

Detection of Car Problems and Solutions

Darshan Golechha¹, Animesh Ghosh², Avinash Dyasa³, Kshitij Waghela^{4*}, Noshir Z. Tarapore⁵

^{1,2,3,4}Student, Department of Computer Engineering, Vishwakarma University, Pune, India

⁵Assistant Professor, Department of Computer Engineering, Vishwakarma University, Pune, India

Abstract: This paper shows how easily some of the car problems can be diagnosed and fixed through our application V-heal. With the help of this application people can get out of situations where there is no help nearby or can also fix minor problems of the car without spending any money by going to the garage.

Keywords: GPS (Global Positioning System), API (Application Programming Interface).

1. Introduction

We conducted some research in the field of cars and came to the conclusion that there is no such application which helps in diagnosing car problems and providing optimal solutions. So, this application will provide user with the solutions after they have selected a specific problem which they have encountered. Number of solutions will be provided with appropriate images so that it becomes easy to find those parts and fix the problems. We will make this application using flutter. After providing the relevant solutions a feedback form shall appear asking if it helped the user. In case the solution did not work then the application will navigate the user to the nearest garage/service centre. Also, the purpose of this is to make ease of the car services of the user. There are chances to occur some problems in car while travelling or in user's long drive. If the problem is easy to solve, the user need not to face difficulties in repairing the car. If the problem is difficult to solve then the user must approach the nearby mechanic or car service centres. At that time, they may not know the nearest car service and mechanic, so this app can be ideal in those scenarios. Other than that, if user has some minor problems in the car and does not want to spend money by going to the garage then our application can come in hand. It can help user fix their problems without spending money and saving some time. We believe this app can really help users to be self-independent by solving their own problems and at the same time saving money and getting knowledge about different car parts.

A. Motivation

While on a journey with some friends we faced a battery related problem at a tricky location where the nearest help was hours away, despite searching online we did not find any satisfactory results, we were left stranded for almost hours. This experience made us think of an idea of an application which helps in diagnosing car problems and providing optimal solutions. Most of the car problems that are often faced by car owner are really easy to solve but they think it's hard to solve

and take their cars to garage where the servicemen overcharge the customers and scare them saying there is a huge and damage and need a costly repair. This can be true sometimes but most of the time it's not and so we thought of simplifying this problem and came up with this solution What makes our idea so unique is that there are no application similar to this which helps in solving simple car problems and giving optimal yet working solutions

B. Objectives

- This is an application which will detect the probable mechanical faults in your car based on your inputs and will provide possible solutions and recommend the nearest car garage/service centres.
- Get user out of sketchy situations if in one to a safe place where the user can get additional assistance if needed for one's car.
- Save money spent on repairs of small and easily solvable problems.
- Navigate to nearest trustworthy garages to get major problems solved.

2. Implementation

A. Flutter

Flutter is a cross-platform UI toolkit that is designed to allow code reuse across operating systems such as iOS and Android, while also allowing applications to interface directly with underlying platform services. The goal is to enable developers to deliver high-performance apps that feel natural on different platforms, embracing differences where they exist while sharing as much code as possible.

During development, Flutter apps run in a VM that offers stateful hot reload of changes without needing a full recompile. For release, Flutter apps are compiled directly to machine code, whether Intel x64 or ARM instructions, or to JavaScript if targeting the web. The framework is open source, with a permissive BSD license, and has a thriving ecosystem of third-party packages that supplement the core library functionality.

This overview is divided into a number of sections:

1. The layer model: The pieces from which Flutter is constructed.
2. Reactive user interfaces: A core concept for Flutter user interface development.
3. An introduction to widgets: The fundamental building

*Corresponding author: kshitijwaghela@gmail.com

blocks of Flutter user interfaces.

4. The rendering process: How Flutter turns UI code into pixels.
5. An overview of the platform embedders: The code that lets mobile and desktop OSes execute Flutter apps.
6. Integrating Flutter with other code: Information about different techniques available to Flutter apps.
7. Support for the web: Concluding remarks about the characteristics of Flutter in a browser environment.

B. Dart

Dart is a programming language designed for client development, such as for the web and mobile apps. It is developed by Google and can also be used to build server and desktop applications.

It is an object-oriented, class-based, garbage-collected language with C-style syntax. It can compile to either native code or JavaScript. It supports interfaces, mixins, abstract classes, reified generics, and type inference.

1. Stand-alone: The Dart software development kit (SDK) ships with a stand-alone Dart VM, allowing Dart code to run in a command-line interface environment. As the language tools included in the Dart SDK are written mostly in Dart, the stand-alone Dart VM is a critical part of the SDK. These tools include the dart2js compiler and a package manager called pub. Dart ships with a complete standard library allowing users to write fully working system apps, such as custom web servers.
2. Ahead-of-time compiled: Dart code can be AOT-compiled into machine code (native instruction sets). Apps built with Flutter, a mobile app SDK built with Dart, are deployed to app stores as AOT-compiled Dart code.
3. Native: Dart 2.6 with dart2native compiler to compile to self-contained, native executables code. Before Dart 2.6, this feature only exposed this capability on iOS and Android mobile devices via Flutter.
4. Android Studio: Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020. It is a replacement for the Eclipse Android Development Tools (E-ADT) as the primary IDE for native Android application development.

Android Studio was announced on May 16, 2013 at the Google I/O conference. It was in the early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014. The first stable build was released in December 2014, starting from version 1.0.

On May 7, 2019, Kotlin replaced Java as Google's preferred language for Android app development. Java is still supported, as is C++.

Features:

- Gradle-based build support.
- Android-specific refactoring and quick fixes.
- Lint tools to catch performance, usability, version compatibility and other problems.
- ProGuard integration and app-signing capabilities.
- Template-based wizards to create common Android designs and components.
- A rich layout editor that allows users to drag-and-drop UI components, option to preview layouts on multiple screen configurations.
- Support for building Android Wear apps.
- Built-in support for Google Cloud Platform, enabling integration with Firebase Cloud Messaging (Earlier 'Google Cloud Messaging') and Google App Engine.
- Android Virtual Device (Emulator) to run and debug apps in the Android studio.

3. Literature Survey

[1] G. Rajalakshmi and Y. Jeya Singh An Android Application for Location based Car Service Recommendation. Asian Journal of Applied Science and Technology (AJAST) Volume 1, Issue 3, Pages 145-148, April 2017.

G. Rajalakshmi and Y. Jeya Singh presented with a service where they plan on to help user find a nearest service centre recommendation based on user's location. This service promises to help user locate a repair shop if the user needs one and recommend a well-known or good garage. The thought behind their project was to eliminate the process of finding a garage to get user's vehicle to service by finding them while driving or asking people of the neighbourhood.

[2] Seong-jin Jang, and Jong-wook Jang A Study on Development of Engine Fault Diagnostic System, Vol. 2015.

Hwa-seon Kim and his partners implemented a mobile diagnosing system that has a user-friendly interface for proper diagnosis of user's problems. Their project includes using a OBD -II scanner and attaching it to the port available in user's car. This scanner then reports back to the application with all the proper scan results and points the user if and where the problem lies. This scanner reads the data from the ECU of the car which is a central nervous system of the car.

[3] Bernd Tibken, Mike Albani and Thomas Fischer A new optimization problem for the solution of decision problems with applications to passenger occupation detection in cars.

Bernd Tibken and his partners shed light on a real-world example as to how important it is to detect if a passenger is sitting on a seat or a baby seat is attached to the seat. This is detected by the occupancy of the seat belt and weight sensors under the seat. At times a baby seat is attached to the front seat and in case of accident the deployment of and airbag can be dangerous. Disabling the area in case of vacancy of seat may help save the cost of restoring the airbag in case of repairs.

4. Problem Statement

If your car gets stalled due to some mechanical failure and there is no help nearby, then how do you fix your car?

If there is a minor problem in your car and you want an instant solution to fix your problem then how do you fix it?

5. System Architecture

If your car gets stalled due to some mechanical failure and there is no help nearby, then how do you fix your car?

If there is a minor problem in your car and you want an instant solution to fix your problem then how do you fix it?

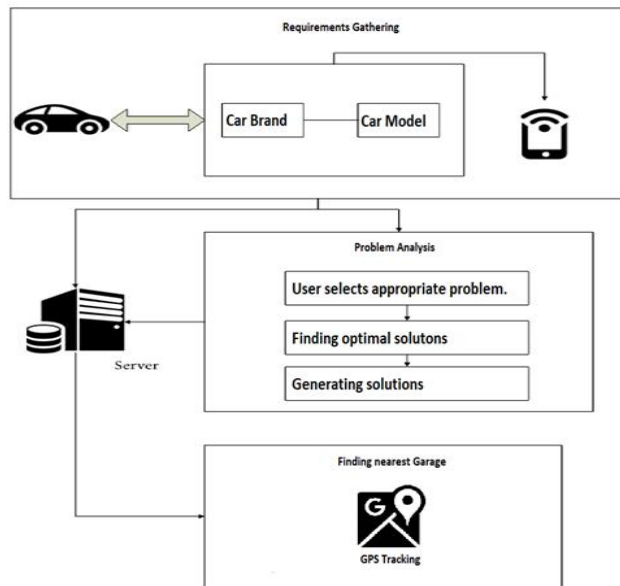


Fig. 1. System architecture

The fig. 1, represents the system architecture which comprises of requirements gathering followed by problem analysis and solution deployment.

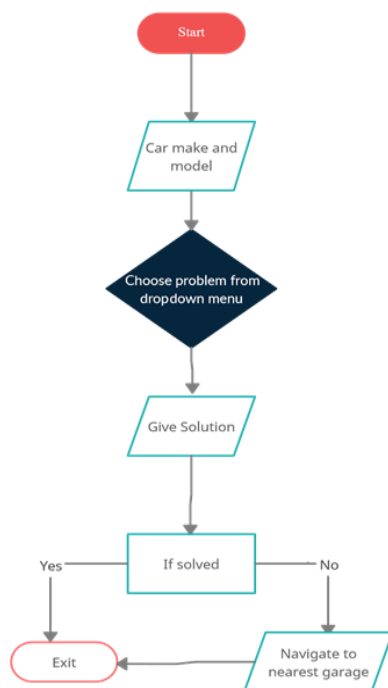


Fig. 2. Work flow

This fig. 2, represents the work flow of our system.

6. Conclusion

This application will give a brief and quick solutions to most of the car problems which a normal user can solve to get out of a sketchy situation very easily. As most of the car problems have real minute repairs to fix them but due to lack of knowledge leads to hefty bills from a garage or repair shop. Our application will help users put an end to such problems and also save time of going to a garage or service centre. In failure to solve the problem user can also seamlessly use integrated garage finder to get their repairs done. This application will make solving car problems easy, quick and also save bucks.

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