Jaypee Institute of Information Technology, Noida

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Submitted to:
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Project Title: AMBULANCE SERVICE APP (EMBULANCE)

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DECLARATION

We hereby declare that this submission is our own work and that, to the best of our knowledge and beliefs, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma from a university or other institute of higher learning, except where due acknowledgment has been made in the text.

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CERTIFICATE

This is to certify that the work titled "AMBULANCE SERVICEAPP(EMBULANCE)" submitted by Name of Students of B. Tech of Jaypee Institute of Information Technology, Noida has been carried out under my supervision. This work has not been submitted partially or wholly to any other University or Institute for the award of any other degree or diploma.

Digital Signature of Supervisor
Dr. Anuradha Gupta
Professor
1 May 2024

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Chapter 1

Introduction

Welcome to our innovative ambulance tracking app, a game-changer in emergency medical services. This advanced application harnesses state-of-the-art GPS technology to provide users with unparalleled access to timely and efficient ambulance services. By seamlessly integrating real-time location tracking, route optimization, and live updates, our app ensures swift response times and optimal resource allocation during emergencies.

With a user-friendly interface and intuitive design, this app empowers individuals to quickly request and track the nearest available ambulance with just a few taps on their smartphones. Stay informed every step of the way with detailed information on the ambulance's location, estimated time of arrival, and dynamic route adjustments based on traffic conditions.

Our commitment to enhancing emergency response systems is reflected in the reliability and effectiveness of our ambulance tracking app. Whether you're facing a medical crisis or assisting someone in need, this app is your lifeline in critical situations. Download now and experience the peace of mind that comes with having immediate access to life-saving assistance at your fingertips.

Chapter 2

Problem statement

In emergency situations, every second counts. The current emergency response system often falls short, leading to delayed response times and increased stress for patients and their loved ones. The SOS Ambulance Tracking App addresses these challenges by providing real-time updates on ambulance location, estimated arrival time, and route optimization features, ensuring swift and efficient medical assistance during critical situations.

Solution

Our app presents a holistic solution to the obstacles faced by emergency medical services. Through real-time tracking, optimized ambulance allocation, and seamless driver-patient communication, we empower users to access prompt and dependable emergency care. This integrated approach ensures swift response times, efficient resource utilization, and enhanced user experience, ultimately revolutionizing the delivery of emergency medical services.

Chapter 3

Objectives

1. Timely Response: Ensure that emergency medical services (EMS) can reach the accident location promptly with the necessary supplies and equipment to provide immediate assistance and transfer patients to healthcare facilities if needed.

2. Efficient Resource Allocation: Optimize the allocation of ambulances and emergency medical equipment to ensure that the right resources are available at the right time to address emergencies effectively.

3. Enhanced Communication: Facilitate seamless communication between EMS, patients, and registered contacts through SMS alerts and data sharing, enabling quick coordination and information exchange during critical situations.

4. Preventive Measures: Implement features that help prevent accidents through warnings, alerts, and data monitoring, contributing to overall safety and accident prevention efforts.

5. User Support: Provide users with a platform to quickly request emergency assistance, share vital information like GPS location and personal details, and alert their contacts in case of emergencies, enhancing user safety and peace of mind.

Chapter 4

Algorithm Used

The polyline algorithm is a critical tool in the field of geographic information systems (GIS) and mapping applications. It serves the purpose of condensing complex geometric data into a more manageable and efficient form. By simplifying a series of points connected by straight line segments, the algorithm creates a smaller set of points while still retaining the essential characteristics of the original line. This reduction in points not only reduces the size of the data but also enhances processing speed, making it more practical for various GIS operations. Despite the reduction in data points, the algorithm aims to preserve the overall shape and trajectory of the original line as accurately as possible. This balance between simplification and accuracy is achieved through techniques like the Douglas-Peucker algorithm, which iteratively removes redundant points while minimizing distortion. As a result, the polyline algorithm enables GIS professionals and mapping applications to work with large datasets efficiently, facilitating tasks such as route planning, spatial analysis, and visualization.

Methodology Used

1. Real-Time Tracking: Enable users to track the location of the nearest ambulance in real-time, ensuring swift response times during emergencies.

2. Efficient Ambulance Allocation: Optimize the allocation of ambulances based on user requests, ensuring timely assistance for patients in critical situations.

3. Seamless Communication: Facilitate seamless communication between drivers and patients, enhancing the overall user experience and ensuring effective coordination during emergencies.

4. Status Toggle for Drivers: Allow ambulance drivers to toggle their availability status, enabling users to make informed decisions when booking ambulances.

5. Enhanced Security: Ensure the security of both patients and vehicles by enabling tracking features for ambulances and implementing measures to enhance safety during transit.

Chapter 5

Implementation

1. Market Research: Conducted thorough market research to understand the demand for ambulance booking apps, identify trends, and analyze user needs to create a unique app concept.

2. Idea Formulation: Formulated a unique app idea based on the market research findings, ensuring that the app addresses key user requirements and stands out from existing solutions.

3. Design and Development: Designed the app with features like real-time location tracking, multi-payment options, driver status toggle, and enhanced security measures as outlined in the search results.

4. User Interface Design: Created a simple and intuitive user interface with clear buttons and easy navigation, especially for emergency situations where users need quick access to features.

5. Testing: Test the app extensively to ensure functionality, usability, and reliability. Conduct thorough testing to identify and fix any bugs or issues before launching the app.

6. Key Features Implementation:
Implement a search & book feature for users to find and book ambulances easily.
Develop a driver app that allows drivers to receive real-time notifications, track patient locations, and manage their availability

Technologies Used

1) Flutter
2) Dart

Chapter 6

Workflow

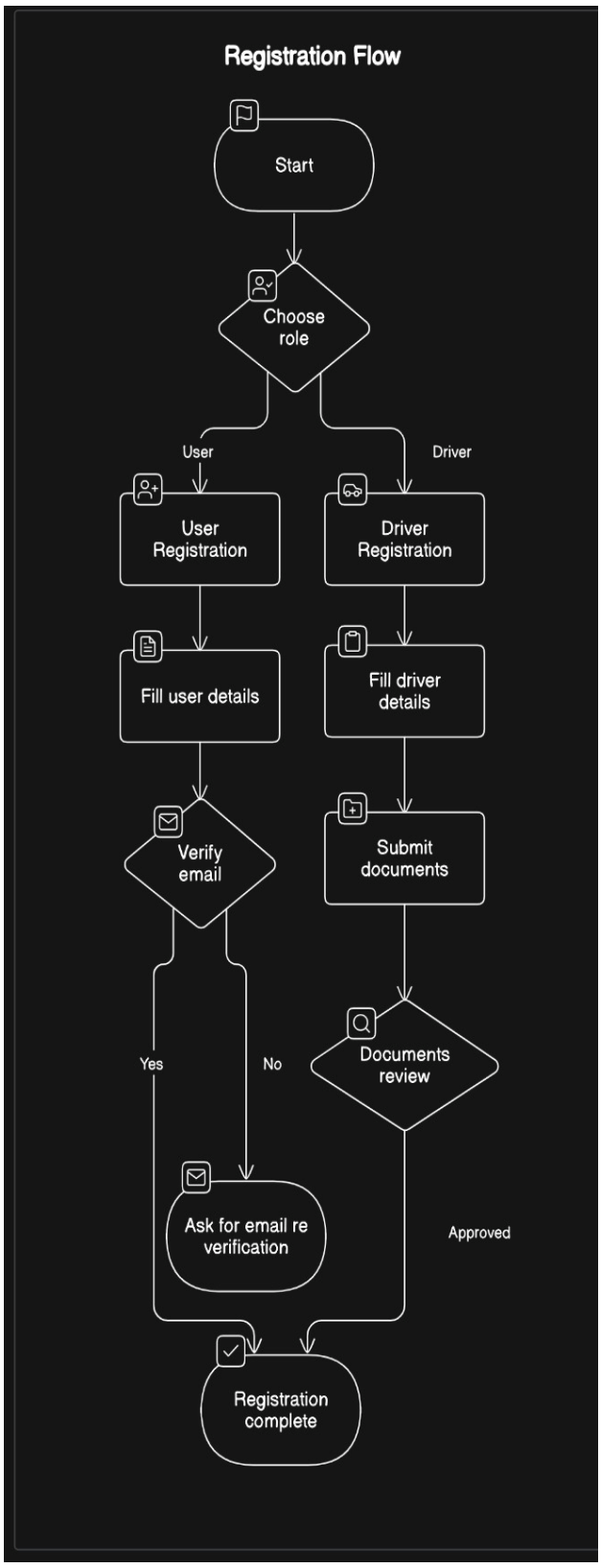

Fig 1.1

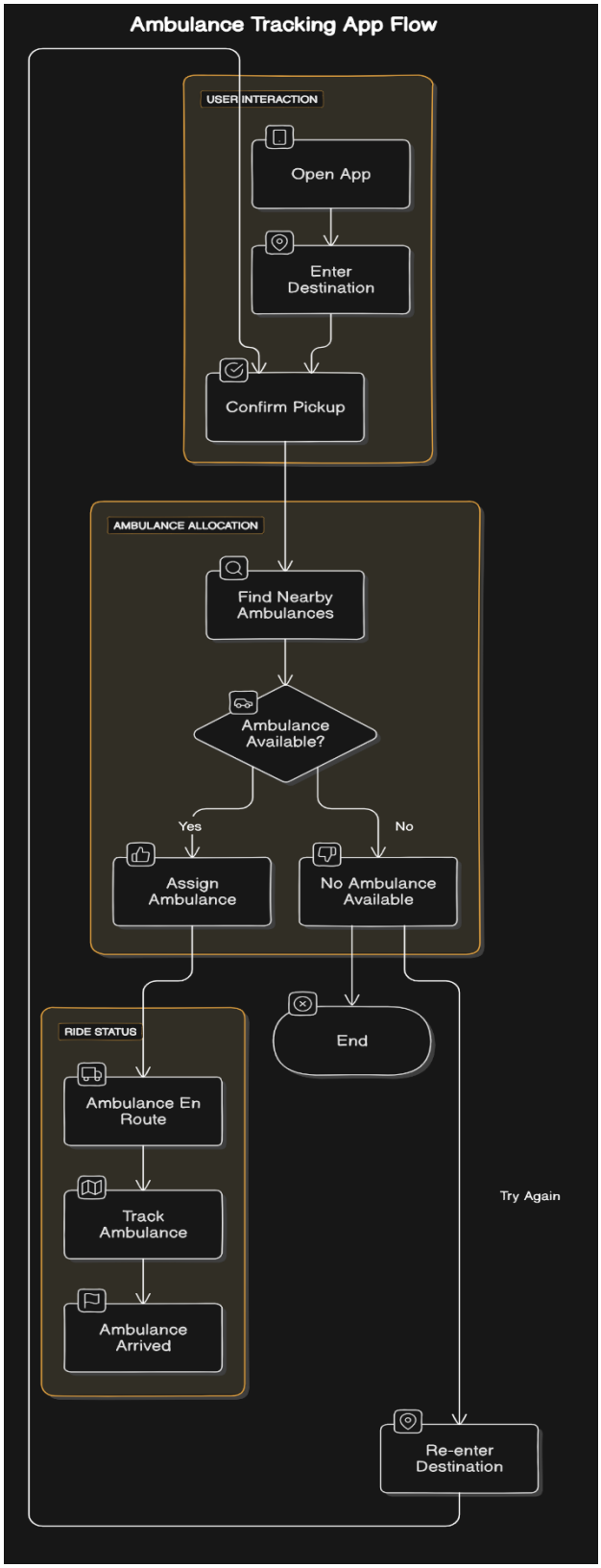

Fig 1.2

Chapter 7 : Requirement Analysis

1. Software Requirements Specification (SRS)

1. Introduction

1.1 Purpose

-The purpose of this document is to outline the requirements for the development of the SOS Ambulance Tracking App, which aims to enhance emergency response services by providing real-time tracking and management functionalities for ambulances.

1.2 Scope

The SOS Ambulance Tracking App will include the following functionalities:
-Real-time tracking of ambulance locations.
-Management of ambulance fleet, including availability status and assignment to emergency calls.
-Integration with emergency response systems for seamless communication and coordination.
-User interface for both emergency dispatchers and ambulance drivers.

2. Functional Requirements

2.1 User Management

2.1.1 Registration

-Emergency dispatchers and ambulance drivers can register accounts with the app by providing necessary details.
-User information is securely stored within the app's database.

2.1.2 Authentication

-Registered users can log in to the app using their credentials.
-Authentication is performed securely to ensure only authorized access to the app's functionalities.

2.2 Ambulance Tracking

2.2.1 Real-time Location Tracking

-The app will continuously track the GPS location of each ambulance in real-time.
-Ambulance locations will be displayed on a map interface for easy visualization by emergency dispatchers.

2.2.2 Integration with Emergency Response Systems

-The app will integrate with existing emergency response systems to receive and manage emergency calls.
-Seamless communication channels will be established between dispatchers, drivers, and emergency responders.

3. Non-Functional Requirements

3.1 Security

- User data and communication channels within the app will be encrypted to ensure confidentiality and integrity.
- Access controls will restrict unauthorized access to sensitive information.

3.2 Performance

- The app should handle a high volume of concurrent users and emergency calls efficiently.
- Minimal latency is crucial for real-time tracking and communication.

3.3 Usability

- The user interface should be intuitive and easy to navigate for both dispatchers and drivers.
- Training resources will be provided to ensure users can effectively utilize the app.

4. System Architecture

The SOS Ambulance Tracking App follows a centralized architecture, with a backend server managing communication between the app's components. The architecture consists of the following layers:
Presentation Layer: User interface for dispatchers and drivers.
Application Layer: Business logic for managing ambulance tracking.
Data Layer: Backend database for storing user information and driver information.

Chapter 8

Functionalities and Screenshots

Drivers App

Signup screen

New driver has to fill up all his details in order to start taking bookings.

Login Screen

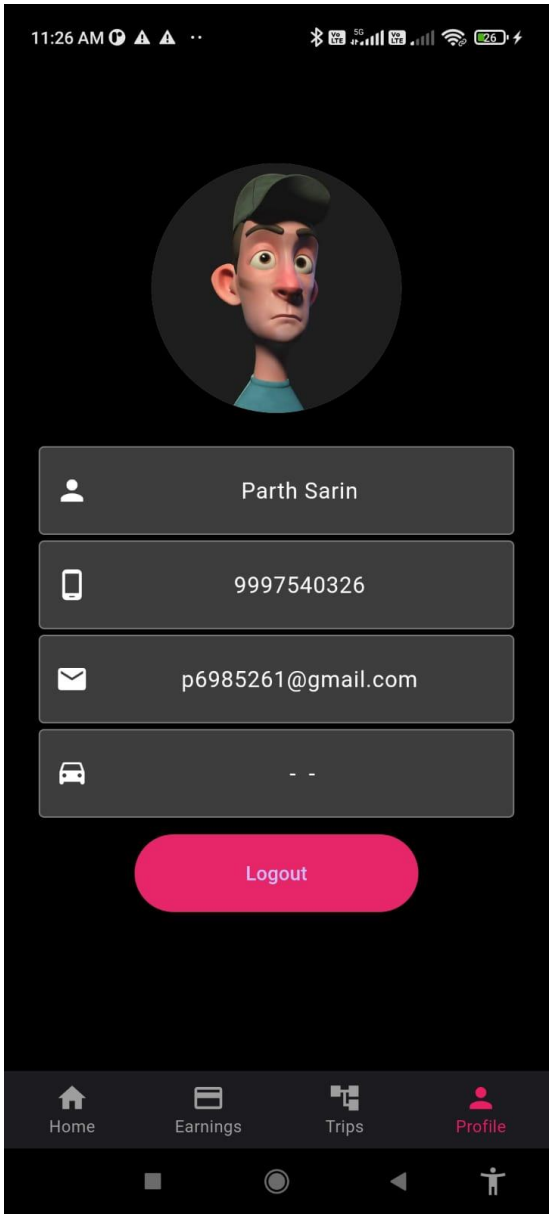

Fig 2.1

Searching for patients

-Go Online Now

It means that the driver is now available to take bookings.

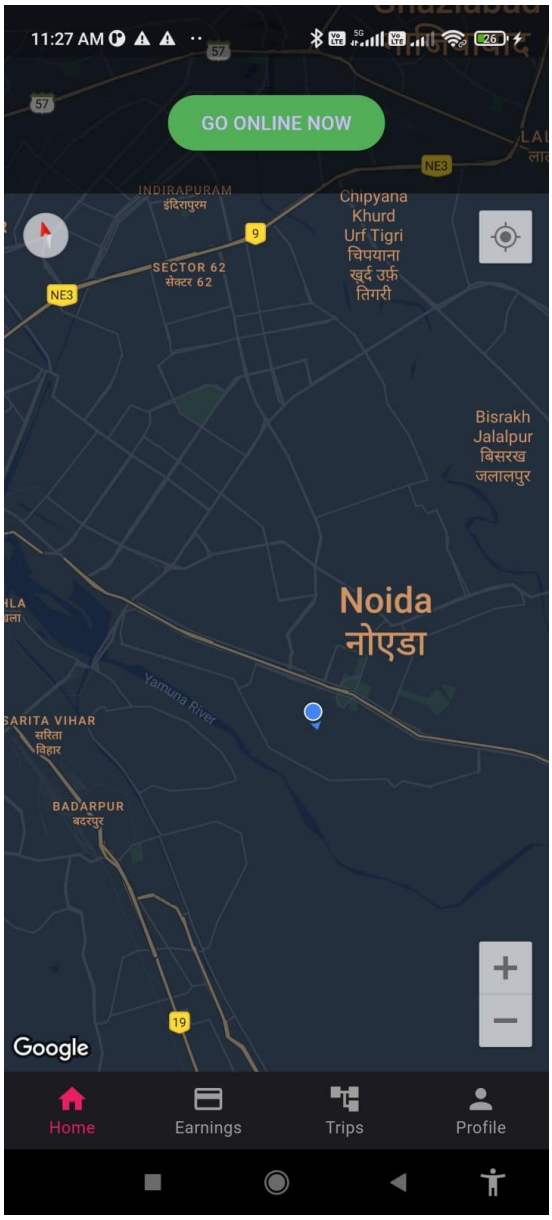

Fig 3.1

-Go Offline Now

It means driver has completed his service hours or is not available.

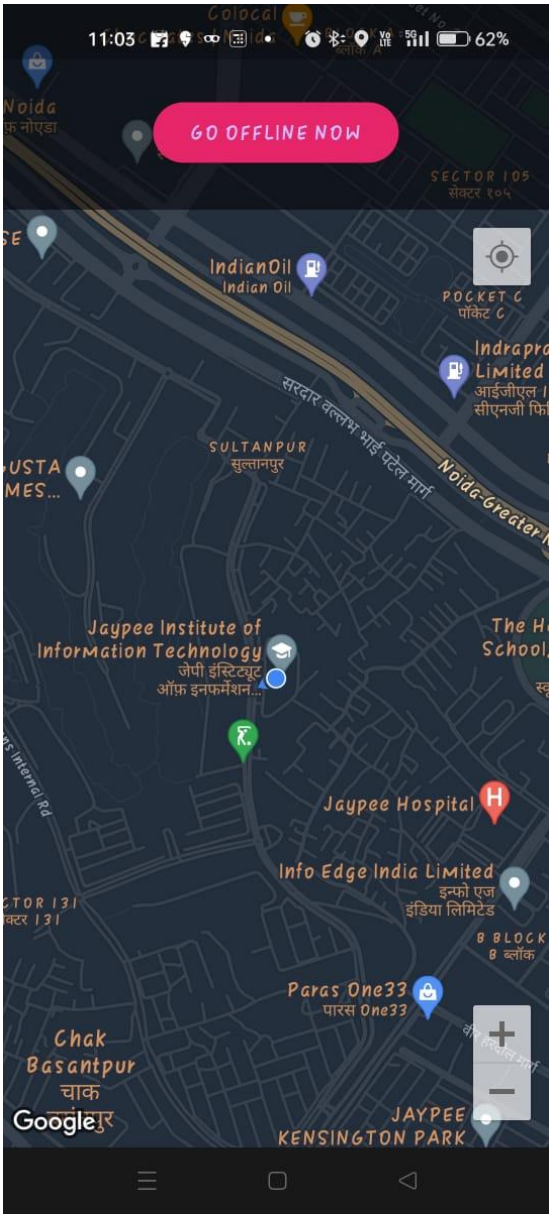

Fig 3.2

User's App

Signup Screen

New user has to register on the app with the help of username, password and email.

Main Page

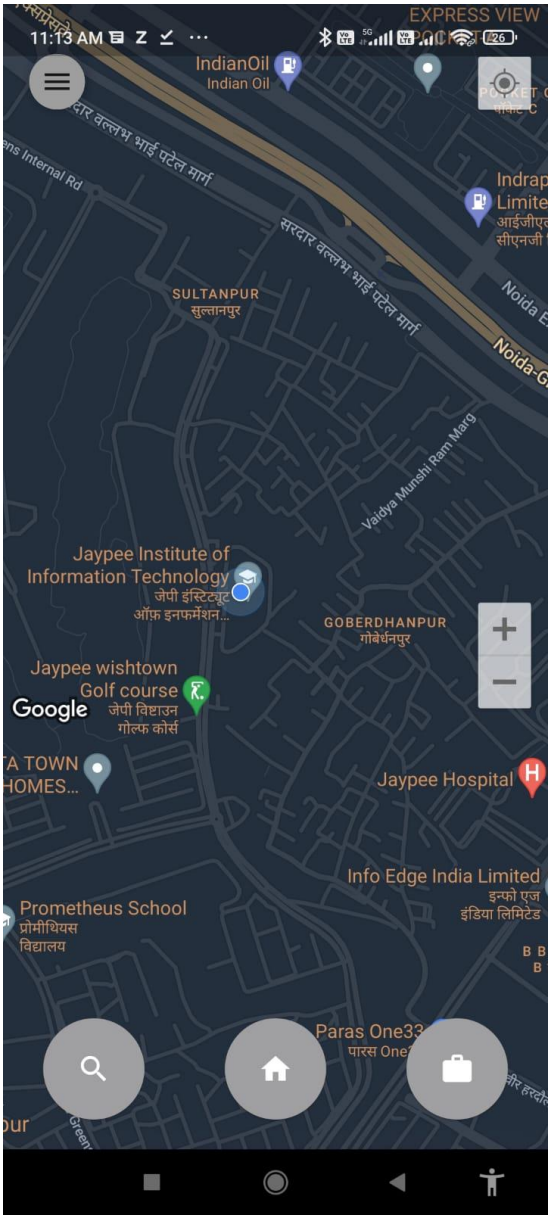

Fig 4.1

Profile

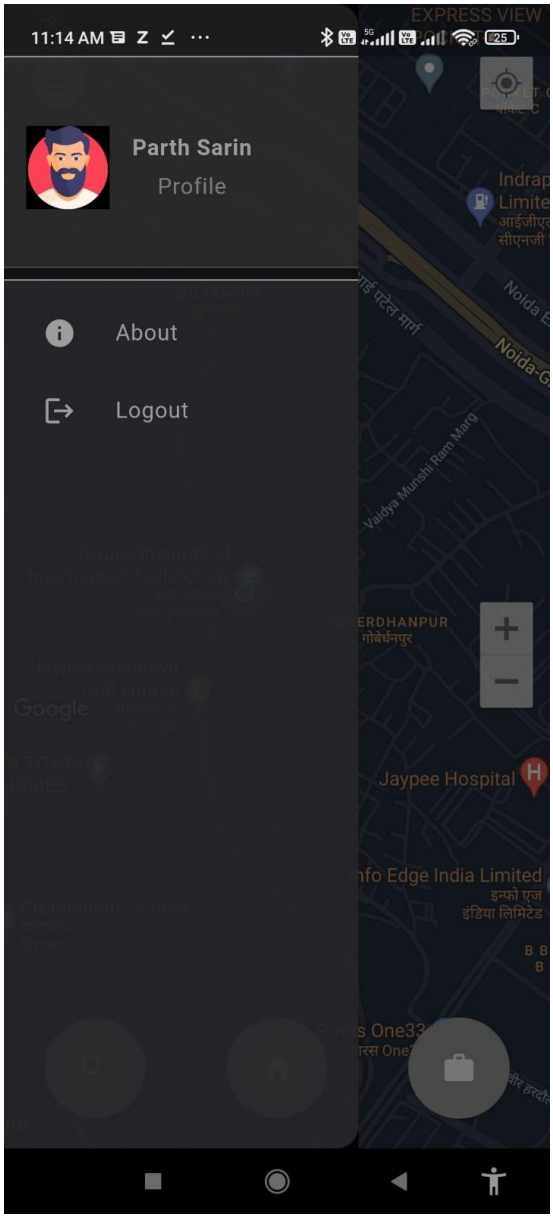

Fig 4.2

Destination

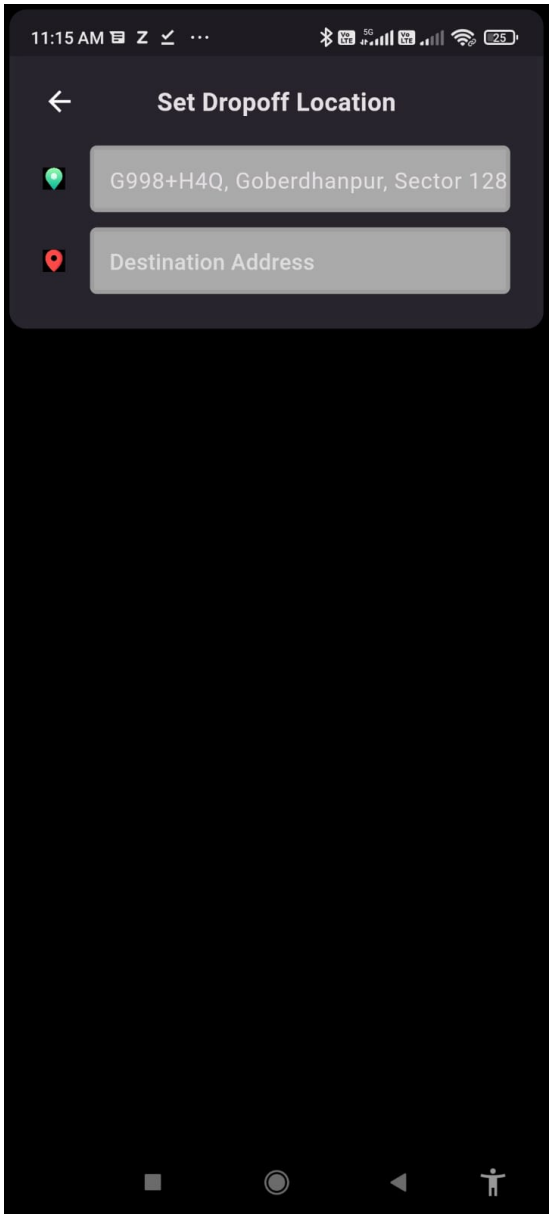

Fig 5.1

Distance

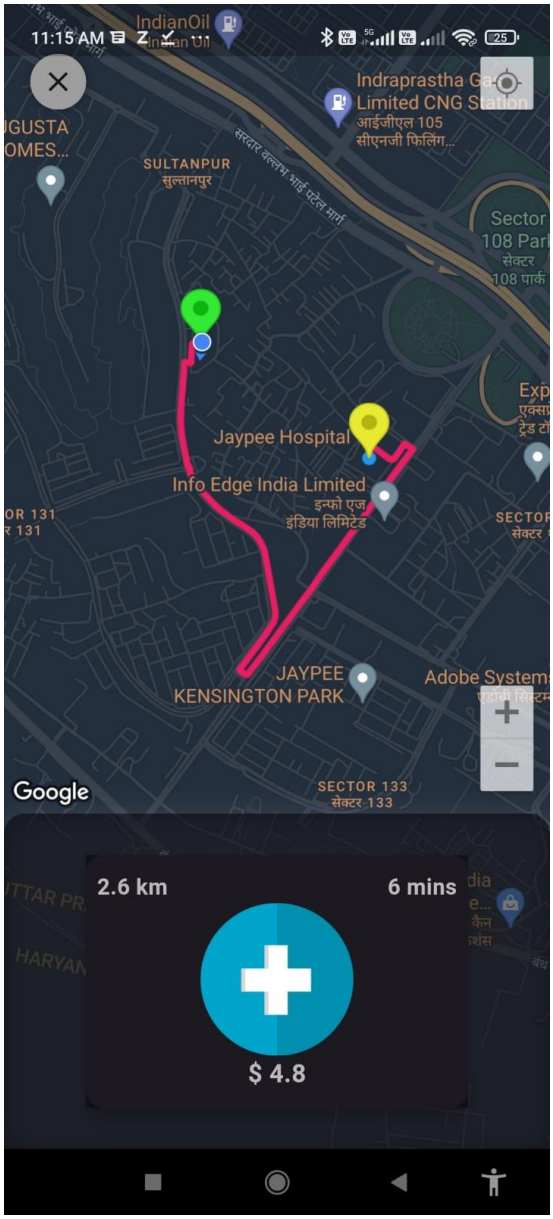

Fig 5.2

API's Used

1. Google Maps API: Integrates interactive maps and geolocation services into applications.
2. Geocoding and Reverse Geocoding API: Converts addresses into geographic coordinates (latitude and longitude) and vice versa.
3. Places API: Provides detailed information about places, including businesses, landmarks, and points of interest.
4. Directions API: Calculates directions between locations, including various transportation modes and routes.
5. Cloud Messaging API: Enables sending notifications and data messages to apps on Android devices.

Chapter 9

CONCLUSION

In conclusion, developing an SOS Ambulance Tracking App using Flutter and Dart in Android Studio presents a significant opportunity to enhance emergency medical services by providing real-time tracking, efficient ambulance allocation, seamless communication, and enhanced security measures. By following the outlined steps of implementation and incorporating key features such as real-time location tracking, emergency button (SOS), multi-payment options, driver status toggle, and robust testing procedures, a comprehensive and user-friendly app can be created to improve emergency response systems.

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