



MEDASSISTPRO

Hospital Services & Management

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ABSTRACT

MedAssistPro is a mobile app that enhances patient access to hospital services. It allows users to schedule and manage appointments, update medical history, and provide insurance details from their smartphones.

The app centralizes healthcare management, offering tools for effective health management, secure billing, and payments. Built with Android and Firebase, MedAssistPro ensures data security through encryption, aiming to revolutionize the patient experience in healthcare.

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- Thank You

INTRODUCTION

In the rapidly evolving field of healthcare, accessibility and efficiency are paramount. The MedAssistPro project aims to bridge the gap between healthcare providers and patients by offering a seamless, integrated mobile application.

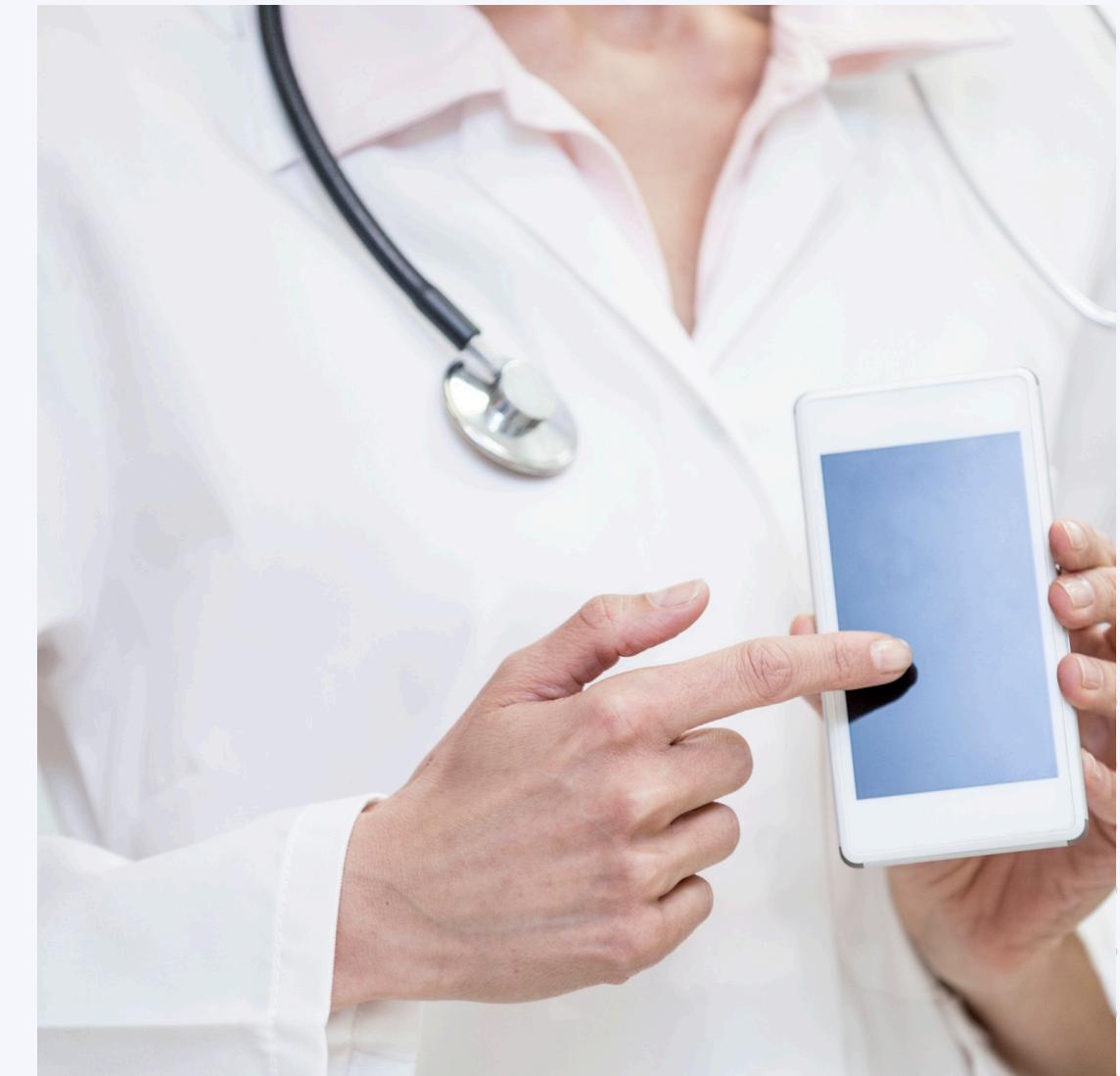
This app provides many hospital services, including appointment booking, medical history submission, insurance details, and billing management. MedAssistPro strives to enhance patient experience and streamline hospital operations by leveraging modern technology.



BACKGROUND

Access to quality healthcare remains a global issue. In 2018, the WHO estimated global healthcare expenditure at \$8.3 trillion, yet half the world's population lacked essential health services in 2020. Developing countries face severe accessibility challenges, with physician density below 1 per 1,000 people, compared to over 3 in high-income countries.

mHealth apps provide remote access to medical consultations, health records, and diagnostics. With 5.8 billion unique mobile subscribers predicted by 2025, mHealth presents a significant opportunity to enhance healthcare access.



PROBLEM STATEMENT

Hospitals and Healthcare facilities often face challenges in providing accessible and efficient services to patients due to the complexity and volume of tasks involved.

There is a need for a comprehensive mobile application to centralize hospital services, streamline operations, and enhance overall patient experience and healthcare service efficiency.

First Problem

Manual processes for patient appointment, medical history, insurance management, and healthcare access are time-consuming, error-prone, and inefficient.

Second Problem

A lack of a centralized system leads to fragmented information, complicating patient healthcare management and data access for providers.

- 1 Addressing Healthcare Accessibility and Efficiency
- 2 Leveraging Mobile Health (mHealth) Technology
- 3 Streamlining Healthcare Operations
- 4 Enhancing Patient Experience
- 5 Ensuring Data Security and Compliance

WHY WAS THIS TOPIC CHOSEN?



PROJECT SCOPE



MedAssistPro is designed to cater to patients, offering a convenient interface to access hospital services directly from their smartphones. Patients can easily book and manage appointments, submit, view and maintain their medical history, and submit insurance details within a user-friendly application. This centralized access simplifies the healthcare process, ensuring patients have all the necessary tools to manage their health effectively and efficiently.

OBJECTIVES

The primary objective of this project is to develop a user-friendly mobile application that centralizes various hospital services. This includes:

- **Appointment Scheduling**

Allowing patients to schedule and manage appointments with healthcare professionals easily. Users can book or cancel appointments if necessary.

- **Medical History Management**

Enabling patients to securely submit and maintain their medical records, including past reports, ongoing treatments, and diagnoses, ensures comprehensive data for better treatment.

OBJECTIVES

- **Insurance Details Submission**
Facilitating the submission of insurance information. Users can submit their insurance details, and ensure it is up-to-date and accessible.

- **Billing Information**
Patients can view their billing information with service details and costs in an invoice format. A secure payment button allows for easy bill payment.

OBJECTIVES

● Manage Appointments

Patients can view and manage their upcoming or completed appointments, making accessing or cancelling schedules easy.

● User Profile Management

Users can manage their profile details and emergency contact, ensuring up-to-date data for both patients and healthcare providers.

OBJECTIVES

● Secure Data Handling

Patient data is encrypted and complies with privacy regulations like HIPAA, using advanced methods to protect sensitive information and ensure security.

● Unit Testing

Using JUnit and Mockito for unit testing to ensure code reliability & robust application development, verifying that all functionalities perform as expected.

METHODOLOGY

Architecture

Using a client-server architecture with the mobile app as the client and Firebase as the backend for scalability and efficient data management.

Interfaces

The app features an intuitive UI and integrates Firebase APIs for authentication, database operations, and secure data handling.

Modules

The app includes modules for login, user registration, navigation, profile management, health records, appointment scheduling, billing, security, and unit testing.

Data Management

The app uses Firebase Firestore for real-time data storage and AES encryption to protect sensitive information, with secure key storage.

IMPLEMENTATION

● Code Review & Documentation

A thorough code review was conducted to identify and fix any remaining issues, and all user manuals and technical documentation were completed.

● Infrastructure Setup

Firebase was set up for authentication, database, and storage, with servers configured and network settings established.

● Version Control

Git was used for version control to manage code changes and maintain a history of project development.

● Backend Deployment

Backend services were deployed to the cloud, configuring Firebase, Firestore, and Authentication, with security rules set for data privacy.

IMPLEMENTATION

● Mobile App Deployment

The Android application (APK) was built and packaged for deployment.

● Database Configuration

Initial data, including test users and sample medical data, was imported, and database indexes were set up for efficient querying.

● API Integration

The necessary Firebase third-party APIs were integrated, and proper API configurations and keys were securely stored and accessed.

● Security Configuration

AES encryption was implemented for sensitive data, and authentication mechanisms and user roles were set up to ensure proper access control.

IMPLEMENTATION

● Unit Testing

Unit testing with JUnit and Mockito ensured code reliability, with key functionalities tested to catch errors early.

● User Training

User manuals, technical documentation, and FAQs were provided to help users navigate and utilize the app effectively.

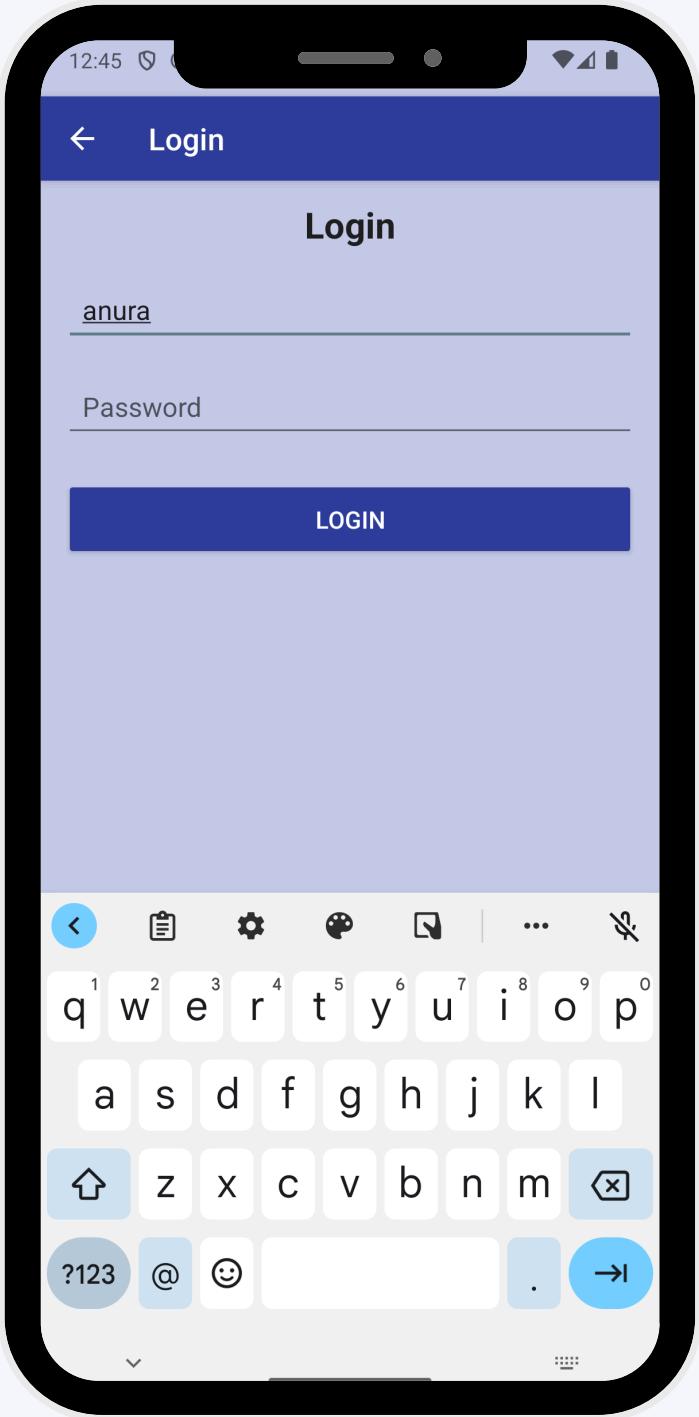
● Monitoring

Monitoring tools were implemented to track performance, server health, and security, with alerts for critical issues like downtimes and breaches.

● Regular Updates

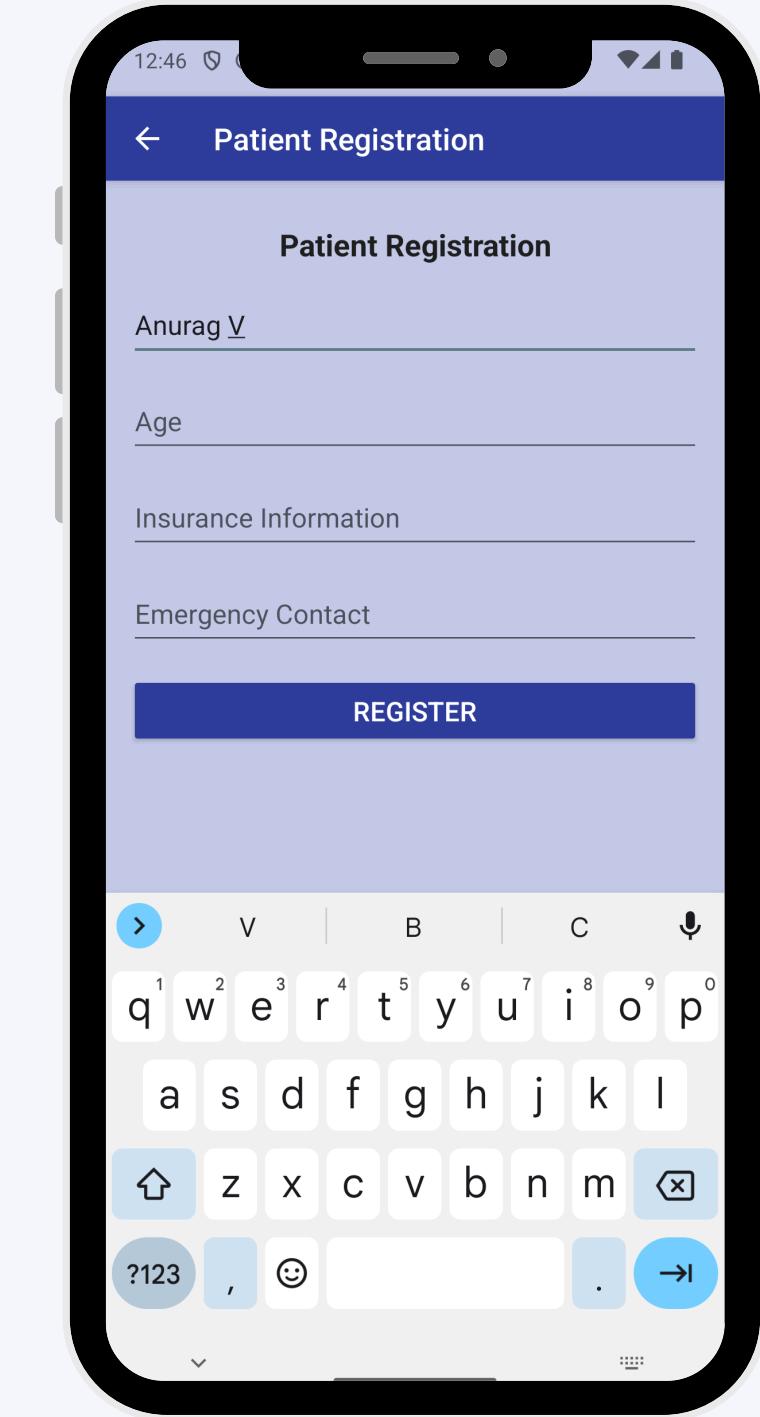
Regular updates were planned and scheduled to add new features, fix bugs, and improve performance.

MODULES



Login

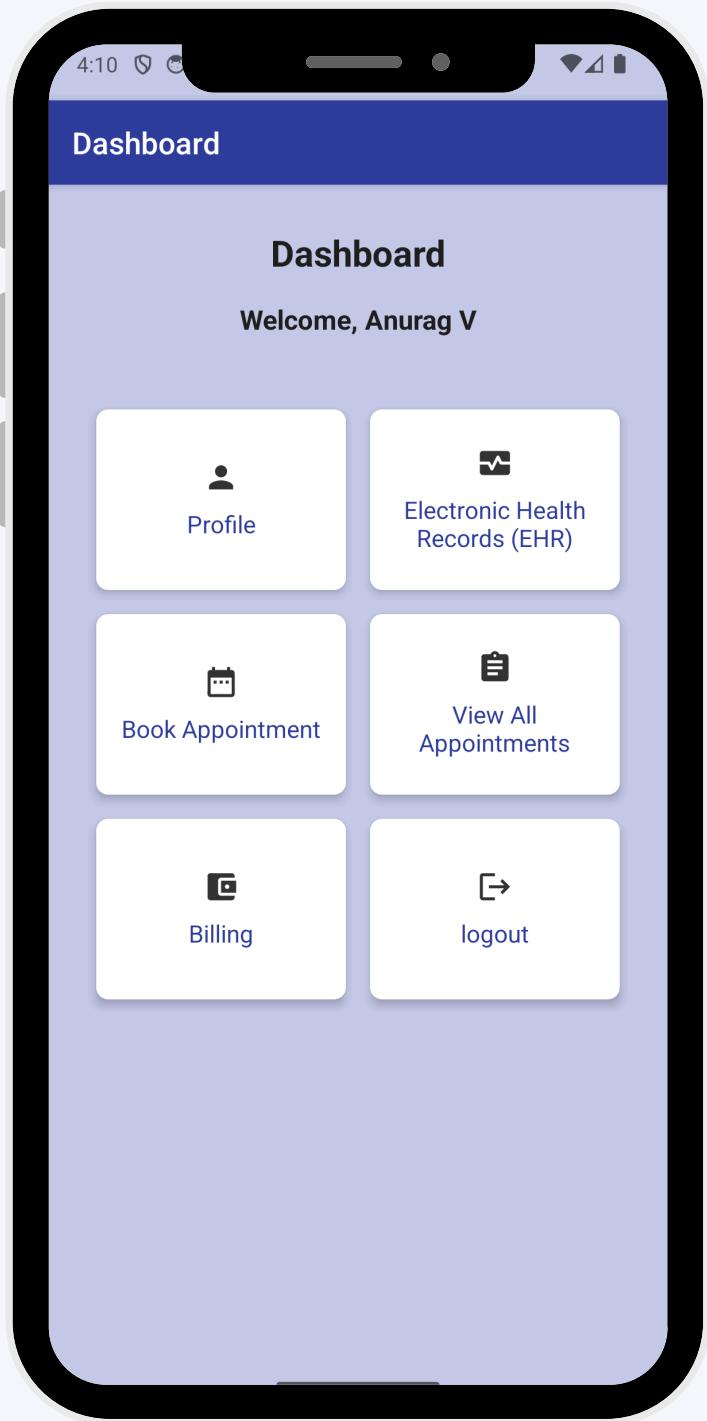
Users start by logging into the app using their credentials. The system authenticates the user through the Authentication DB in Firebase.



Patient Registration

Unregistered users were directed to complete registration, and user data was encrypted and decrypted before storage in the Users DB Collection.

MODULES

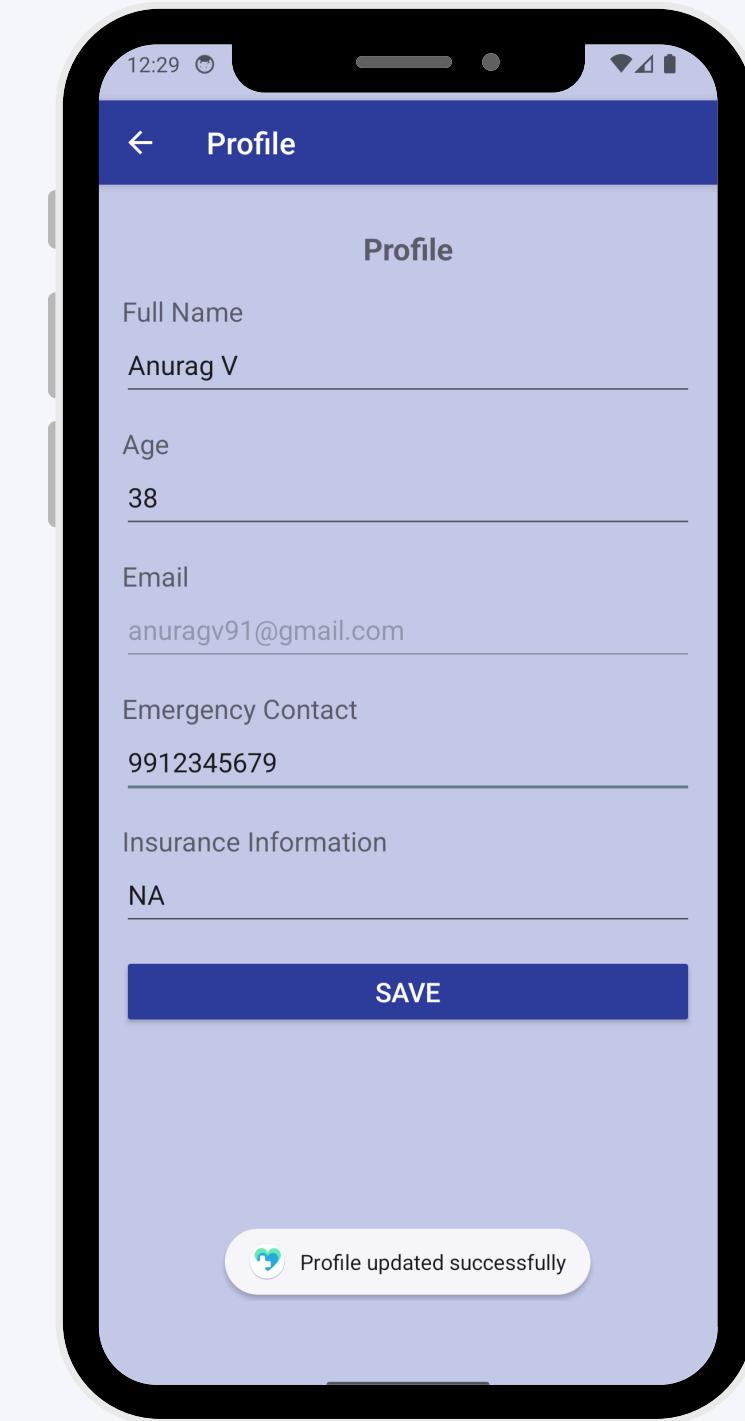


Dashboard

After login and registration, users are navigated to the Dashboard, the central hub for accessing hospital services.

Profile Management

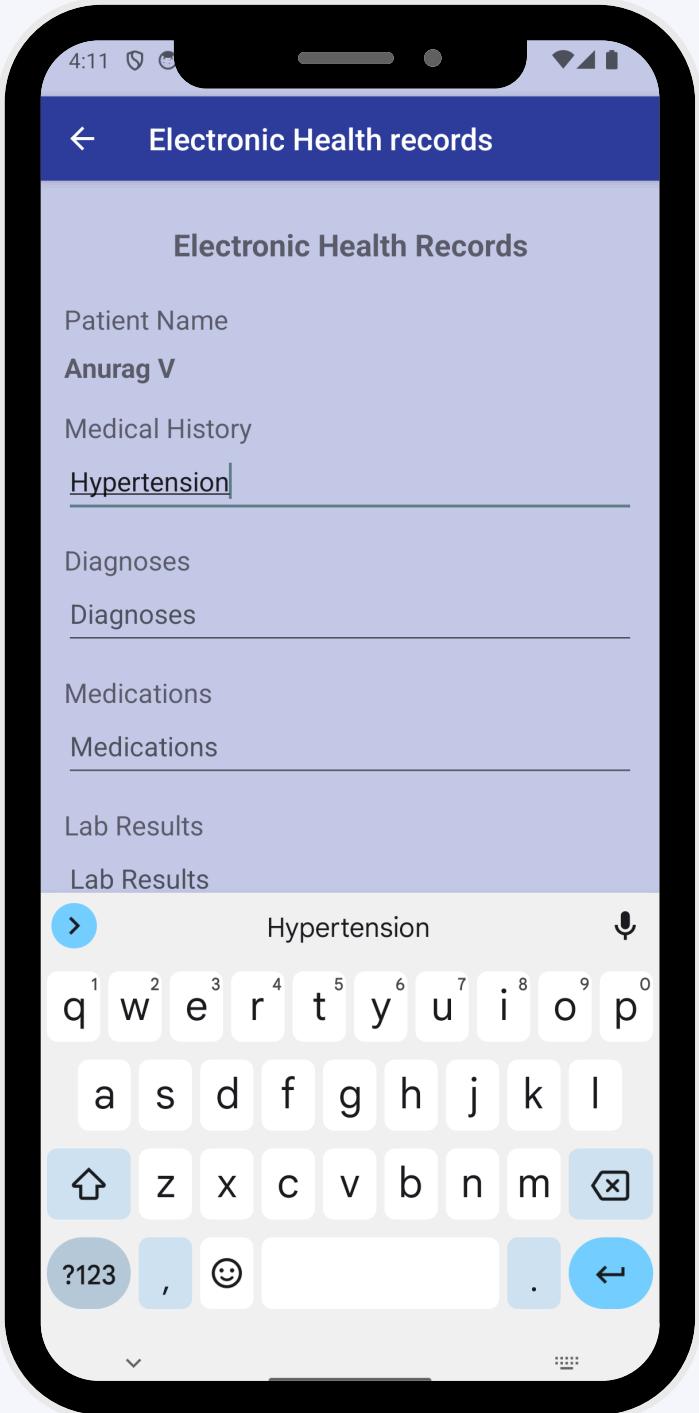
Users can view and edit their profile information, which is encrypted and decrypted before storage in the Users DB Collection.



MODULES

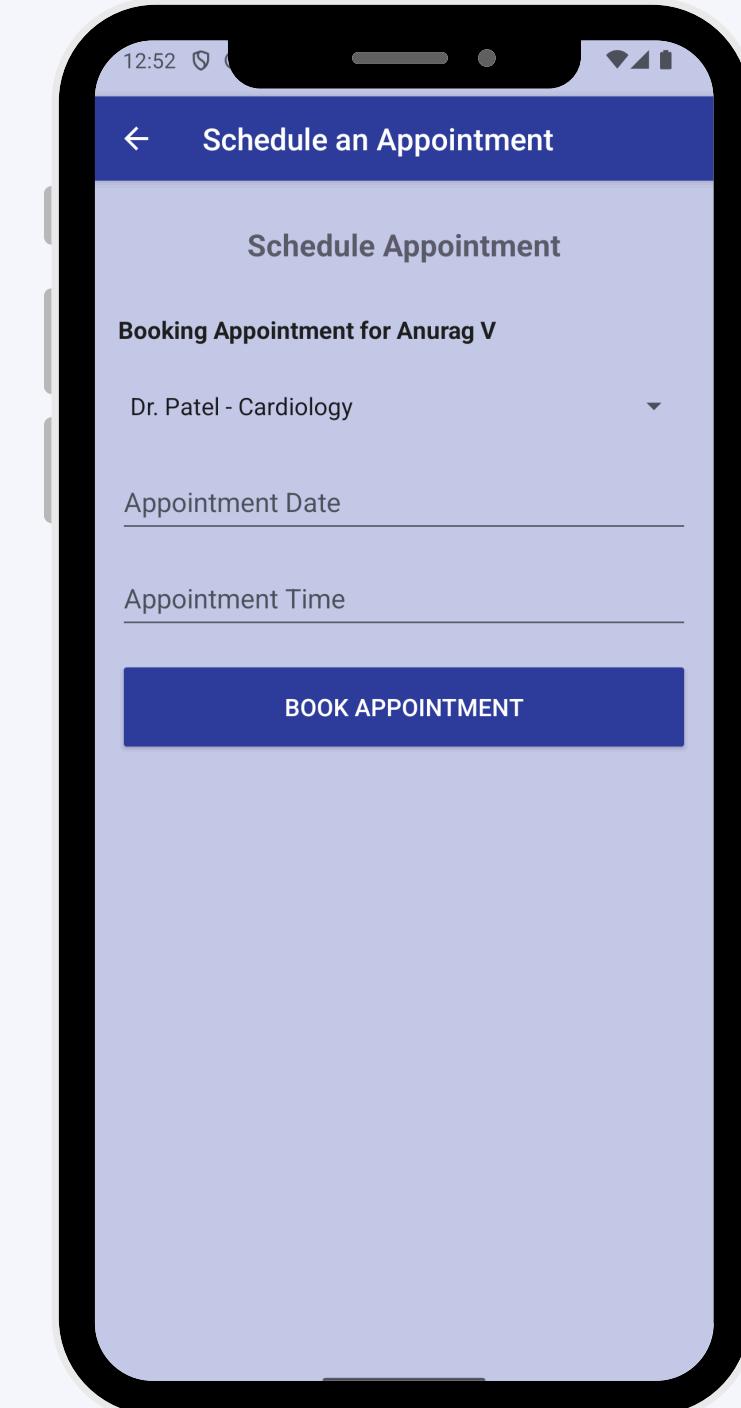
Electronic Health Records

Users can securely submit, view, and edit their electronic health records, which are encrypted and decrypted before being stored in the EHR DB Collection.

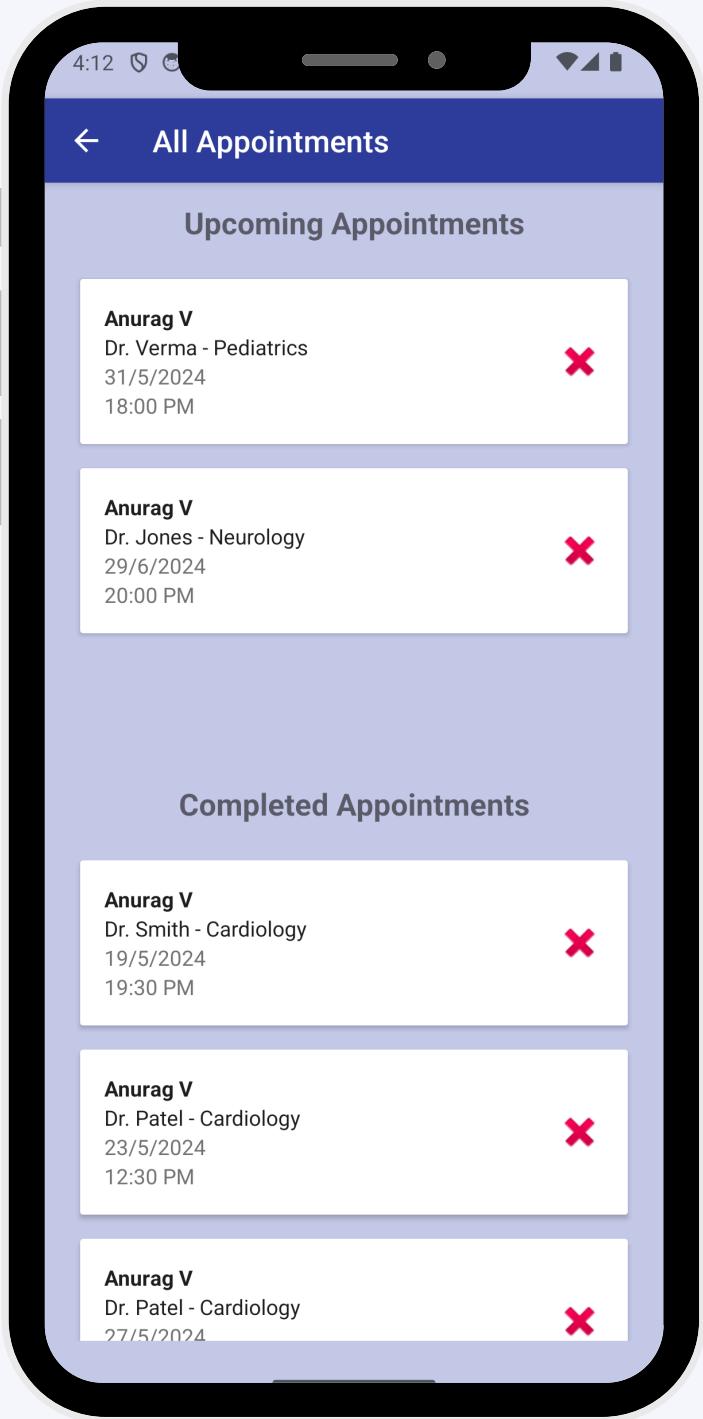


Appointment Scheduling

Users can schedule appointments with healthcare professionals, with details stored in the Appointments DB Collection.

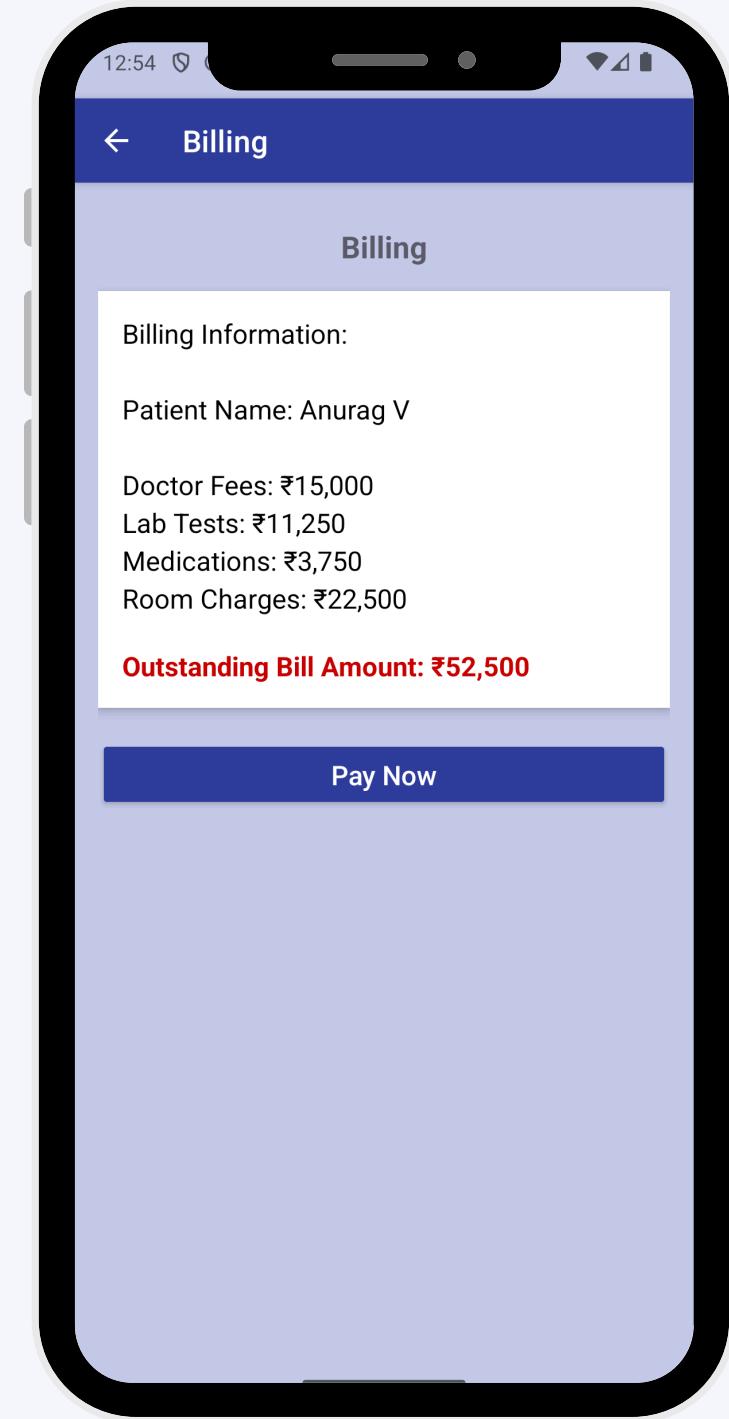


MODULES



Manage Appointments

Users can view and cancel their upcoming and completed appointments, with data managed in the Appointments DB Collection.



Billing Management

Users can view detailed invoices with highlighted outstanding payments and use a 'Pay Now' button for payments. Integration is planned for future iterations.

PROJECT CONTRIBUTION

● Enhanced Patient Accessibility

MedAssistPro enhances patient access by enabling appointment scheduling, medical history submission, & insurance management via app

● Streamlined Hospital Operations

MedAssistPro streamlines appointment, record, and insurance management, reducing administrative tasks and improving patient care with quick access to accurate information.

PROJECT CONTRIBUTION

● Improved Patient Engagement & Satisfaction

The app boosts patient engagement by simplifying appointments, EHR access, and bill payments, improving satisfaction, adherence, and health.

● Secure and Compliant Data Handling

MedAssistPro ensures data security and HIPAA compliance with advanced encryption, protecting patient information and reducing breach risks, building user trust.

PROJECT CONTRIBUTION

● Reduction in Operational Costs

MedAssistPro cuts costs by automating administrative tasks and reducing paperwork, manual data entry, and scheduling errors.

● Contribution to Public Health

MedAssistPro aids public health research by analyzing aggregated, anonymized data, offering insights into health trends and outcomes to improve strategies and policies.

CONCLUSION

The MedAssistPro project embodies a significant innovation in delivering healthcare services through a mobile application. By integrating various hospital services into a user-friendly platform, MedAssistPro addresses critical challenges in healthcare accessibility and operational efficiency.



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THANK YOU

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