International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 04 | Apr 2022 www.irjet.net p-ISSN: 2395-0072

UBER FOR AMBULANCES, EMERGENCY HEALTH RESPONSE AND BLOOD INVENTORY

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Abstract - *In India, the primary reason for avoidable deaths can be attributed to the fact that the person could not be taken to the hospital on time. This is not only due to the congestion on the road but also due to the delay in the procurement of emergency services ambulances. This gap between the patient and the ambulance exists largely due to the absence of an effective system which could locate and connect the ambulance driver to the patients. To solve this problem, we need to look no further than the hugely popular ride hailing application-Uber. If the Uber model can be applied, taking taxis out of the equation and adding ambulances, not only will we achieve an effective and convenient network of emergency services, but also save countless lives. Ambulances are the workhorse of Emergency medical response. Usually, Patients are limited to the medical contacts in their phone; for this reason, whenever in an emergency, they discover difficult to get any assist. This system aims to create an application that would empower the patient to book an ambulance to the hospital. The patient can provide their location as well as the desired hospital location to the application. The system would then figure out the closest available ambulance and the quotations and distance of the ride. Finally, payment services will be provided to facilitate hassle-free payment to the ambulance driver. The undertaking in addition endeavors to make a contribution blood stock-delivery services to the hospitals.*

Key Words: **Ambulance, Application, Blood Inventory, Health, Response**

1. INTRODUCTION

Medical science has improved the standard of living significantly. Anybody at the potential risk of their life can be led to the path of recovery through the means of a radical health response. Emergency patients need a swift and efficient mode of transport to the nearest hospitals. This task might look manageable but is pretty complex. The proposed application aims to make certain simplicity, effectiveness, and responsive elements, through the means of a modern cross-platform mobile application that can allow the customer to find out the close by ambulance and hospitals. React Native, a cross-platform mobile application framework based on JavaScript, will be the base of the application. This would allow both Android and IOS users to avail the benefits of the application. The Patient can locate the ambulance based on its location and estimated time of arrival through the means of Google Maps and Geolocation API.

2. LITERATURE SURVEY

A. A Study on Consumer Perception of Ola and Uber Taxi Services

In this, [1] have done a survey of the Ola and Uber customers and found out what makes them prefer it over the conventional taxi services. They have found out that the major reasons for people preferring Uber and Ola are the ease of booking and prompt arrival. Since we are building an Uber for ambulances, the insights from this paper would be invaluable. The results of the survey will help us in building a customer-centric application and rectifying the problems faced in the conventional ambulance experience.

B. Ambulance Service

In this [2] provide a general thesis on an effective ambulance service. They have proposed an Android application for booking ambulances by connecting the patient and the driver. The software architecture defined in the paper forms the basis of our proposed system. We intend to improve upon the paper by using modern application development tools such as React Native and Graphql and also provide an aesthetic User Interface.

C. An Efficient Application Model of Smart Ambulance Support (108) Services

In this [3] talk about the various features and equipment that must be present in an ambulance to ensure an efficient service.

D. GPS Based Shortest direction for Ambulances using VANETs

In this [4] talk about a VANET path based real-time navigation system for ambulances to provide the shortest path taking traffic congestion into account and adjusting accordingly. Their study proposed a dynamic routing algorithm based on integration of GPS and real-time traffic data. They concluded that the proposed solution is much better that static routing and will save time.

E. Location Tracking using Google Geolocation API

In this [5] present a fully implemented system which is used for tracking a location using Google Geolocation API. The location is tracked with the help of the GPS present in the user's device.

3. SYSTEM ARCHITECTURE

A. Software Architecture

This mobile application comprises of a three-tier software architecture. The presentation tier contains the React Native based cross-platform application which have two types of users; customer and driver. The application tier communicates with the presentation tier through a Axios HTTP Client. NodeJS is used to build the application server, with Express.js providing the framework. Payment, SMS and Maps API is also present to provide their respective services. The data tier consists of the database server, housing an SQL database. The application server is connected to the database, query it and also modify it through an SQL client.

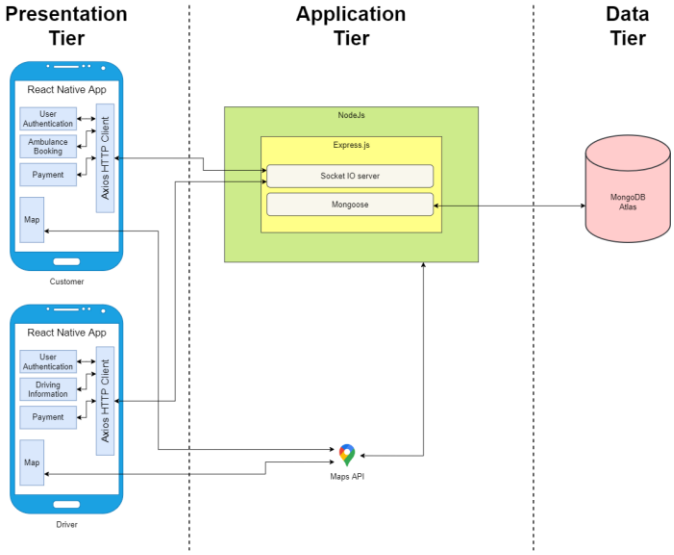


Fig 1. Software Architecture Diagram

B. Use Case Diagram of the System

The following Use Case Diagram shows the different ways the user can interact with the system. It mentions the frequent interactions that a user might have with the system and also shows the basic flow of events occurring during the use of the application.

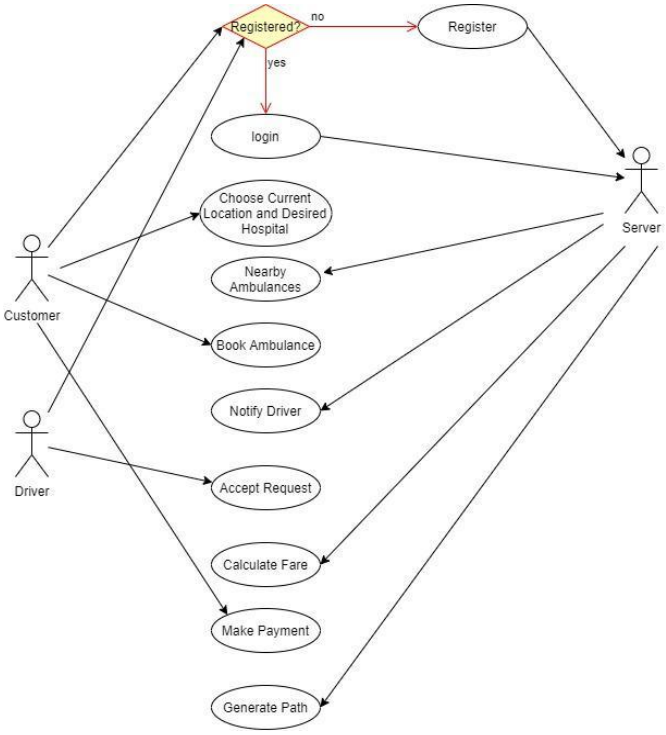


Fig 2. Use Case Diagram

C. Sequence Diagram of the System

The following Sequence Diagram of the entire system explains how the various entities interact with each other and also provides a sequence of the general events that occur during the use of the application. There are two actors' part of the system, namely the Customer and the Driver. The server acts as the bridge between the two actors. The mobile application present at the actors' side provide as a medium of communication between them and the server.

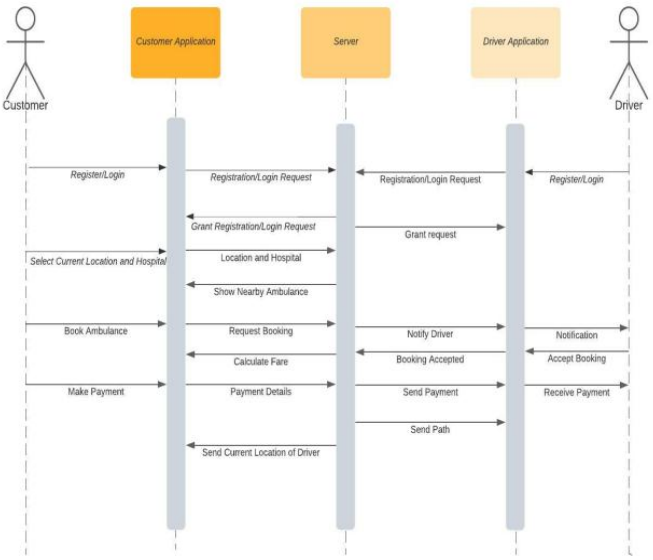


Fig 3. Sequence Diagram

4. PROPOSED SYSTEM

A. System Overview

In this project we have built a system to facilitate emergency health response. In particular, we have looked to create a modern, cross-platform mobile application for locating and booking an ambulance for transporting a patient to the hospital, by following the Uber model.

The application is having 2 types of users:

1. Customer: It can be anyone who is requesting the services of an ambulance; A person requesting on the behalf of the patient or the patient themself.
2. Driver: The driver of the ambulance who will be notified of the customer's request.

There is a single app for both the customer and the driver with two modes, customer mode and driver mode. The preferred mode can be chosen during registration.

To determine the ambulance path, we have used Google Maps SDK and its geolocation API for the route.

B. User Architecture

The initial parts of the application are the customer mobile application, and driver mobile application.

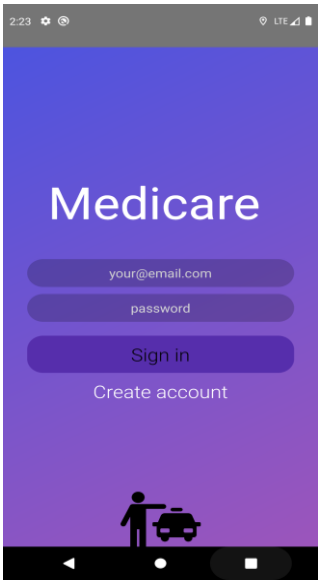
❖ Customer

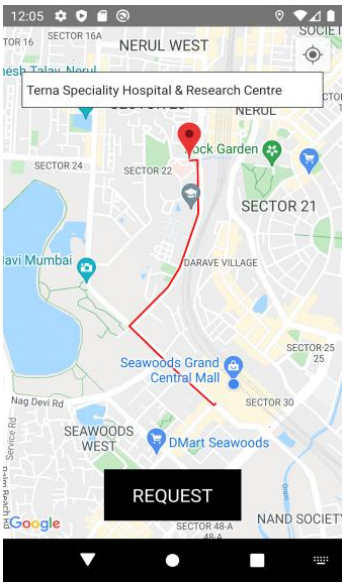
- Registration and login through mobile number and password
- SMS service for
  - verification of phone number
  - resetting password
  - confirmation of payment
- A 2D map displaying
  - the current location of the customer
  - the ambulance(s) available nearby
  - the nearby hospitals
  - upon successful booking of an ambulance, the live tracking of it to the point of reaching the hospital
- Address pinning and storage of addresses
- Details of the ambulance
  - Driver's name
  - Driver's photo
  - Driver's phone number
  - Registration number
- Option between cash/cashless payment
- Third-party payment gateway to facilitate cashless payment.
- Route to be taken by the ambulance predetermined by the geolocation API
- Estimated Time of Arrival of the ambulance
- Total Cost of the service will be displayed
- Push notifications to indicate the arrival of the ambulance
- OTP to be provided to the driver during verification will be displayed
- Past bookings history
- A rating out of 5 stars can be given to the driver

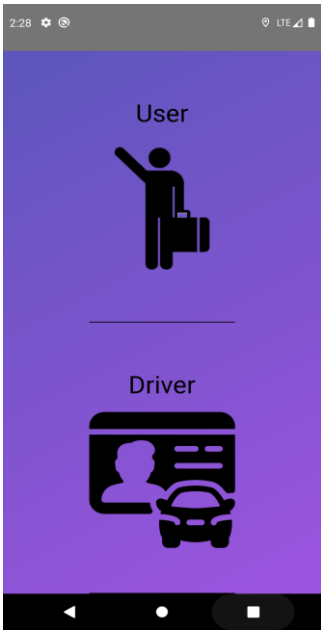
❖ Driver

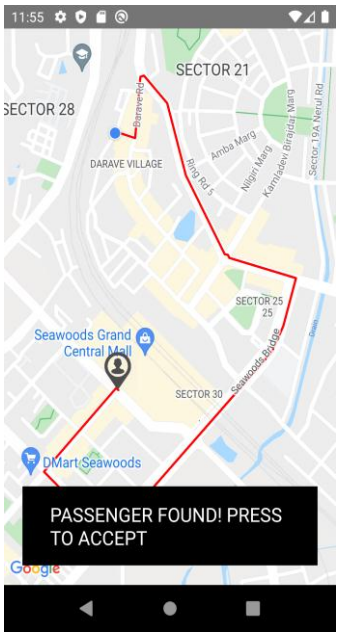
- Registration using
  - Name
  - Phone Number
  - Registration Number of the ambulance
  - Profile picture
  - Password
  - UPI/Bank Account details for payment
- Login using phone number and password
- Current location of the driver
- Upon a request
  - the location of the customer and the hospital chosen by them
  - option to accept/reject the request
  - Mode of payment chosen by the customer
- Upon accepting a request, route navigation till the hospital
- Input for entering the OTP provided by the customer for verification.

5. RESULT









6. CONCLUSION

Currently, there is not much development in the field of mobile application-based health services, with only a few projects working to aid ambulances. It is our attempt to change the scenario through this project by providing a more user-friendly experience. This will be beneficial for the users in case of any type of emergencies as it saves time which gets consumed in searching for the ambulance by other means. The project also hopes to assist the ambulance drivers by providing the most efficient path right from picking up the patient to reaching the hospital. When both the user and the driver are benefitted in this way, it will lead to the bridging of the communication gap between them, thus ensuring that timely emergency medical service is provided to the patient and their likelihood of treatment and survival is maximized.

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