A PROJECT REPORT

ON

Doctor-On-Call Web Application

Submitted in partial fulfilment for the award of

Post Graduate Diploma in Advance Computing

(PG-DAC) from

INSTITUTE OF EMERGING TECHNOLOGIES

Authorized Training Centre

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CERTIFICATE

This is to certify that the project report entitled **Doctor-On-Call Web Application** is a bonfire work carried out by **Mr. Chetan Karnik, Mr. Rushikesh Mhetre, Mr. Sourabh Dalal, Mr. Usama Bagwan, Mr. Harshvardhan Wadavane** and submitted in partial fulfilment of the requirement for the C-DAC ACTS, DAC course in Institute of Emerging Technology in the batch of September 2023.

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Our most heart full thanks goes to **Mr. Sangram Patil (Director, IET)** who gave all the required support and kind coordination to provide all the necessities like required hardware, internet facility and extra lab hours to complete the project and throughout the course up to the last day here in C-DAC ACTS, Pune.

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Abstract

In today's fast-paced world, accessing quality healthcare services often proves challenging due to various constraints such as long waiting times and geographical limitations. The "Doctor on Call" project aims to address these challenges by introducing a comprehensive web application that facilitates the booking of appointments for allopathic, homoeopathic, and ayurvedic treatments with doctors who offer remote consultations and prescription services without the need for physical clinics.

Through the “Doctor-On-Call” platform, users can easily schedule appointments with qualified doctors from diverse medical disciplines, eliminating the barriers associated with traditional healthcare systems. The application streamlines the appointment booking process, allowing users to select their preferred date and time slots conveniently. Once an appointment is booked, patients have the flexibility to consult with doctors remotely via video calls or teleconferencing tools.

In cases where physical examinations are necessary, doctors will arrange for in-person consultations with patients at mutually agreed-upon locations. During these consultations, doctors conduct thorough check-ups, gather medical histories, and assess patients' health conditions to provide accurate diagnoses and personalized treatment plans. Subsequently, doctors create electronic prescriptions tailored to patients' healthcare needs, which are securely delivered to users through the platform.

The “Doctor-On-Call” project aims to improve accessibility, convenience, and efficiency in healthcare delivery while ensuring the highest standards of quality care and patient satisfaction. By leveraging technology to bridge the gap between patients and doctors, the platform not only enhances the overall healthcare experience but also promotes collaboration and professional development within the medical community.

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1. INTRODUCTION

In the era of digital transformation, accessing quality healthcare services should be effortless and efficient. Introducing "Doctor-on-Call" a cutting-edge web application designed to revolutionize the way you book appointments and receive medical consultations. With "Doctor-on-Call" we bring the expertise of allopathic, homoeopathic, and ayurvedic doctors directly to your fingertips, eliminating the hassle of traditional clinic visits.

Solving Healthcare Access Challenges: In today's fast-paced world, finding the time to visit a doctor's clinic can be daunting. Moreover, accessing specialists in different medical disciplines often involves navigating complex appointment systems and long waiting times. "Doctor-on-Call" addresses these challenges by offering a seamless platform where users can easily book appointments with certified doctors who provide remote consultations.

Convenience at Your Fingertips: With "Doctor-on-Call," you can say goodbye to long queues and tedious appointment scheduling processes. Our user-friendly interface allows you to browse through a diverse pool of qualified doctors offering allopathic, homoeopathic, and ayurvedic treatments. Whether you're seeking immediate medical advice or long-term care, our platform empowers you to book appointments with just a few clicks, all from the comfort of your home.

Empowering Doctors Without Clinics: "Doctor-on-Call" bridges the gap between patients and doctors who may not have physical clinic spaces. We provide a platform for talented healthcare professionals to offer their expertise remotely, ensuring that

patients have access to a wide range of medical services regardless of geographical constraints.

Seamless Prescription Delivery: After your remote consultation, your doctor will create a personalized prescription tailored to your healthcare needs. Through our secure platform, you'll receive your prescription electronically, eliminating the need for paper-based prescriptions and streamlining the entire healthcare process.

Ensuring Privacy and Security: At Doctor-on-Call we understand the importance of privacy and data security when it comes to your healthcare information. Our platform employs state-of-the-art encryption protocols to safeguard your personal data and medical history, ensuring confidentiality at every step of the process.

Join the Healthcare Revolution: Experience the future of healthcare booking with "Doctor-on-Call." Whether you're seeking allopathic, homoeopathic or ayurvedic treatments, our platform offers unparalleled convenience, accessibility, and quality care. Say hello to hassle-free appointments and expert medical advice, all within reach through Doctor-on-Call.

2. PROBLEM DEFINITION AND SCOPE:

Problem Definition:

Accessing healthcare services efficiently and conveniently poses a significant challenge for many individuals, particularly when seeking specialized treatments across different medical disciplines. Traditional healthcare systems often involve long waiting times for appointments and physical visits to clinics, which can be cumbersome and time-consuming for patients. Additionally, patients may face difficulties finding doctors who offer remote consultations and prescription services without their own physical clinics.

Scope:

The "Doctor on Call" web application aims to address the aforementioned challenges by providing a comprehensive platform for users to book appointments for allopathic, homoeopathic, and ayurvedic treatments with doctors who offer remote consultations and prescription services. The scope of the project includes the following key functionalities:

1. User Registration and Authentication:

- Users will be able to register on the platform and create accounts securely.
- Authentication mechanisms will be implemented to ensure user privacy and data security.

2. Doctor Profile Management:

- Doctors will have the ability to create profiles detailing their qualifications, specialities, availability for remote consultations, and prescription services.
- Profile verification processes will be implemented to validate the credentials of doctors joining the platform.

3. Appointment Booking System:

- Users will be able to search for doctors based on their medical discipline, speciality, availability, and location.
- A calendar-based booking system will enable users to schedule appointments with doctors at their preferred date and time slots.
- Users will receive confirmation notifications upon successful booking of appointments.

4. **Remote Consultations:**
    - Doctors will conduct remote consultations with patients via video calls or teleconferencing tools, eliminating the need for physical visits.
    - During consultations, doctors will assess patients' medical conditions, provide diagnoses, and recommend appropriate treatments.
5. **Physical Visits and Consultations:**
    - In cases where physical examinations are necessary, doctors will arrange for in-person consultations with patients at mutually agreed-upon locations.
    - Doctors will conduct thorough checkups, gather medical history, and assess patients' health conditions.
6. **Prescription Generation and Delivery:**
    - Following consultations, doctors will create electronic prescriptions based on patients' medical needs.
    - Prescriptions will be securely delivered to patients through the platform, ensuring accessibility and convenience.
7. **Feedback and Rating System:**
    - Users will have the opportunity to provide feedback and ratings for doctors based on their consultation experiences.
    - Feedback mechanisms will help maintain service quality and improve user satisfaction.
8. **Data Security and Privacy Measures:**
    - Robust data encryption protocols will be implemented to safeguard users' personal information and medical data.
    - Compliance with relevant healthcare regulations and standards will be ensured to maintain privacy and confidentiality.

By implementing these functionalities, the Doctor-on-Call project aims to streamline the healthcare booking process, enhance accessibility to specialized treatments, and improve the overall patient experience.

2.2 GOALS & OBJECTIVES:

Accessibility and Convenience

Enable users to easily book appointments for allopathic, homeopathic, and ayurvedic treatments through a user-friendly web application interface.

Ensure that users can access qualified doctors offering remote consultations and prescription services without the constraints of physical clinic locations.

Provide a seamless experience for users to schedule appointments at their preferred times, enhancing convenience and accessibility to healthcare services.

Efficiency in Healthcare Delivery

Streamline the appointment booking process to minimize waiting times and administrative burdens for both patients and doctors.

Facilitate efficient remote consultations between doctors and patients, leveraging technology to bridge the gap between healthcare providers and patients.

Implement electronic prescription generation and delivery mechanisms to expedite the process of obtaining prescribed medications, reducing delays and improving patient outcomes.

Quality Care and Patient Satisfaction

Ensure that doctors conduct thorough physical examinations during in-person consultations to provide accurate diagnoses and personalized treatment plans.

Establish mechanisms for gathering feedback from patients to assess their satisfaction with the consultation experience and the quality of care provided by doctors.

Uphold high standards of professionalism and ethical conduct among participating doctors, prioritizing patient well-being and safety in all interactions.

Collaboration and Professional Development

Foster collaboration among doctors from different medical disciplines (allopathic, homoeopathic, ayurvedic) to offer comprehensive healthcare solutions tailored to individual patient needs.

Promote continuous professional development among participating doctors by facilitating access to educational resources and training opportunities.

Encourage knowledge sharing and interdisciplinary learning to enhance the overall quality of care delivered through the platform and drive innovation in healthcare delivery.

By focusing on these goals and objectives, the "Doctor on Call" project aims to redefine the healthcare experience, making it more accessible, efficient, and patient-centred while fostering collaboration and professional growth within the medical community.

2.3 MAJOR CONSTRAINTS AND OUTCOME:

The implementation of an application can face several constraints and challenges, which may impact the expected outcomes. Here are some major constraints and potential outcomes associated with the deployment of such a system:

Major Constraints:

Regulatory Compliance: Adhering to healthcare regulations and standards, including patient privacy laws (e.g., HIPAA), medical licensing requirements, and telemedicine regulations, may pose constraints on the implementation and operation of the web application.

- **Technological Limitations**: Dependence on internet connectivity and technological infrastructure may limit the accessibility of the platform, particularly in areas with poor internet connectivity or limited technological resources.
- **Doctor Availability**: Ensuring a sufficient number of qualified doctors across different medical disciplines who are willing to participate in the platform and provide remote consultations may be a challenge.
- **Patient Trust and Adoption**: Building trust among patients regarding the quality and reliability of remote consultations and prescription services may require concerted efforts in educating and engaging potential users.
- **Data Security Concerns:** Safeguarding patient data and ensuring compliance with data protection regulations (e.g., GDPR) are critical, and any breaches in data security could lead to legal and reputational repercussions.

Outcomes:

- **Improved Access to Healthcare:** The web application will enable users to easily access healthcare services from qualified doctors offering remote consultations, regardless of geographical barriers or physical clinic locations.
- **Enhanced Convenience and Efficiency:** Patients will benefit from streamlined appointment booking processes, reduced waiting times, and the ability to consult

with doctors from the comfort of their homes, leading to greater convenience and efficiency in healthcare delivery.

- **Quality Patient Care:** By facilitating thorough physical examinations during in-person consultations and ensuring personalized treatment plans, the project aims to enhance the quality of patient care and promote better health outcomes.
- **Increased Patient Satisfaction:** Providing a user-friendly platform for booking appointments, conducting consultations, and receiving prescriptions will contribute to higher levels of patient satisfaction and engagement with healthcare services.
- **Professional Collaboration and Development:** The project will foster collaboration among healthcare professionals from different medical disciplines, promoting interdisciplinary learning and professional development opportunities within the medical community.
- **Positive Impact on Healthcare Delivery:** Overall, the "Doctor-On-Call" project seeks to make a positive impact on healthcare delivery by leveraging technology to improve access, efficiency, and quality of care for patients seeking allopathic, homoeopathic, and ayurvedic treatments.

3. SOFTWARE REQUIREMENT SPECIFICATIONS:

Doctor-On-Call

3.1 Purpose System

The purpose of this document is to provide a detailed description of the software system "Doctor-On-Call". This system aims to book appointments and facilitate consultations and medical assistance.

3.2 Scope

The "Doctor–On–Call" system will include a web application accessible to users seeking medical advice. The application will enable users to book with available doctors for consultations and visits.

3.3 System Modules

Definitions, Acronyms, and Abbreviations

SRS: Software Requirements Specification
API: Application Programming Interface
UI: User Interface

1. System Description

System Overview

"Doctor-On-Call" is a telemedicine application that allows users to request on-Demand medical consultations with registered and available doctors. The
The system will prioritize ease of use, security, and real-time communication.

System Features

User Registration and Authentication

- Users can create accounts with their personal information.
  - A secure authentication mechanism will be implemented.

Doctor Availability Status

- Doctors can set their availability status (online/offline).
- Real-time updates on doctor availability.

Appointment Scheduling

- Users can schedule appointments with available doctors.
- Notifications for upcoming appointments.
- Secure and encrypted communication.
- Appointment Request Processing
- Upon user request, the system should identify and display a list of available doctors based on their specialization, availability, and proximity to the user's location.
- Users can select a preferred doctor and propose a time slot for the appointment.

Prescription and Medical Records

- Doctors can generate and share electronic prescriptions.
- Users can access and manage their medical records.

2. Functional Requirements

2.1 User Module

User Registration

- Users must provide valid information for registration.
- Unique usernames and passwords for authentication.

Profile Management

- Users can update their profiles.
- Option to add and edit medical history.

Appointment Booking

- Users can view available doctors and schedule appointments.
- Confirmation notifications for booked appointments.

2.2 Doctor Module

Doctor Registration

- Doctors must provide the necessary credentials for registration.
- Verification process for medical professionals.

Availability Management

- Doctors can set and update their availability status.
- Real-time synchronization with the user interface.

Consultation Management

- Doctors receive and accept/reject appointment requests

Prescription and Medical Records Management

Prescription Generation

- Doctors should have the capability to create electronic prescriptions during or after a consultation.
- Prescriptions should include details such as medication names, dosage and instructions.

Prescription Delivery

- Users should receive electronic prescriptions securely through the application.
- Prescription details should be stored in the user's medical records.

Medical Records Access

- Users should have the ability to access and download their medical records at any time.
- The system should maintain a secure and organized repository of medical records for each user.

Medical History Update

- Users should be able to add, edit, or update their medical history through the application.
- Changes in the medical history should be reflected in future consultations.

3. Non-functional Requirement

Performance

- The server must be able to support an unlimited number of devices.

- Any amount of active client payments must be supported by the server, and payments must never be lost.

Security

- Registered users will be allowed to place an Appointment.
- Sensitive data will always be transmitted with encryption. The system will internally maintain a secure communication channel between servers (web servers, application servers, database servers).
- Online Doctor-On-Call portal will be secure from malicious attacks.

Reliability

- The site's response time should be as quick as feasible, and it should be able to load and balance the server.

Availability

- This application is available for 24 hours anywhere, anytime.

Maintainability

- Commercial database software will be used to maintain System data Persistence.
- A readymade Web Server will be installed to host online doctor-On- Call portal (Web Site) to management server capabilities.
- IT operations team will easily monitor and configure the system using administrative tools provided by Servers.
- Separate environments will be maintained for the system for isolation in production, testing, and development.

Portability

- PDA: Portable Device Application

- The system will provide a portable User Interface (HTML, CSS, React) through which users will be able to access the Doctor-On- Call portal.
- The system can be deployed to a single server, multi-server, to any OS, Cloud (Azure or AWS or GCP).

Accessibility

- After authentication, only logged-in users will be able to place an Appointment.
- Through a personalized dashboard, the BOD team will be able to monitor daily, weekly, monthly, and annual business growth.

Efficiency

- The system will be able to manage all transactions with isolation.

Safety

- All the data will be hidden for other users.

Scalability

- The system should be scalable, with the ability to accommodate a large number of users at once.
- Role-based security will be applied for Application data and operations accessibility.

Benefits

- The Patients will save time because they are not going to the clinic.

- The doctor can visit patient at the proper time.
- The patient can book doctor appointment at any time from its place in that area.

USER INTERFACE:

The user interface for the system shall be compatible with any type of web browser such as Mozilla Firefox, Google Chrome, Microsoft EDGE, Opera, BING etc.

SOFTWARE INTERFACE:

FRONTEND	BACKEND	DATABASE
ReactJS	Spring Boot	MySQL

5. PERFORMANCE REQUIREMENTS:

Performance requirements for a doctor-on-call application ensure that the platform functions effectively, efficiently, and reliably. These requirements are crucial to deliver a seamless user experience and achieve the goals of the application.

5.1 H/W REQUIREMENTS:

Server Side			
Monitor	Processor	RAM	Disk Space
Resolution: 1024x768	Intel or AMD 2GHZ or higher	4 GB	128GB
Client Side			
Monitor	Processor	RAM	Disk Space
Resolution: 1024x768	intel or and 1ghz dual core min	4 GB	128 GB

6. UML DIAGRAM

6.1 DFD:

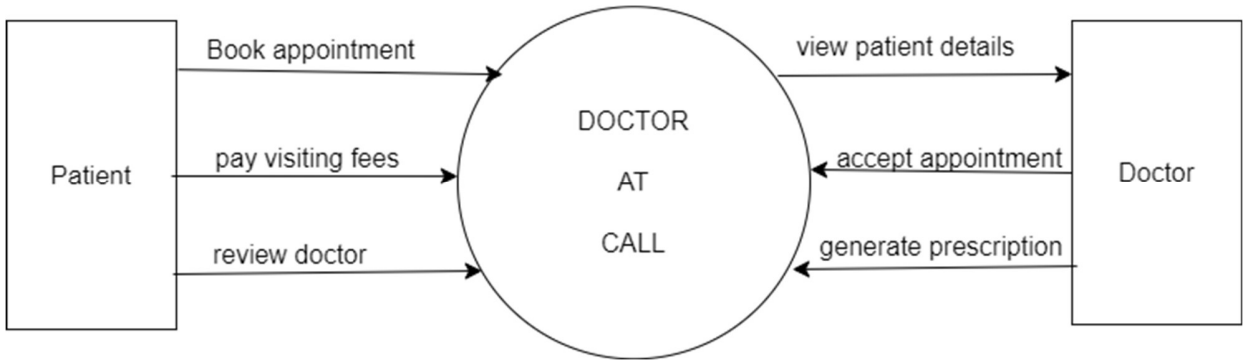


Figure: DFD Level 0

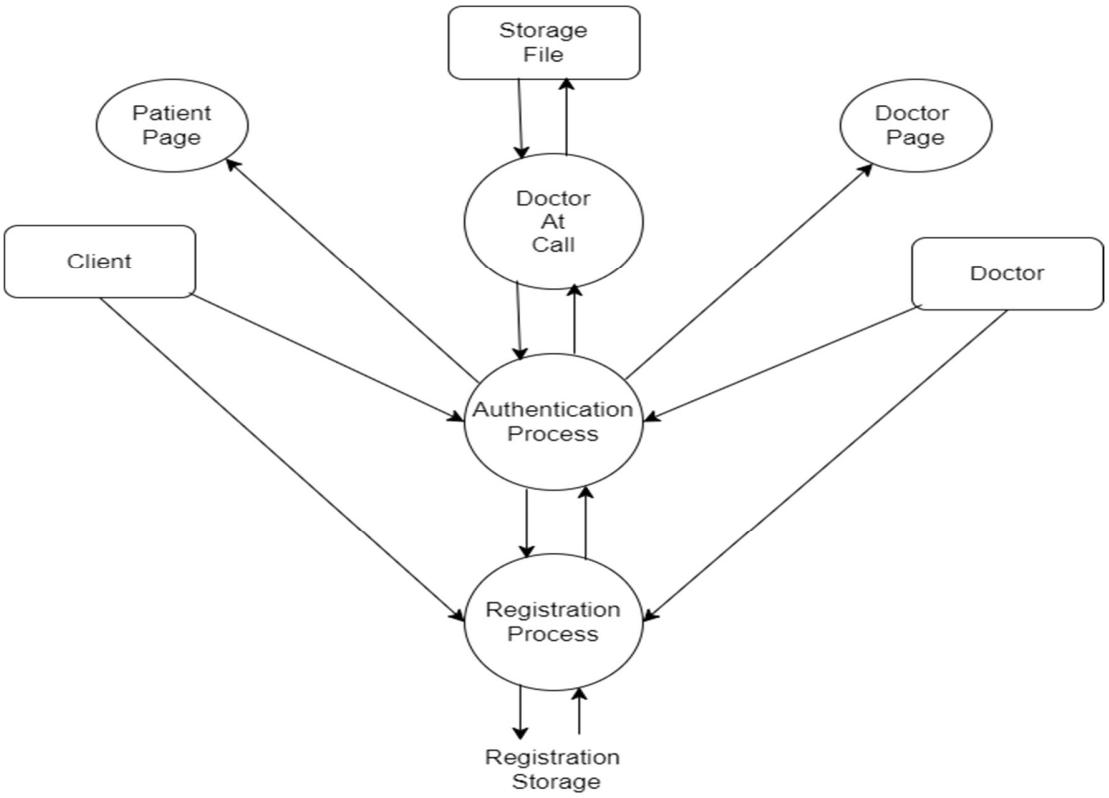
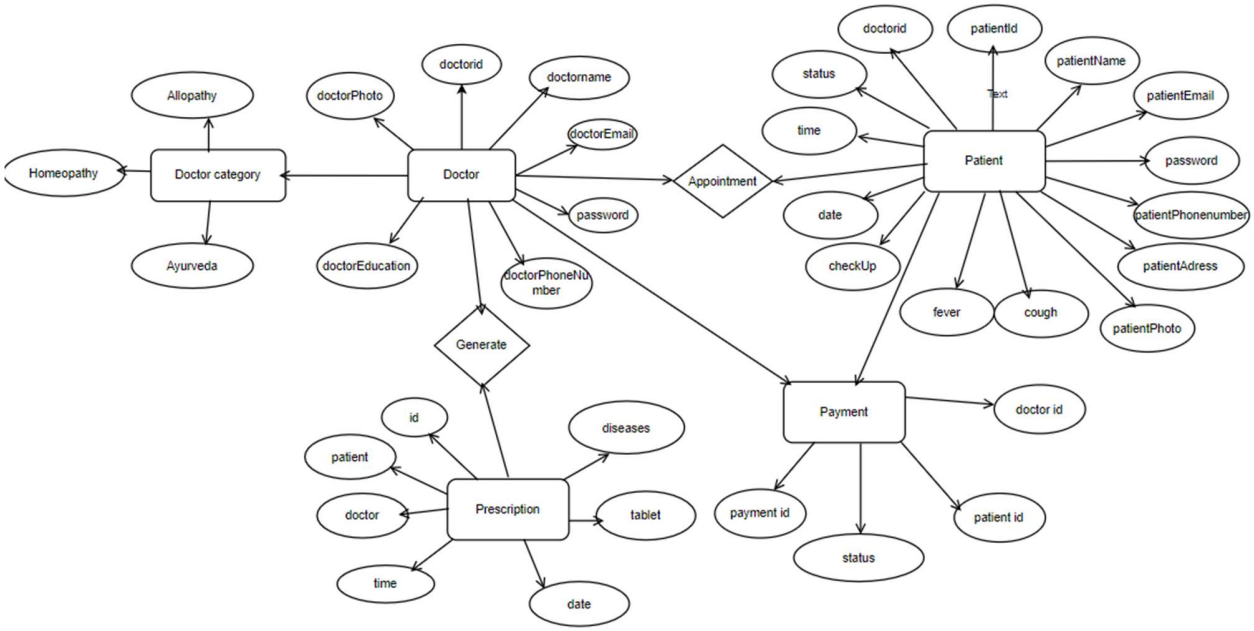


Figure: DFD Level 1

6.2 ERD:


Allopathy
doctorPhoto
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doctorEmail
Homeopathy
Doctor category
Doctor
password
Ayurveda
doctorEducation
doctorPhoneNu
mber
Generate
id
diseases
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doctor
Prescription
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time
date
Appointment
doctorid
patientId
patientName
status
Text
patientEmail
time
Patient
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patientAdress
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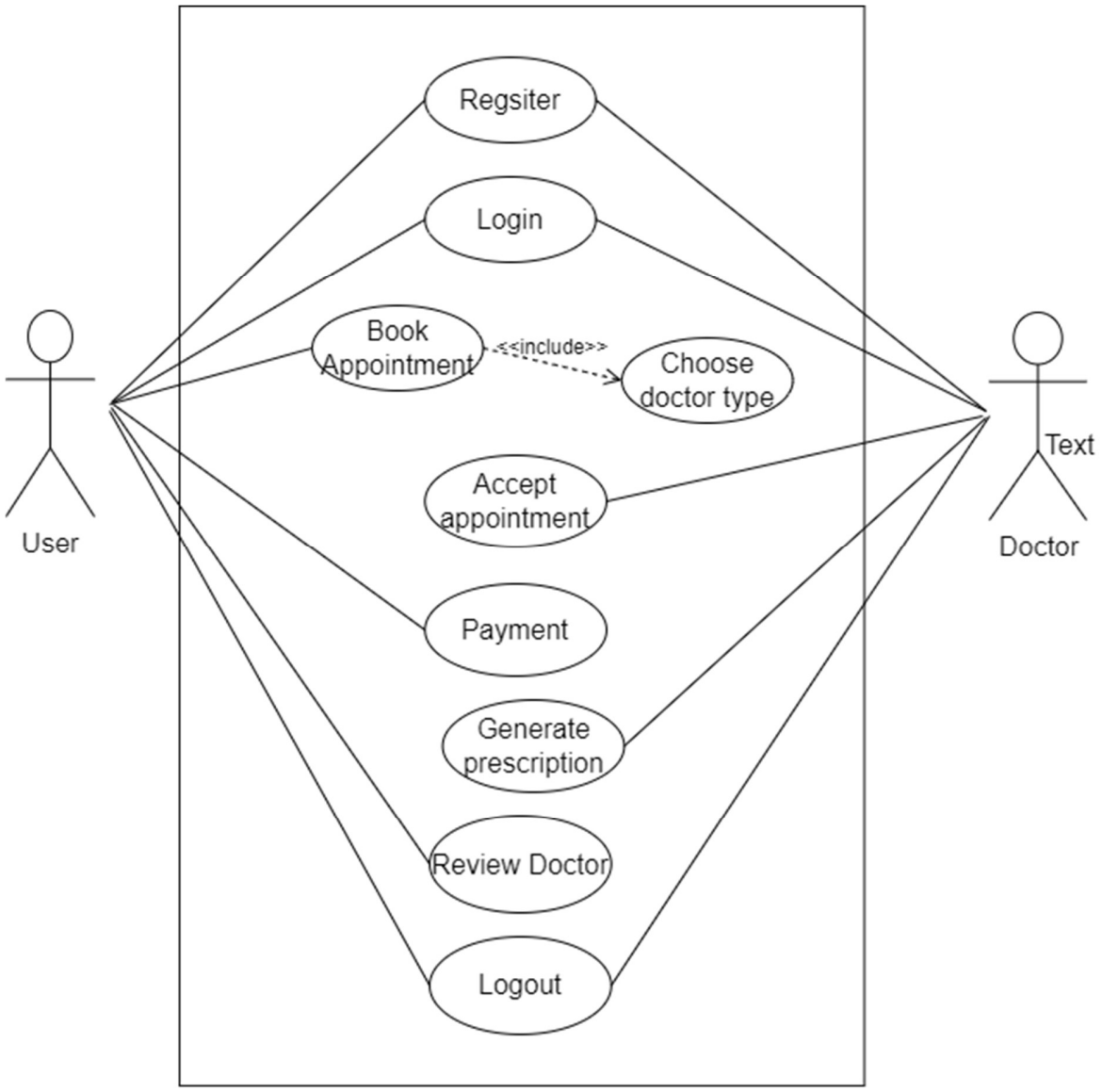
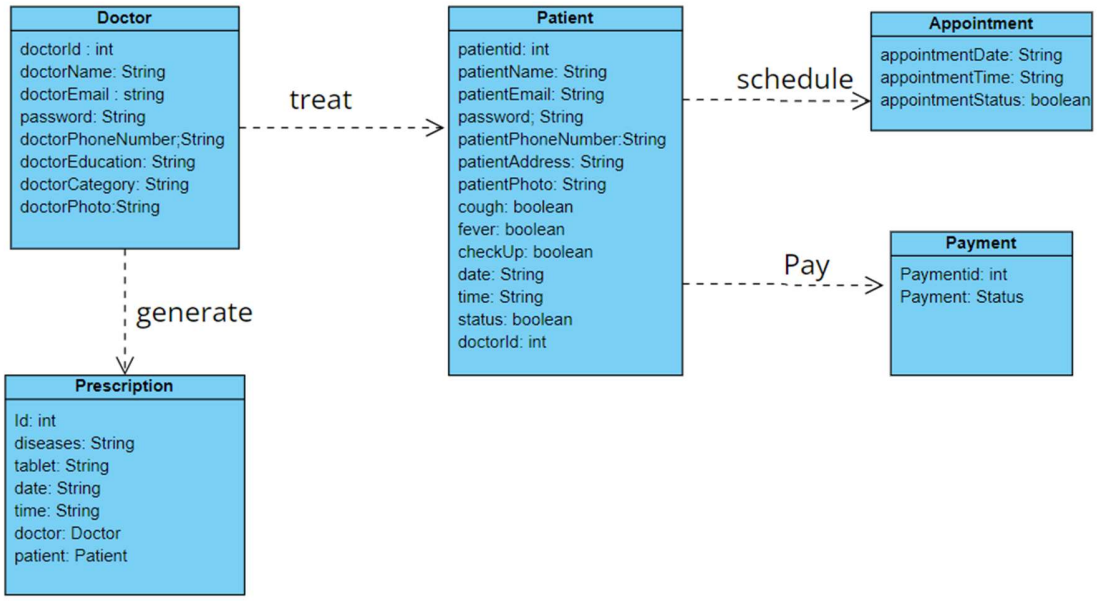
cough
patientPhoto
Payment
doctor id
payment id
patient id
status

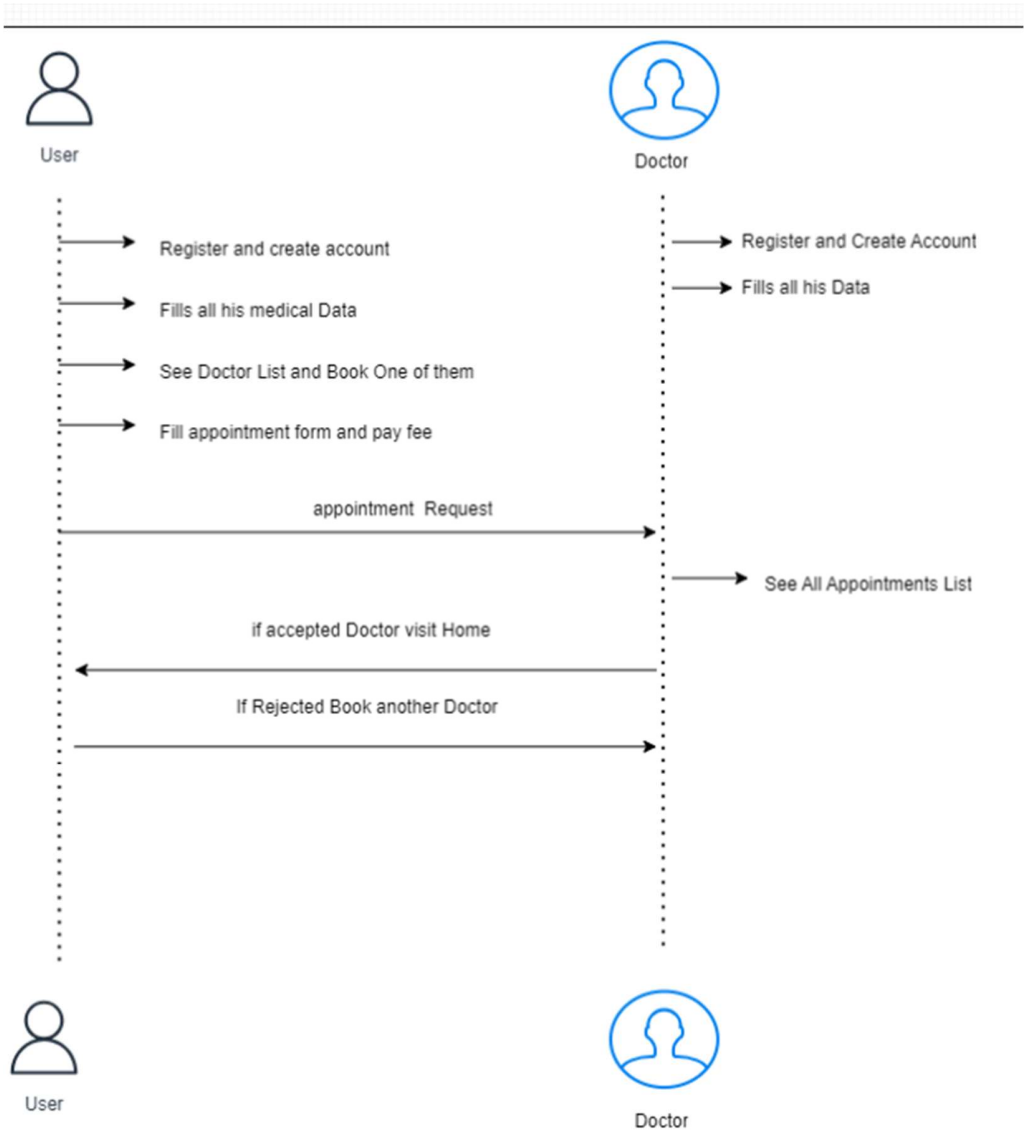
6.3 Use Case Diagram:



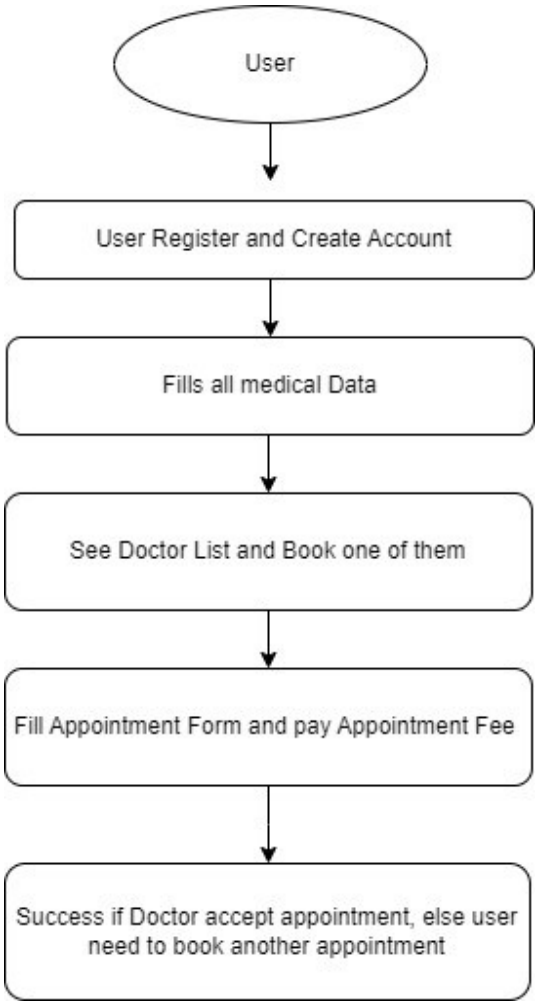
6.4 Class Diagram:

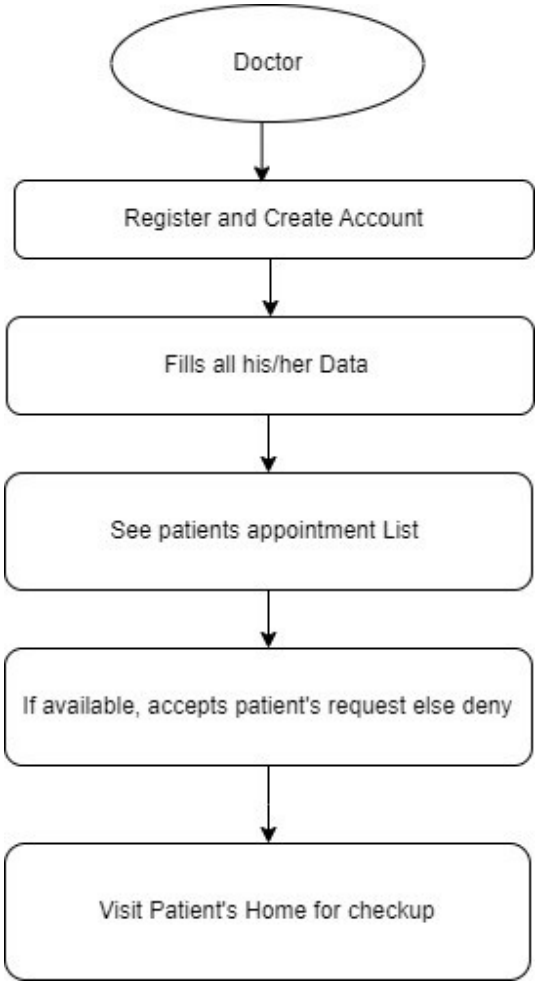


6.5 Sequence Diagram:

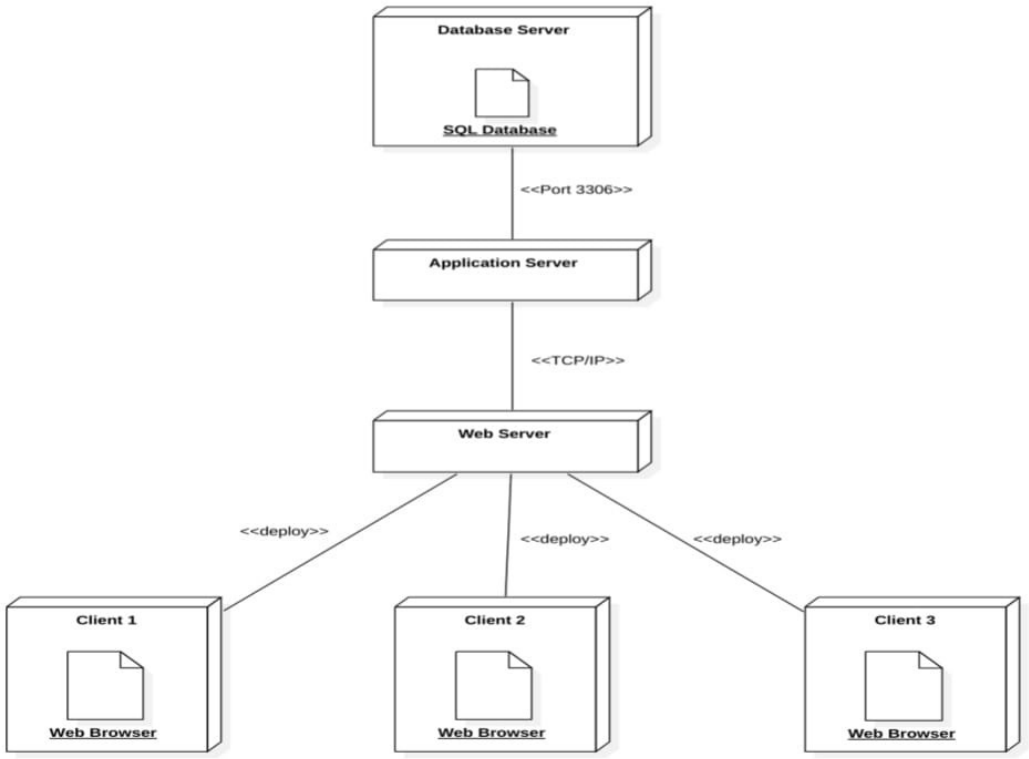


6.6 Activity Diagram:




Doctor
Register and Create Account
Fills all his/her Data
See patients appointment List
If available, accepts patient's request else deny
Visit Patient's Home for checkup

6.7 Deployment Diagram:



6.8 System Architecture:

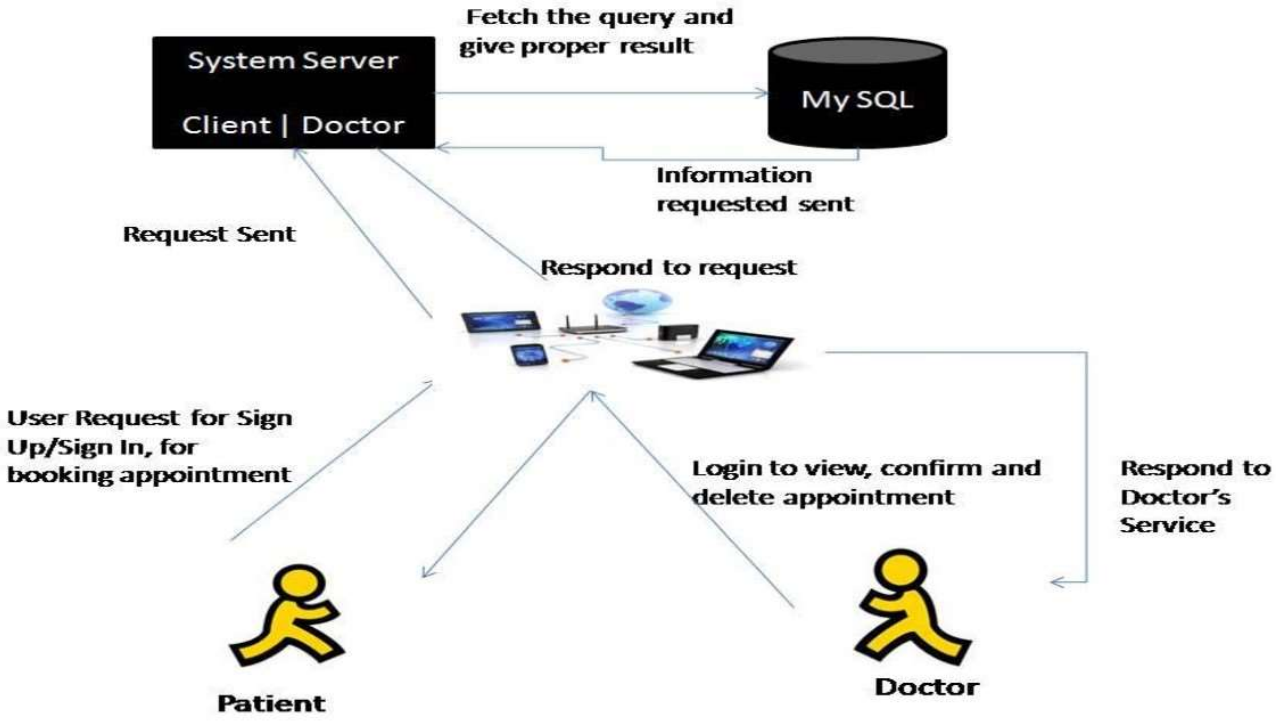
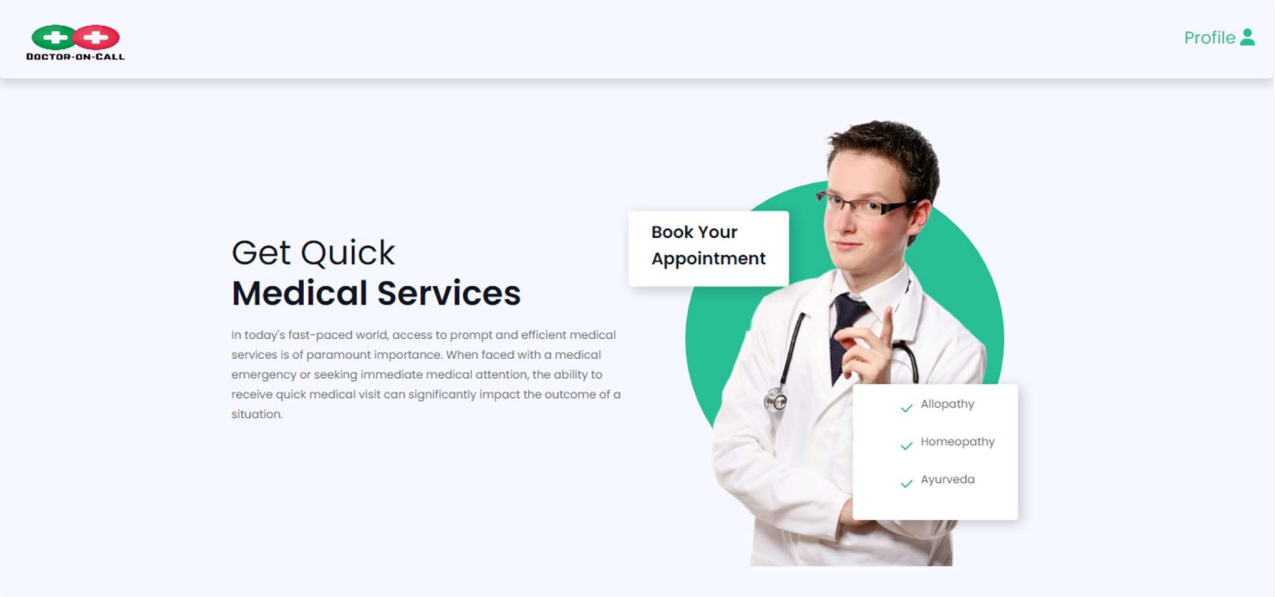


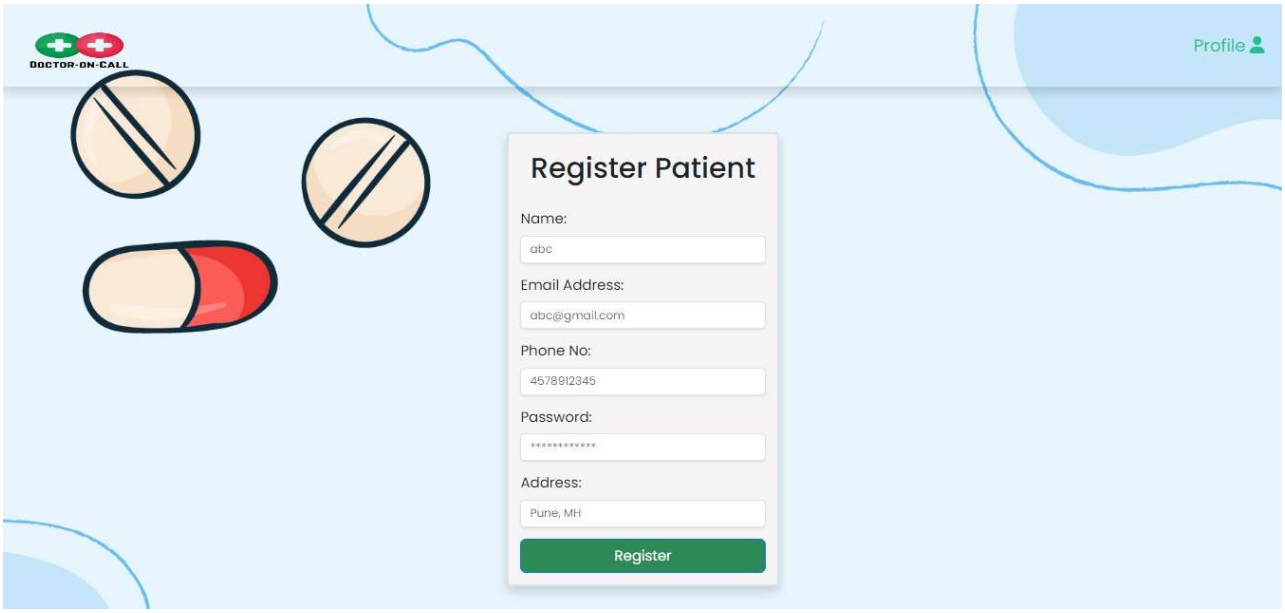
Fig. 1 System Architecture

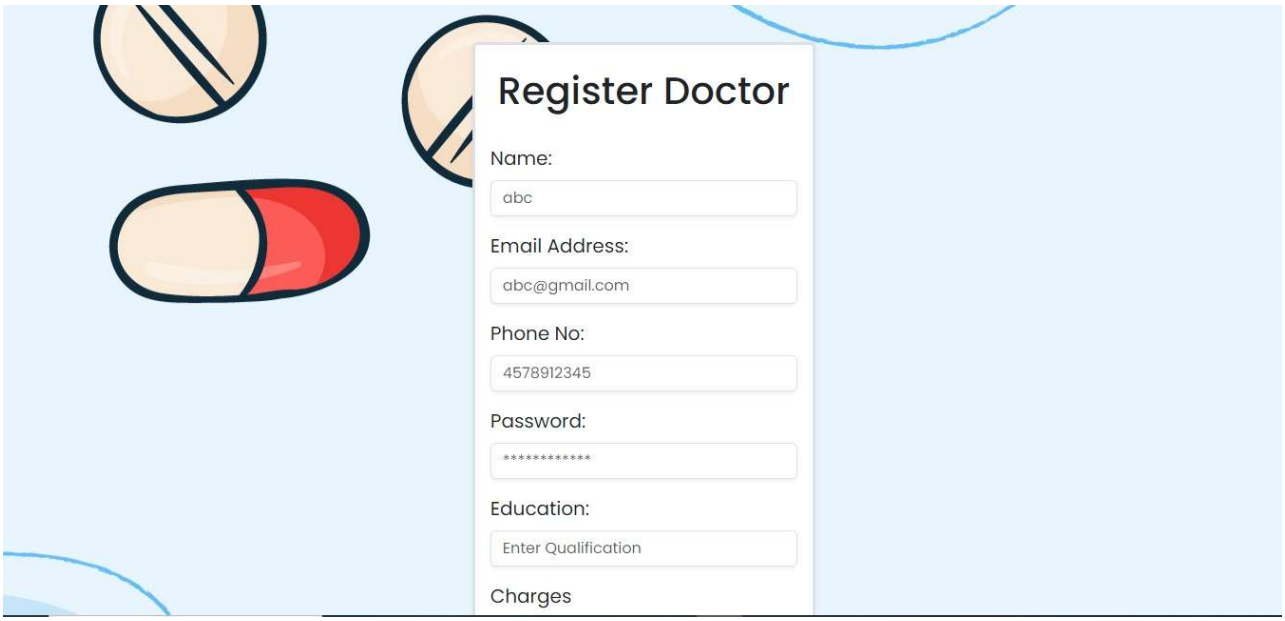
7. Test Cases:

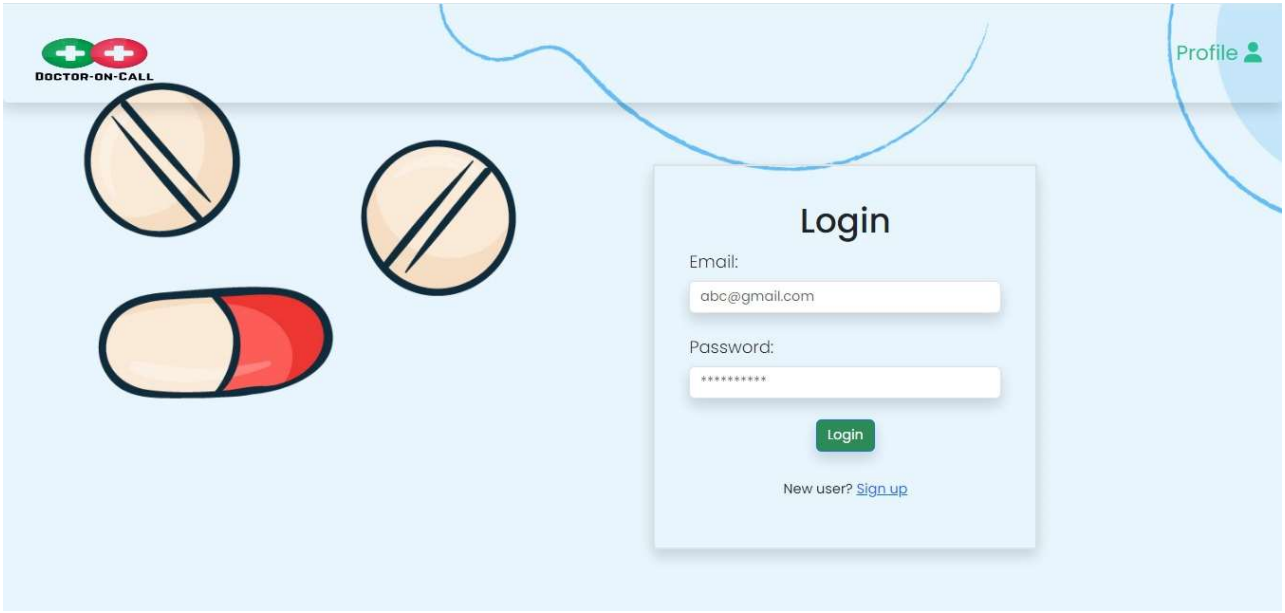
Test Case ID	Test Case Description	Test Steps	Expected Result	Pass / Fail
TC001	Patient Registration	1. Navigate to the registration page. 2. Enter valid details. 3. Submit the registration form.	Patient is successfully registered and confirmation message is displayed.	Pass
TC002	Doctor Registration	1. Navigate to the registration page. 2. Enter valid details. 3. Submit the registration form.	Doctor is successfully Registered and confirmation message is displayed.	Pass
TC003	Patient Login	1. Navigate to the login page. 2. Enter valid credentials. 3. Click on the login button.	Patient is successfully logged in and the system redirects to the Patient home page.	Pass
TC004	Doctor Login	1. Navigate to the login page. 2. Enter valid credentials. 3. Click on the login button.	Doctor is successfully logged in, and the system redirects to the Doctor home page.	Pass
TC005	Book Appointment	1. Log in as a patient. 2. Book the appointment	Request is successfully sent to doctor	Pass
TC006	Accept appointment request	1. Log in as a doctor. 2. Accept the appointment	Accepts the appointment	Pass
TC007	Make payment	1. Log in as a patient 2. Make payment of booked appointment	Payment confirmation message	Pass
TC008	Generate prescription	1. Log in as a doctor 2. Generate prescription	Prescription successfully sent to patient	Pass
TC009	Access history of patient	1. Patient login 2. View history	Table of history of patient appointments	Pass
TC010	Sign Out	1. Patient Sign out 2. Doctor Sign out	Patient Sign out Doctor Sign out	Pass

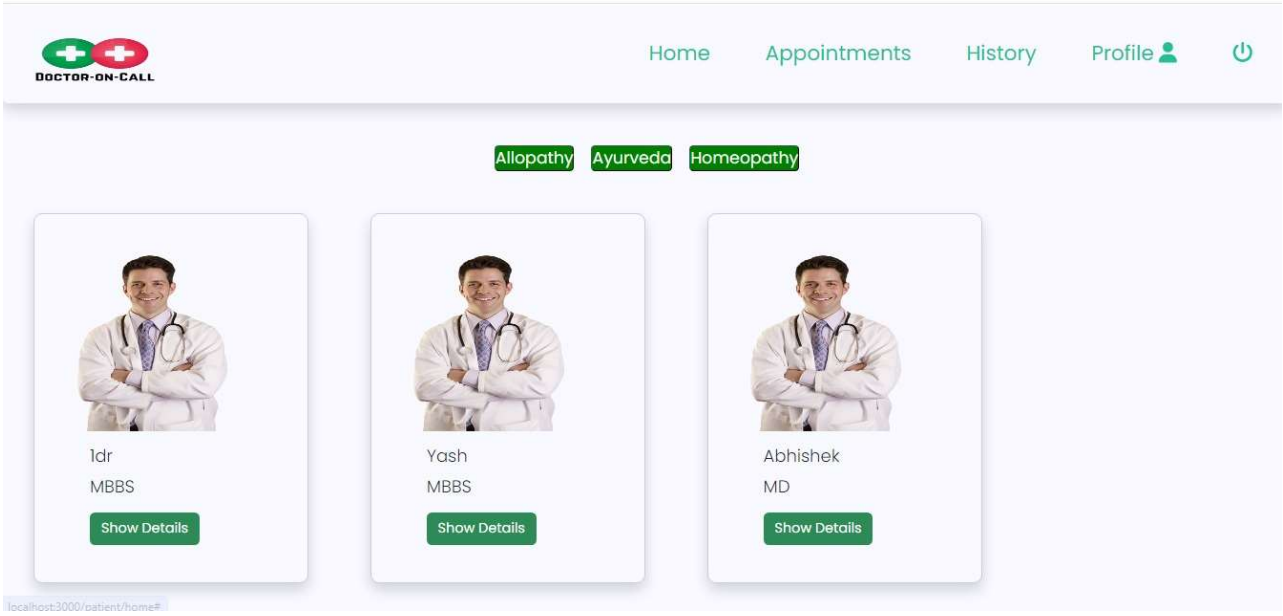
8. Screenshots:






Register Doctor
Name:
abc
Email Address:
abc@gmail.com
Phone No:
4578912345
Password:
****
Education:
Enter Qualification
Charges


DOCTOR-ON-CALL
Profile
Login
Email:
abc@gmail.com
Password:
****
Login
New user? Sign up


DOCTOR-ON-CALL
Home
Appointments
History
Profile
Allopathy
Ayurveda
Homeopathy
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MBBS
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Abhishek
MD
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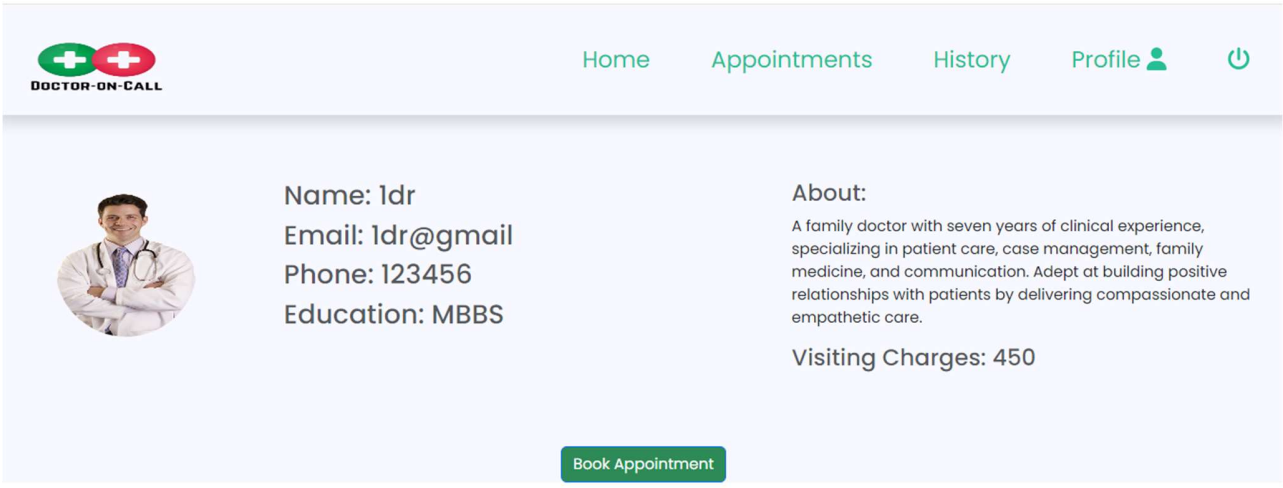
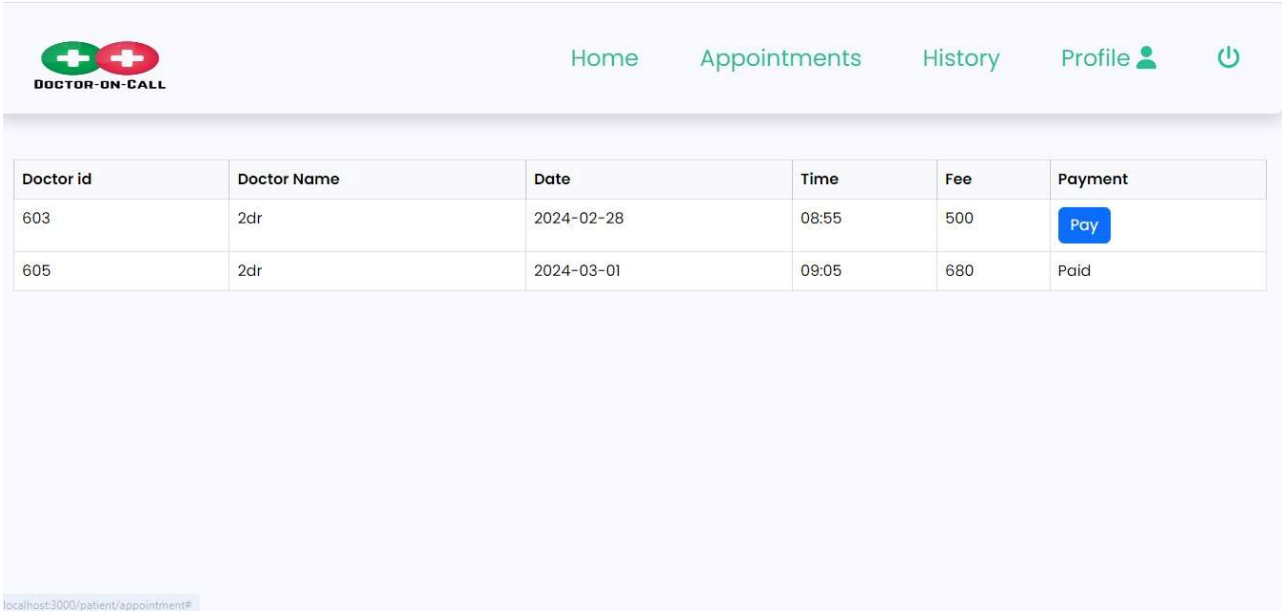

DOCTOR-ON-CALL
Home
Appointments
History
Profile
Name: 1dr
Email: 1dr@gmail
Phone: 123456
Education: MBBS
About:
A family doctor with seven years of clinical experience, specializing in patient care, case management, family medicine, and communication. Adept at building positive relationships with patients by delivering compassionate and empathetic care.
Visiting Charges: 450
Book Appointment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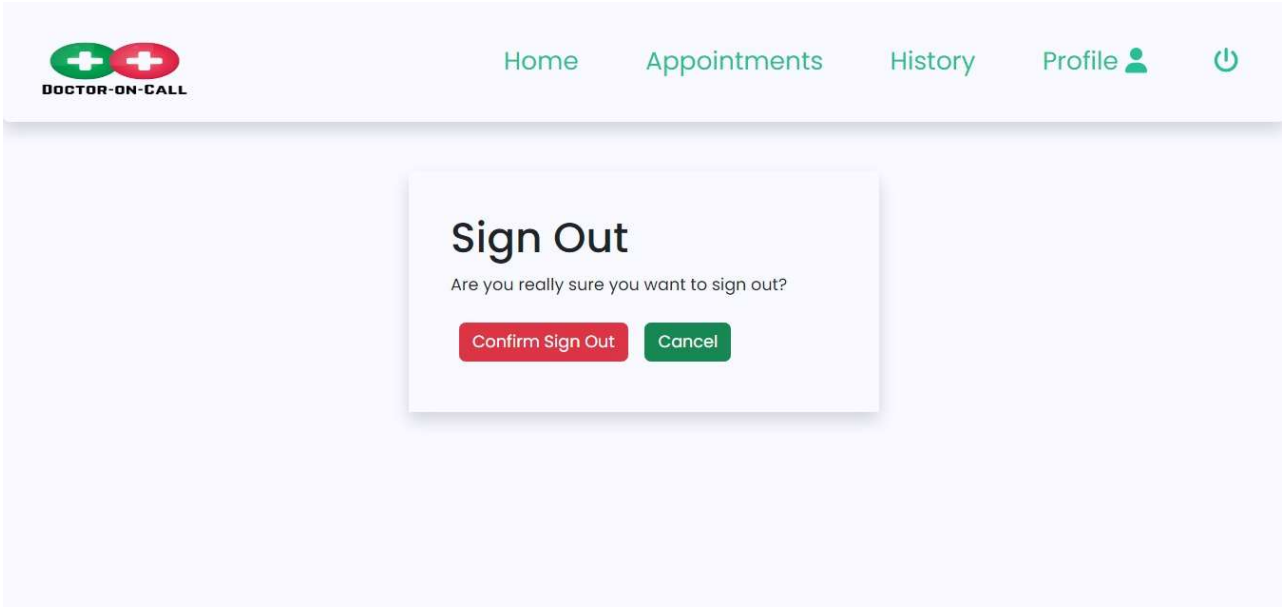
DOCTOR-ON-CALL
Home
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Sign Out
Are you really sure you want to sign out?
Confirm Sign Out
Cancel

9. References:

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