

HealthCare App Development

Tele Consultation Platform

Final Report

- By Team 7

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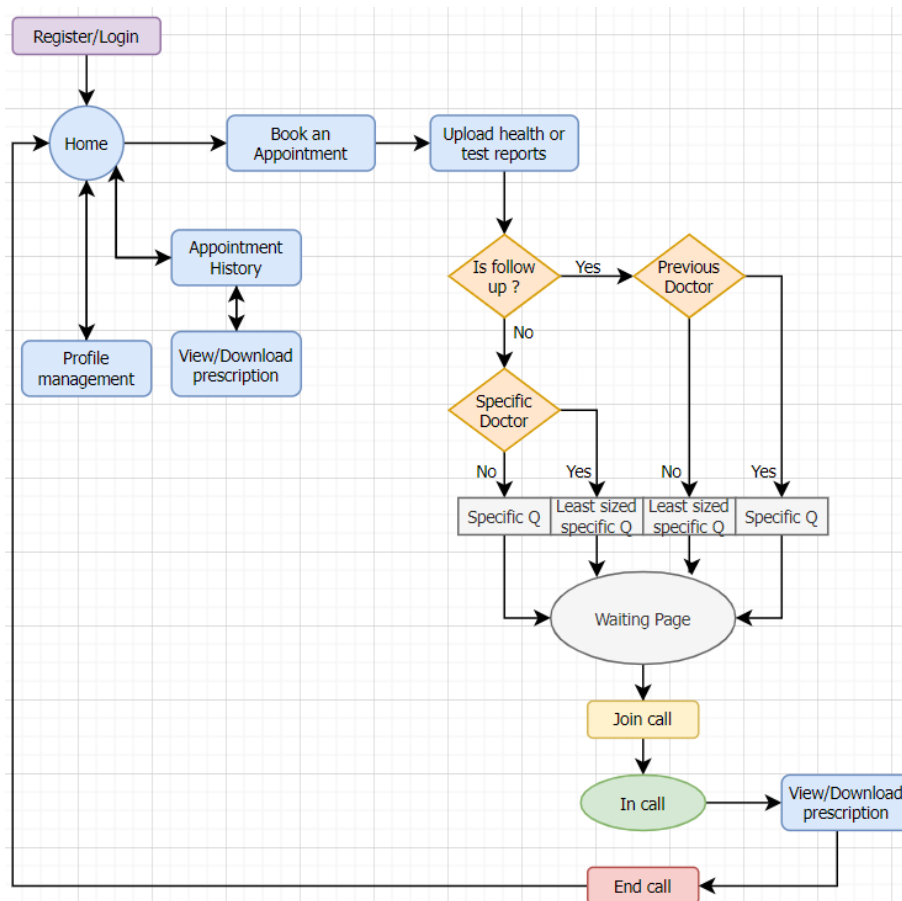
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Introduction

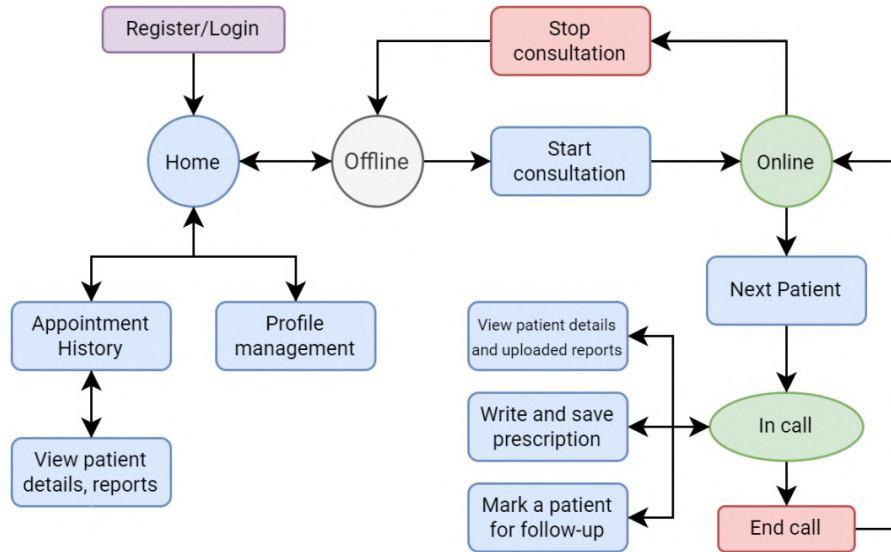
The application has two end users , Doctor and Patient. The following section briefs the implementation and serves as a walkthrough for both Patient's and Doctor's perspective of the application. Mechanisms involved in these implementations are discussed in detail in a later section.

Website Flow

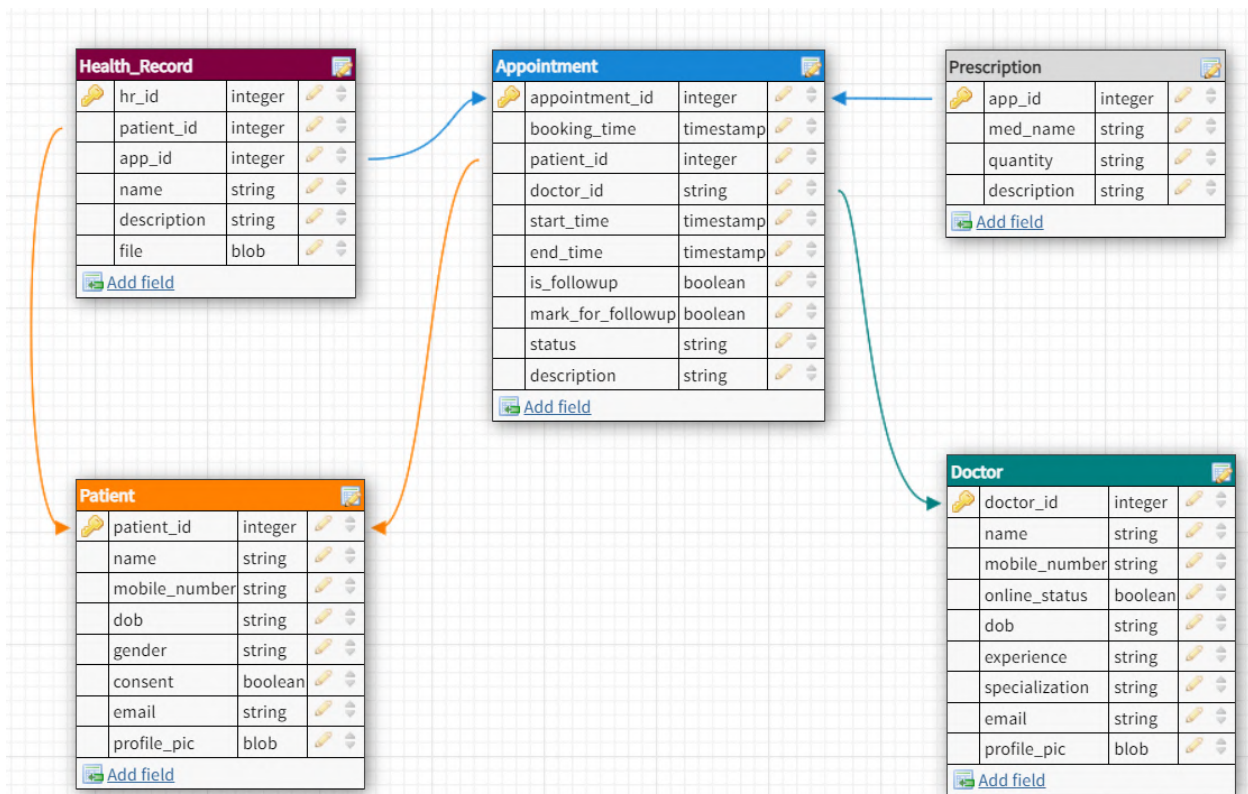
Patient side -



Doctor side -



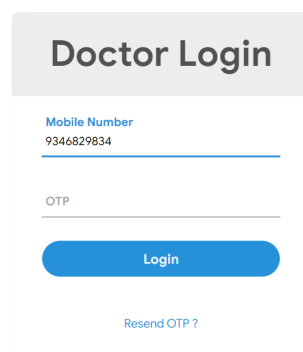
SQL Database Schema:



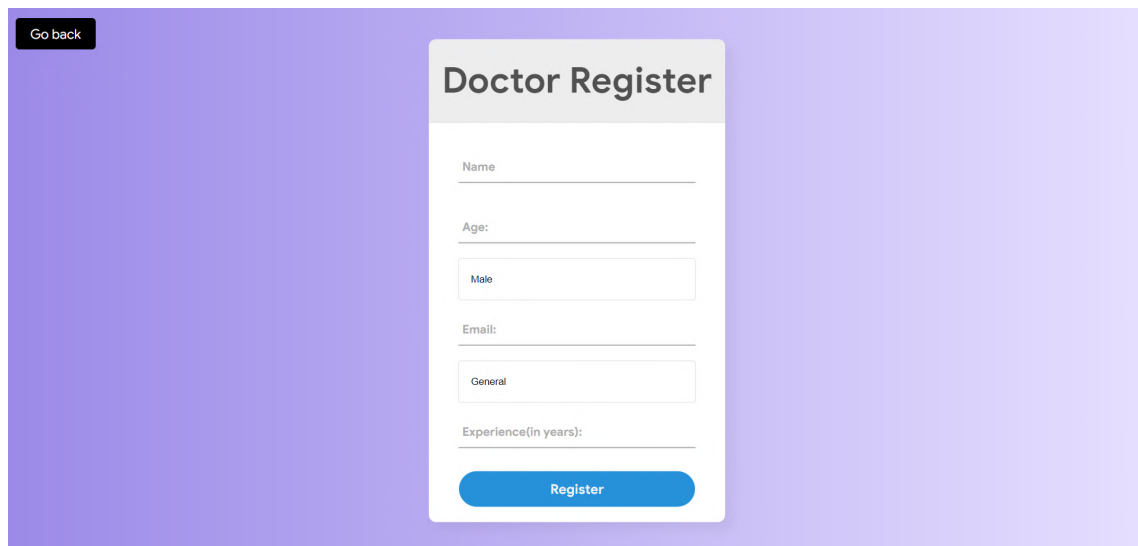
Doctor side pages:

- **Authentication** : Doctor shall be able to logon to the application by providing his phone number and verify through the OTP. In case if the doctor is a new user, he shall be directed to the registration page automatically where he/she can register themselves by providing appropriate details then he shall be redirected to the home page whereas an already registered Doctor would be taken to home page right away from login.

Go back



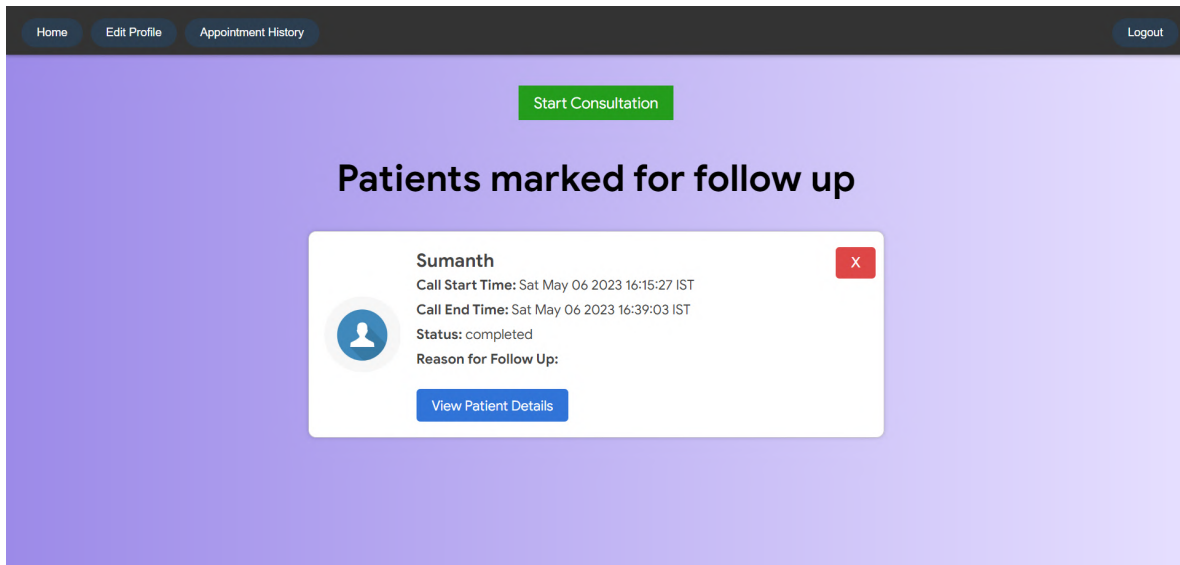
The image shows a 'Doctor Login' form. It has a title 'Doctor Login' in a grey header. Below the title, there is a label 'Mobile Number' in blue, followed by a text input field containing '9346829834'. Below this is an 'OTP' label and another text input field. A blue 'Login' button is positioned below the OTP field. At the bottom, there is a blue link 'Resend OTP ?'.



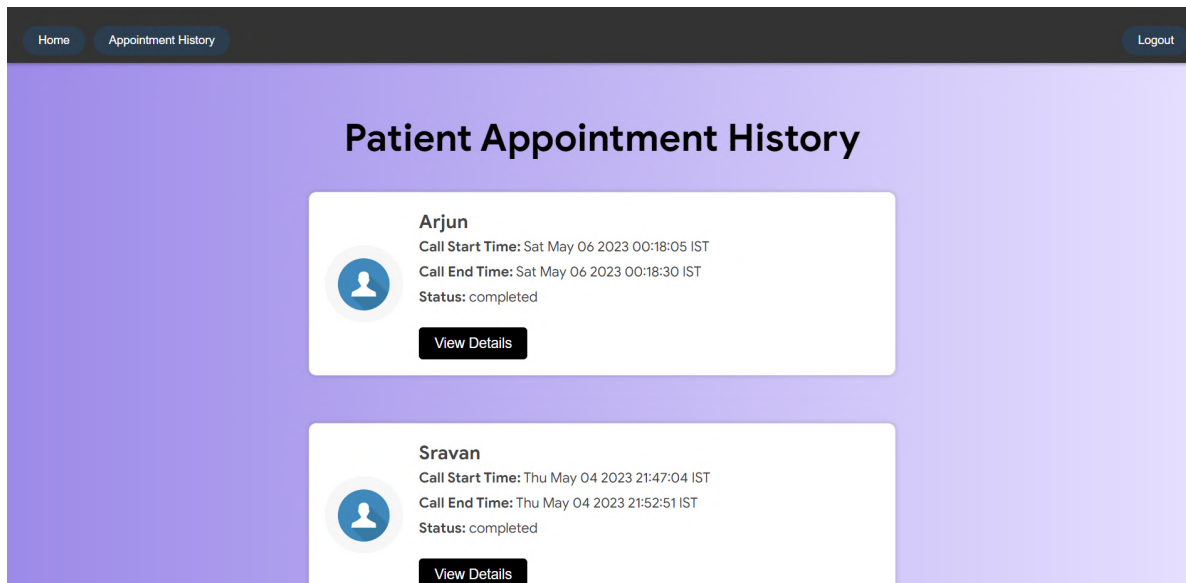
The image shows a 'Doctor Register' form on a purple background. In the top left corner of the purple area is a 'Go back' button. The form itself has a title 'Doctor Register' in a grey header. Below the title, there are several input fields: 'Name', 'Age:', a gender selection box with 'Male' selected, 'Email:', a 'General' specialty selection box, and 'Experience(In years):'. A blue 'Register' button is at the bottom of the form.

- Home page includes nav bar for basic operations, a Start consultation button which enables the doctor's status from offline to online and makes him visible to the patients that he is available for consultation and redirects him to the Video call page. Doctors can

mark patients for follow up during the call, These follow-up reminders shall be displayed on the homepage for the doctor as a list of patients marked for follow up.

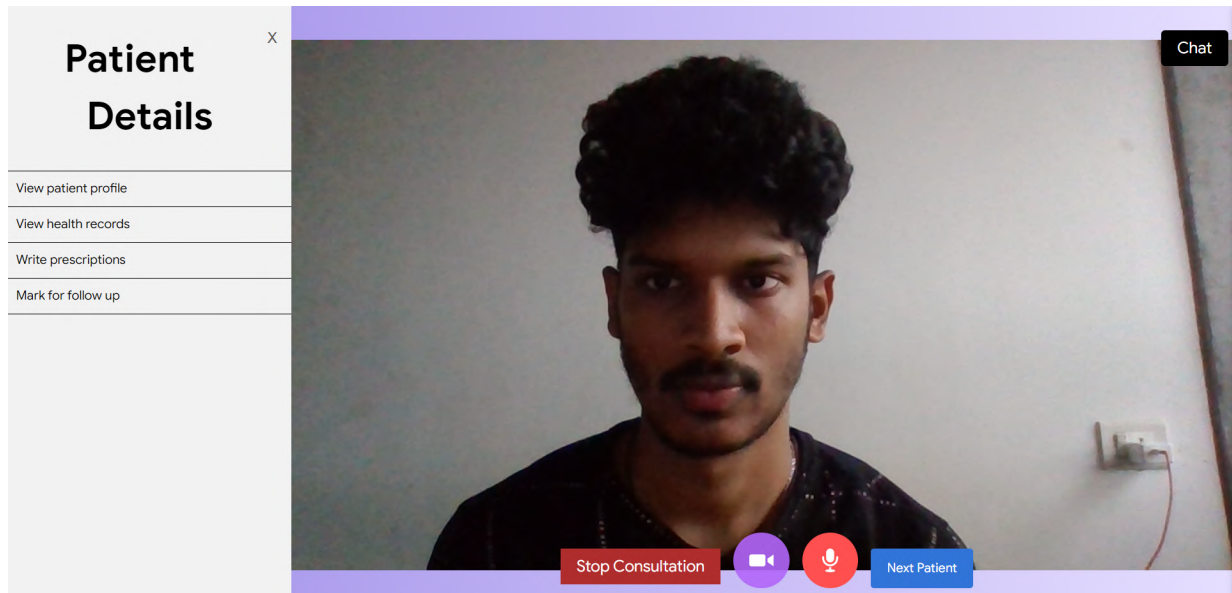


- **Appointment History:** As the name suggests, it has records of the past video calls, details of patients involved in those calls as well.

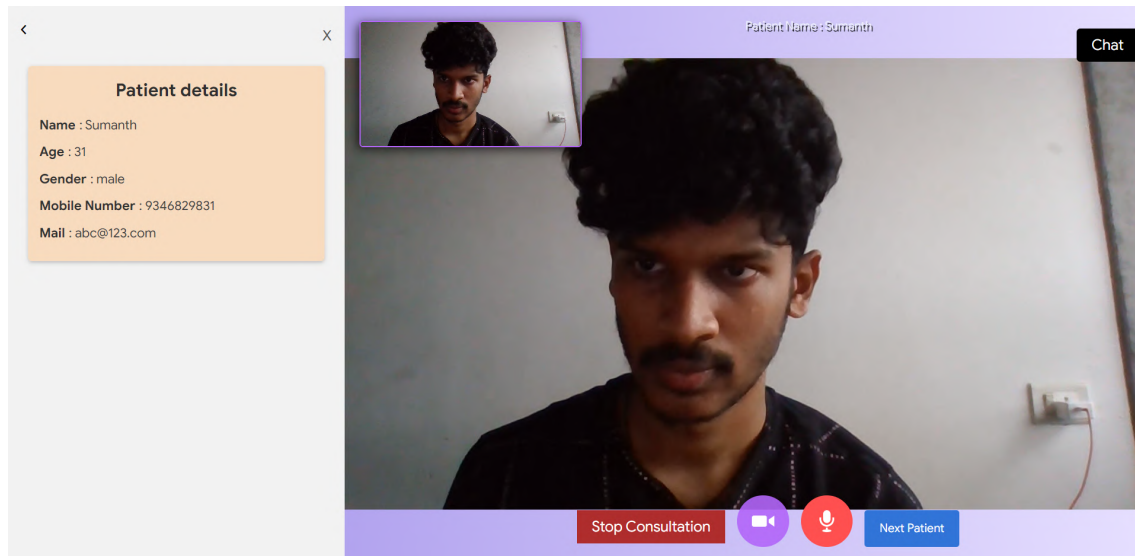


Video Call (Doctor's perspective)

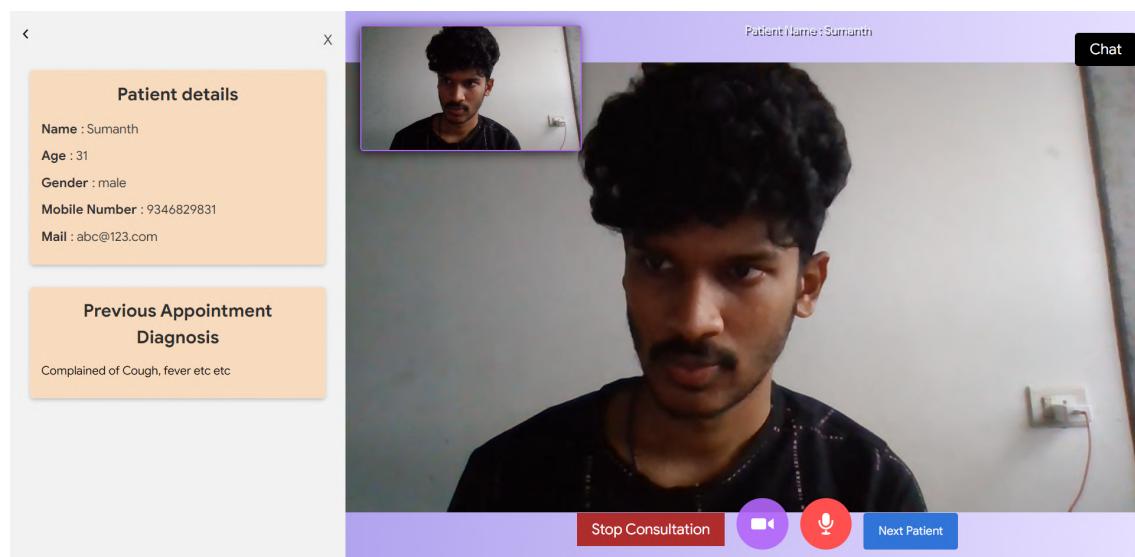
Video call page consists of several features as listed below, the obvious ones are the Camera toggle and Mic toggle.



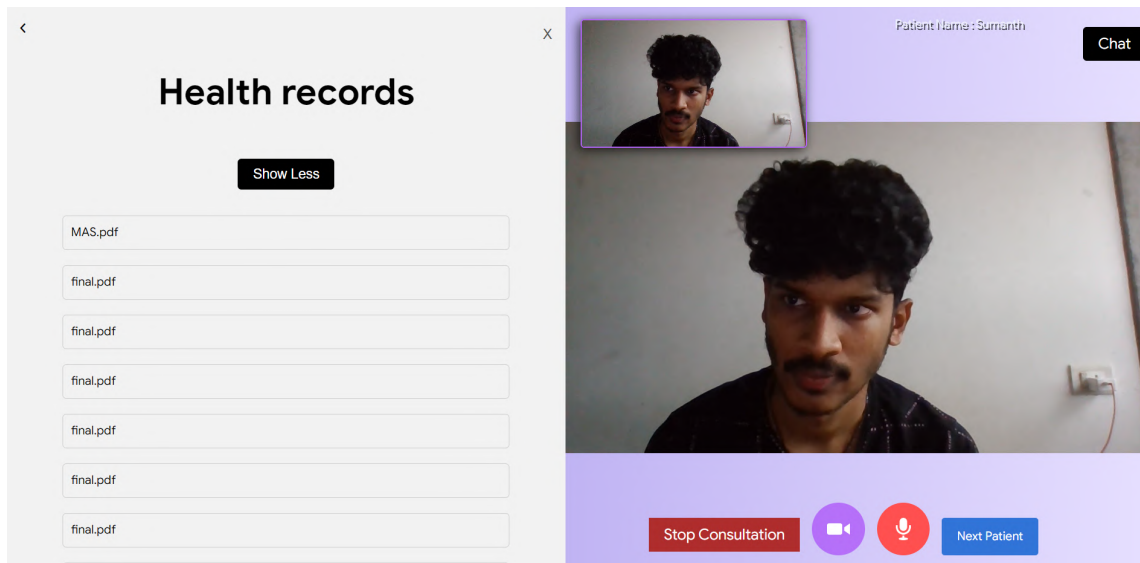
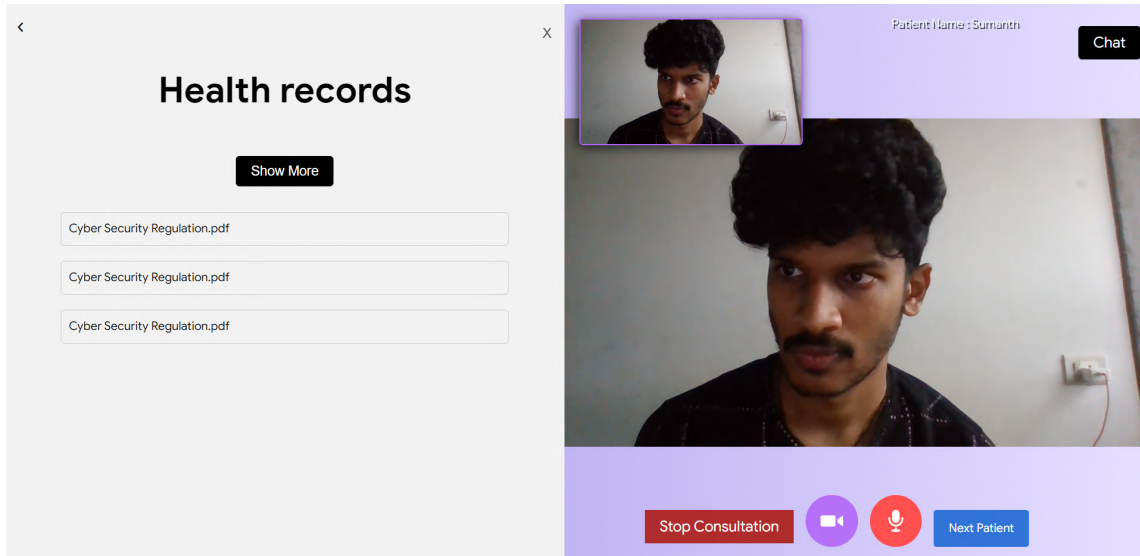
- **Stop Consultation** : Ends the video call and doctor status shall be offline hence not visible to patients for consultation.
- **Next Patient**: Doctor lets in each patient using this button, the next waiting patient in the waiting queue is let into the video call. Used after a consultation with a patient is completed.
- **View patient profile**: Shows the details of the patients , If patient is a follow up then his previous Diagnosis shall be shown as well.



In case of a followup, previous diagnosis by the doctor shall be shown.

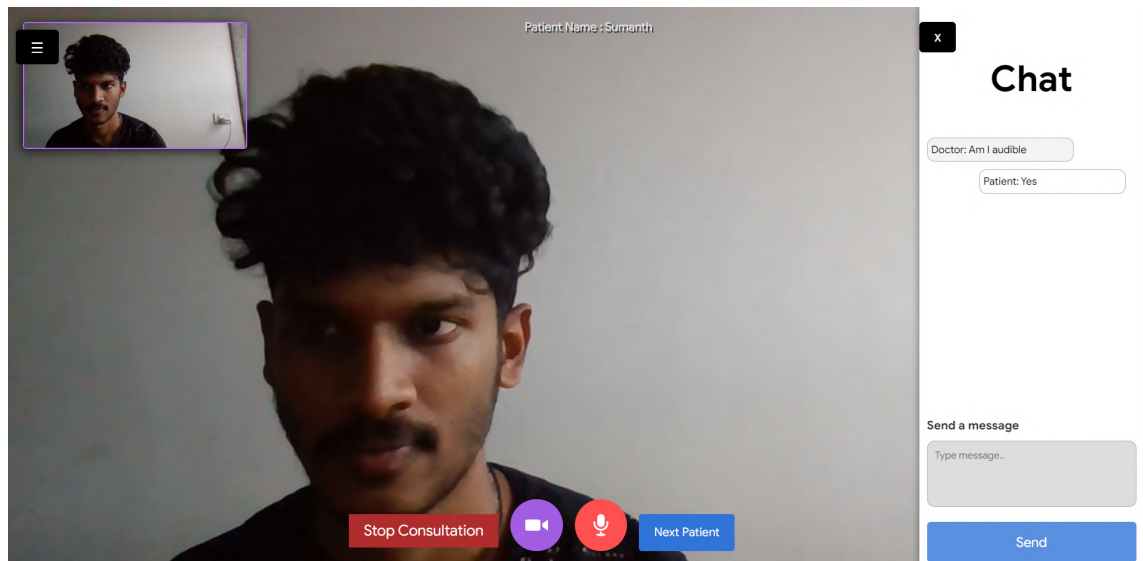


- **View Health Records:** Health records uploaded by the patient shall be displayed, Firstly only three records were shown can extend them by clicking on show more



- **Write Prescription:** Doctor can write down the prescription in the assigned format, this shall be converted to a pdf form and shall be sent to the patient after the call ends

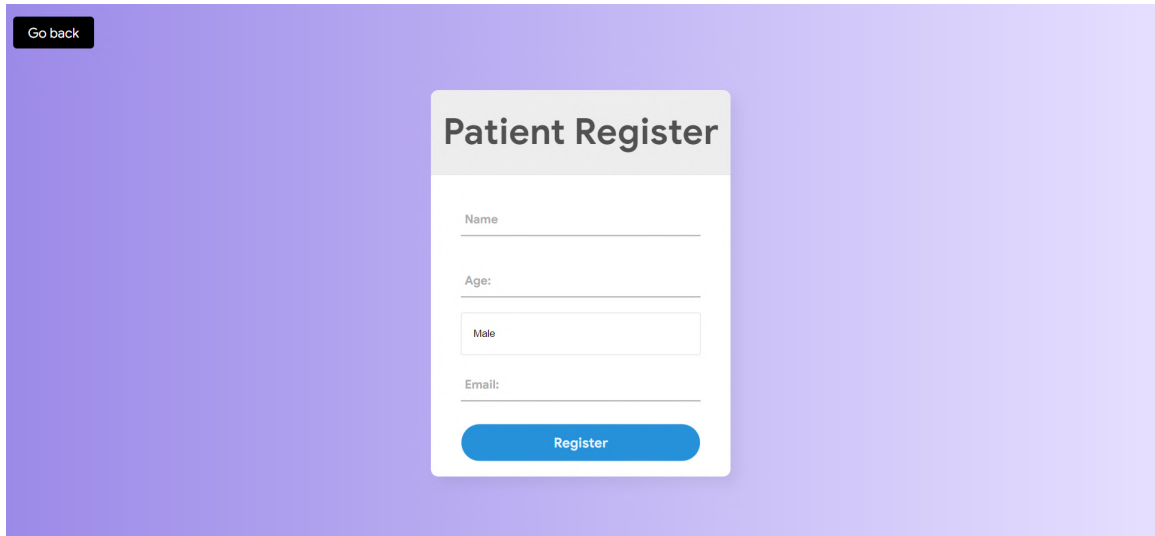
- Chat: A regular Chat window where doctors can communicate with patients.



Patient's POV:

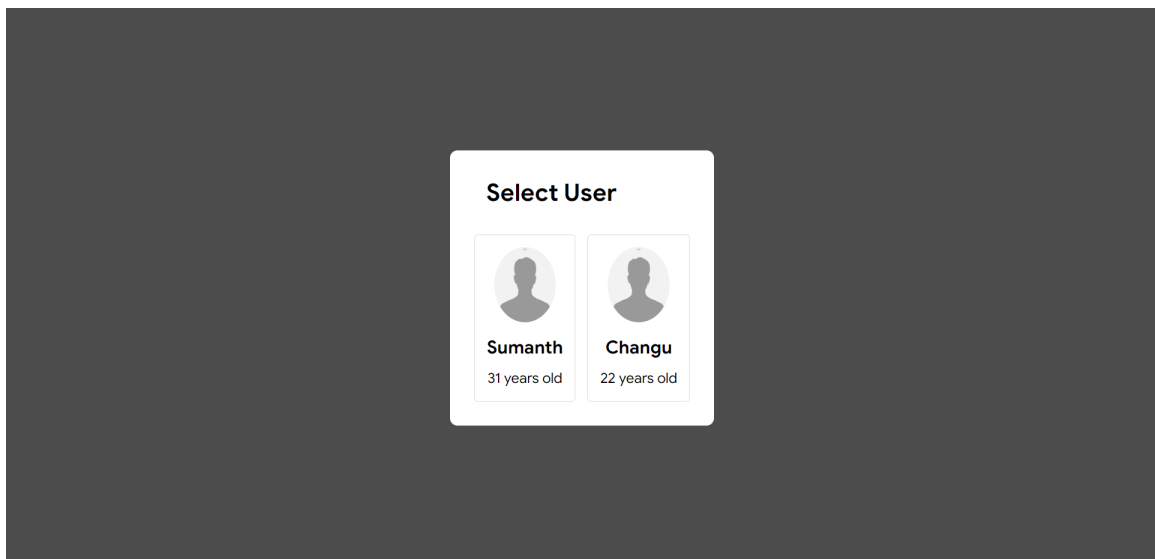
- Authenticate: Similar to Doctor's Login, Patient can log on to the application by entering his mobile number and verifying himself by an OTP, If the user is new he shall be redirected to the register page else to Patient Select Profile.

A screenshot of the "Patient Login" form. The form is centered on a light purple background. At the top left of the form, there is a "Go back" button. The form has a title "Patient Login". Below the title, there is a "Mobile Number" field with the value "9346829835". Below that is an "OTP" field. At the bottom of the form is a blue "Login" button. Below the "Login" button, there is a link that says "Resend OTP ?".



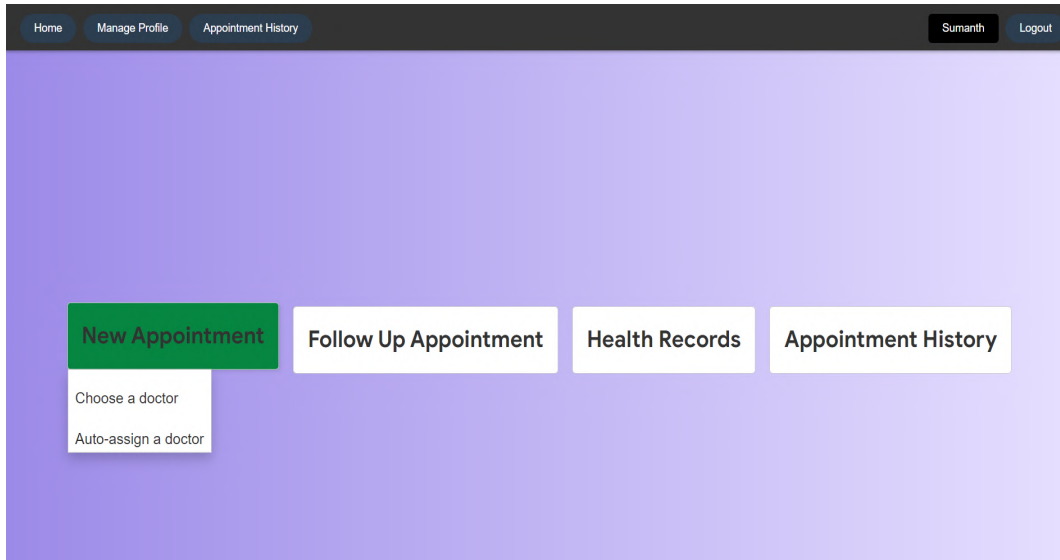
A screenshot of a 'Patient Register' form on a purple background. The form is white with a grey header containing the title 'Patient Register'. It includes input fields for 'Name', 'Age:', and 'Email:'. There is a dropdown menu for gender with 'Male' selected. A blue 'Register' button is at the bottom. A 'Go back' button is in the top left corner.

- **Select Profile:** If the user is already registered, He shall be taken to select profile page where he can select users registered under the same mobile number , for example a family registered under the same mobile number.



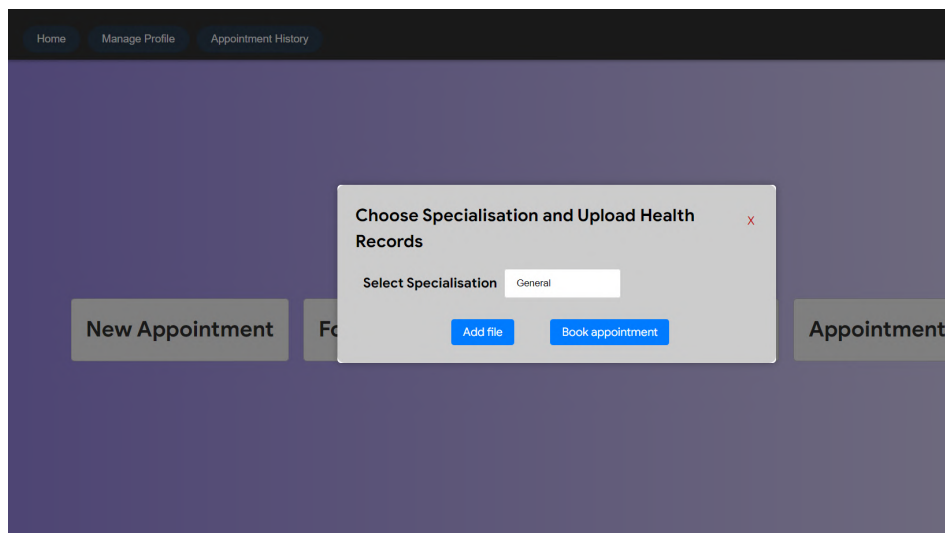
A screenshot of a 'Select User' screen on a dark grey background. The screen shows two user profiles in white boxes. Each profile has a grey silhouette icon, a name, and an age. The first profile is for 'Sumanth', 31 years old. The second profile is for 'Changu', 22 years old.

- **Patient Home:** Patient home has multiple options which includes basic nav bar for navigation and the following.
 - **New Appointment:** Choose a Doctor or Auto Assign a doctor.

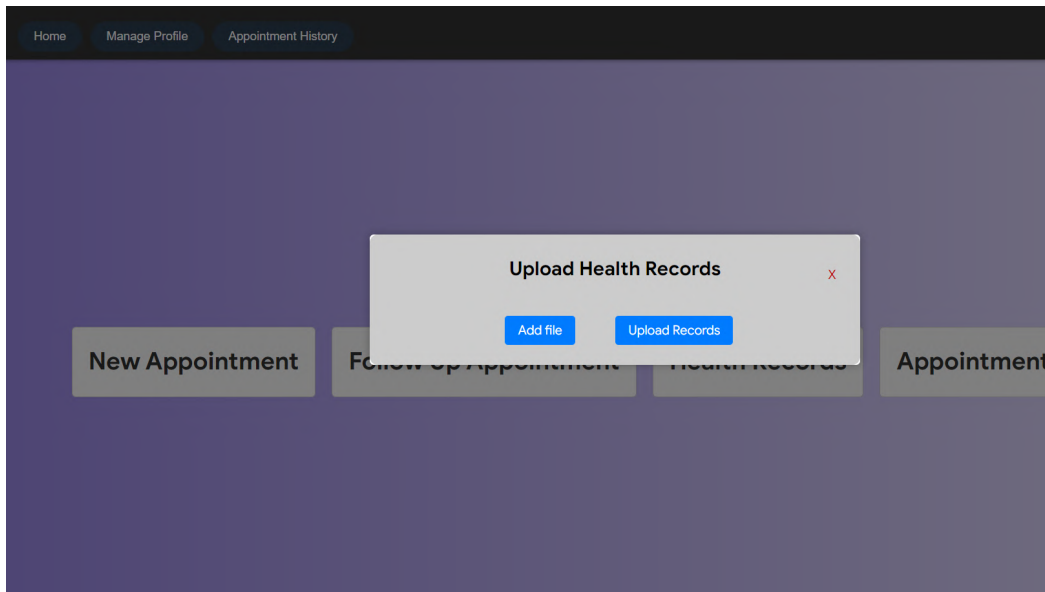


Choosing a doctor takes you to the list of online doctors to choose from.

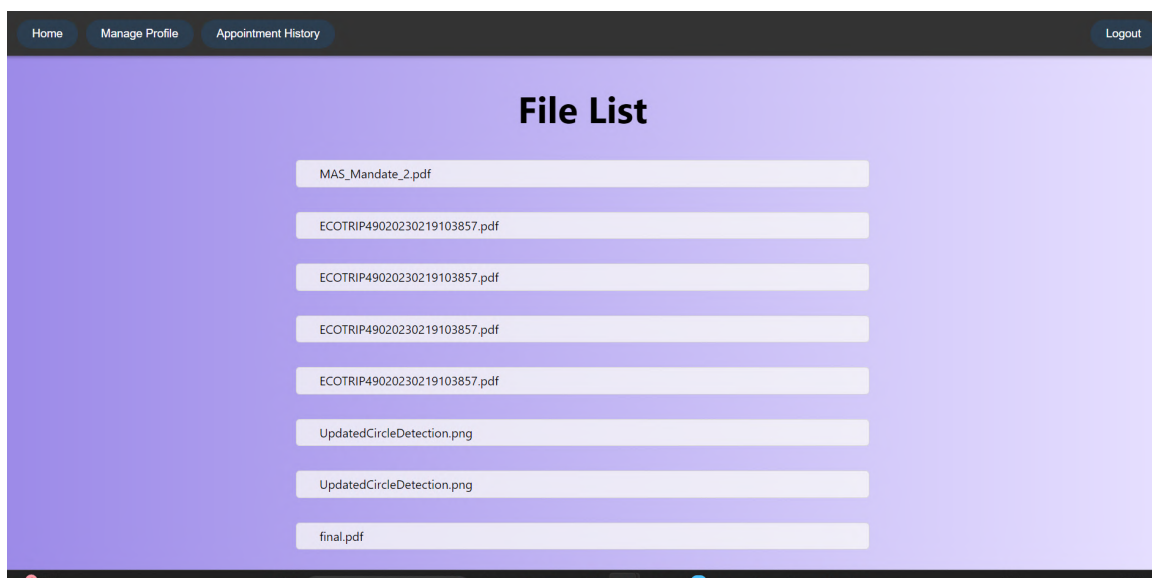
- Auto assign would ask you to choose specialization and upload records before booking an appointment.



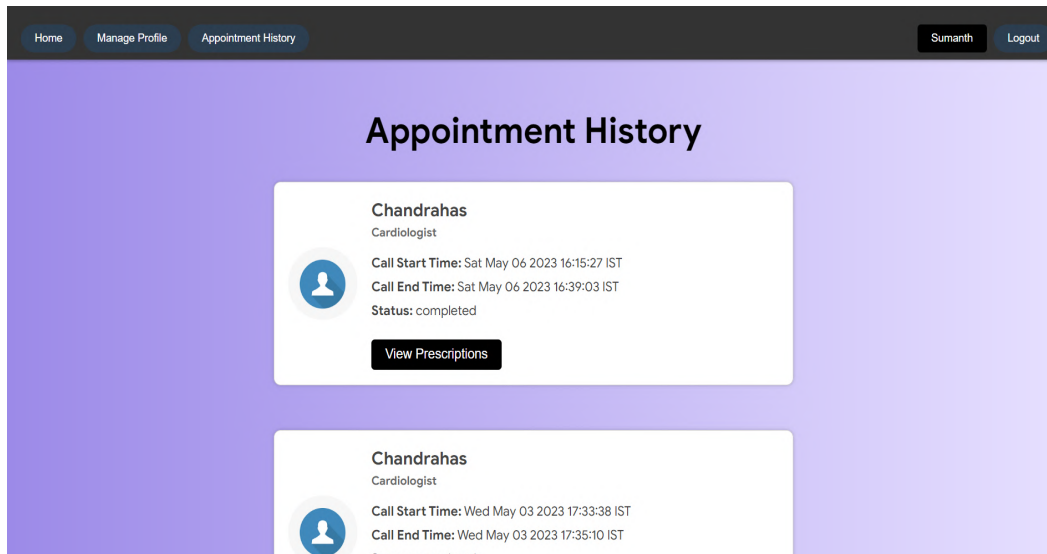
- Follow Up enables you to auto assign previously consulted doctors or some random doctor as you wish.
- Health records section is used to upload and view uploaded health records.



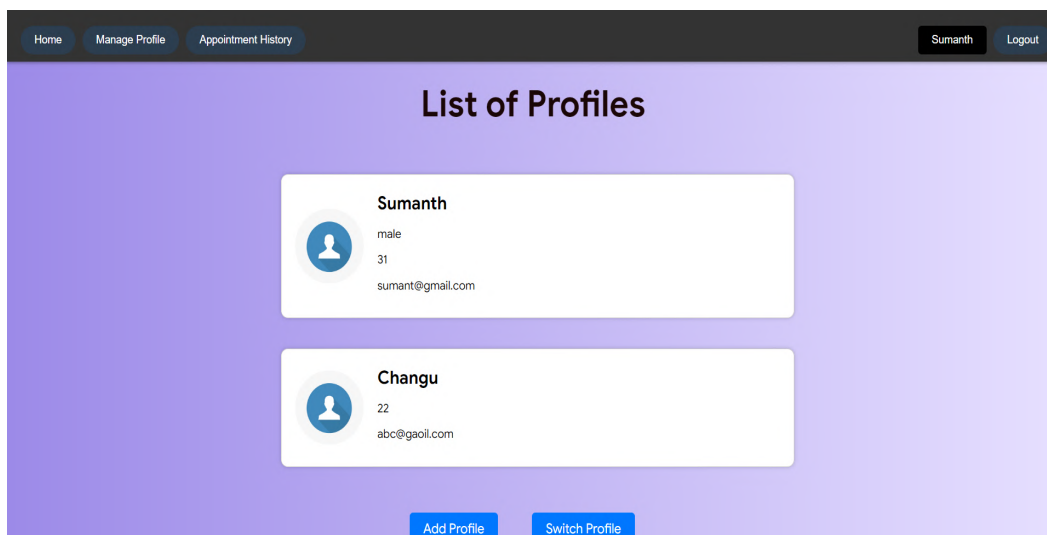
View Health Records:



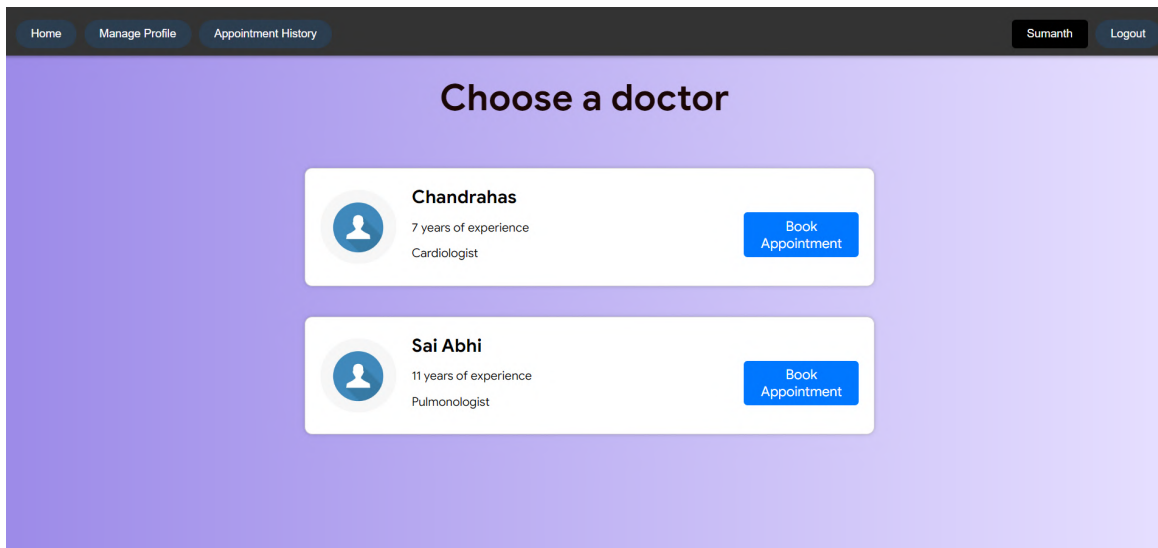
- **Appointment History:** Lets user view Appointment History which includes doctor's details.



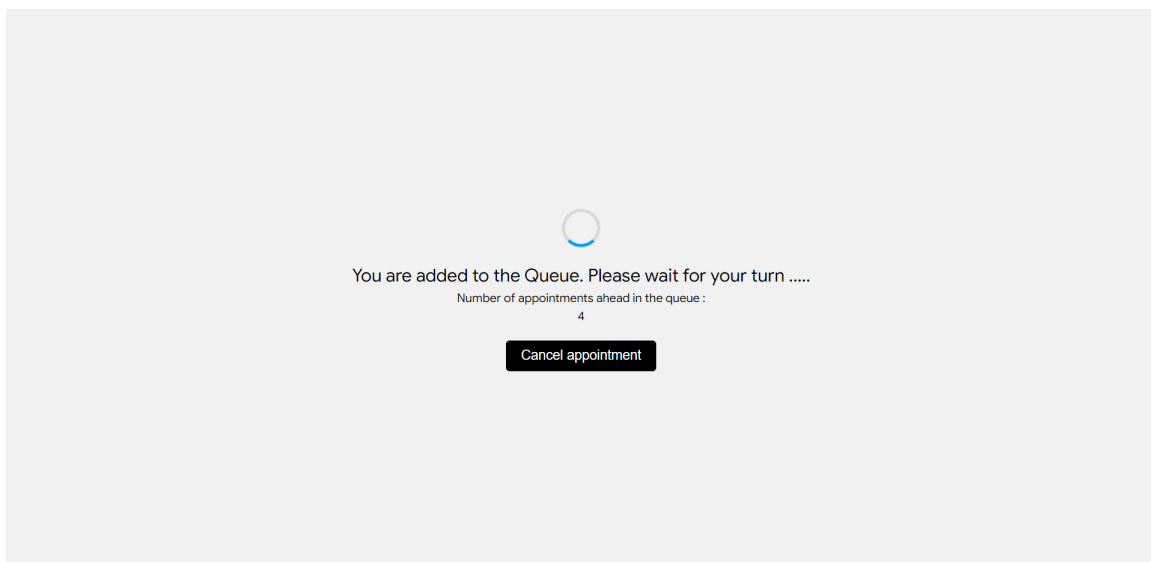
- Manage Profiles: You can add/manage profiles of your family members under the same mobile number



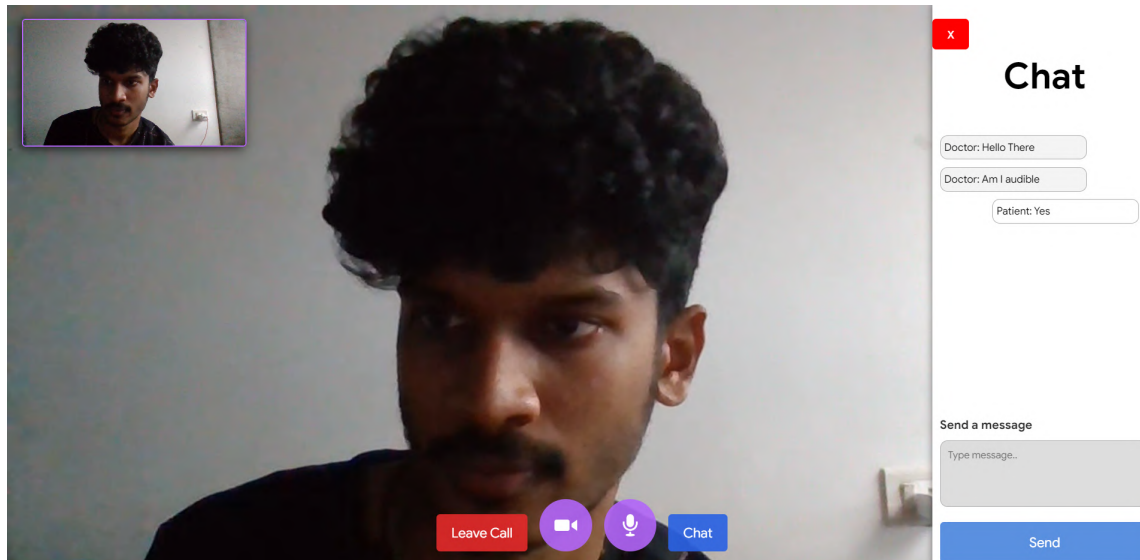
- **Choose a Doctor Page:** This page displays all the doctors that are available online. Book appointment shall ask you to upload records, after records are uploaded you shall be redirected to the waiting page. I.e. queue of that particular doctor



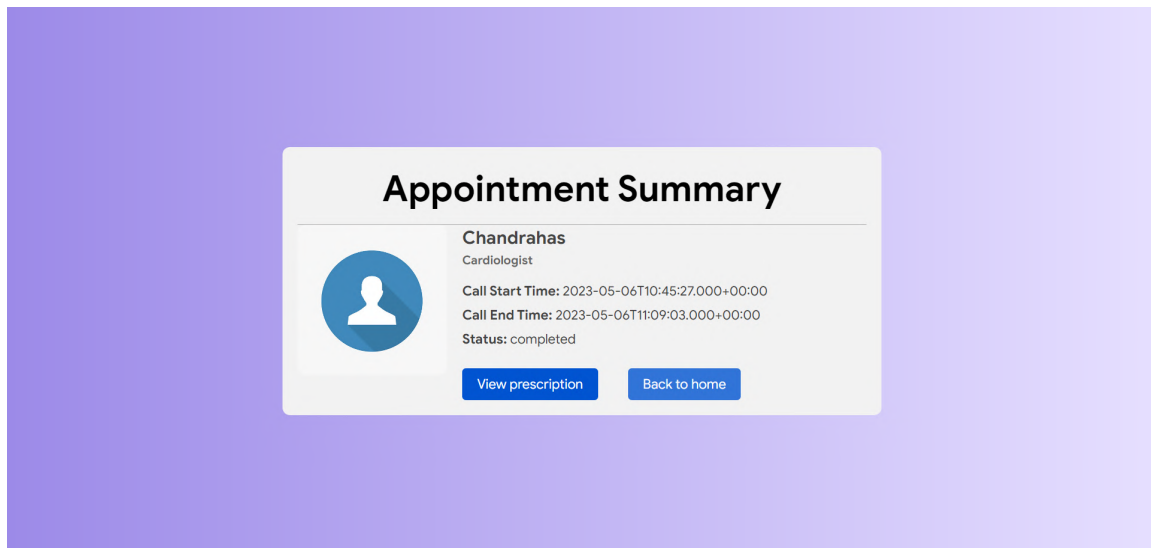
- **Waiting Page :** It displays the number of patients ahead of you in the queue in real time, you shall be directly redirected to the video call page once the waiting queue is clear. You can also cancel the appointment if you wish to.



- Patient Call page: It has options to toggle mic, video and Chat with Doctor. Leave calls end the call and you shall be taken to the appointment summary page.



- Appointment summary Page : Displays details regarding call and lets you view prescriptions sent by the doctor.



Sample Prescription:

Tele Consultation Platform - Prescriptions

Appointment Id : 2

Patient Name : Dhamodhar

Doctor Consulted : Dr.Chandrabhas (Cardiologist)

Diagnosis : Mild cough, runny nose. Difficult to eat / drink.

1. Medicine Name : Med 1

Quantity : 10 tablets

Description : Take 1 tablet of med1 every night for 10 days.

Features:

1. Multiple Profile Management : Multiple users can register under the same mobile number and Manage their data which prevents the hassle of multiple registered mobile numbers comes in handy especially for families.
2. Follow Up utility for Patients who want to consult a doctor for follow up which enables them to connect with the same doctor they've previously connected with ,Automatically displaying all the data concerned with the previous appointment.
3. Digitized Prescription Transfer utility: Doctor can enter the prescription during call in a specified format which shall automatically be converted into pdf and be sent to the patient.
4. Video Call and Chat features involving many Sophisticated utilities in itself(viewing health records, writing prescriptions, marking for follow-up) with simplified user interface.
5. Effective Patient Queue Management Algorithm

Queue Management Algorithm:

Queue is implemented mainly on a first-come-first-serve basis. Each doctor has their respective queue for patients to wait in. Now any new incoming patient who prefers

1. Particular Doctor: Shall be assigned to that particular's doctor's queue irrespective of the number of patients already in the queue
2. Particular Specialization: In this case there could be many queues associated with doctors of specific specialization. Out of these queues, the queue with the least number of waiting patients is chosen and Incoming Patients are directed to this queue.

Security:

- We have used jwt to authorize login of both patient and doctor.
- A token is generated after successful login of patient and doctor. This token is sent with all API call requests from frontend to backend as an authorization header. Any corruption of the token or if the token is expired then the user is logged out and session ends.
- All the PII data of the users is encrypted in the database using Advanced Encryption Standard (AES) . Below are the columns that are encrypted in the database.
 - Doctor
 - Name
 - Mobile Number
 - E-mail Address
 - Patient
 - Name
 - Mobile Number
 - Date of Birth
 - E-mail Address
 - Health Records

Future Tasks

- Handle all unexpected user actions during a video call.
- Feature to add profile pictures.
- Make the platform more efficient and robust with the help of stress testing.
- Deployment to make the platform ready for use.
- Multi-language accessibility.

TechStack Used

1. **Database:** SQL
2. **BackEnd:** SpringBoot
3. **FrontEnd:** React

Individual Contributions

Dhamodhar Reddy - Backend APIs, Video Call and Queue Management, Login Authentication

Chandahas Sai - Front-End React work, Integration with Back-end Calls, Local Storage Management

Sai Abhijith P - Jwt implementation (login authorization) session management, database PII encryption, chat implementation in the video call

Aditya Kaka - Front-End UI/UX design, worked on the prototype/wireframe of the webpage

Anish Sai B - Front-End React work, designing web pages- UI/UX work.

Links to Codebase

- **Github Repository:** <https://github.com/Dhamodhar-DDR/Tele-Consultation>
- **Demo Video:** <https://drive.google.com/file/d/1CXZ7J4YU24ZvzXMqdvzsW9ww0jiYyXnv/view?usp=sharing>