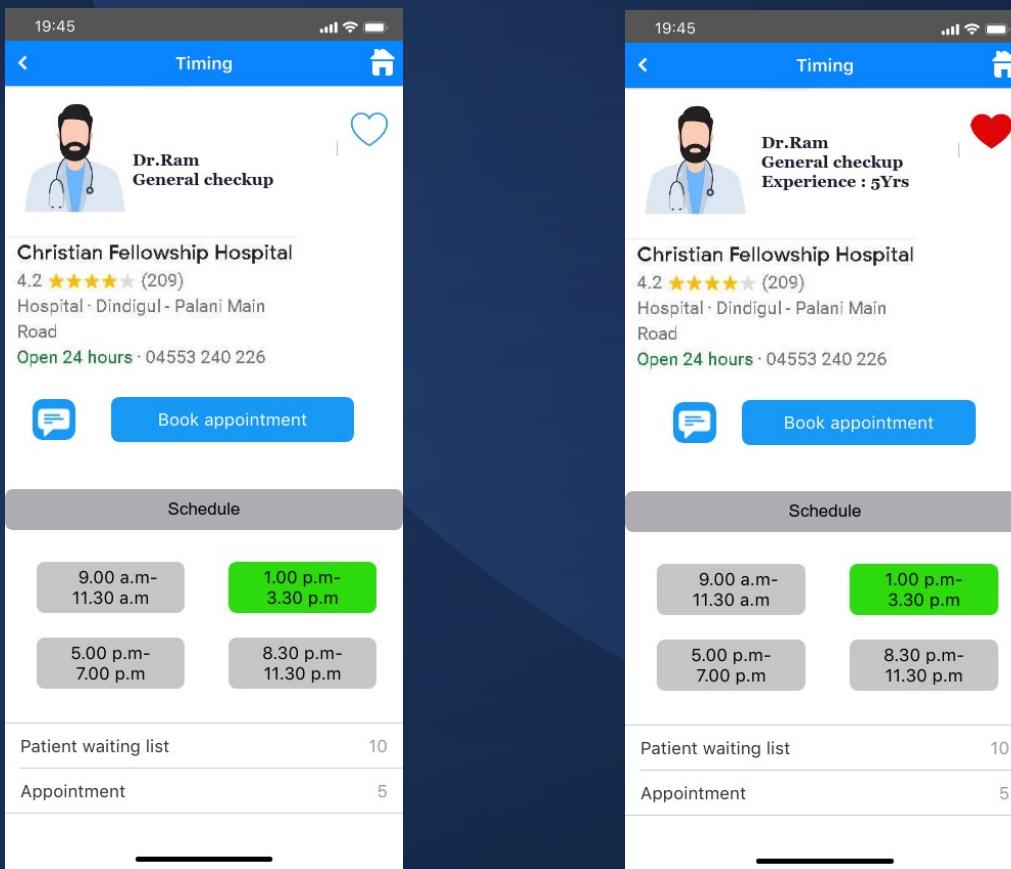
- After checking the doctors availability we can also use this option to check the waiting list of Patients to the concerned doctor in detail
- After clicking the avail option, Doctors availability will be shown with timing schedule as free slots without coloring and booked slots with green color.
- Next options like Number of Patient in a waiting list and the number of slot with appointment booked can also viewed.

# FEEDBACK



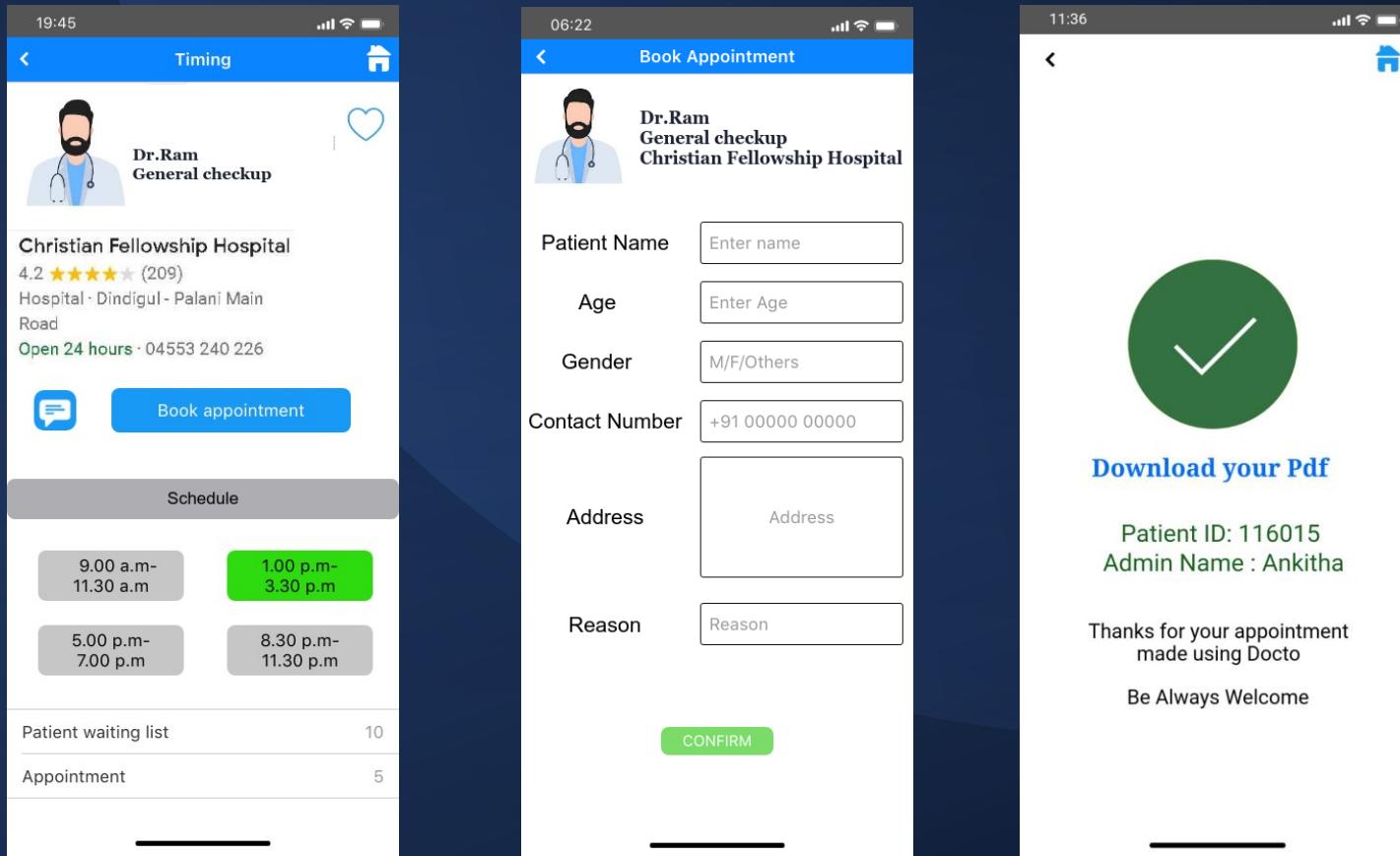
- Using the Feedback button patients can give their Feedbacks.
- After clicking the Feedback button, Patients will be directed to the Feedback page. In this page, they can rate their overall experience and they can also add comment which is optional.

## LIKE



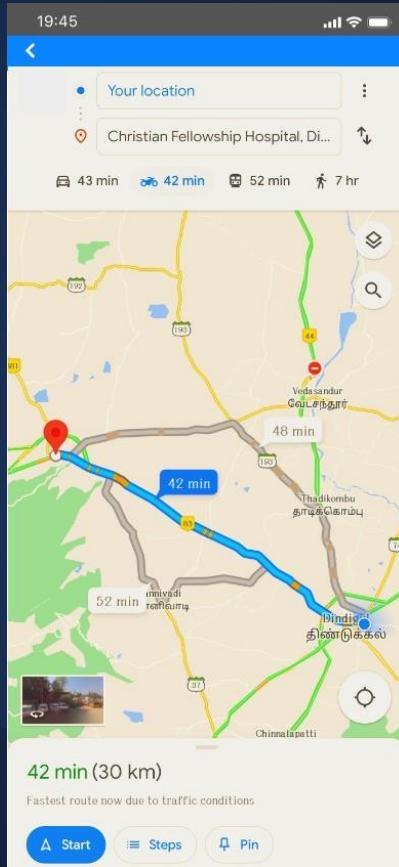
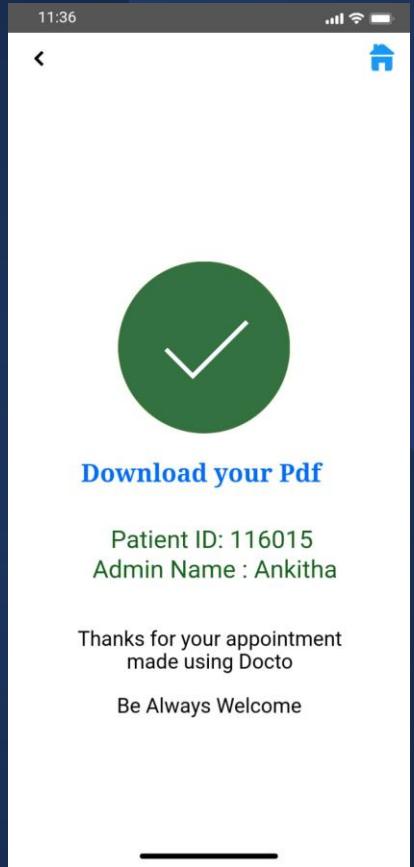
- Using the like button, patients can also like the doctor and add that doctor in their favourites list (if needed).

# BOOK APPOINTMENT



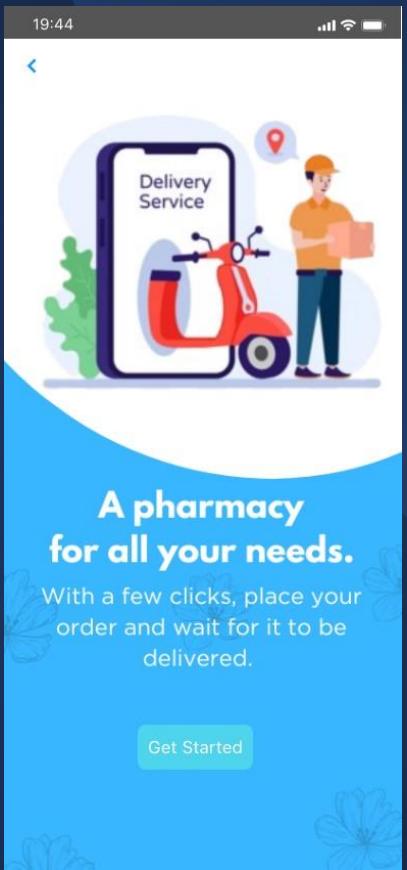
- After clicking the Book appointment button, patient can book an appointment with the concerned doctor through this app.
- Patients have to enter their details and then click confirm to download their appointment schedule as a pdf file. And their Patient ID and the name of the Admin who booked their appointment will be displayed along with their Download your pdf button.

## DOWNLOAD PDF



- After clicking the Download your Pdf button, Patient's appointment Pdf will open, in which they can see their appointment details.
- There is a Map Link button. After clicking the map button, the map will direct you to the hospital from your current location.
- This will be more convenient for the user after booking an appointment and directions to guide to that hospital in case of any emergency.

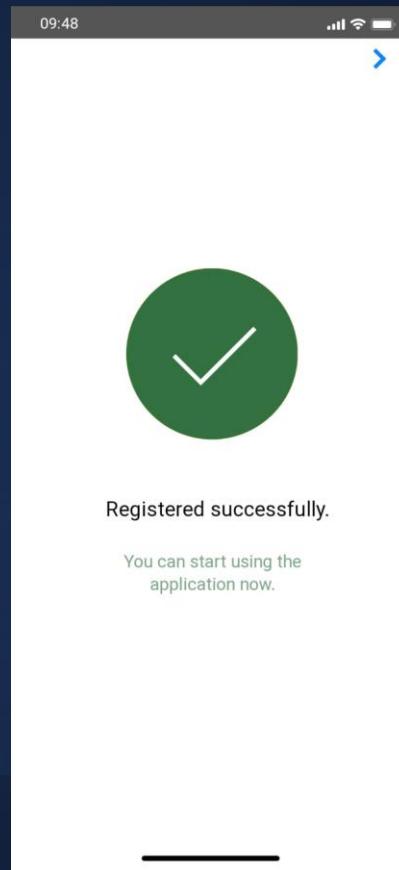
# E-PHARMACY



Welcome page

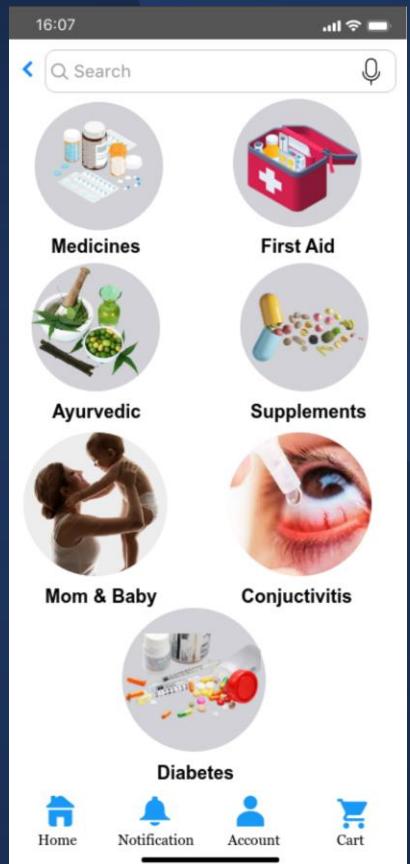
The register page has a header 'Details' and a logo. It contains fields for First name, Last name, Email id, Mobile Number, DOB, Age, Blood Group, Gender, and Address. At the bottom is a blue 'Register' button.

Register page



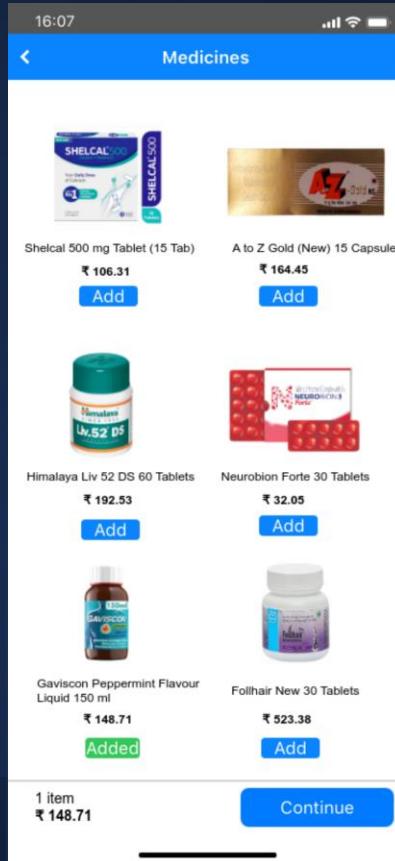
- By choosing the E-Pharmacy option in home page, user will lead to another page which requires user to register their location details and other basic details for successful registration.
- Once successfully registered, they can access their medical services like purchasing medicines and it will be delivered at their doorstep.

# E-PHARMACY



**Home page**

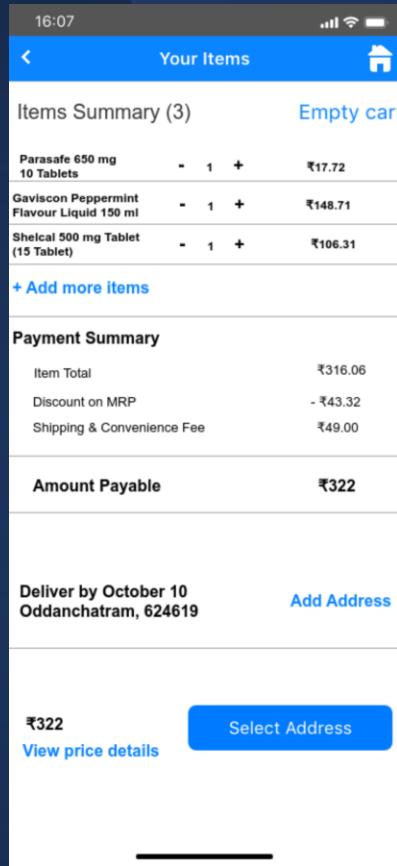
- After registration process, home page will be displayed to the user.
- In home page there is a search bar, voice-activated feature for hands-free usage and there are six categories of pharmaceuticals.
- Using these categories user can purchase their pharmaceuticals.



**Medicines page**

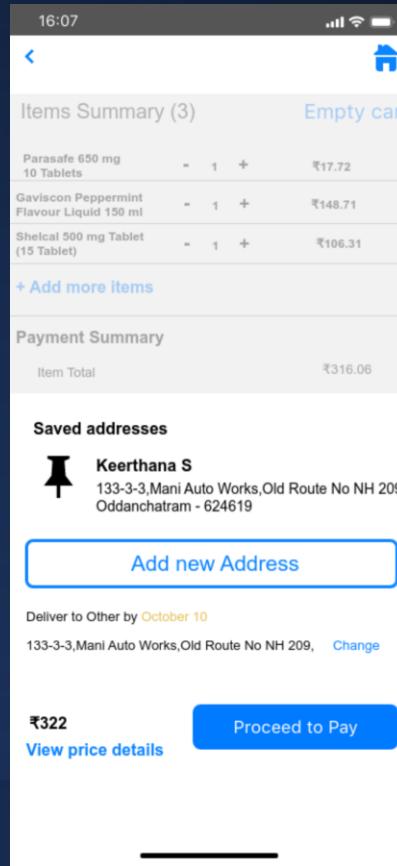
- After clicking the Medicines in home page, a list of medicines will be displayed along with their price details.
- User can select their desired medicines and click Continue for further process.

# E-PHARMACY



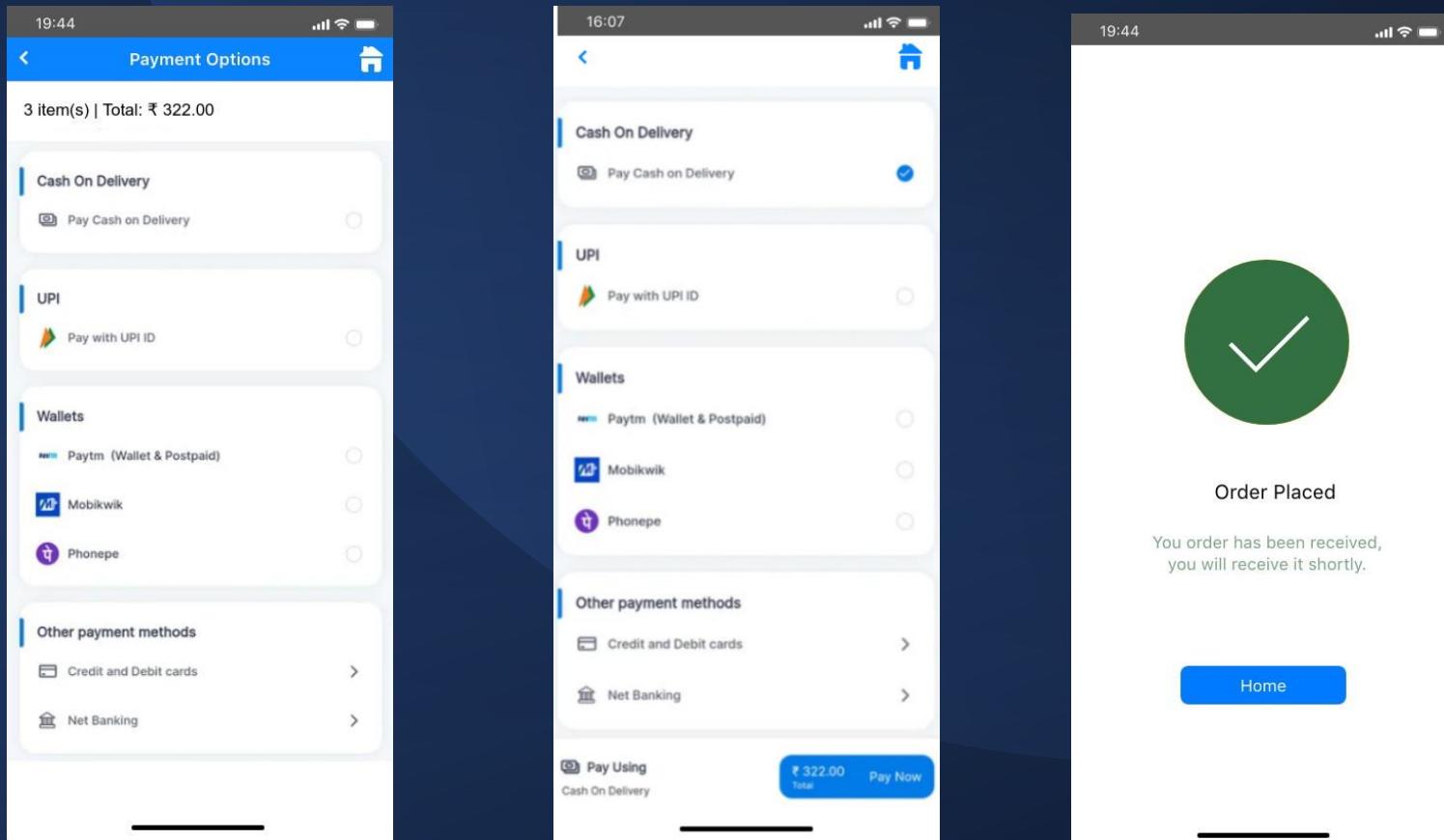
Your Items page

- After clicking the continue button in medicines page, Your Items page will be displayed to the user.
- In this page, the list of medicines selected by the user will be displayed along with the quantity and price tag.
- User can also add more items if needed
- Total amount payable and price details are shown.
- User need to click Select Address for further process.



- After clicking the Select Address button, Saved Address will display. They can choose that address or can add new address.
- Delivery date will display
- User need to click Proceed to Pay button for payment options.

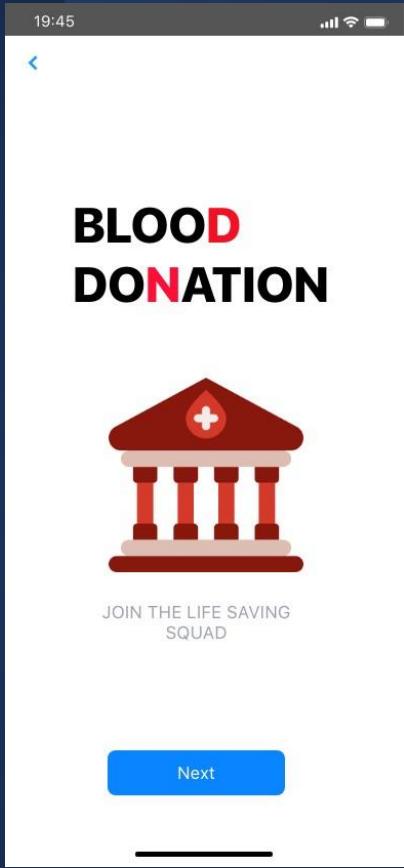
# E-PHARMACY



## Payment Options page

- After clicking Proceed to pay button, they will be directed to Payment Options page.
- In this page, they need to select their payment option.
- After that, their order will be placed successfully.

# BLOOD DONATION



Welcome page

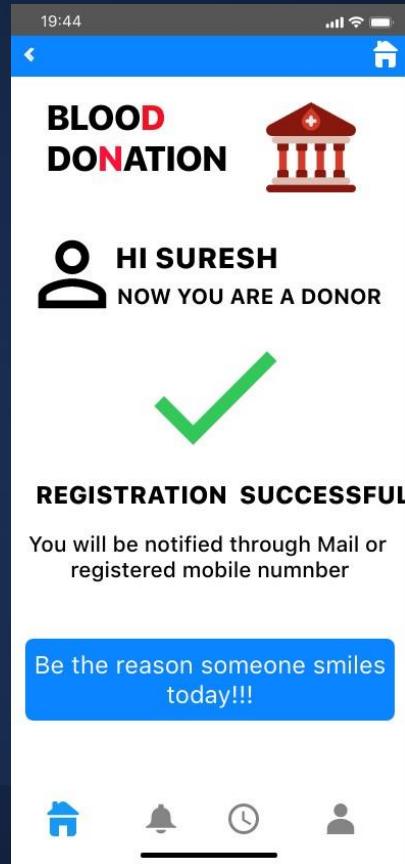
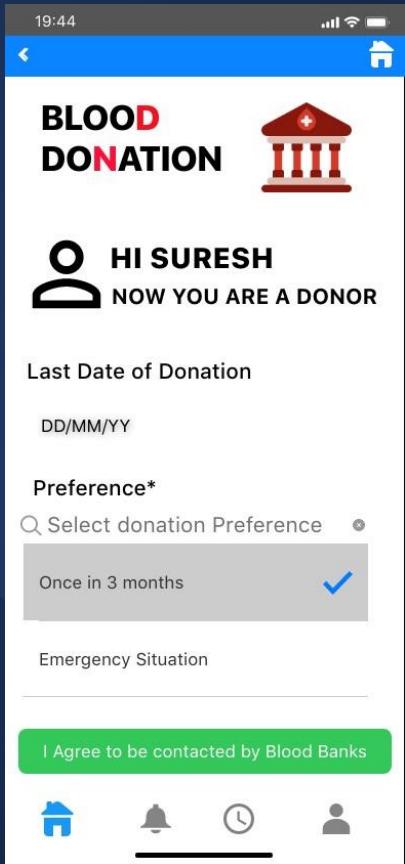
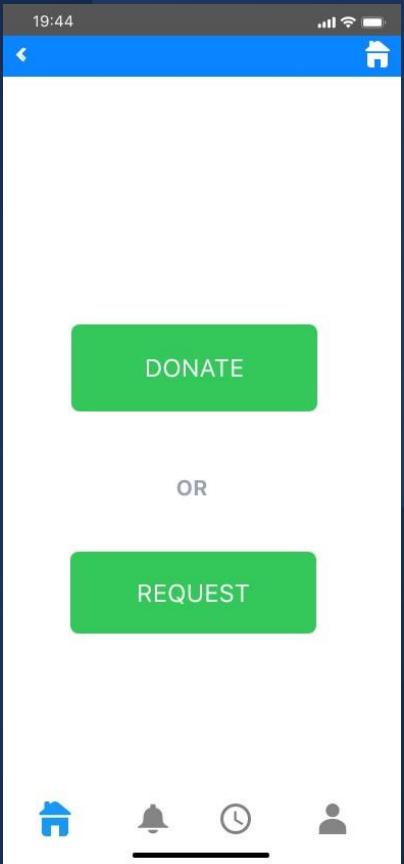
The Register page has a header "Details" and a "BLOOD DONATION" logo. It contains fields for "First name" and "Last name", "Email Id", "Mobile Number", "DOB", "Age", "Gender", and "Address". At the bottom are "Reset" and "Confirm" buttons.

Register page



- After clicking Blood Donation option in home page, user needs to register their basic details and then click next to select their blood group and then proceed.

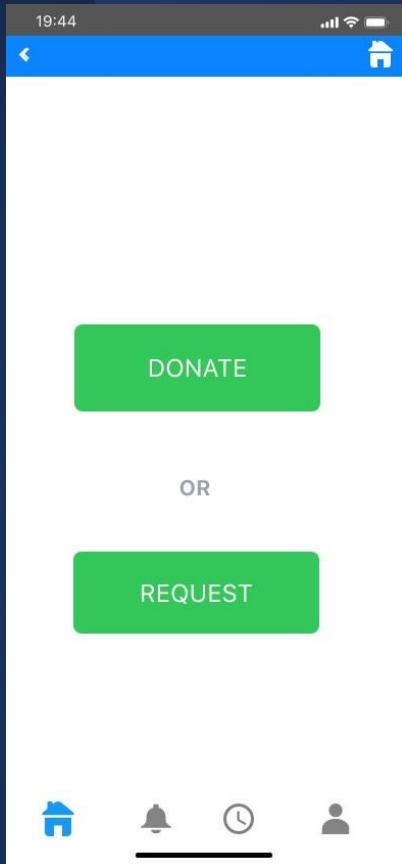
# BLOOD DONATION



**Donate page**

- After clicking confirm, they will be asked whether they need to Donate or Request.
- If they are willing to Donate, then they need to click the Donate button.
- After clicking Donate button they will be directed to a page, where they will be displayed as Donor.
- After selecting the last date of donation, preference and then agreeing to be connected by Blood Banks ,the registration process will be completed.

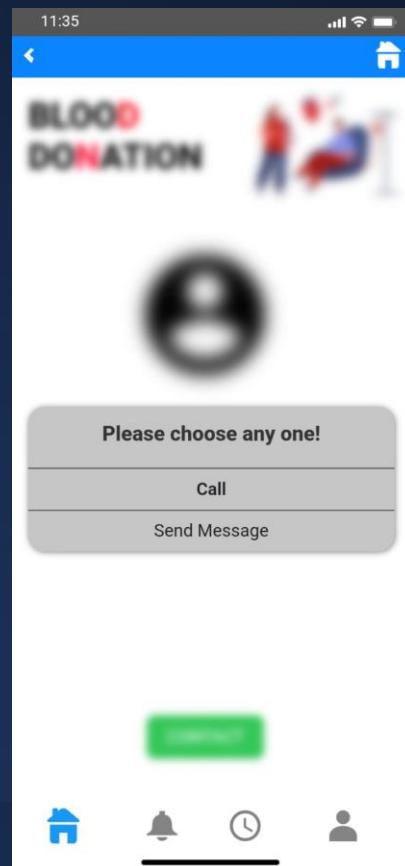
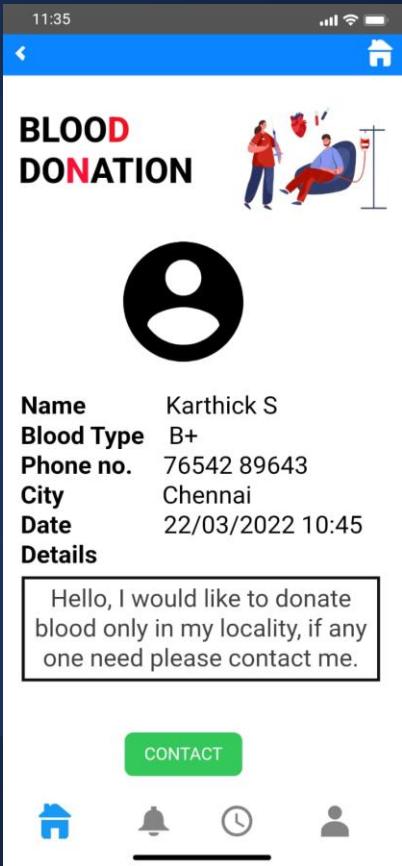
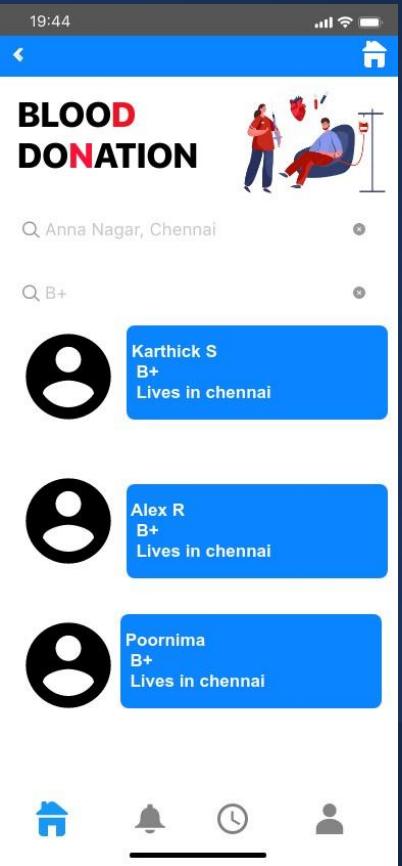
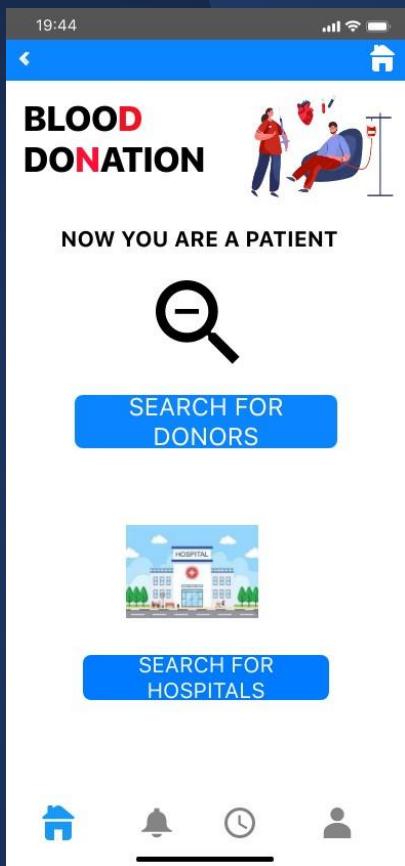
# BLOOD DONATION



- If they need to Request for blood, then they need to click the Request button.
- After clicking the Request button, they will be directed to the page where they can Search for Donors or lastly Search for Hospitals who will have stock of blood.

**Request page**

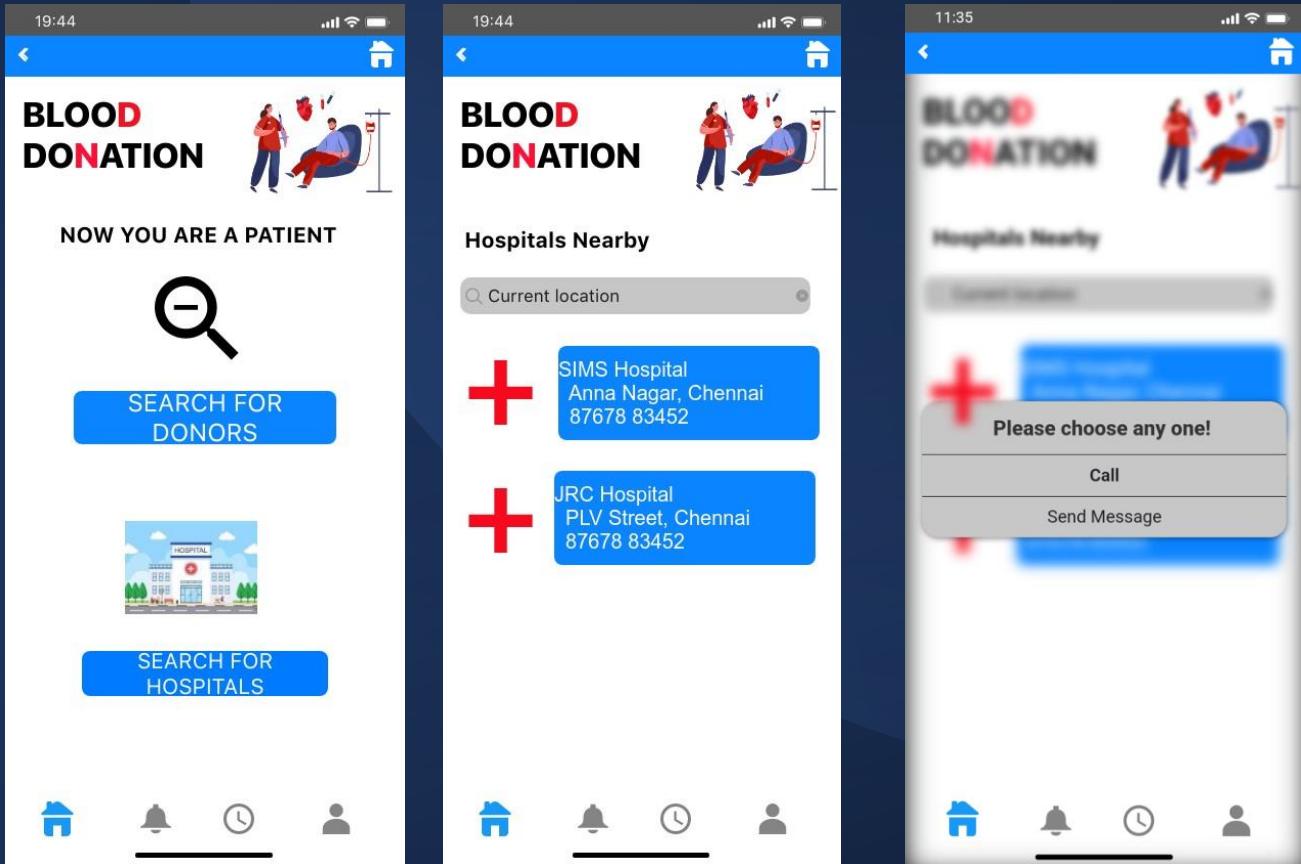
# BLOOD DONATION



- After clicking the Search for Donors button, they will be directed to the page where they need to enter their Location and Blood Group.
- People who are willing to donate with the above given Locality and Blood Group will be shown.
- Based on user's preference, they can select anyone.
- After that, the basic details of the selected person will be displayed.
- If they need contact, then they need to click the Contact button.
- Then a dialog box will display, in which they can either Call or Send Message to that person

**Search for Donors page**

# BLOOD DONATION



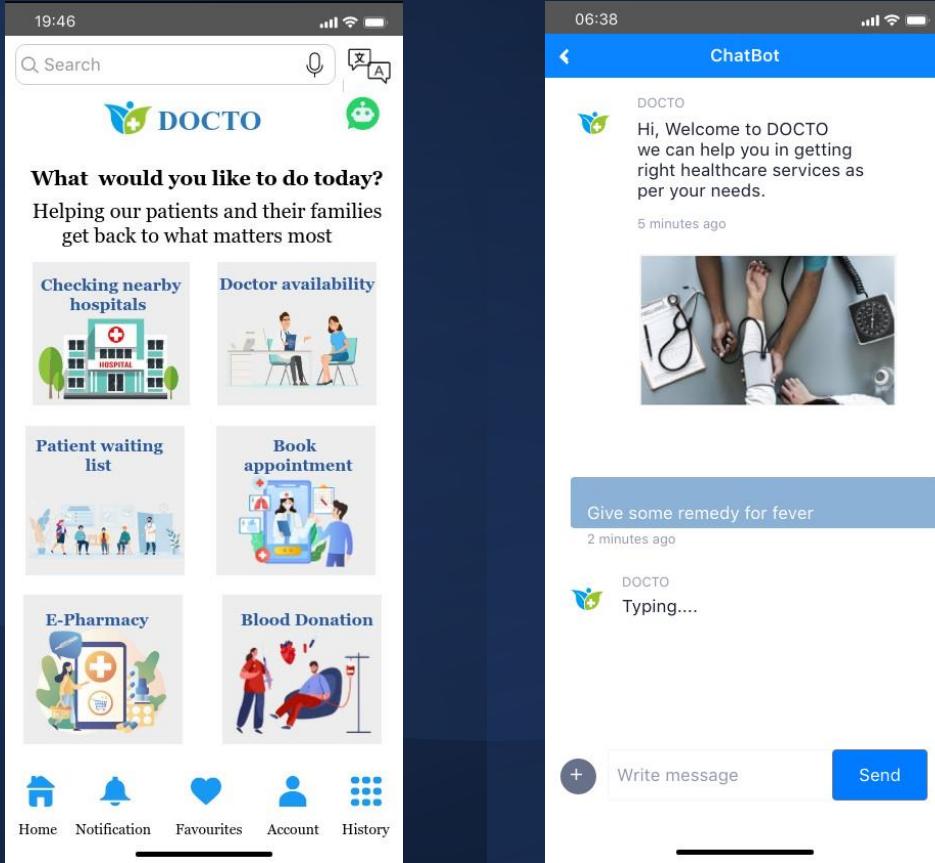
Welcome page

- After clicking the Search for Hospitals button, user will be directed to a page where we need to enter our current location.
- Then the list of hospitals in our current location will be displayed.
- User can select anyone hospital by their preference.
- After selecting the hospital, a dialog box appears in which they can contact the hospital by either Calling or Sending Message.

# WHATSSAPP BOT (chatbot)

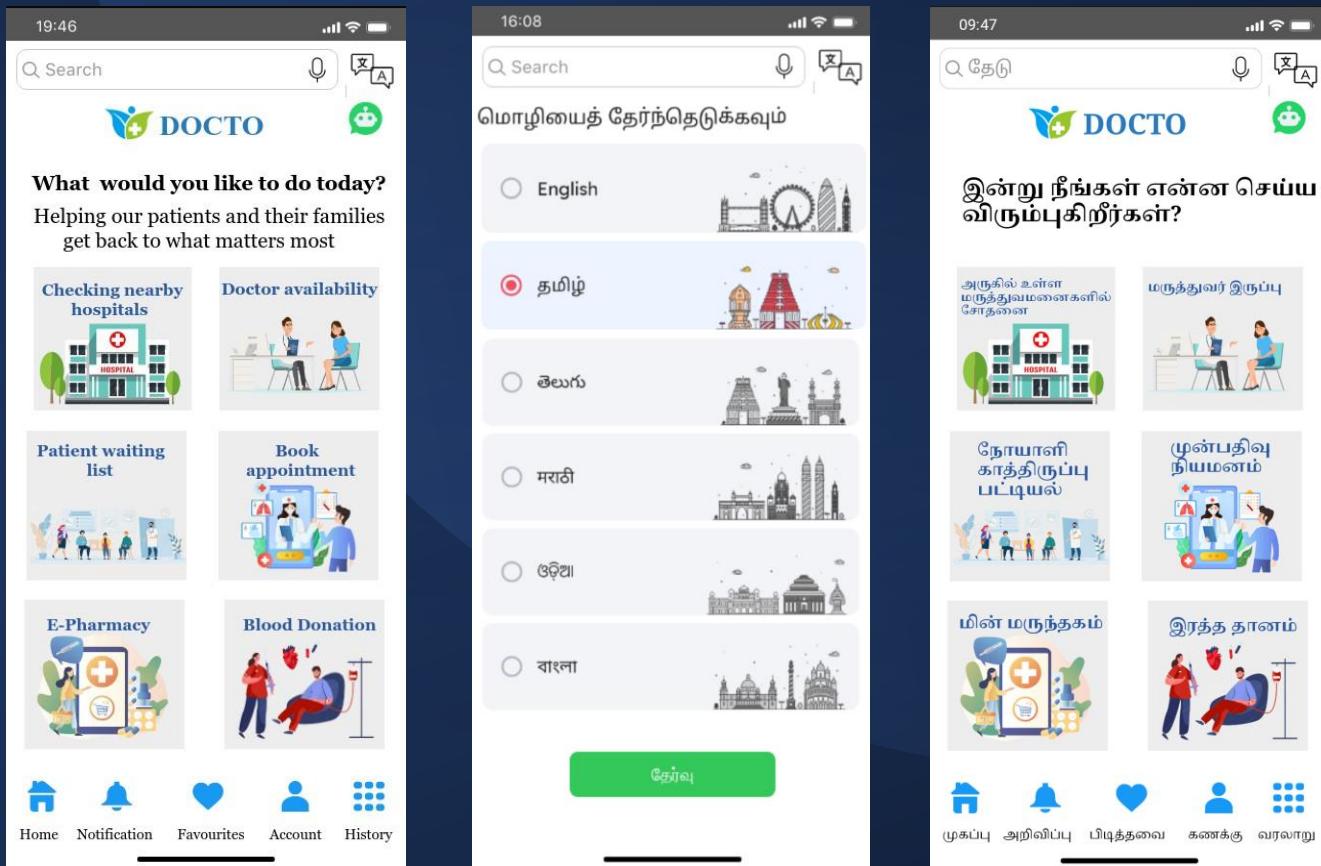


Apart from the above 4 stages, this is the unique stage where patients can get suggestions or information through chatbots.



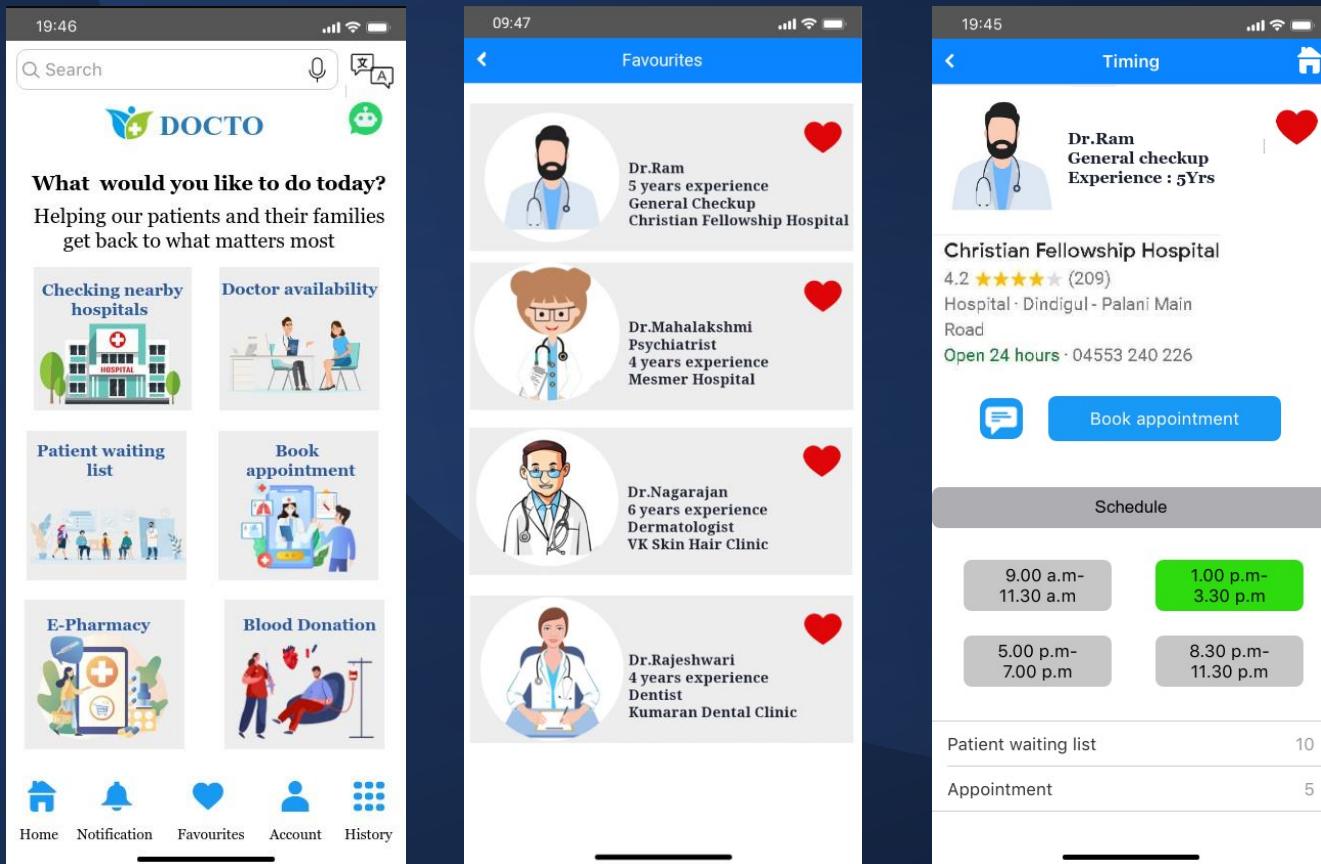
In a homepage, we have to click the what's app bot icon to start a chat with chatbot. In this we can clarify our doubts and also provide a user interaction lively with the doctors. They can also get a detailed suggestion from doctor.

# TRANSLATION



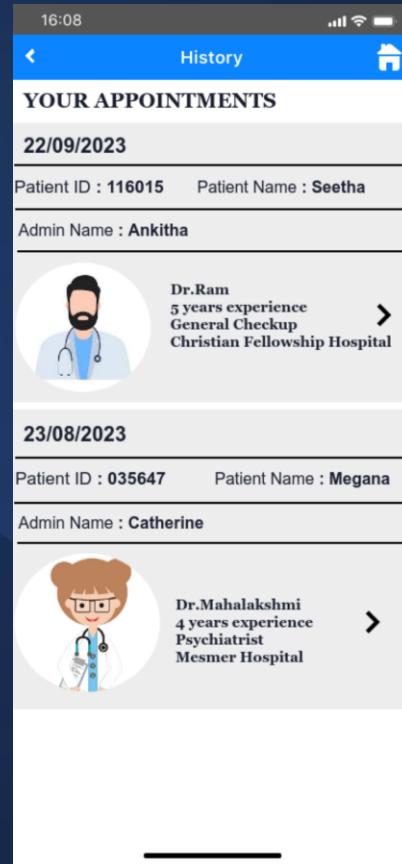
- In homepage, we have Translation button.
- User need to click the Translation button.
- After clicking the Translation button, A list of languages will be displayed.
- User can select their preferred language and then the app will be translated to their preferred language.
- In this list of languages we have selected Tamil language and the whole app is translated to Tamil language.

# FAVOURITES



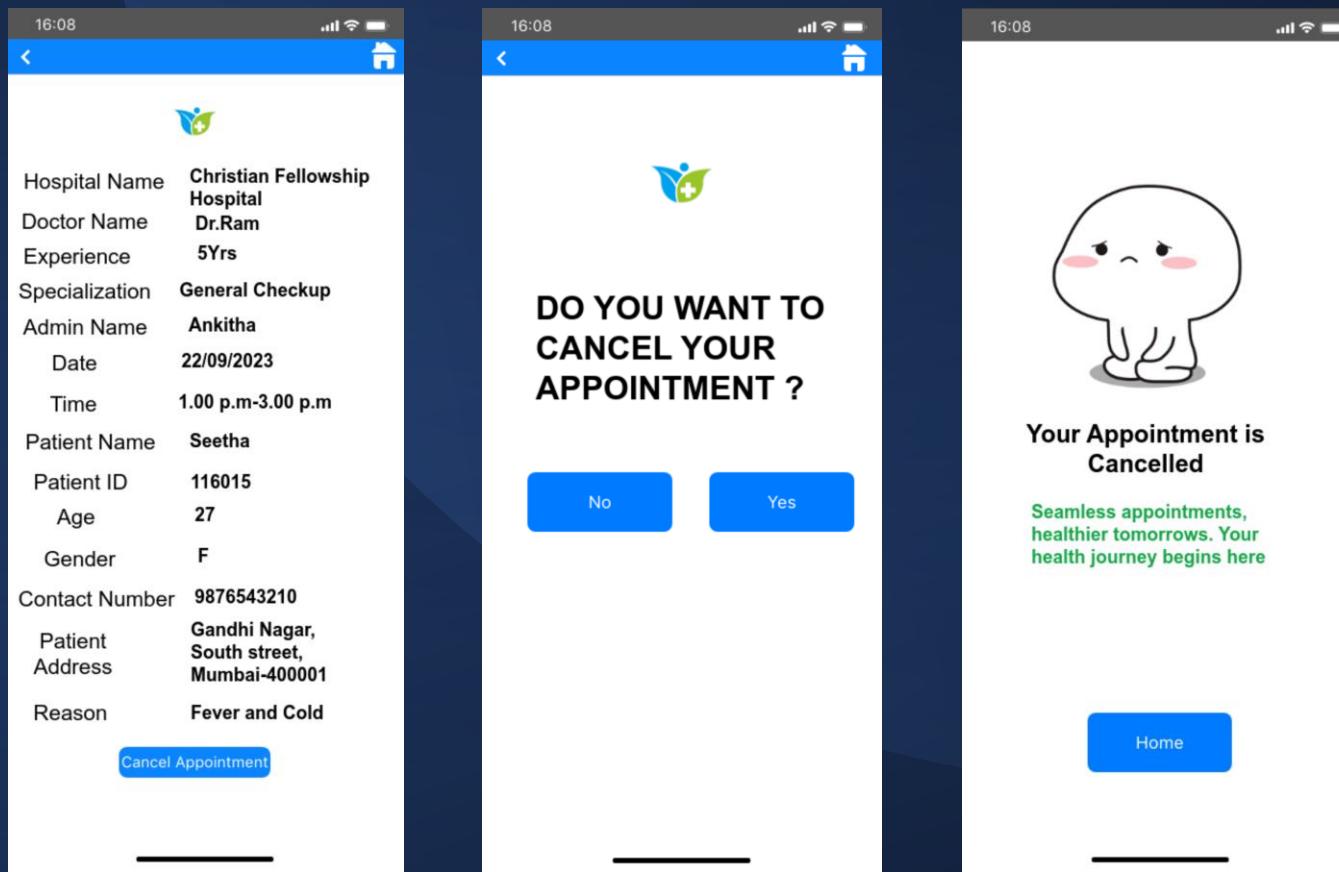
- In homepage, we have Favourites button.
- After clicking the Favourites option, patient can put their doctors in favourites list after consultation with them. Next time they can select the doctor easily by clicking the favourites icon which in turn reduce the time of selecting a doctor.

# CANCEL APPOINTMENT



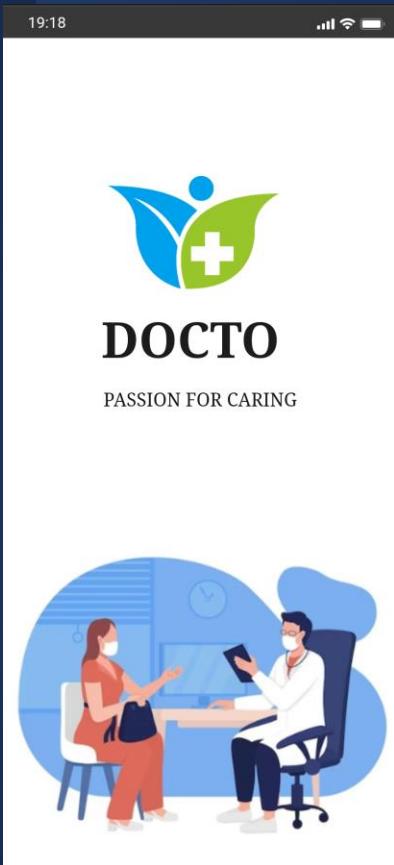
- In homepage, we have History button.
- After clicking the History button, the list of Appointments booked by the patients will be displayed.
- It has the important details of an appointment like Patient ID, Patient Name, Admin Name, and the Doctor's detail.

# CANCEL APPOINTMENT

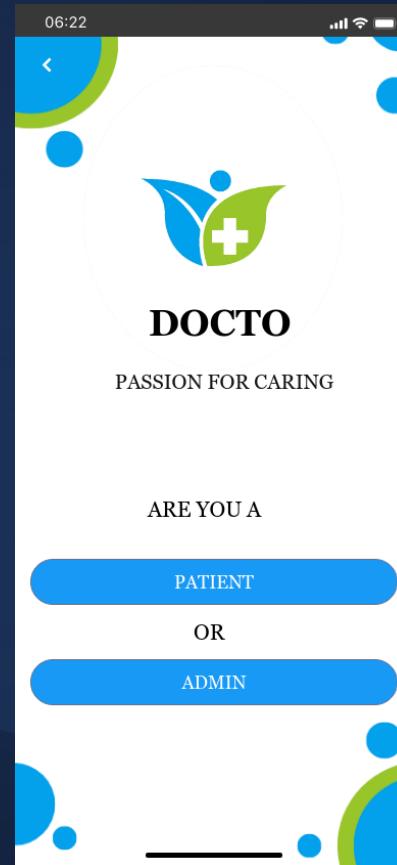


- Patient can select an appointment which shows all the details of an appointment booked.
- They can also use Cancellation of an Appointment option to cancel their Booked Appointment.
- They can click yes or no for further proceedings of cancellation.
- If they wish to cancel means click Yes to proceed which in turn leads to a successful cancellation of an appointment page.

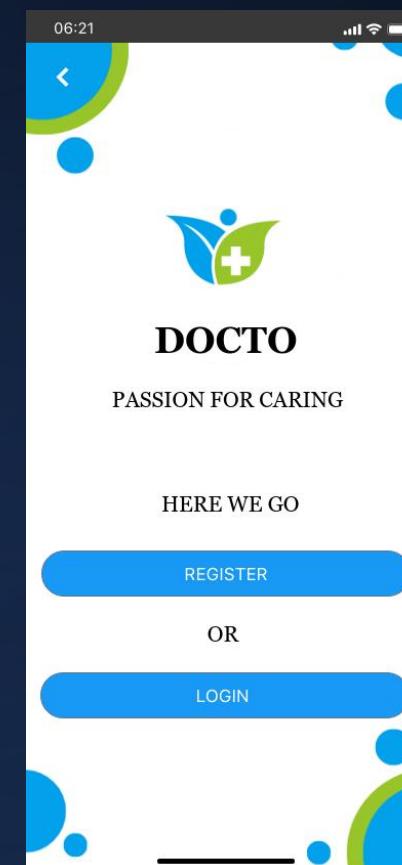
# PROTOTYPE(Admin)



Onboarding

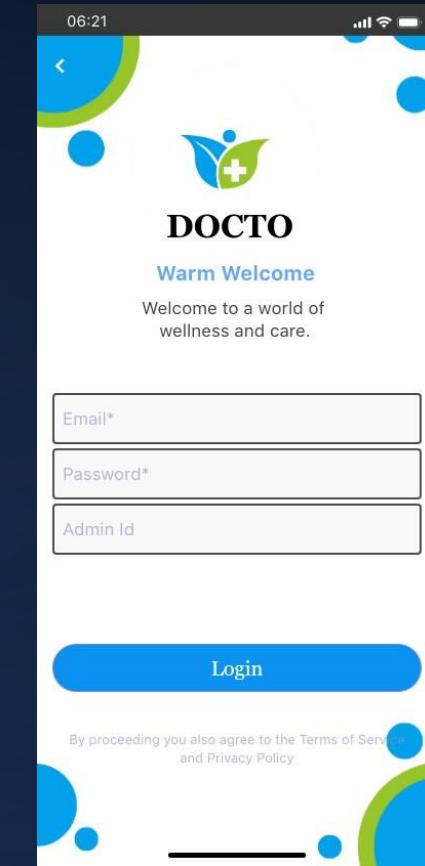
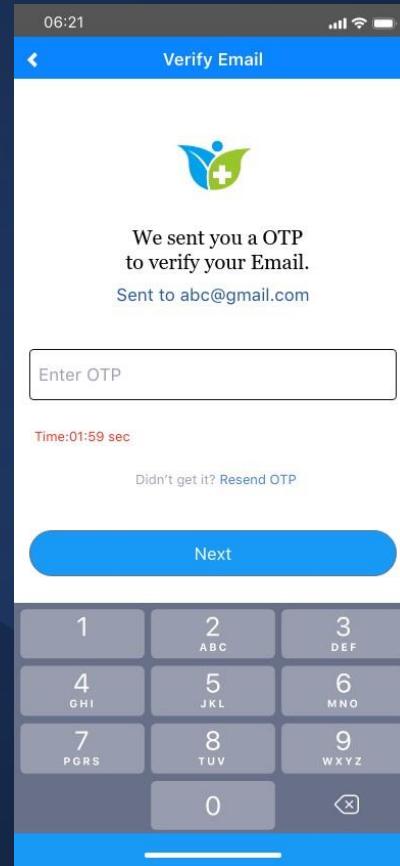
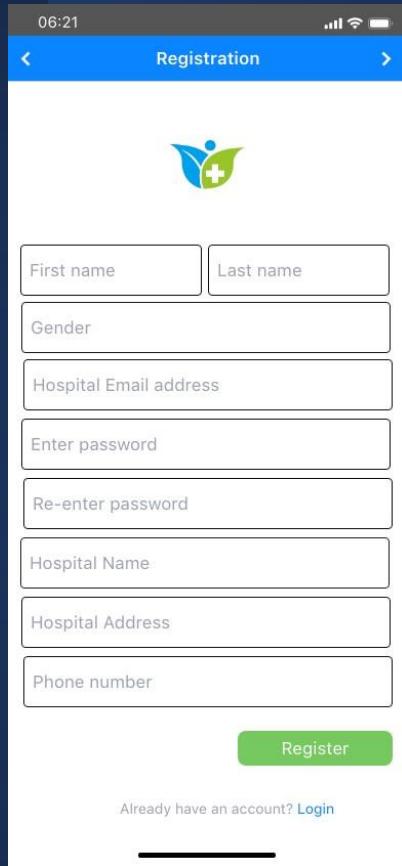


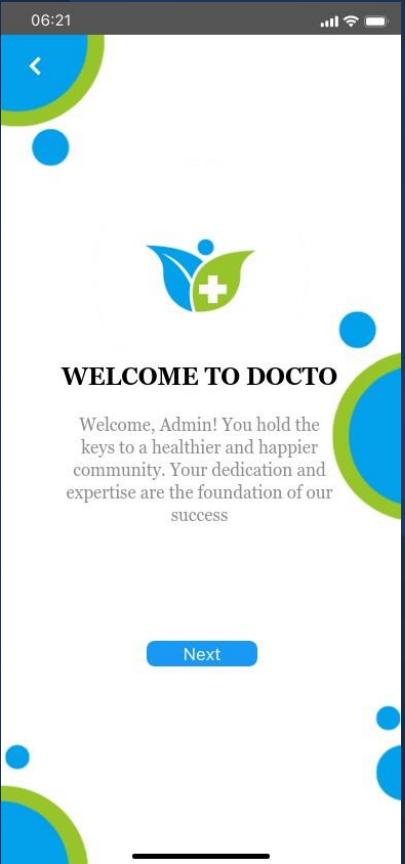
Authentication



Register or login

# SIGN UP AND LOGIN FOR ADMIN:





Welcome page



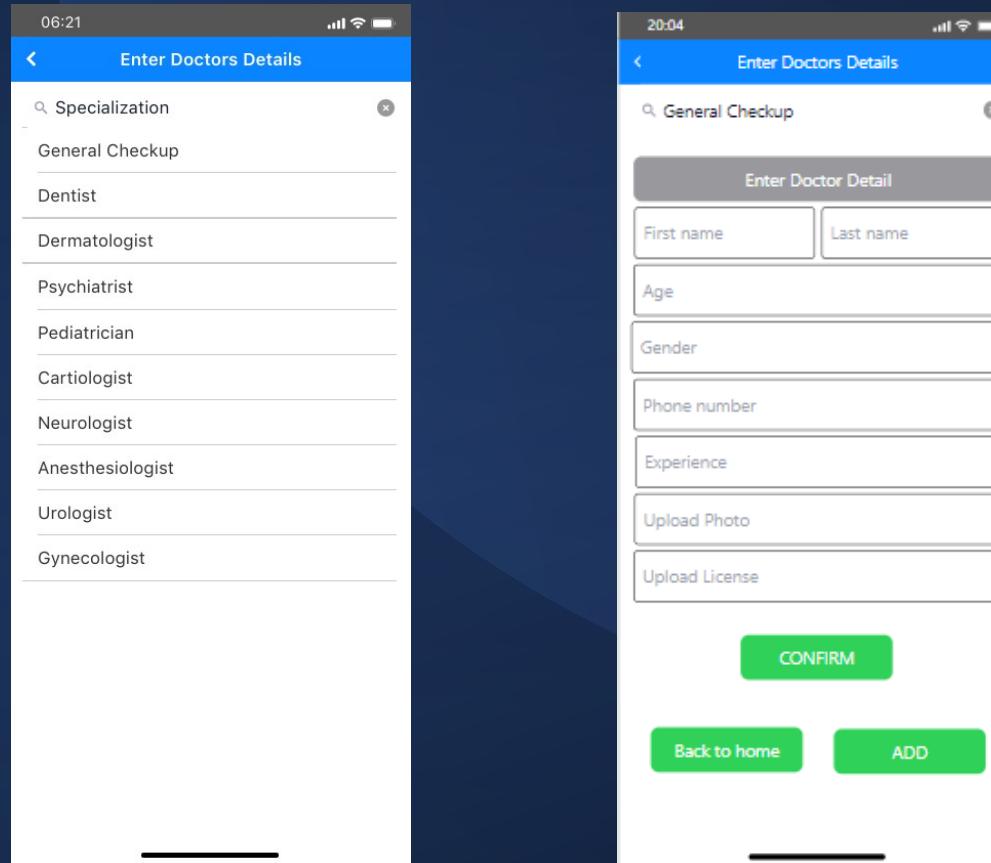
Home page

After authentication process admin will able to see a welcome page and then click next button to view the home page..

### Four major features in a home page:

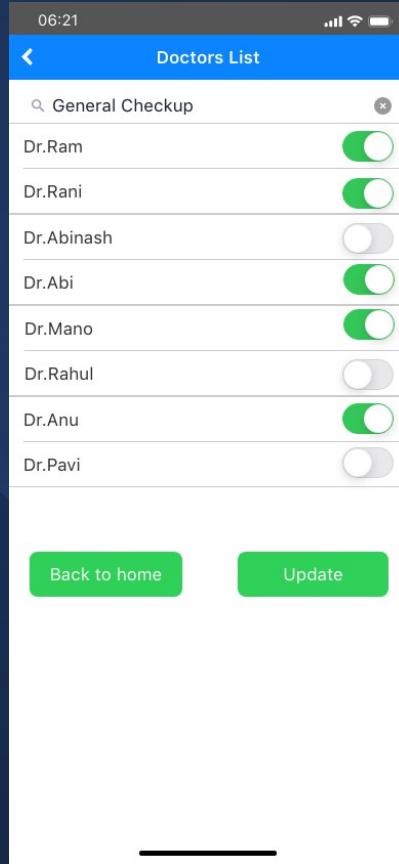
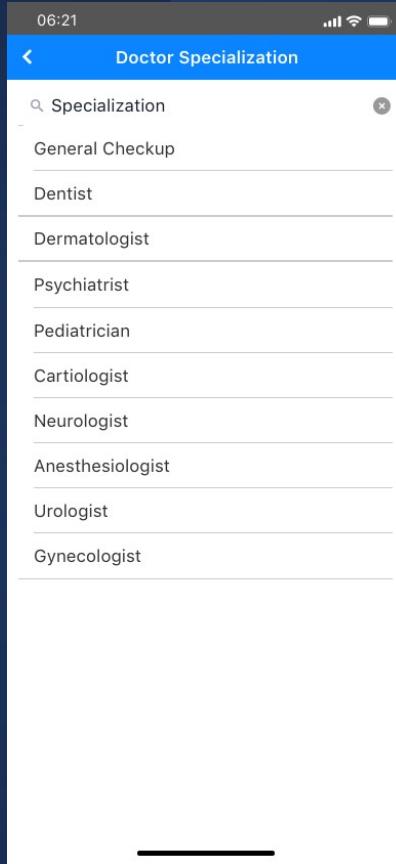
1. Doctor Personal details
2. Doctor List Updates
3. Doctor Schedule
4. Appointments

# DOCTOR PERSONAL DETAILS



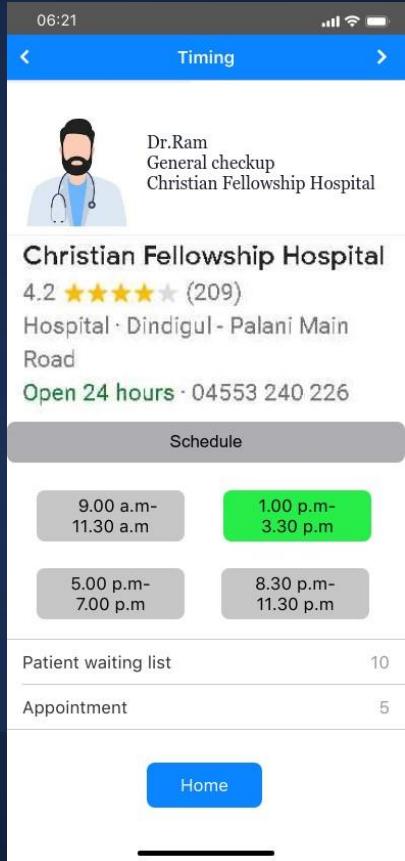
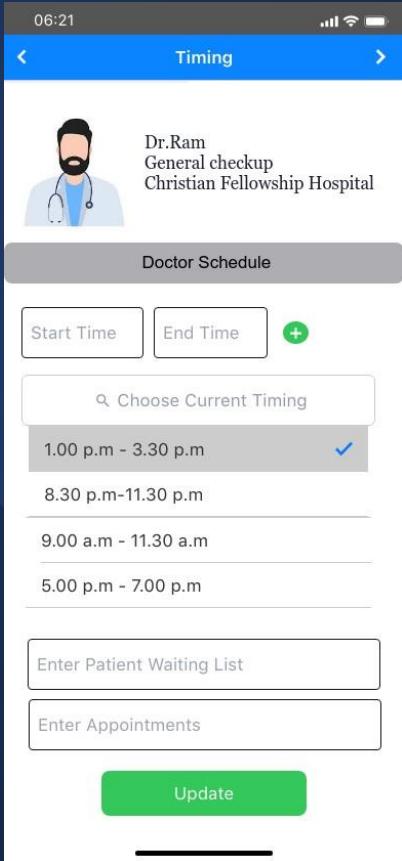
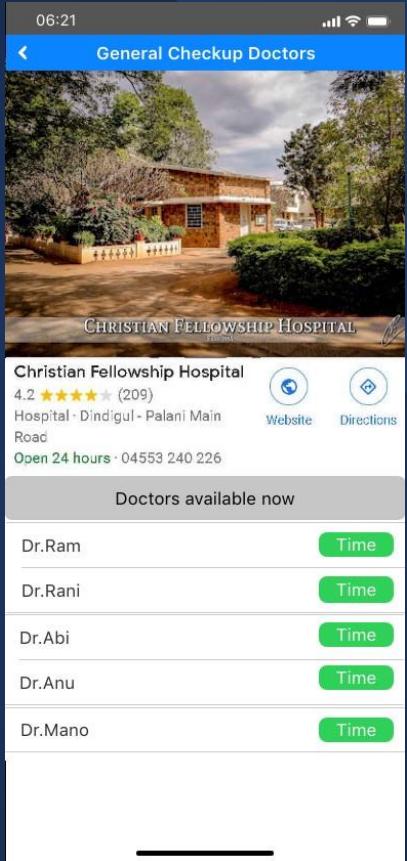
- After clicking Enter doctor details in home page, the specialization have to be selected.
- In next page the admins have to fill the doctors personal details and submit the data using the confirm button.
- Then the admin can add another doctor details using the add button.

# DOCTOR LIST UPDATES



- By clicking Doctor list Updates, admin will know about the status of the doctor availability. By choosing this admin need to select the specialization and then they can view the doctors list of availability under that category.
- The admin can adjust the on/off button based on the doctors availability.
- After updating the status of doctor availability by the admin, it will be viewed by the patients immediately.

# DOCTOR SCHEDULE



- By clicking the doctor schedule option, list of doctors available in hospital will be listed. The admin have to select the time option to enter the schedules of each doctor.
- Based on the patients booked timing slot and the number of appointments, admin have to update the number of patients waiting list which includes the manual visit of patients in the hospital also.
- This will be viewed by patients immediately after updating the waiting list of patients in admin side.

## APPOINTMENTS



By clicking the Appointment option, the patients who booked an appointment through this app will be listed with their names and contact number.

# CHALLENGES FACED

- We have **learnt new tools** from scratch to create prototype.
- **User Interface was difficult** to design because it was new to us.
- Collecting Health **relevant details will be more difficult**
- To fix an appointment with a doctor for getting feedback will be so difficult.
- Designing a **logo** is a challenging one.
- **Building trust among users** regarding the accuracy of information and reliability of the app.
- Handling sensitive **patient data securely** and complying with healthcare data regulations.

# END USERS REACTION

- We have showcased our prototype to more than 10 end users and validated our idea.
- Their reaction made us to involve more in our project.
- They felt easy to use our app (User friendliness).
- Home care patients are interested in using this app .
- They felt this app will save their time.
- Senior citizens found it more useful and helpful.

# FEEDBACKS

- We got our feedbacks through videos and audios.
- They suggested us to keep video conference facility with doctors, to be available in many languages, and to connect with E-pharmacies
- We improved them by adding what's app bot facility instead of video conference facility.
- All suggestions are implemented now by us and if needed we will add many more features in future.
- Target Audience Feedback Video Link  
: [https://youtu.be/s91dznnCJ8c?si=tRqNVK\\_jP4jlnF\\_u](https://youtu.be/s91dznnCJ8c?si=tRqNVK_jP4jlnF_u)

# OBSERVED OR EXPECTED IMPACT

- Our project can increase access to medical services by allowing patients to find available doctors quickly, **reducing wait times for appointments**.
- Patients can **save time** by booking appointments or consultations **without** lengthy phone calls or **clinic visits**.
- Patients can schedule appointments, and **access medical advice** without the need for physical visits, making healthcare more convenient.
- In case of urgent **medical needs**, these apps can help patients find **nearby healthcare providers swiftly**.
- Doctors can manage their schedules more efficiently and **reduce administrative work**, allowing them to focus on patient care.

# ADAPTATION IN IDENTIFIED TARGET AUDIENCE

- **Suggestion:** Video Conference facility with Doctors.  
**Solution:** Replaced with **What's app bot.**
- **Suggestion:** To be available in many languages.  
**Solution:** Implemented.
- **Suggestion:** Connecting with E-Pharmacies.  
**Solution:** Implemented.

# OVERALL EXPERIENCE

- We played a pivotal role in developing a **doctor's availability app** aimed at simplifying **appointment bookings** for patients and **waiting list** of the **patients**.
- Challenges included integrating **real-time data** and **ensuring data security**.
- Collaborative efforts, led to a user-friendly app.
- User feedback and iterative improvements resulted in **increased engagement, reduced waiting times, and optimized schedules**.
- This experience enhanced our **adaptability**, communication skills, and **problem-solving abilities**, reinforcing the importance of adhering to **industry standards** in healthcare technology.
- We are enthusiastic about **applying these lessons** to future projects.

# BIGGEST LESSON LEARNED

- During the DO phase, the biggest lesson we have learnt was the importance of **effective collaboration**. Our team had chosen a complex project and as we delved into prototype, we encountered numerous roadblocks and disagreements on this approach. This situation made us realize that even the most talented individuals need to **work together seamlessly to succeed**.
- To address this, we initiated **daily stand-up meetings** to **discuss progress** and concerns openly. We also assigned specific roles to each team member based on their strengths and expertise. As a result, our communication improved and we began to make more efficient decisions. Ultimately, we not only **completed our task on time** but also developed a stronger bond as a team.
- This expertise taught us that collaboration is not just about dividing tasks but about effective **communication, mutual respect** and **adaptability**. This lesson has been invaluable not only in this particular DO phase but also in our professional career, where **teamwork plays a crucial role in achieving success**.

# SCALABILITY OF OUR SOLUTION

- Our medical app is designed with **scalability** as a top priority. It efficiently manages **patient records** and **user accounts**, safety to use multiple healthcare facilities.
- In evaluating the scalability of our app, its essential to conduct through **validation** and include both **current and future demands easily**.
- Our model is not just about maintaining performance, **reliability** and security when the app grows, **consulting with an expert** help to ensure our model scale up further.
- By implementing our app, the solution can scale efficiently to meet the increasing demands of hospitals, doctors, and patients, ensuring a **smooth and reliable experience** even as the user base grows

# TARGET AUDIENCE PAYING FOR THIS SOLUTION

- We believe that our target audience will be willing to pay for our Doctor Availability app for several reasons. First and foremost, our extensive market research including **surveys and interviews with potential users**, has indicated a strong demand for **convenient and reliable platform** to access the doctor availability.
- In short, based on user friendliness, pricing strategy, user feedback and market trends. We are confident that our target audience especially those who are **senior citizen**, recognize the value of our Doctor Availability app and be willing to pay for the services it provides.

# ABOUT OUR TEAM

Name of the team: **HACKSTARS**

Role of each team members:

- \***KAVIYA J** - Team Leader
- \***ANISHA J** – Designer
- \***DHARSHINI S** – Researcher
- \***KIRUTHIKA G** – Project Coordinator

**Photographs of our team during the brainstorm session and working together**



# ABOUT OUR TEAM

**Kaviya (Team Leader):** Kaviya's leadership provided clear direction and motivation, fostering a harmonious work environment for the team.

**Anisha (Designer):** Anisha's user-centric design choices, informed by Dharshini's research insights, ensured an engaging and intuitive user interface.

**Dharshini (Researcher):** Dharshini's data-driven recommendations guided design and decision-making, addressing the needs of both users and healthcare professionals.

**Kiruthika (Project Coordinator):** Kiruthika's efficient coordination efforts kept the team organized and focused, enabling the project to meet its deadlines and goals.

In essence, the team members collaborated and complemented each other's skills and roles, resulting in endless effort that allowed our prototype to progress smoothly, meet user needs, and stay on track within defined timelines.

# ABOUT OUR MENTOR

**Mentor name : N.J.DIVYA.**

**Specialization :** IOT in healthcare, pursuing her PhD in Healthcare application. So she is interested in carrying out our problem statement intentionally.

**Role :**

- She supported to develop our prototype design.
- Guided to choose our problem statement and what type of quality features to be included in our DO phase and it was explained by her elaborately.
- Supported in carrying out our both presentation work and in academics wise scheduling of classes also.
- She helped in such a way to understand the clarity of idea we presented, supported to teach us experimental knowledge and the content depth of the idea visually.