Application Based Smart Vehicle Breakdown Assistance

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Abstract-**Now-a-days people prefer to travel in their own vehicle as travelling has become an integrated part of a life. Traveler's might plan and make all precautions to make the journey safe and smooth but in the unfortunate and unforeseen event of a breakdown during journey, what is needed is immediate help which becomes very difficult to search a suitable service provider in unknown area. This is the worst experience that the travelers have to face. Therefore, to overcome this issue we have proposed an android based application with the aim of providing emergency road side assistance services within no time to ensure a pleasurable and uninterrupted journey anywhere. To build this application Android Studio is used as a platform, XML as a front-end and Java/Kotlin as a back-end development and Google cloud Firebase as a real time Database which includes variety of custom tools and libraries that helps to develop Android-based mobile/tablet app. The proposed approach utilizes registration and login through email-id. This application will fetch user's current location and will list out the nearest service provider through Dijkstra's algorithm within just one click. User can put their issues of breakdown (if known) accordingly one of the garages would take the job and go to the traveler's location and repair their automobile. This Android Application is going to be a good solution who seek help in unknown location. The approach has been tested for its performance and has attained superior results. Hence, this application lets the users have a stress-free travel time.**

Keywords - **Vehicle Breakdown, Location, Mechanic, Android Application.**

I. INTRODUCTION

Roadside trouble is an avoidable issue among the society. All the automobiles, even the newest ones are prone to typical roadsides issues such as dead batteries and flat tires. Over the years, the demand for emergency road services has risen around the world. The" Vehicle App" is an Android based application for On-Road Vehicle Breakdown Assistance that can search a mechanic for assistant based on the user's current location. Due to various reasons disruption can occur during traveling like engine repair, tyre puncture, doping, break failed, etc. so it becomes quite difficult to search for a suitable service provider in anonymous location The issues that traveler's face is lack of knowledge of near-by garages, surrounding area being unknown to them and many more. This application will overcome these issues by providing a user-friendly platform. [4]

To use this application the user and the mechanics must register where the data is stored in the real time database i.e., Firebase. Registered users can log in during the vehicle breakdown and can find the nearby mechanics. Notification of request will be sent to the nearby mechanics by the user through SMS. User can save their time and get their automobile repaired. Hence, it provides direct communication between user and the mechanic. We provide safe and secure services.

II. RELATED WORKS

People have a tendency to develop more and more solutions to existing issues as technology advances. As the severity of the problem or difficulties grows, more solutions are developed. There may be numerous solutions to a single issue. We discovered several similar featured applications and systems for each of the basic components of the proposed application; which are summarized below.

1) Varun Kapadi, Saigita Guruju etc. (2017)" Emergency Breakdown Services Using Android Application". In this paper, the proposed emergency breakdown service provides a user-friendly environment. It is the easiest way to identify the location as well as the nearby needed locations. This application is made with the thought in mind, that after an accident or a breakdown, the user is in a state of panic. This interface of the application is designed in a simplistic way, with direct access to services provided by the application. The application provides nearby location information such asa petrol pump, police station, service station, and hospital.

2) Harsha Supare, Kanchan Yadav, etc. (2020)" A Car Breakdown Service Station Locator System". The suggested system creates a connection between Car Repair Service Providers (CASP) and the public. The system will search for any CASPs that are close to the reported incident location. Users can contact service provider CASP to get in touch with the service provider closest to their area. the services are made available together with the service provider's information, which the traveler can access. With Google API for map services, passengers are informed about service availability and accessibility.

3) M.A.D Wickrama,D.S.C.Dharmakeerthi,S.A.Balasooriya (2021) proposed "Mobile Based Solution for Vehicle Assistance". Authors decided to develop a mobile applicationto assist drivers with vehicle breakdowns ans system's major functionality including providing a personal assistant to aid with vehicle breakdowns, predicting upcoming vehicle maintenance procedures, providing trustworthy spare part pricing, and recommending the best insurance providers to customers. This will enhance the decision making ability of the customers.

4) Akhila V Khanapuri, Anagha Shastri, Gareth D'souza, Shannon D'souza (2015) had proposed" On Road: A Car Assistant Application". As there is an increase in the rise in prices of fuel and an exponential increase in the number of cars on the road, road accidents, and vehicle case breakdowns are recorded. An Android-based application is proposed to find an effective way to achieve maximum fuel efficiency and monitors parameters like Engine RPM, fuel status, and throttle position through Onboard Diagnostics (OBD-II) which will help and assist the drivers and provide assistance in case of breakdown of a vehicle and also assist the drivers to achieve better fuel economy.

III. PROBLEM STATEMENT

To develop a mobile based application that solves the problem by making the availability of proper service provider to the user's exact location in less time, and provide user-friendly environment.

IV. OBJECTIVE

- The main objective is to provide better services and to make the process easy and finally appointing a mechanic within short period of time.
- The system aims to develop a platform which improves the efficiency of service provider and the user.
- This application will help to reduce the user's time and cost.
- Integrity, reliability, quality and passion thus form basis of our work.
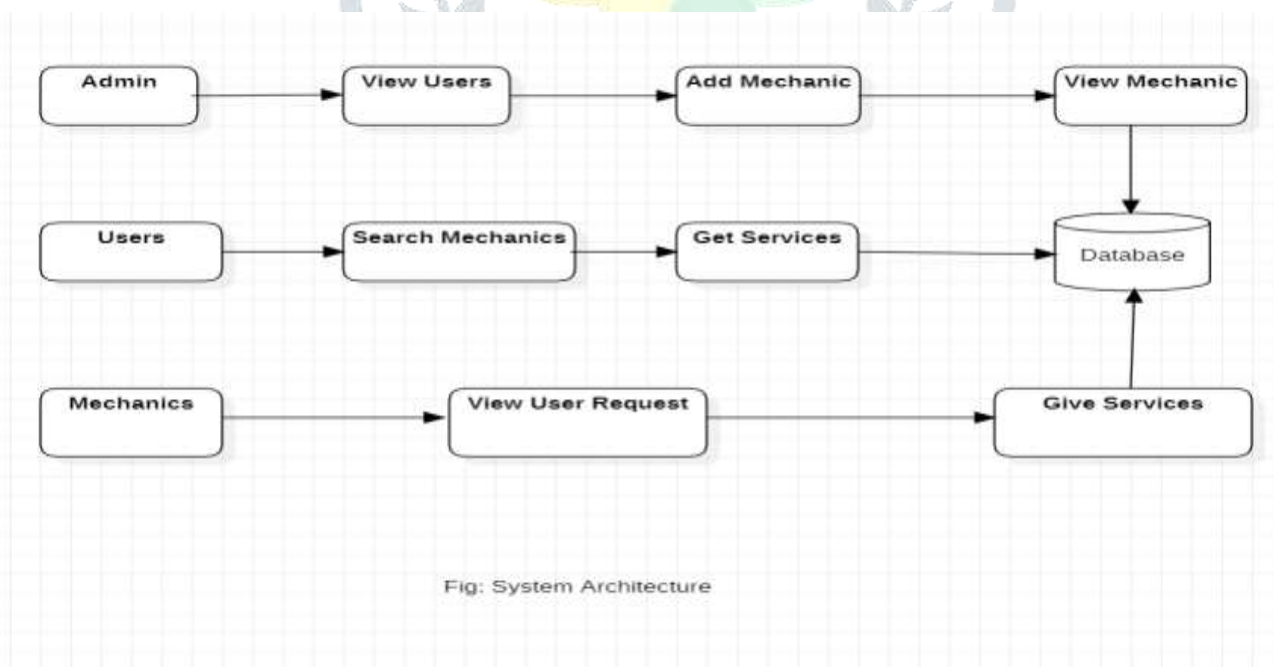
V. SYSTEM ARCHITECTURE

Fig: System Architecture

Fig 5.1- Model Workflow

The motivation behind this project is to create a platform which provides user-friendly environment that will help drivers/users and mechanics work more efficiently. This android application will help to find mechanics easily and quickly as it is very difficult to find suitable mechanics nearby area from different locations wherever you are traveling. With one click the application willhelp to overcome the issue that drivers are facing with their vehicles. This online mechanic locator reduces a lot of time for the user and costs. The main objective is to provide a better service and to make the process easy. Here, the proposedsystem is accessed by three entities i.e., Admin, Mechanic, and the User. A mechanic can perform tasks by viewing requests ifreceived from users and can also

send feedback to the admin. Users can send a request to a suitable mechanic and appoint them by short message service through the application.

A. Module Description

1) Admin: Admin is an important entity in this application which is used to add number of nearby garages. User and mechanic data are process and maintained by the admin. The major role of the admin is to allocate nearby garages when the user needs assistance. Admin allocates based on Dijkstra's shortest path algorithm, which shows the closest service provider first. Following the selection of the appropriate garages, feature such as sending the request will be allowed and the assistant will be redirected to the user's current location with the help of Google maps.

2) User: This is one of the second entity in the application which performs a major role. Users step into this application by registering and login and make the current location access through GPS and search for the service provider. If the user can't find the problem, there are options there for other faults so they can search assistant according to their problems andit will give the nearest assistants within the closet location. Users can pick the particular assistant with their ratings and performance. Assistant details are transparently displayed for the users so they can trust them with no objections this leads to secure interconnection between them. After that, they can book their assistant and get help from that assistant and ready to go.

3) Mechanic: Mechanic is one of the most important entities. Mechanic must also register and login in the applicationto view the request of the customer through short message service (SMS) which will provide the user detail and the model number of vehicle as every kind of automobiles have different spare parts. The Mechanic will then go to the current location of the user and will provide the services accordingly. User can also make their payments after getting the service through this application.

This will be most effective platform which directly connects and communicates both user and mechanic simultaneously. This application will overcome number of issues and provide hassle free journey.

VI. ALGORITHM

Dijkstra's Algorithm: Dijkstra's algorithm is used to find the shortest path tree from a single source node, by building a set of nodes that have minimum distance from the source. In this application, as there are several routes available to reach to a particular destination the following algorithm will be used to find the shortest path or the best route between the destination to visit from your current location on a Google Map.

Fig 6.1- Finding Best Route in Google Map
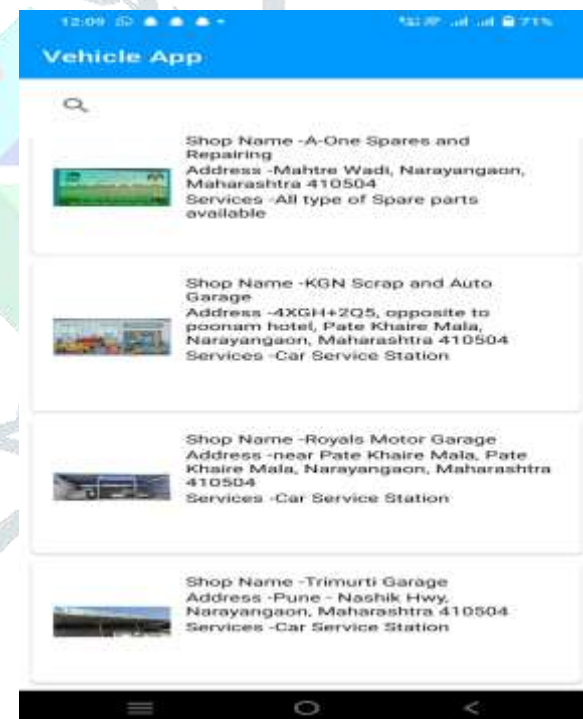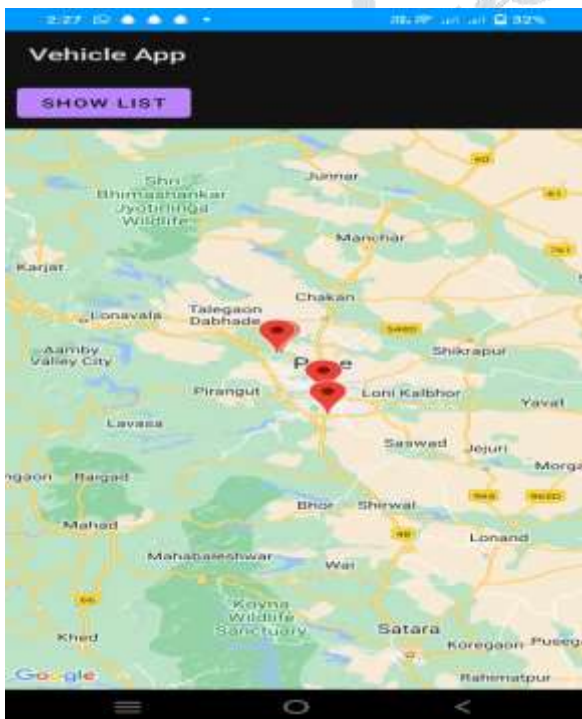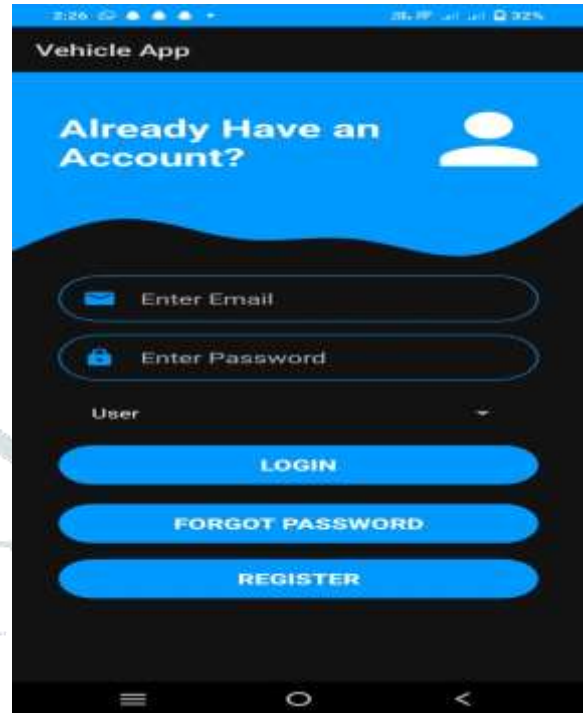
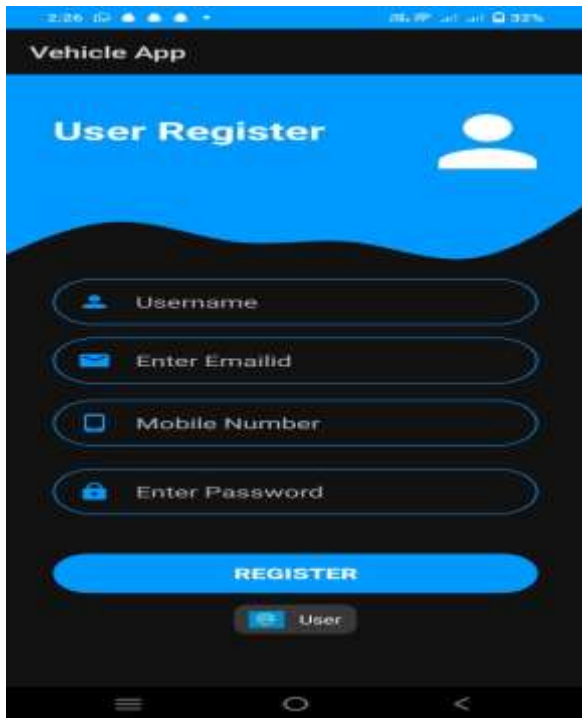## VII. ADVANTAGES AND DISADVANTAGES

A. Advantages
- o Secure registration of user's and mechanic.
- o The new system is more user-friendly, reliable and flexible.
- o Reduces manual work.

B. Disadvantages
- o Requires an active internet connection.
- o System will provide inaccurate results if data not entered properly.
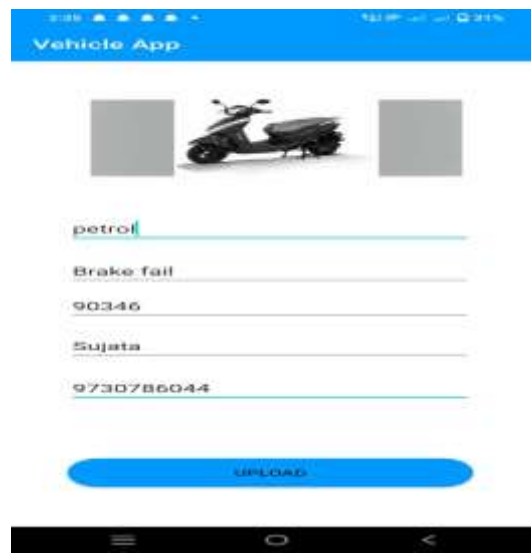
VIII. RESULT AND DISCUSSIONS

3.User's Current Location is fetched &
Nearest Garages are visible

4. List of mechanics

5.Send request to one of the garages

6.Fill the User and Vehicle details

7.Message is sent through SMS

8.Admin adds Garages after Registration & login

8.Mechanic Registration

9.View Request of user

PERFORMANCE ANALYSIS: The Existing and Proposed Systems are analysed. The problems can be easily rectified with this concept. Nealy 70% of the performance can be increased.

IX. CONCLUSION

We presented the design and implementation of an android based application called "Vehicle App" system. While the chances of a properly maintained vehicle experiencing a breakdown are less, but the machine which have the probability of breakdown anytime and anywhere it is never possibility to predict when the user may experience a vehicle breakdown. The Android application developed here is to make the life of a vehicle owner that much easier, as even in the probability of breakdown, the vehicle owner is assured of the fact that he/she has a solution to the problem within a few steps of entering details in his/her smart phone and save himself from a major setback in such an undesirable situation. The proposed system here act as a source of protection against the unpredictability of vehicle breakdown and offers the owner some peace of mind in the event of operational failure of the user's vehicle.

X. FUTURE SCOPE

In Future the system can be extended by adding modules like medical, food and so forth for providing services like medical emergency and food supply etc., So that by adding these modules the system will become more useful and by using the system the people can reduce their time and effort. This project can be developed in cross platform like IOT as well, in which it will provide emergency road side breakdown assistant on the spot if accident occurs. This will reduce human efforts and luxuriate human lives, hand in hand, with the modern technology.

XI. REFERENCES

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