

A DOCTOR APPOINTMENT APPLICATION USING FLUTTER

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Abstract: Many hospitals around the world are loaded with COVID-19 patients in the present scenario. With medical staff getting busy during the Corona virus cases, people need to visit the hospital and waits until the doctor is available. If the doctor cancels the appointment for some emergency reasons, then the patient is not able to know about the cancellation of the appointment unless or until he or she visits the hospital. This is where doctor appointment apps can become the knight in shining armor and help people to make an appointment with the doctor at their convenience. The main idea of this work is to build an effective application for users with busy schedule to make an appointment with doctors of different specialist by viewing their profile.

Keywords: Flutter, Dart, Firebase, Mobile Application, Appointment, Online application, Hospital, Scheduling, Track, Healthcare.

I. INTRODUCTION

Many medical applications are one of the trendiest markets for app creation. Especially during lockdown people were enabled or restricted to go out for medicine, food and other necessities. From this parameter we choose to build this app. Now-a-days peoples are getting afraid about health checkup due to some Rumors regarding the medical treatments. Number of peoples is not getting the appointments and also number of peoples is not able to go and book their appointments.

With the ongoing corona virus pandemic, telemedicine has become an important tool for both doctor and patients. Going to a hospital waits in a queue to get doctor appointment brings its own set of risks to overcome the problems, we are going to design and develop the application in such a way that users can search the best doctor and schedule their appointment date and time according to patient's availability to get the right treatment advice [1]. The doctor appointment application provides patient an easy way of booking appointment from their home using mobile.

If anybody is ill and wants to visit a doctor for check-up, he or she needs to visit the hospital and waits until the doctor is available. The patient also waits in a queue while getting appointment. If the doctor cancels the appointment for some emergency reasons, then the patient is not able to know about the cancelation of the appointment unless or until he or she visits the hospital. As the mobile communication technology is developing rapidly, therefore, one can use the mobile's applications to overcome such problems and inconvenience for the patients [2].

This application (app) is designed in such a way where the user first asks to register for creating a user profile, and after logging in with the respective profile, user gets the permission to access to the different doctor's profiles. This application also requires the doctors to register and create their own profiles with adequate amount of information based on their qualification and specialty. First, users will select a doctor specialization category, which shows the available doctors list of that category from where he or she can select a doctor according to their preference. In this application, better rated doctors will appear at the top of the list. After selecting the doctor an entire profile is unveiled for the user to learn about the details of that doctor. If the user is satisfied with the biography of the doctor, then with the contact button, he or she can directly book an appointment.

II. EXISTING SYSTEM

In the existing system people manually visit and search for the best medicine services offered by any doctors, ask for referrals to known people and then you have to first wait in line to take appointment for the doctors and wait for your time to have meet with them and discuss on your health problems. it is difficult for people to schedule their work according to the timings of the particular doctor.

III. PROPOSED SYSTEM

In "Appoint Me" we have tried to consider all of the above problems with the existing system in India. The proposed system consists of two panels: Doctor and Patient. Our objective was to provide a platform where all patients can be brought together. In this application, this way people can get to know and choose to visit any doctor of their choice. By using this application user will be able to know and access the professional profile of each registered doctor from all specialties.

Doctor's profile includes information regarding their professional experience, educational background, clinic timings, working days, clinic accessibility. Users would be able to book appointment sitting at their homes. The user can choose a doctor close to them or have more professional experience from the other doctors. When registering as a patient, the user can give all necessary medical history so that he doesn't need to keep or bring his medical file when going for a check-up. Every time when a user books his appointment, the doctor can easily get access to the patient's profile and also update medical record. The doctor's patients are brought to one platform will allow patients to be more flexible they can register and search for the doctors. The list of doctors will be shown and patient can book by selecting the time slots and the receptionist will confirm the booking so everything is computerized a done very fast which will save time. Where in other side doctor can register and manage appointment status with the help of receptionist.

IV. TECHNOLOGY

The platform in which we have developed the mobile application. The framework used for designing front end is flutter. firebase is used to store, update and retrieve the data such as user's login information, prescription details, hospital location details and search history from the database. The user needs a proper internet connection to book the online appointment.

▪ FLUTTER

Flutter is a mobile SDK, built and open sourced by Google; and at its core, it's about empowering everyone to build beautiful mobile apps. Whether you come from the world of web development or native mobile development, Flutter makes it easier than ever to create mobile apps in a familiar, simplified way. Flutter is special in that it makes it truly possible to "write once, and deploy everywhere." [3].

▪ FIREBASE

Google Firebase is Google-backed application development software which allows developers to develop Android, IOS, and Web apps. For reporting and fixing app crashes, tracking analytics, creating marketing and product experiments, firebase provides several tools. Firebase has three main services, i.e., a real-time database, user authentication, and hosting. We can use these services with the help of the Firebase iOS SDK to create apps without writing any server code [4].

1) Firebase Authentication

In the present era, user authentication is one of the most important requirements for Android apps. It is essential to authenticate users, and it is much harder if we have to write all this code our own. This is done very easily with the help of Firebase. All authenticate doctor and patient mobile data store in authentication.

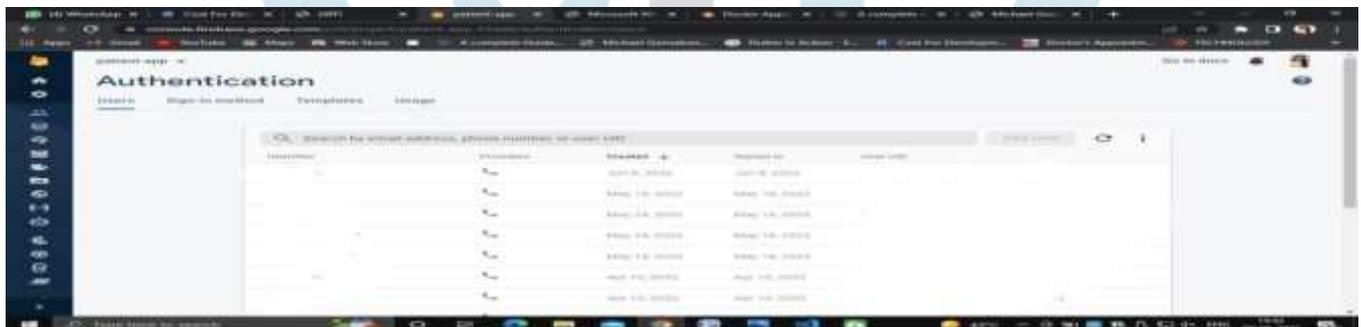


Figure 1: Firebase Authentication

2) Firestore Database

In firestore database we have all data of doctor, patient and appointment store in.

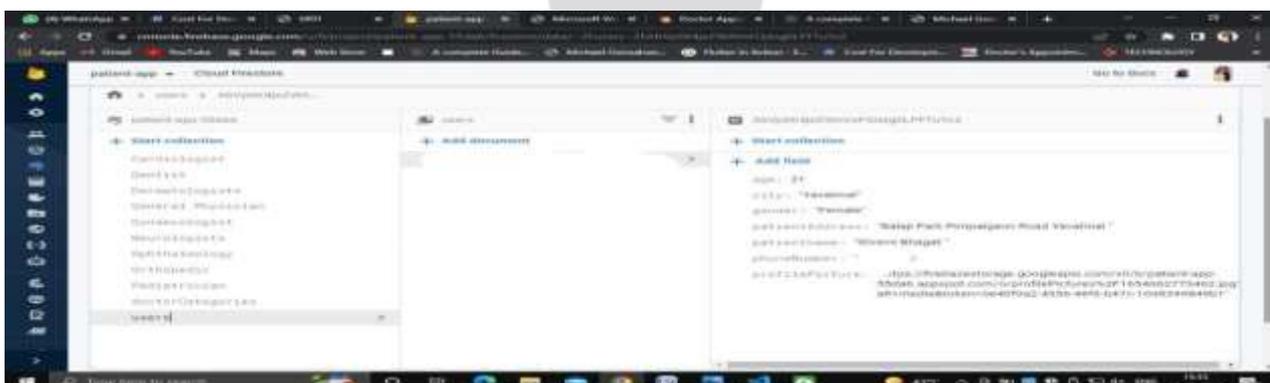


Figure 2: Firestore Database

V. IMPLEMENTATION OF PATIENT APP

1) Uploading the APK on the Android Platform and Splash Screen

The user will firstly download the application and install it in their mobile devices. Once installed, this application will remain into the device permanently until the user deletes it or uninstalls it. The name of our application is Appoint me. Figure 3, shows the prototype demo APK on an Android smart phone.

A splash screen is the screen shown while an app is loaded. It is the screen to make a first impression of our service, so take care of it being remembered by the user. This screen design includes the logo of our app; it's placed in the middle of the screen. Figure 4 show splash screen of Appoint me application.



Figure 3: Appoint me APK in Android Mobile

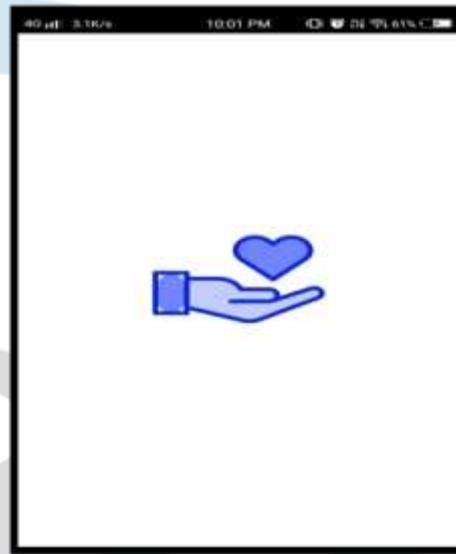


Figure 4: Splash Screen

2) Onboarding screen

These screens are aimed at presenting the app to the user, its features, and how useful it may be. The onboarding screen has to explain the user the benefits of the app. They appear to users who launch the app for the first time helping them get oriented within unfamiliar features and controls as well as understand if the application can be useful for them.

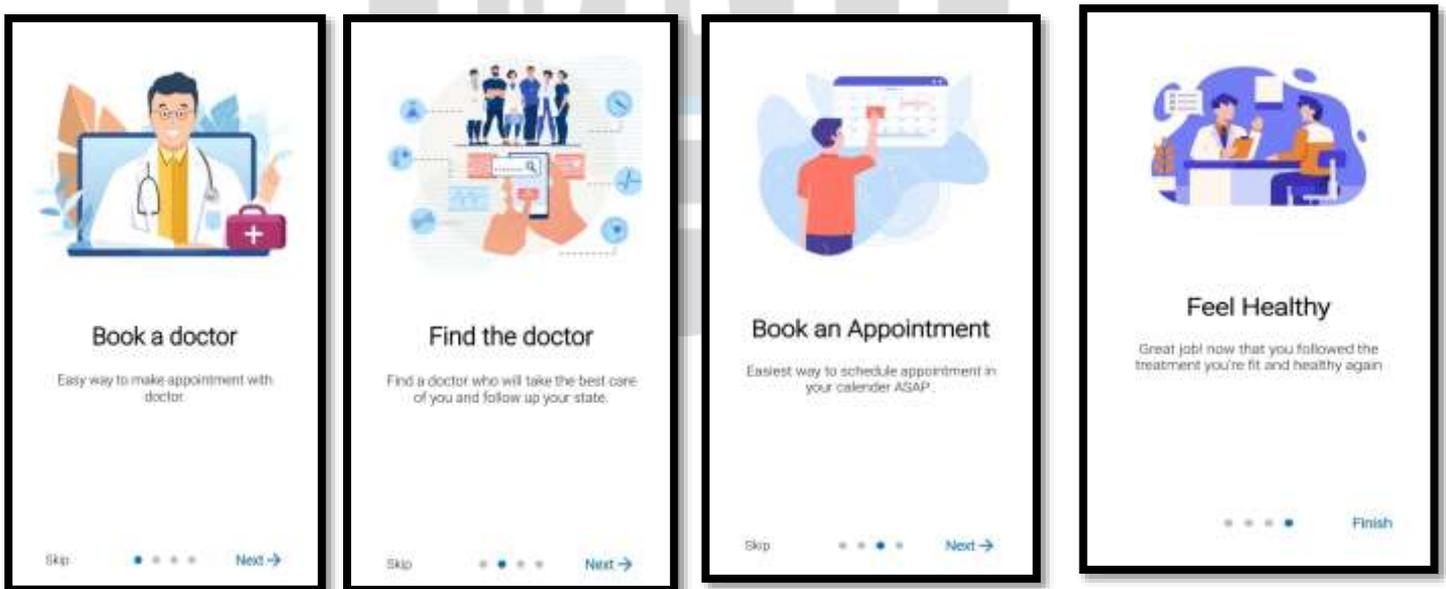


Figure 5: Onboarding Screen

3) Phone Number Verification Screen

After Onboarding, a patient needs to do phone verification. The Phone verification screen contains input box to enter 10 digits phone numbers of patients and there is button Request OTP. If the phone number string contains special characters and alphabets then their Request button will not enable for next process be an error. Users have to enter 10-digit phone number if he/she enters less than 10-digit number or greater than 10-digit number then the Request OTP button is disabled. If phone number contains correct 10-digit phone number then Request OTP button gets enable.

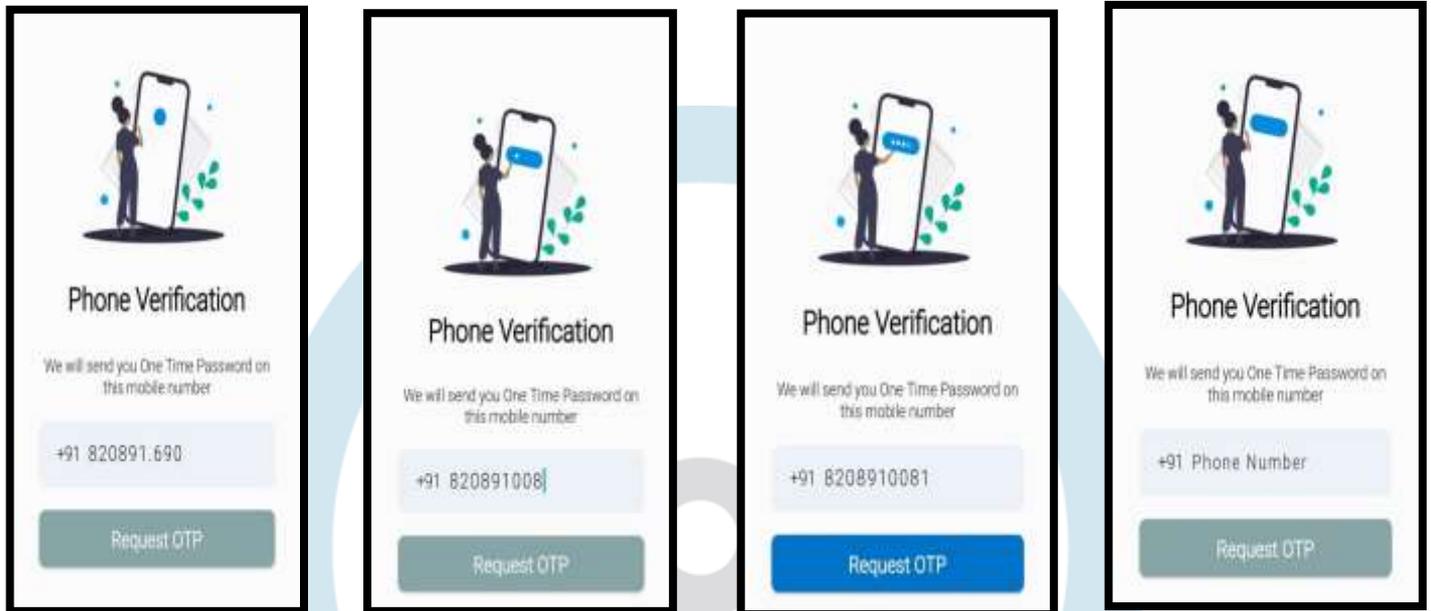


Figure 6: Phone verification screen

4) OTP Verification Screen

By clicking on the Request OTP button, Then firebase sends 6 digits OTP received on entered phone number It will automatically be printed on the given boxes because we implement automatic OTP verification... then the next step is to click on the continue button to go further in the registration process. If it's OTP is not received within two minutes then we have resent button for resending the OTP again. If OTP entered by the user is wrong or invalid then the box color terminates to Red.

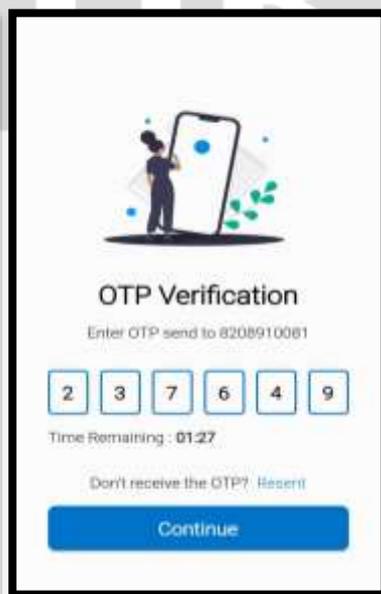


Figure 7.1: OTP Verification Screen

Figure 7.2: OTP Verification Failed Screen

5) Patient Registration Screen

When phone verification done successfully, then the patients will have a patient registration form. In this registration screen, patients have to fill the patient information such as name, address, age, gender. In gender there are two options such as male or female patient will have to select any one of them. The patient will have to select city to take an appointment with doctor. In this we have created this application for yavatmal city. Then there is a register button to register. The Registration button works when we fill all the information which is mandatory then only, we can register on the application. If all the information entered by patient is not in a correct form, then app show error message on screen invalid information entered by user such as please enter your name, address, age etc.

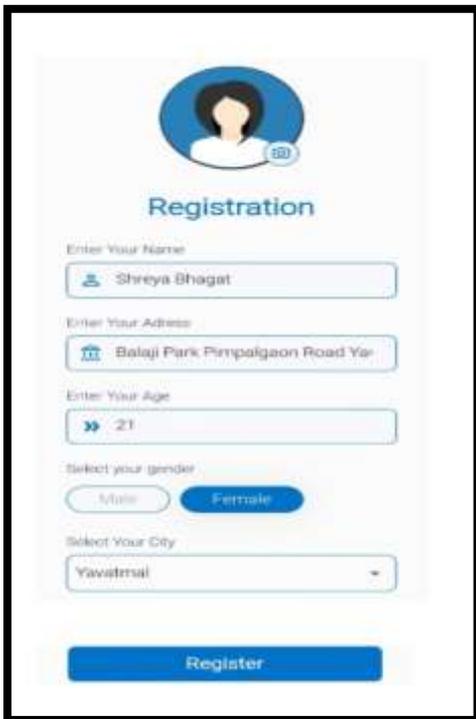


Figure 8.1 shows the successful registration screen. It features a profile icon at the top, followed by the title "Registration". Below the title are four input fields: "Enter Your Name" (with "Shreya Bhagat" entered), "Enter Your Address" (with "Balaji Park Pimpalgaon Road Yav" entered), "Enter Your Age" (with "21" entered), and "Select your gender" (with "Female" selected). A "Select Your City" dropdown menu shows "Yavatmal". A blue "Register" button is at the bottom.

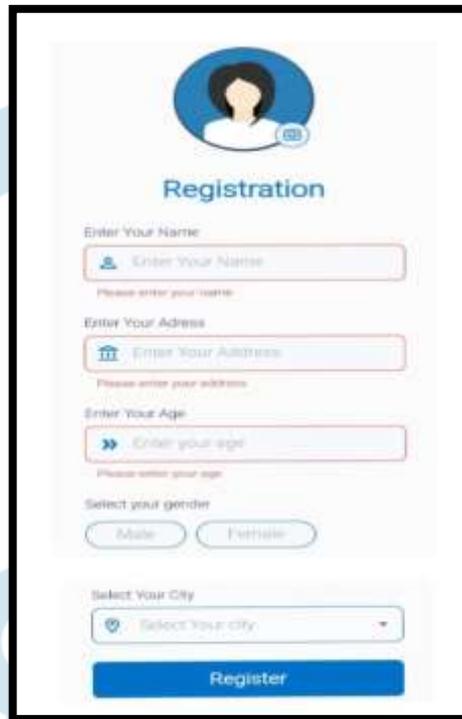


Figure 8.2 shows the registration failed screen. It features a profile icon at the top, followed by the title "Registration". Below the title are four input fields, each with a red border and an error message: "Enter Your Name" (with "Please enter your name"), "Enter Your Address" (with "Please enter your address"), "Enter Your Age" (with "Please enter your age"), and "Select your gender" (with "Male" and "Female" buttons). A "Select Your City" dropdown menu shows "Select your city". A blue "Register" button is at the bottom.

Figure 8.1: Registration Screen

Figure 8.2: Registration Failed Screen

6) Dashboard Screen

After successfully registering on this application, patient has the dashboard screen. In dashboard screen in bottom there are four tabs such as Home, Schedule, History, and Setting. In home tab you see a welcome message followed by user's name then after that greeting message according to time such as "Good Morning", "Good Afternoon" and "Good Evening". After that patient can see a container box that contains our app's slogan "Your Health is Our Priority". After that patient see a list of doctor category in horizontal manner. In doctor category we have Heart, Tooth, Skin, General, Gynecologist, Brain, Eye, Bone, Child Specialist. Then after this there is a list of top doctors. The doctors who are having experience more than 10 years then that come in top doctors list.

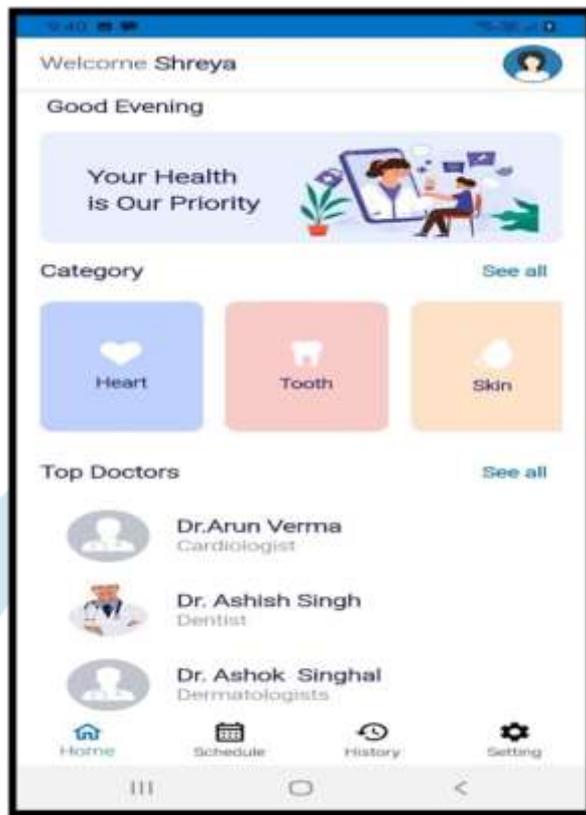


Figure 9: Dashboard Screen

7) All Category Doctors List Screen and Top Doctor Screen

If patient want to see the list of all category doctors, then there is a button called See all. After clicking on see all button patient will see the list of all category doctor in vertical manner.

If patient want to see the list of all Top doctors, then there is a button called See all. After clicking on see all button patient will see the list of all top doctors.

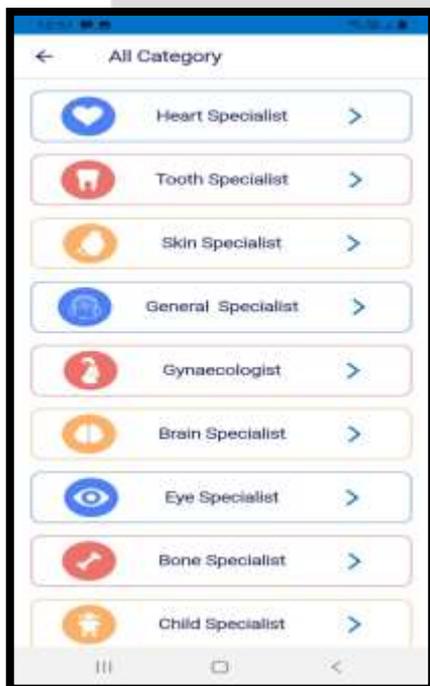


Figure 10.1: All Category Doctors List Screen

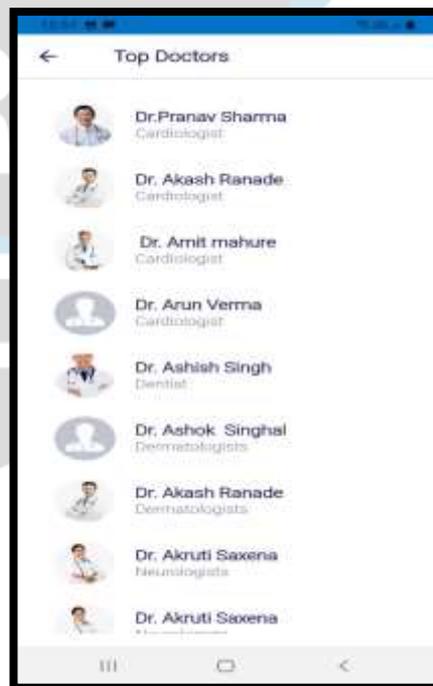


Figure 10.2: Top Doctor Screen

8) Heart Category List Screen and Search Screen

If the patient selects the heart category, then he/she can view a list of Heart Doctors. In bottom of the screen there is a search option to search the doctor. After clicking on the search option, we can search the doctor by their name or surname. We implement search functionality in insensitive manner

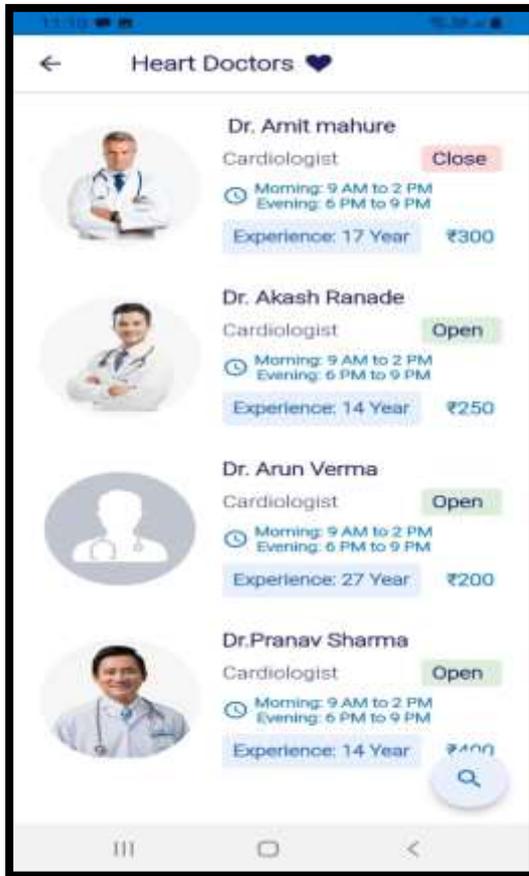


Figure 11.1: Heart Category List Screen

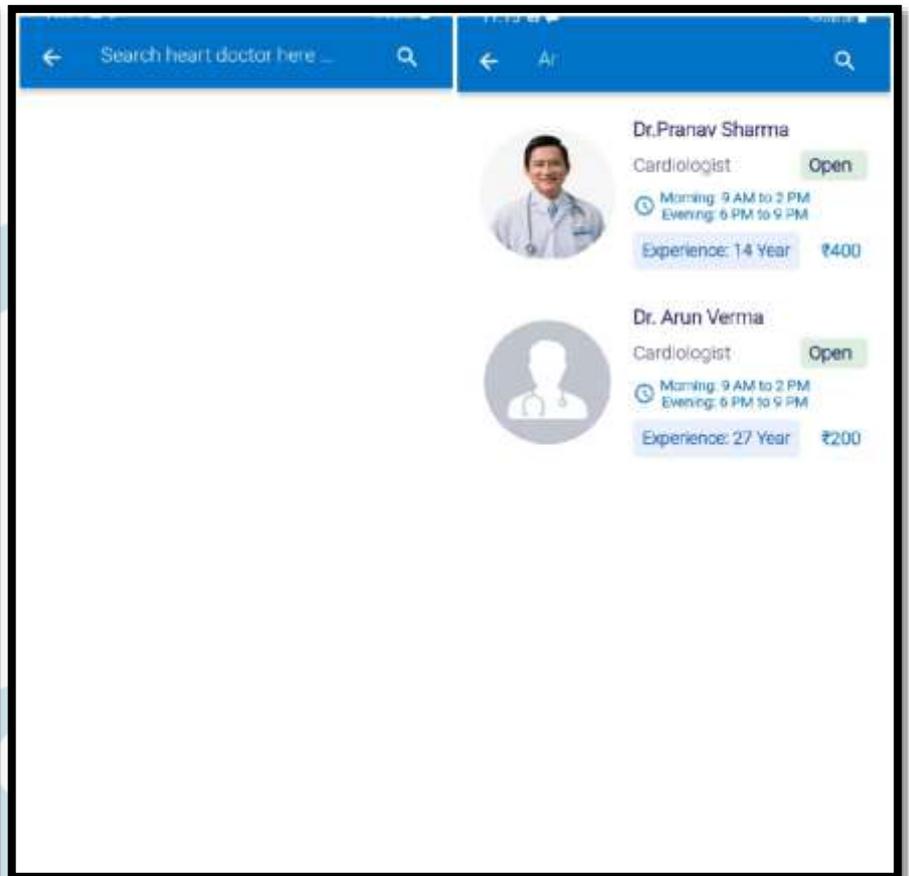


Figure 11.2: Search Screen

9) Details Doctor Screen

If the patient selects the particular doctor and then he/she can view the complete doctor details such as doctor's name, doctor's category, doctor's Education, doctor's phone number then year of experience then number of patients he/she treated the fees. After that there is a about section in that section there is a brief information about doctors. Then after that address section that contain address of hospital. Then we can see opening and closing timing of hospital. If the hospital is open/close then according to that information it will reflect on the screen. If the hospital is opened on Sunday, then it will appear in green color text (Sunday Opened) with green checkbox icon. If the hospital is closed on Sunday, then it will appear in red color text (Sunday Closed) with Red Cross icon.



Figure 12: Details Doctor Screen

10) Appointment Booking Screen

Patients can choose which doctor to consult or book an appointment with based on their specialties and expertise stated in their profiles. By clicking in the book appointment button, Book appointment screen appear then patient has to select date, slot time and then after if patient want to upload his/her report then he/she can attach report only in PDF file. The patient has to send a request for appointment by selecting a day or time. The firebase database gets updated accordingly. If the appointment is successfully registered in the firebase the user will land another screen that show of “appointment done” message on screen after successfully book appointment then that info display in homepage.

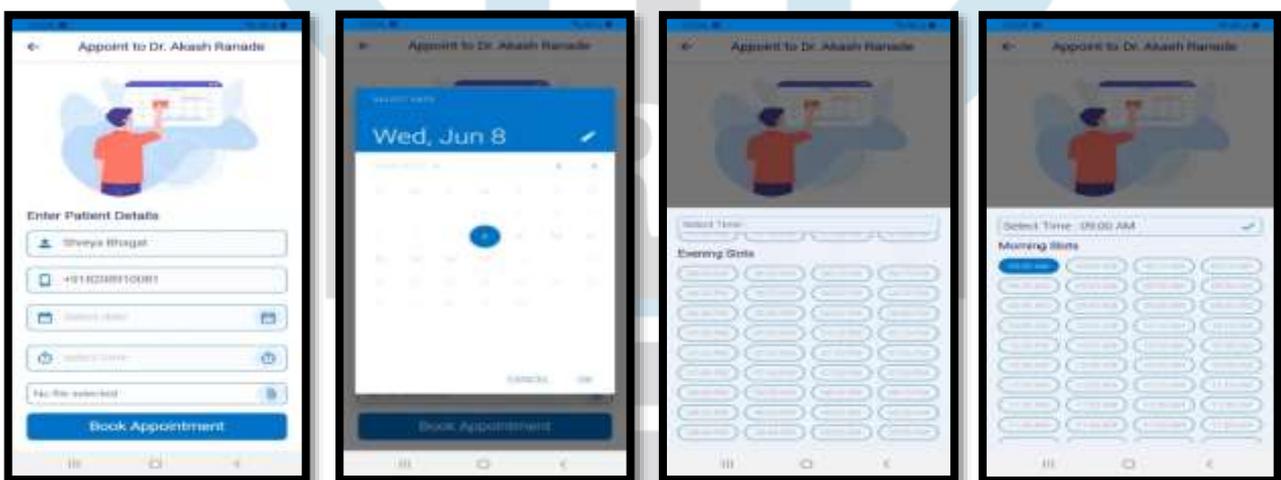


Figure 13: Appointment Booking Screen

11) Schedule Screen

Firstly, it shows no appointment and if patient book appointment, then all data shown on schedule screen. The data contain doctor name, appointment date, appointment time, doctor phone number and patient report. If patient want to cancel his/her appointment then by clicking on cancel button he/she can cancel appointment

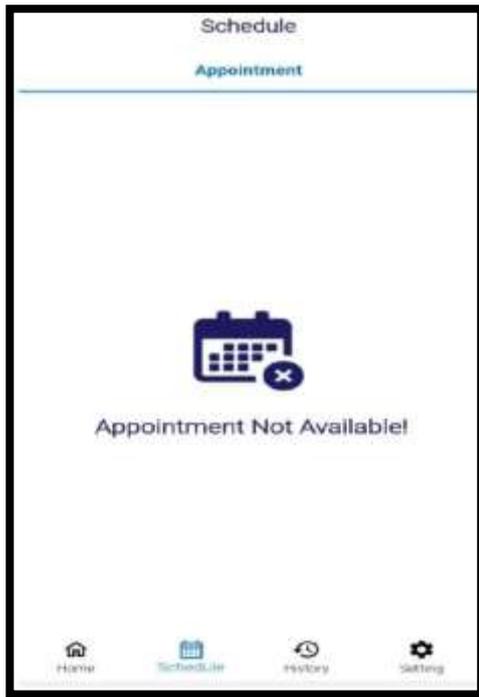


Figure 14.1: Schedule Screen



Figure 14.2: Schedule Screen

12) History Screen

History helps patient recall the past appointment. If no appointment done previously then on history screen, we can see a “No History Available!” message. If appointment history is there then patient can see an appointment history with respect to date month and appointment time.

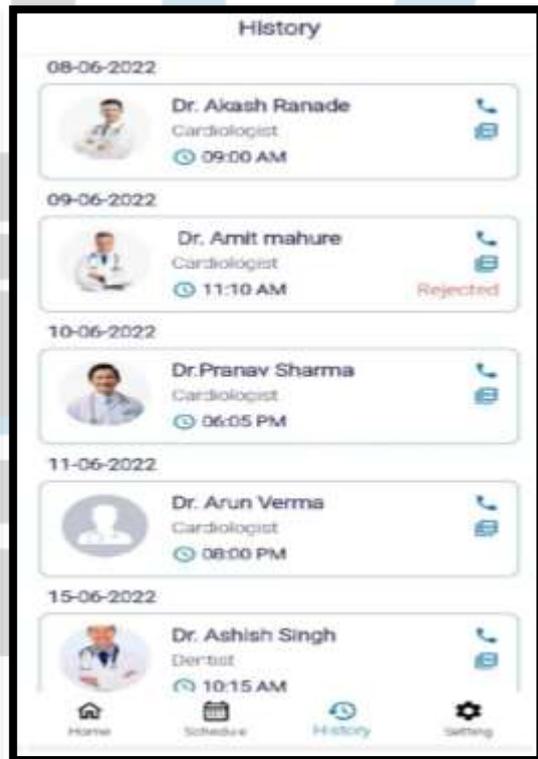


Figure 15: History Screen

13) Setting Screen

In setting screen patient have their profile and app info the app info contains logo of our app, app name and version. The healthcare industry is very personalized, so patient should provide their personal information like name, age, gender, address, and other details,

if any, that will help in the process of appointment and medication process. In the settings tab, there is an edit option to update profile such as profile photo, name address, and age.

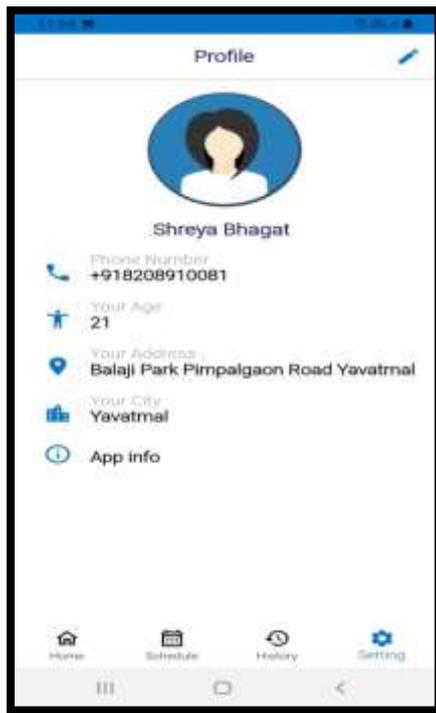


Figure 16.1: Setting Screen

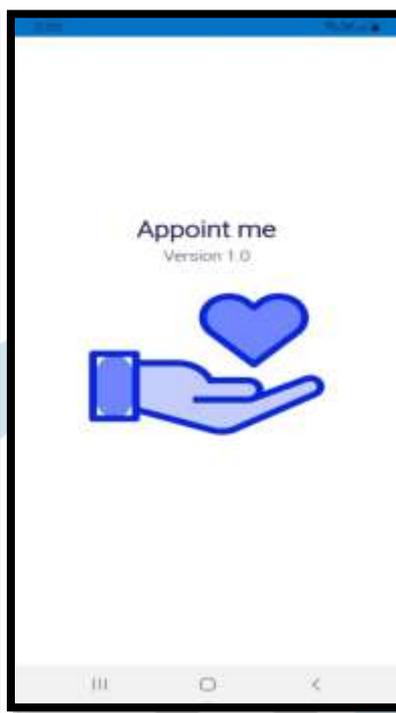


Figure 16.2: App info Screen



Figure 16.3: Edit Profile Screen

VI. IMPLEMENTATION OF DOCTOR APP

1) Onboarding screen and phone verification

Onboarding screen and phone verification screen is same as the patient app's onboarding screen and phone verification screen.

2) Registration screen

When phone verification done successfully then the doctor will have a doctor registration form. In this registration screen, doctor have to fill the doctor information such as name, education, category, age, gender, medical reg. No, year of experience, number of patients treat, patient treatment fees, professional bio, Sunday closed, city and hospital address. In education there are various types of education doctor can select any one of them. In gender there are two options such as male or female doctor will have to select any one of them. In Sunday closed doctor will have two options such as yes or no according to user's choice user can select any one of them. If hospital is closed on Sunday, then doctor have to select Yes otherwise No option. The doctor will have to select city where his/her hospital is present. In this we have created this application for Yavatmal city. Then there is a register button to register. The registration button works when we fill all the information which is mandatory then only, doctor can register as a doctor on this application.

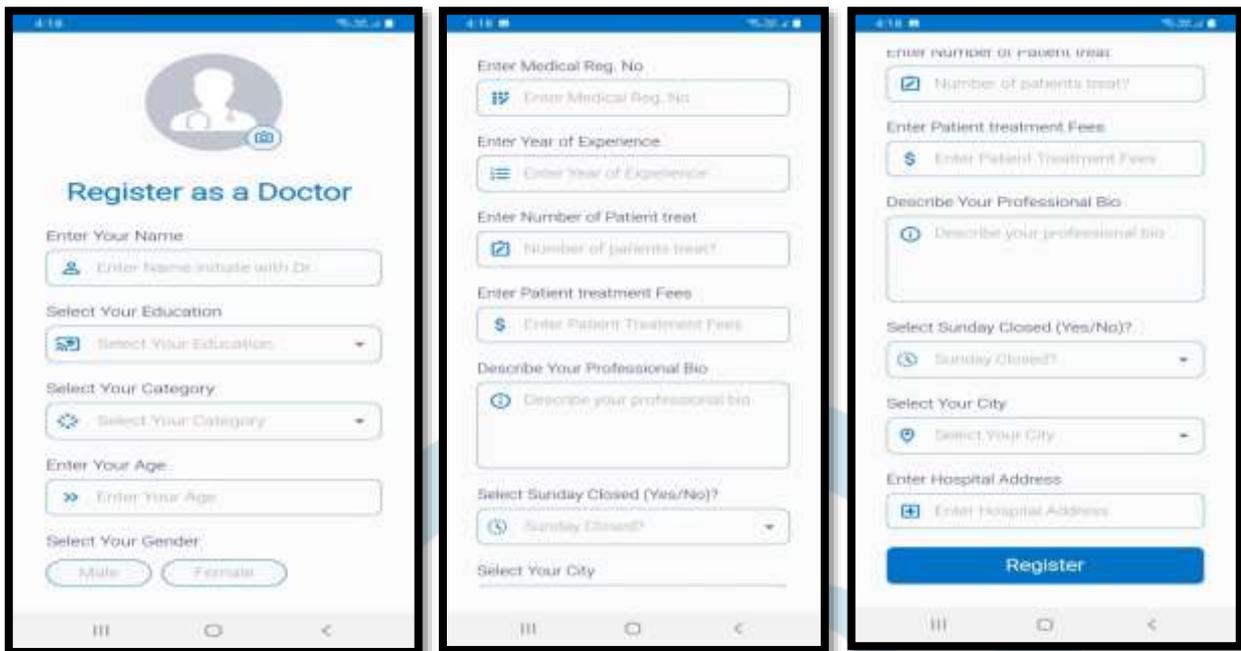


Figure 17: Doctor Registration Screen

3) Dashboard Screen

After successfully registering on this application receptionist have the dashboard screen In dashboard screen in bottom there are four tabs such as Home, Upcoming, History, Profile. In home tab receptionist can see a welcome message followed by doctor’s name and doctor’s profile picture then after that greeting message according to time such as “Good Morning”, “Good Afternoon” and “Good Evening”. After that there is one section called as Today’s appointment. In this receptionist can see all the today’s appointment on home screen. If appointment request is not available then receptionist can see a message such as “Appointment Request Not Available!” If patient has book appointment, then receptionist can see all the today’s appointments on the home screen. The card contains date like patient name, appointment time, patient phone number. After booking appointment receptionist can have two buttons reject button and arrived button which If receptionist want to cancel his/her appointment then by clicking on reject button receptionist can cancel appointment. After clicking on arrived button status of patient change to busy” Busy with Doctor”. In this doctor can see the pdf of patient report. After clicking on pdf icon, doctor can see a patient report. After treating patient receptionist have to click on “Busy with Doctor Button” then the status of patient change appointment as shown in figure.

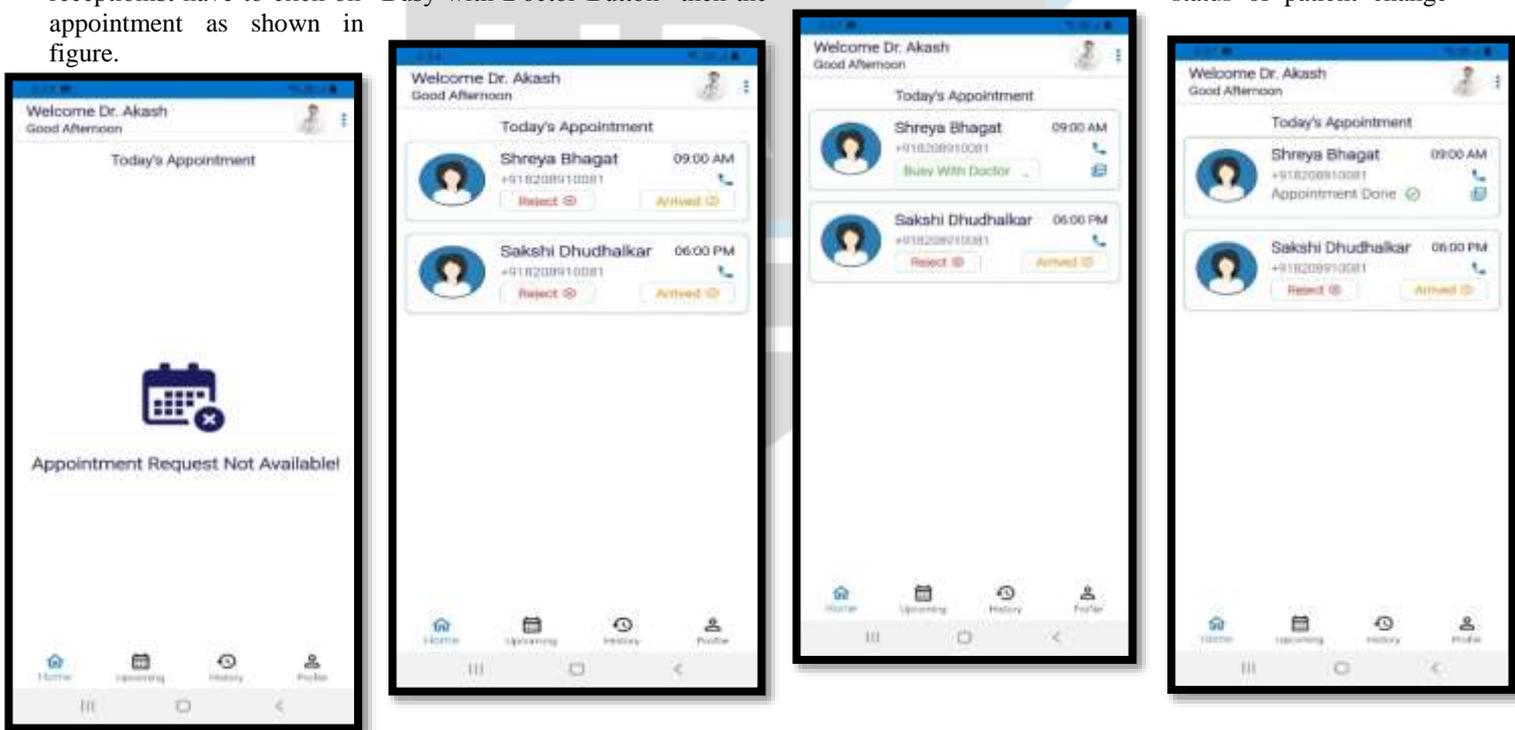


Figure 18: Dashboard Screen

4) Upcoming Screen

Firstly, if no appointments schedule, then its shows Appointment Request Not available and if patient book appointment, then all the appointments are shown on upcoming screen with all patient data. Receptionist can see all the upcoming appointment with date and timing.

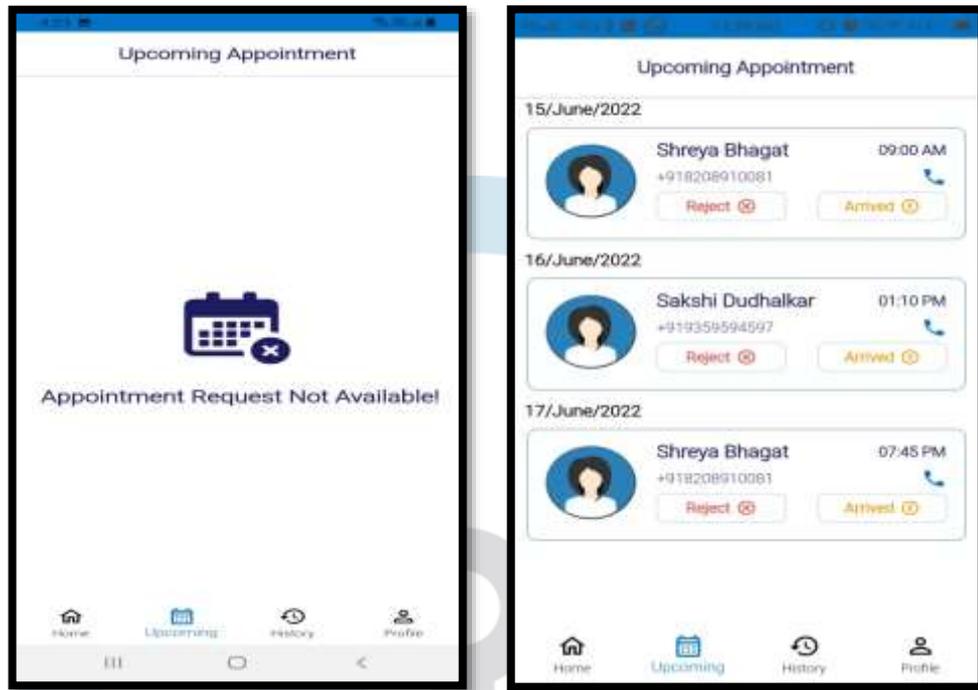


Figure 19: Upcoming Screen

5) History Screen

If no appointment done previously then on history screen doctor can see a “No History Available!” message. If appointment history is there then receptionist can see an appointment history with respect to date month and appointment time



Figure 20: History Screen

6) Profile Screen

This profile screen having doctor's profile such as doctor's name, doctor's Education, doctor's phone number then year of experience then number of patients he/she treated and the fees and the app info. The app info contains logo of our app, app name and version. After that there is a about section in that section there is a brief information about doctors. Then after that address section that contain address of hospital. Then we can see opening and closing timing of hospital. If the hospital is open/close then according to that information it will reflect on the screen. If the hospital is opened on Sunday, then it will appear in green color text (Sunday Opened) with green checkbox icon. If the hospital is closed on Sunday, then it will appear in red color text (Sunday Closed) with red cross icon. In top of the profile screen tab, there is a hospital Open/Close option with green button. Receptionist can click on this button to indicate the closed or opened hospital. And in top right corner there is an edit option to update profile of the doctor. In edit profile screen doctor can edit his/her profile.

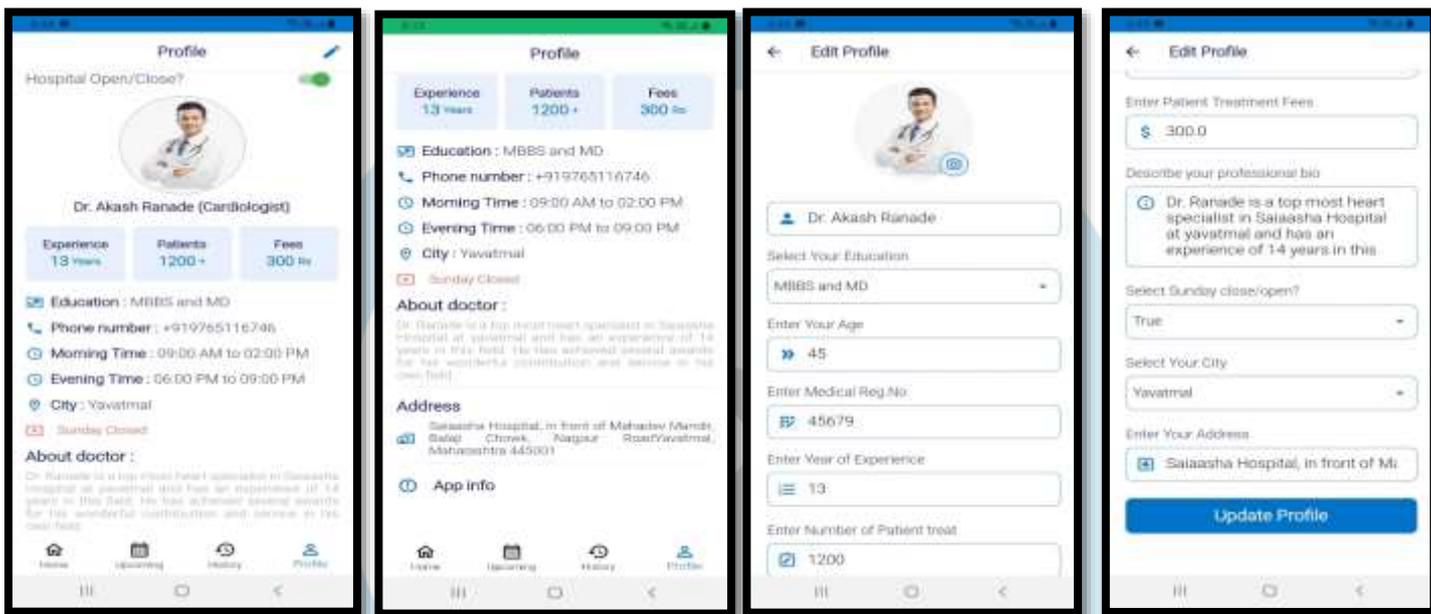


Figure 21.1: Profile Screen

Figure 21.2: Edit Profile Screen

CONCLUSION

In this age of science and technology people are getting easier and convenient ways to solve their everyday problems. This paper will be useful in solving the appointment scheduling problems. It will be helpful in connecting every doctor. Any kind of bacterial or fungal disease which can be spread through increased waiting time in hospitals can be mitigated. Thus, the mobile application provides stress free environment to patient regarding their waiting time.

FUTURE WORK

Our application has following future work and we would like to develop all these future.

- 1) Our app supports only one location i.e. yavatmal but In future we are trying to expand its availability at every city in the country.
- 2) Online patient system. So that patient can make payments easily.
- 3) The ambulance system option so that in the emergency situations it will be a great help in just one click.
- 4) The main future work of our application is to develop the option of blood donations and acceptance at the same time. Any patient who wants to donate blood. He/she can donate and it is accepted by particular hospital.

REFERENCES

- [1] Smartphone shipments worldwide 2009-2018 | Statistic [Internet]. Statista. [cited 2018 Dec 7]. Available from: <https://www.statista.com/statistics/271491/worldwideshipmentsof-smartphones-since-2009/>
- [2] Arthur Hylton III and Suresh Sankaran arayanan "Application of Intelligent Agents in Hospital Appointment Scheduling System", International Journal of Computer Theory and Engineering, Vol. 4, August 2012, pp. 625-630.
- [3] <https://www.geeksforgeeks.org/flutter-tutorial/>
- [4] <https://www.tutorialspoint.com/firebase/index.htm>