



“Go Furthr”:The Vehicle Statistics App

Praveen kumar K B¹, Vishakh k², Vismitha T S³, Pruthvi Raj B U⁴, Naveen Kumar A N⁵

UG Students, Dept. of I.S.E., SSIT, Sri Siddhartha Academy of Higher Education, Tumkur, Karnataka¹⁻⁴

Associate Professor, Dept. of I.S.E., SSIT, Sri Siddharth Academy of Higher Education, Tumkur, Karnataka⁵

Abstract: In this paper, we present an Vehicle maintenance can be daunting. With so much else going on in life, it's difficult to remember to schedule things like oil changes and brake jobs. Vehicle mileage, health, and service tracking are crucial aspects of vehicle management. They involve monitoring and recording various parameters related to a vehicle's performance and condition. Here's a brief note on each aspect:

In today's fast-paced world, logging information has become synonymous with efficiency and informed decision-making, making "Gofurthr" an indispensable app. In the face of growing environmental concerns and the need for resource optimization, this application provides a user-friendly platform for individuals and businesses to meticulously track and manage essential vehicle-related data, with a particular focus on fuel consumption and performance.

In an era where every decision is increasingly data-driven, "Gofurthr" not only streamlines the often-cumbersome process of record-keeping but also empowers users with valuable insights into their driving habits, enabling them to make informed choices for optimizing fuel efficiency, reducing costs, and minimizing their environmental footprint. Through its seamless integration of technology, connectivity, and user-friendly design, "Gofurthr" emerges as a catalyst for a more connected, sustainable, and efficient approach to transportation management in our modern world.

I. INTRODUCTION

The Vehicle maintenance can be daunting. With so much else going on in life, it's difficult to remember to schedule things like oil changes and brake jobs. Vehicle mileage, health, and service tracking are crucial aspects of vehicle management. They involve monitoring and recording various parameters related to a vehicle's performance and condition. Here's a brief note on each aspect:

Vehicle Mileage Tracking: This involves tracking the distance a vehicle travels. It's essential for calculating fuel efficiency, planning maintenance schedules, and managing expenses.

Service Tracking: Service tracking involves keeping a record of all the services and repairs a vehicle undergoes. This helps in maintaining the vehicle in optimal condition and planning future services.

Gone are the days of frantically searching through old receipts and guessing when your last oil change was. If you have ever had to take your car to a repair shop, you know it can be a bit of a hassle.

Well, it turns out that the market for automotive repair and maintenance is growing like crazy. Car maintenance is an important factor in owning a vehicle, ensuring its optimal performance, and safety. Car maintenance apps have emerged as valuable tools that help vehicle owners in keeping track of their maintenance tasks and schedules conveniently.

Our app “GoFurthr” is a general-purpose database app built for effortlessly tracking and recording vehicle fuel consumption and essential statistics. With a user-friendly interface, it simplifies the process of maintaining detailed records, offering insights into your vehicle's efficiency and expenses. This project aims to solve the problem of tracking and accountability of vehicles by providing a software platform and serve as an important step to help in Vehicle tracking, component monitoring, vehicle analysis and fleet management.

II. RELATED WORK

Traditional Manual Methods: Historically, individuals and businesses have relied on manual methods for recording vehicle-related information. This may involve maintaining handwritten logs, receipts, or spreadsheets to track fuel consumption, expenses, and basic performance metrics. While this approach allows for some recordkeeping, it often lacks real-time insights, can be prone to errors, and may not provide comprehensive data analysis.



Standalone Solutions: Some existing systems may involve standalone software or applications that address specific aspects of vehicle management. For instance, there might be apps focused solely on fuel tracking or expense management. While these solutions may offer some benefits, they often lack integration, requiring users to use multiple applications to manage different aspects of their vehicle data.

Case Study: Honda Connect (App)

Introduction:

Honda Connect is a mobile application designed to complement Honda vehicles by integrating smart features for enhanced connectivity and management. Launched to meet the evolving demands of modern vehicle owners, the app strives to provide an intuitive platform that seamlessly integrates with Honda cars, offering a range of functionalities for a more connected and informed driving experience.

Objective:

The primary objective of Honda Connect is to bridge the gap between vehicle and driver, offering a suite of features that enhance convenience, safety, and overall driving satisfaction. The app aims to leverage technology to create a more personalized and connected driving environment.

Key Features:

- **Telematics and Vehicle Health Monitoring:** Honda Connect provides real-time insights into the vehicle's health, including diagnostic information and maintenance alerts. This feature allows users to stay proactive about their vehicle's well-being.
- **Security and Safety:** The app includes security features such as remote vehicle tracking and 7 immobilizations in case of theft. Additionally, it enhances safety by providing automatic crash notifications and emergency call services.
- **Convenience and Remote Control:** Users can remotely control certain vehicle functions, such as locking and unlocking doors, controlling climate settings, and even starting the engine. This adds a layer of convenience, especially in varying weather conditions.
- **Driving Analytics:** Honda Connect offers driving behavior analysis, including insights into fuel efficiency, speed patterns, and trip history. This feature enables users to adopt more fuel-efficient driving habits.

Conclusion:

Honda Connect serves as a testament to the evolving landscape of vehicle connectivity. By seamlessly integrating technology into the driving experience, the app not only enhances convenience but also contributes to safety, security, and efficiency. As technology continues to advance, Honda Connect remains a noteworthy case study in how automotive companies are leveraging connectivity to redefine the relationship between drivers and their vehicles.

III. PROPOSRD WORK

Our proposed system addresses the existing issues and tackles them as following:

- **Limited Integration:**

Shortcoming: The Honda Connect app may have limitations in integrating seamlessly with various vehicle models and external systems.

Improvement: "Gofurthr" offers broader compatibility across different vehicle makes and models, providing a more inclusive solution for a diverse user base.

- **Data Analysis Depth:**

Shortcoming: The depth of data analysis in the Honda Connect app might be limited, offering basic insights into vehicle health and driving behavior.

Improvement: providing more comprehensive and customizable data analysis tools, allowing users to gain deeper insights into fuel efficiency, performance trends, and maintenance needs.

- **Ease of Use:**

Shortcoming: Users might face challenges in navigating or using certain features within the Honda Connect app, impacting overall user experience.

Improvement: Prioritize a user-friendly design for "Gofurthr," ensuring intuitive navigation and clear instructions, thereby enhancing overall usability and accessibility.



- **Real-time Connectivity:**

Shortcoming: The Honda Connect app may have limitations in real-time connectivity and responsiveness.

Improvement: Make "Gofurthr" stand out by prioritizing real-time connectivity features, enabling users to receive instant updates on their vehicle's status.

- **Customization and Flexibility:**

Shortcoming: The Honda Connect app may lack customization options, limiting users in tailoring the app to their specific preferences.

Improvement: Provide a higher level of customization in "Gofurthr," allowing users to personalize dashboard displays, set individualized alerts, and customize data .

IV. PSEUDO CODE

Home_page:

```
import 'package:curved_navigation_bar/curved_navigation_bar.dart';
import 'package:flutter/material.dart';
import 'package:gofurthr/pages/homePage/landing_page.dart';
import 'package:gofurthr/pages/addVehicle/av_page.dart';
import 'dart:async';
import 'package:gofurthr/components/globals.dart';
import 'package:firebase_auth/firebase_auth.dart';
import 'package:gofurthr/pages/auth/auth_page.dart';
```

```
class HomePage extends StatefulWidget {
  const HomePage({super.key});
```

```
  @override
  State<HomePage> createState() => _HomePageState();
}
```

```
class _HomePageState extends State<HomePage> {
  // ... other code
```

```
  int _selectedIndex = 0;
  final List<Widget> _pages = [
    const LandingPage(),
    const AddVeh(),
  ];
```

```
  final user = FirebaseAuth.instance.currentUser!;
  late StreamSubscription<User?> authStateChangesSubscription;
```

```
  @override
  void initState() {
    super.initState();
    authStateChangesSubscription =
      FirebaseAuth.instance.authStateChanges().listen((user) {
        if (user == null) {
          // User is not signed in, navigate to login page
          Navigator.pushReplacement(
            context, MaterialPageRoute(builder: (context) => const AuthPage()));
        }
        setState(() {}); // Update UI to reflect user state
      });
  }
}
```

```
  @override
  void dispose() {
```



```

authStateChangesSubscription.cancel(); // Clean up listener
super.dispose();
}

//log out
void logOut() async {
  await FirebaseAuth.instance.signOut();
}

@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: PreferredSize(
preferredSize: const Size(double.maxFinite, 50),
  child: AppBar(
    backgroundColor: primary,
    shape:
      RoundedRectangleBorder(borderRadius: BorderRadius.circular(18)),
    centerTitle: true,
    flexibleSpace: Padding(
      padding: const EdgeInsetsDirectional.only(
        top: 50,
        start: 10,
        end: 5,
      ),
    child: Row(
      mainAxisAlignment: MainAxisAlignment.spaceBetween,
      children: [
        Row(
          mainAxisAlignment: MainAxisAlignment.spaceEvenly,
          children: [
            const Icon(Icons.person, size: 30, color: Colors.white),
            const SizedBox(width: 10),
            Text(
              "${user.email}",
              style: const TextStyle(
                color: Colors.white,
                fontSize: 20,
              )) ] ),
        IconButton(
          // Logout button on the right
          onPressed: logOut,
          icon: const Icon(
            Icons.logout,
            color: Colors.white,
          )), ], ),),
    bottomNavigationBar: CurvedNavigationBar(
      backgroundColor: secondary2,
      height: 60,
      color: primary,
      animationDuration: const Duration(milliseconds: 300),
      onTap: (index) {
        setState(() => _selectedIndex = index);
      },
      items: const [
        Icon(

```



```

Icons.home,
  size: 30,
),
Icon(
  Icons.motorcycle_rounded,
  size: 30,
),
Icon(
  Icons.settings,
  size: 30,
),
],
),
body: IndexedStack(
  index: _selectedIndex,
  children: _pages,
),
);
}
}

add_vehicle:
import 'package:cloud_firestore/cloud_firestore.dart';
import 'package:firebase_auth/firebase_auth.dart';
import 'package:flutter/material.dart';
import 'package:gofurthr/components/globals.dart';
import 'package:gofurthr/pages/homePage/home_page.dart';

class AddVehBT extends StatefulWidget {
  bool isEnabled;
  String type;
  String brand;
  String model;

  AddVehBT({
    super.key,
    required this.isEnabled,
    required this.type,
    required this.brand,
    required this.model,
  });

  @override
  State<AddVehBT> createState() => _AddVehBTState();
}

class _AddVehBTState extends State<AddVehBT> {
  final user = FirebaseAuth.instance.currentUser!;
  final collectionRef = FirebaseFirestore.instance.collection('userData');

  void writeData() async {
    collectionRef.doc(user.email).set({});

    // Call getCollectionName asynchronously to obtain the subcollection name
    String subcollectionRef = await getCollectionName();

```



```
// Write data to the document with the generated subcollection name
await collectionRef
  .doc(user.email)
  .collection('Vehicles')
  .doc(subcollectionRef)
  .set({
    'Type': widget.type,
    'Brand': widget.brand,
    'Model': widget.model,
  });
//code to go back to homepage
if (mounted) {
  Navigator.of(context).pushReplacement(
    MaterialPageRoute(builder: (context) => const HomePage()),
  );
}
}
```

```
Future<String> getCollectionName() async {
  var query = collectionRef.doc(user.email).collection('Vehicles');
  var querySnapshot = await query.get();
  int number;
```

```
  if (querySnapshot.docs.isNotEmpty) {
    number = querySnapshot.docs.length;
  } else {
    number = 0;
  }
}
```

```
String subcollectionRef = 'vehicle$number';
return subcollectionRef;
}
```

```
@override
Widget build(BuildContext context) {
  return Container(
```

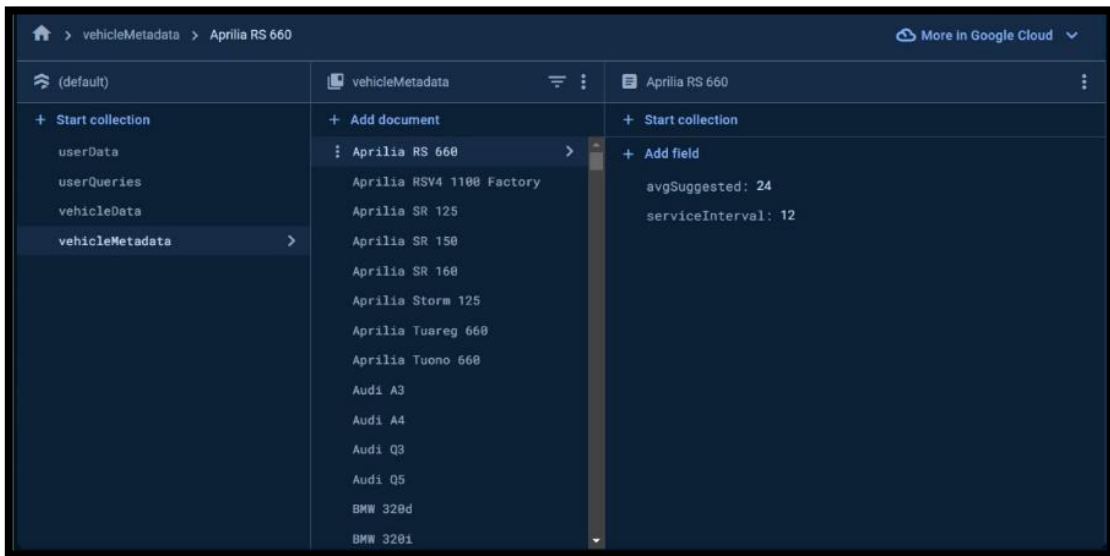
```
width: 200,
height: 50,
decoration: BoxDecoration(
  borderRadius: BorderRadius.circular(50),
),
child: ElevatedButton(
  onPressed: widget.isEnabled
    ? () {
      writeData();
      setState() {
        widget.isEnabled = false;
      };
    }
    : null,
style: ElevatedButton.styleFrom(
  disabledBackgroundColor: Colors.grey,
  disabledForegroundColor: Colors.grey[900],
  backgroundColor: primary,
  foregroundColor: Colors.white,
),
```



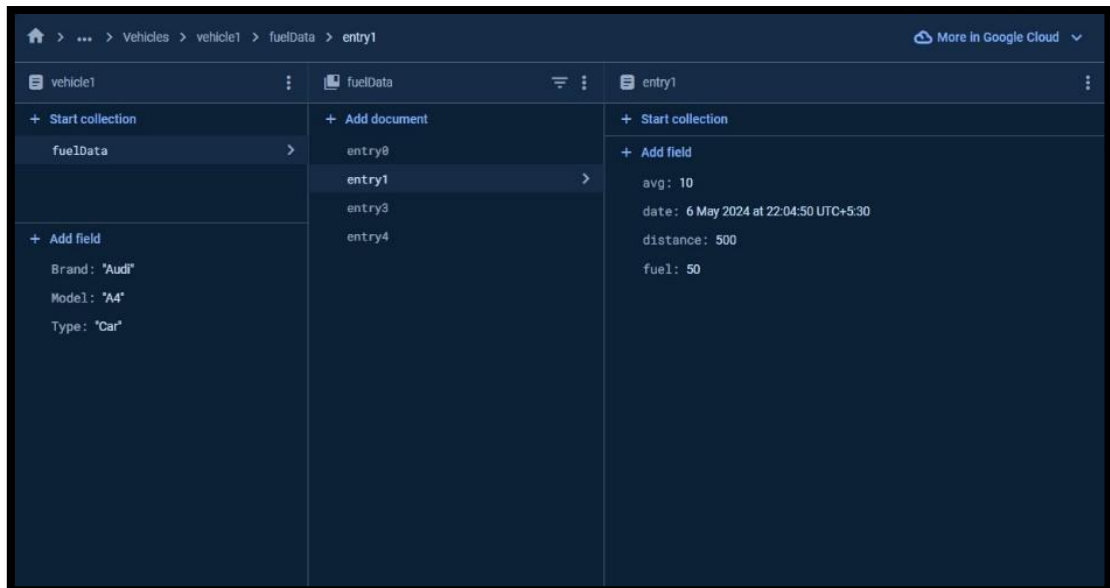
```
child: const Row(
  mainAxisAlignment: MainAxisAlignment.center,
  children: [
    Text(
      "ADD VEHICLE",
      style: TextStyle(
        fontSize: 15,
        letterSpacing: 5,
      ),
    ),
  ],
);
```

V. SIMULATION RESULT

Vehicle Metadata in firebase

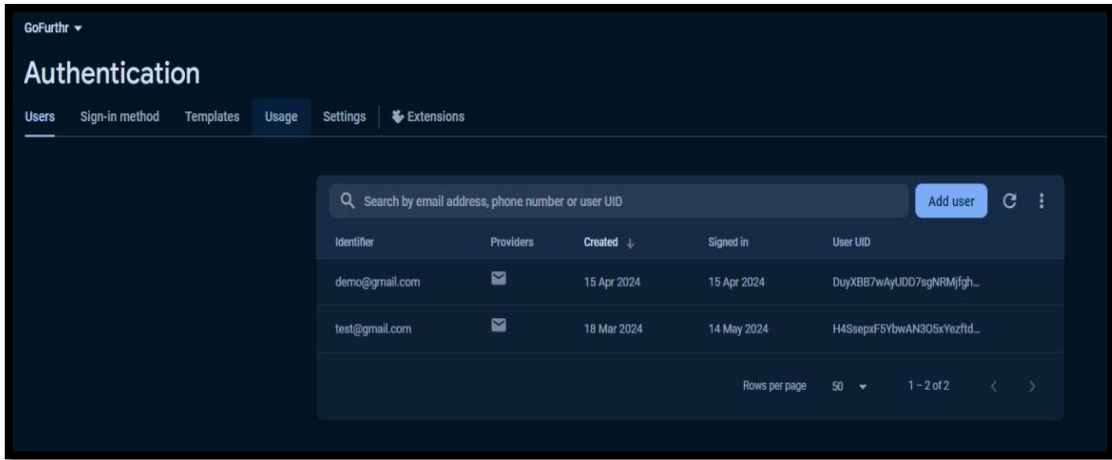


Fuel data of a vehicle

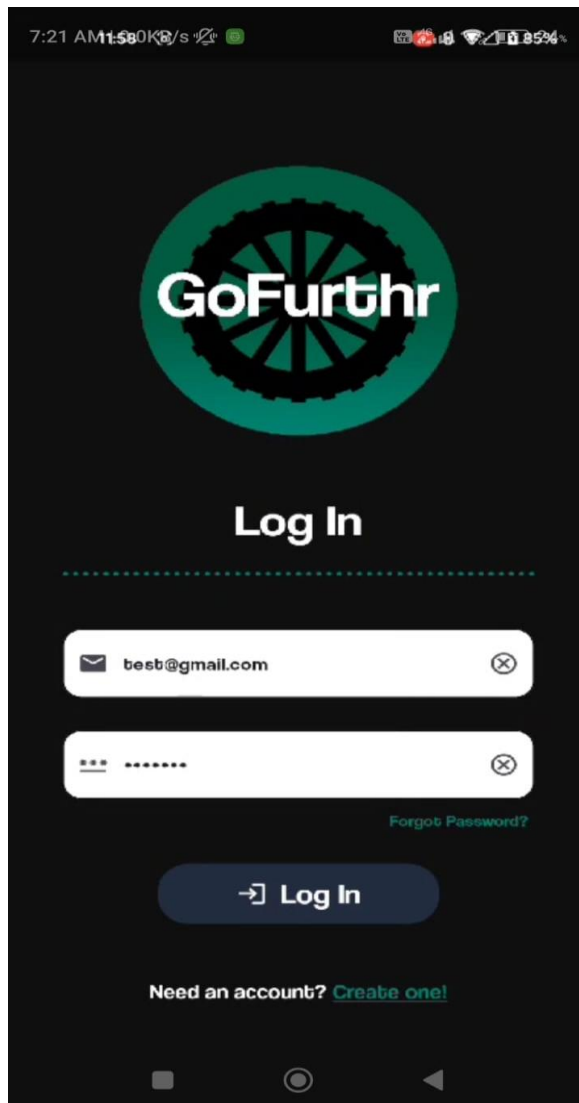


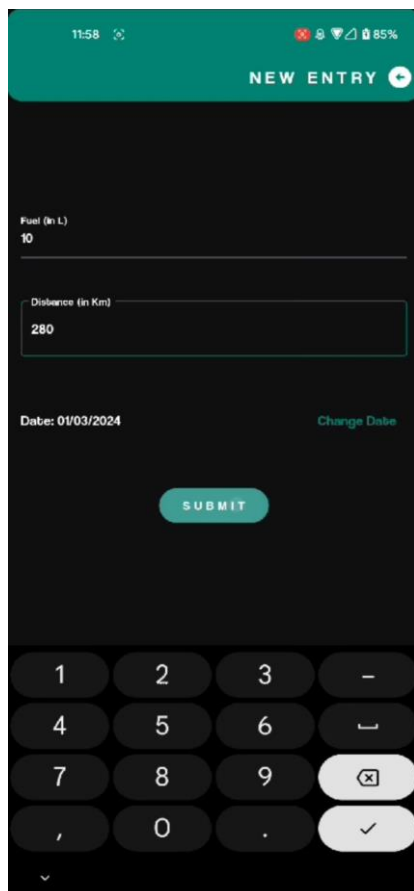
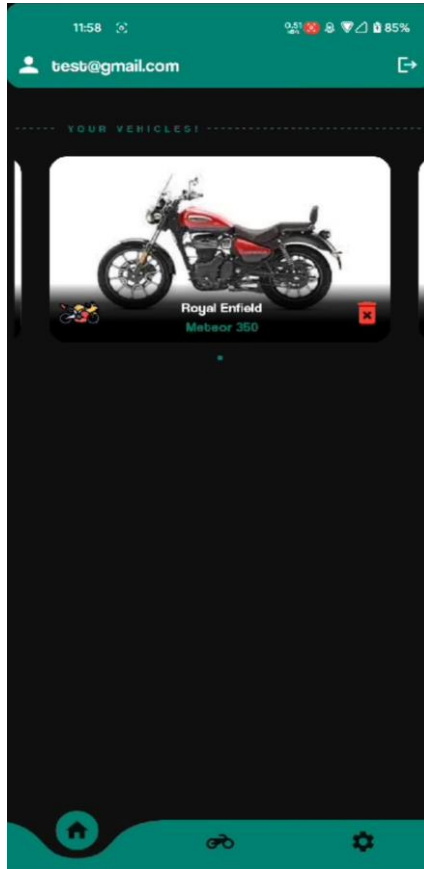


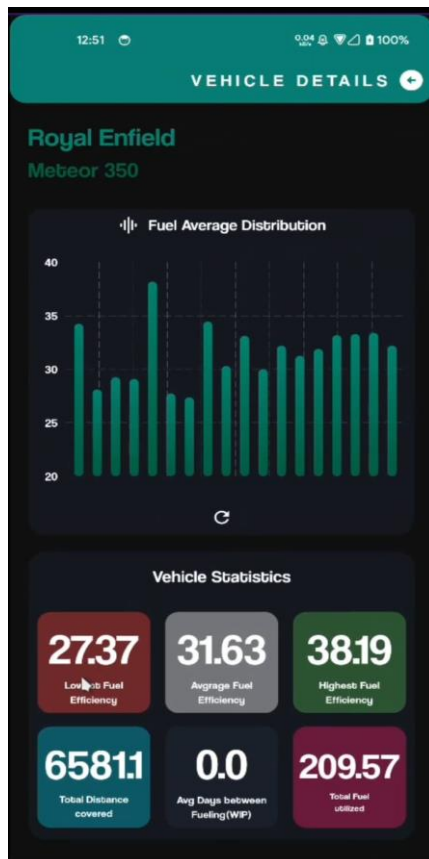
Authentication of individual user data in firebase



MOBILE SCREEN SHOT









VI. CONCLUSION AND FUTURE WORK

In conclusion, "Gofurthr" emerges as a pivotal solution in the realm of vehicle management apps, addressing critical shortcomings observed in existing platforms such as Honda Connect and Suzuki Connect. By seamlessly integrating advanced features for comprehensive fuel consumption tracking, Realtime connectivity, and user-friendly data analytics, our app stands poised to redefine the user experience in vehicle management. The commitment to addressing specific user pain points, ensuring compatibility across various vehicle models, and embracing the latest trends in connected car technologies positions "Gofurthr" as a dynamic and forward-thinking tool. With an emphasis on efficiency, sustainability, and a user-centric design, our app aims to set a new standard for empowering both individual vehicle owners and commercial entities in optimizing their vehicular performance and contributing to a more connected and sustainable future.

Feature Scope:

Seeing the feature scope, the Gofurthr app can handle the service statuses of a vehicle based on the number of kilometre distances, the user can add and save the individual vehicle's legal documents which need the security clearance by the Appstore or google playstore during the launch of the app. At present, the app is been open to the developers so they can add they thoughts and functions which suits for the app's better feature.

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