

Vehicle Break Down Assistance System

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Abstract— The number of vehicles on highways and city roads is. This has led to more vehicle breakdowns. Drivers often have trouble finding mechanics quickly when this happens. This is especially true when they are in a city or a place that is hard to get to. It can be very annoying and even dangerous because it can cause delays. Most of the time, roadside assistance is done by hand. Drivers need to find help on their own. This makes the process slow and not always reliable. We made a Vehicle Breakdown Assistance System to help with these issues. It is a web-based app that gives reliable help on the side of the road. Users can sign up and log in to the Vehicle Breakdown Assistance System. They can tell us about problems with their cars. Using GPS, the system will automatically find out where they are. After that, the Vehicle Breakdown Assistance System sends the mechanic who is free. This makes sure that response times are met. The system also has tracking that happens in real time. This lets users keep an eye on how the mechanics move. The Vehicle Breakdown Assistance System has ways for people to talk to each other. These make it easier for drivers and mechanics to work together. The system lets you pay safely. Users can safely and easily complete transaction. The Vehicle Breakdown Assistance System keeps track of the history of services. This makes it easier for users to keep track of their payments and requests. There is also a way to give feedback. People can. Check out the work that mechanics do. Over time, this helps make the service better. The Vehicle Breakdown Assistance System makes things safer. It cuts down on the time you have to wait. Offers a quick way to help with vehicle break downs. The Vehicle Breakdown Assistance System is easy to use. It helps drivers get help when they need it.

INTRODUCTION

These days, cars are a big part of our lives. People use cars for work, travel, business, and personal reasons. The more cars there are on the road, the more likely it is that something will go wrong. You never know when something will go wrong, like the engine stopping, the batteries dying, the tires going flat, or the fuel running out. It can be very scary and stressful when a car breaks down on the highway or in a remote area. Drivers might not know who to call or where to get help. Most of the time, they have to call someone, ask strangers for help, or wait for a while without knowing when someone will come.

People get angry when their travel plans are delayed. Puts them in danger at times. A lot of roadside assistance services aren't very good. They don't have systems for tracking things in real time, quick responses, or good communication between drivers and mechanics. Drivers might not be able to tell people where they are, and the service providers might take longer than expected to get there. When their travel plans are delayed, people get mad. Sometimes it puts them in danger.

Many roadside assistance services aren't very good. They don't have ways to keep track of things in real time, respond quickly, or talk to each other well between drivers and mechanics. Drivers may not be able to tell people where they are, and the service providers may take longer than they thought to get there. put them in touch with the mechanic. The Vehicle Breakdown Assistance System also lets drivers keep an eye on the mechanic, get updates, talk to each other easily, and make safe online payments. The main goal of the Vehicle Breakdown Assistance System is to make things safer, cut down on wait times, and give drivers peace of mind in an emergency.

There is also a way to give feedback. People can. Check out the work that mechanics do. Over time, this helps make the service better. The Vehicle Breakdown Assistance System makes things safer. It cuts down on the time you have to wait. Offers a quick way to help with vehicle break downs. The Vehicle Breakdown Assistance System is easy to use. It helps drivers get help when they need it.

I. LITERATURE REVIEW

Drivers can have problems when their cars break down on the road, especially if they are in a place that is far away from everything or in a place they don't know. In these situations, it can be hard to find help away from home, and it can take a long time, which can make things worse and make drivers feel even more vulnerable. Some smart systems and apps have been made to help with this problem by connecting drivers with mechanics who are close by through digital platforms. This is because technology is getting better and better. These systems are mostly trying to make it easier and faster for drivers to get help and make the whole process easier for them. However with these new technologies many of the solutions that are already out there still have some big problems, such as needing to be connected to the internet all the time not being able to work on different platforms not being able to work without the internet and not being able to handle emergency situations very well.

The On-Road Vehicle Breakdown Assistance system, which was made by N. Dheeraj Babu and others in 2025 is designed to give drivers efficient help when their vehicle breaks down. This system uses GPS to figure out where the driver is and find mechanics who're close by and can help.[3] It gives drivers a lot of information about the mechanics, including their contact details how away they are and what kinds of services they offer. Drivers can use the system to ask for help and it makes the process of finding someone to help more efficient by automating it. However the system needs to have an internet connection to work which can be a problem in areas where the internet is not very good. Also the system does not have some features that would make it better such as being able to predict when a breakdown might happen or being able to work without the internet.

The Roadside Mechanic Locator Web Application, which was proposed by Aravinthan and Hemalatha in 2024 is a website that helps drivers find mechanics when they need help.[2] One of the things about this system is that it can be used on many different devices without needing to be installed which makes it very convenient. The application uses location tracking to show drivers where the mechanics are lets them talk to the mechanics through the website. However the system needs to have an internet connection to work. It does not work very well when the internet is not available. Also because it is a website it might not work well as other systems that are specifically made for mobile devices. The Breakdown Assistance Finder, which was made by Keerthi Priya and others in 2023 is a system that helps drivers find mechanics by using a rating and review system. This means that drivers can look at what other people have said about the mechanics and choose the one that's best for them[4]. The system uses GPS to find mechanics who're close by which makes it quicker for drivers to get help. Also the system helps mechanics be more accountable and provide service. However the system does not have options for paying which can be a problem for drivers who like to use digital payments. Another system, the High-Tech Roadside Assistance System, which was proposed by Ayaz Shaikh and others in 2023 is an app for Android devices that helps drivers connect with mechanics in time.

The system uses location tracking to find mechanics who're close by and lets drivers talk to them directly which makes the process more efficient. The app is very easy to use, in emergency situations. However the system only works on Android devices, which can be a problem for drivers who use kinds of devices. The Mobile-Based Vehicle Assistance System, which was made by Dharmakeerthi in 2021 is a system that helps drivers get roadside support by using Google Maps. The system helps drivers find their location and find mechanics who're close by which is especially helpful when drivers are in areas they do not know very well. The system gives drivers directions and helps them find the mechanics quickly which reduces confusion and stress.

II. SYSTEM REQUIREMENTS AND DESIGN CONSIDERATIONS

These things are needed for the system to work well, talk to each other in real time, and find places in an emergency. Web technologies and tools are used by the software part of the system to make it work.

Users can see and use the part that is made with HTML, CSS, JavaScript, and React.

Python and the Flask framework are used to make the part that handles the business side of things. Flask takes care of the server's logic and processing. Firebase is where we keep information about users, service requests, and transactions. We also use the Google Maps API and the Geolocation API to find places and get around. We also use WebSockets for real-time communication and Razorpay for safe payments. The system can run on Windows, Linux, and macOS, among other operating systems.

It's easy to add things and keep the Vehicle Breakdown Assistance System up to date. It has different parts that each do their own job, such as the user part, the mechanic part, the location tracking part, and the payment part. This design makes it simple to handle user requests, assign mechanics quickly, and let users and service providers talk to each other. The Vehicle Breakdown Assistance System also lets users get real-time updates, log in securely, and manage their data well, which makes the system work better for them..

III. PROPOSED SYSTEM

This layer is where users and mechanics can use a web interface made with HTML, CSS, and JavaScript to talk to the system.

Users can report problems and see their dashboard, and mechanics can see and handle service requests. It makes sure that the experience is easy and user-friendly so that communication and interaction go smoothly.

Application Layer (Flask Application Backend Layer):

This layer uses the Flask framework to handle all of the core functions and business logic. It handles authentication, processes requests, and uses GPS to find the nearest mechanic. It also has features like secure payment integration, real-time tracking, and communication.



Figure 4.1 Architecture of the system

Layer of Data (Database Layer – SQL): Assistance System is a good way to get help when your car breaks down. It brings together service management, user interaction, location tracking, and payment processing into one platform.

WebSockets and other technologies are used by the Vehicle Breakdown Assistance System to make sure that everything happens in real time. It also uses the Google Maps API to keep track of the mechanics' movements and the Geolocation API to find the user's location. The system is made to work well and be dependable. It gives users a good experience. The Vehicle Breakdown Assistance System is a way for people to get help with their car.

This layer keeps track of all the system's data, such as user information, mechanic information, and service requests. It makes sure that data is safe, organized, and easy to find when you need it. The database makes backend operations run smoothly by giving accurate and up-to-date information.

Interaction Between User and Mechanic:

The user tells the frontend that their car has broken down, and the backend uses GPS to find the nearest mechanic. The mechanic gets the request on their dashboard and can accept it, which lets them track and talk to you in real time. After the service is done, the user pays, and all the information is saved in the database.

IV. IMPLEMENTATION

The Vehicle Breakdown Assistance System is a way to help people when their car breaks down. It uses web technologies to offer a quick and dependable answer for problems that happen on the road. The frontend and the backend are the two parts that make up this system. The front end is what the user sees and uses. HTML, CSS, JavaScript, and React are all used to make it. These technologies work together to make an interface that is easy to use and lets people interact with it.

The backend is the part of the system that processes requests and lets different parts of the system talk to each other. The Flask framework and Python were used to make it. The system also uses Firebase as a database to keep track of things like payment records, user information, and mechanic information. The Vehicle Breakdown Assistance System is made up of separate parts, each of which has a specific job to do. This makes it simple to keep the system running and grow it. When a user logs in and says that something is broken, the system uses GPS to find their location. After that, it looks in the database for mechanics who are close by.

After that, the user can pick a mechanic. When a mechanic gets a request, they can either say yes or no to it. The system lets the user and the mechanic talk to each other in real time if they agree. Google Maps can even help the user find the mechanics. This makes the service process clearer and there is also a payment system in the Vehicle Breakdown Assistance System.

People can pay for services with UPI and digital wallets, among other

things. The system keeps track of all the transactions. Checks to make sure they are safe. Users can also leave ratings and comments after the service is over, which helps make the service better.

The system is set up to deal with mistakes and give updates while the service is going on. It checks that user inputs are correct, handles request failures, and lets users resend requests if they need to. In general, the Vehicle

V. RESULTS

The Vehicle Breakdown Assistance System is made with web technologies so that it can quickly and reliably help with problems on the road. It works quickly because it uses both frontend and backend technologies.

HTML, CSS, JavaScript, and React are used to make the frontend, which makes it responsive.

Python and the Flask framework make up the backend. It handles requests, authentication, and communication between different parts of the system.

Firebase is the database that safely keeps track of user information, mechanic information, service requests, and payment records.

The system is set up so that each function is handled by a different module. This makes it easy to add new features and fix problems. When a user logs in and submits a request

the system finds their current location using GPS. It then searches for mechanics and shows them to the user, who can select one or send a service request.

The Vehicle Breakdown Assistance System provides a solution for vehicle breakdowns.

It helps users quickly request assistance and accurately finds their location.

Nearby mechanics can accept requests in real-time reducing waiting time.

The system also allows for updates, between users and mechanics. The payment process is secure. Happens online after the service is completed. All user, mechanic, service request and payment data is stored safely in the database.

This system improves coordination makes things simplifies roadside assistance. The project achieves its goals by providing an organized breakdown assistance platform.

Future updates can make the system perform better and do things. The Vehicle Breakdown Assistance System meets its objectives. Provides a fast breakdown assistance platform.



Figure 6.1 UI&Landing Page

Allows drivers to register, log in, request assistance, track service status, communicate with mechanics, view service

history, and give feedback



Figure 6.2 clients and mechanic login page

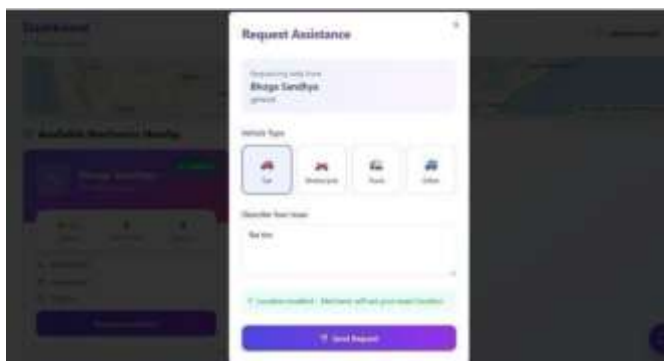


Figure 6.3 history of mechanic

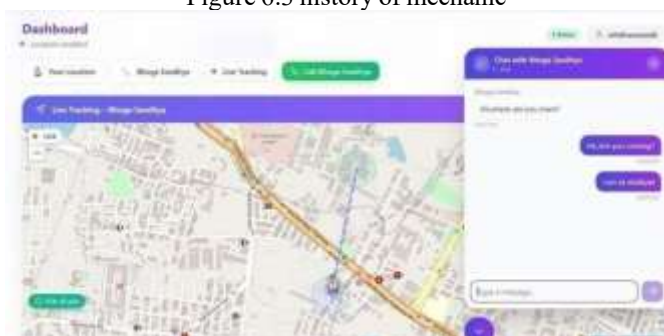


Figure 6.4 live tracking of client

Lets mechanics register, receive requests, accept or reject them, update service status, share live location, and view past services and earnings.

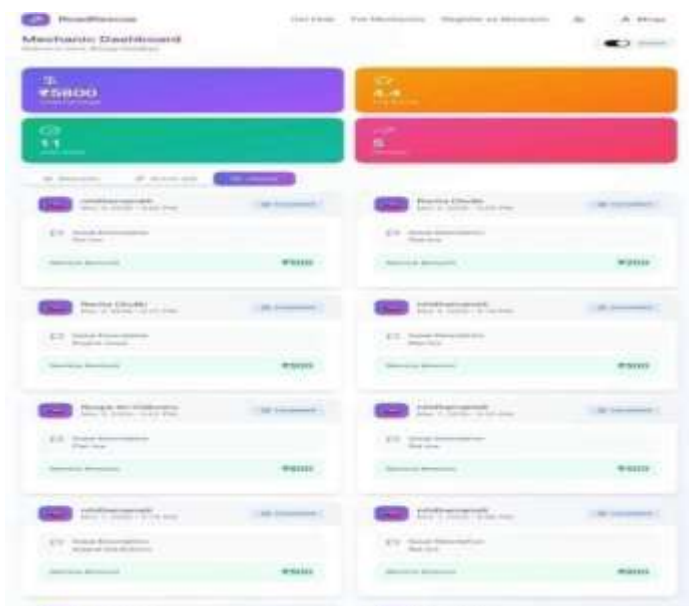


Figure 6.5 mechanic signup page

Figure 6.6 mechanic profile payment history

Uses GPS to detect the user's location, assign the nearest mechanic, and show live tracking during service. Enables secure online payments and keeps a record of all transactions.

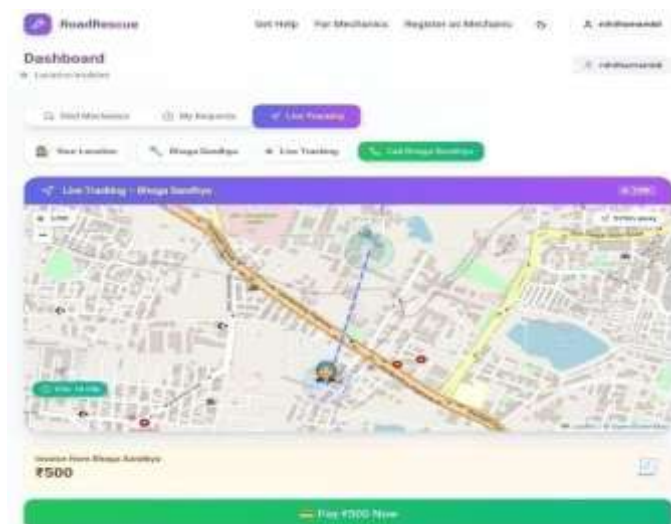
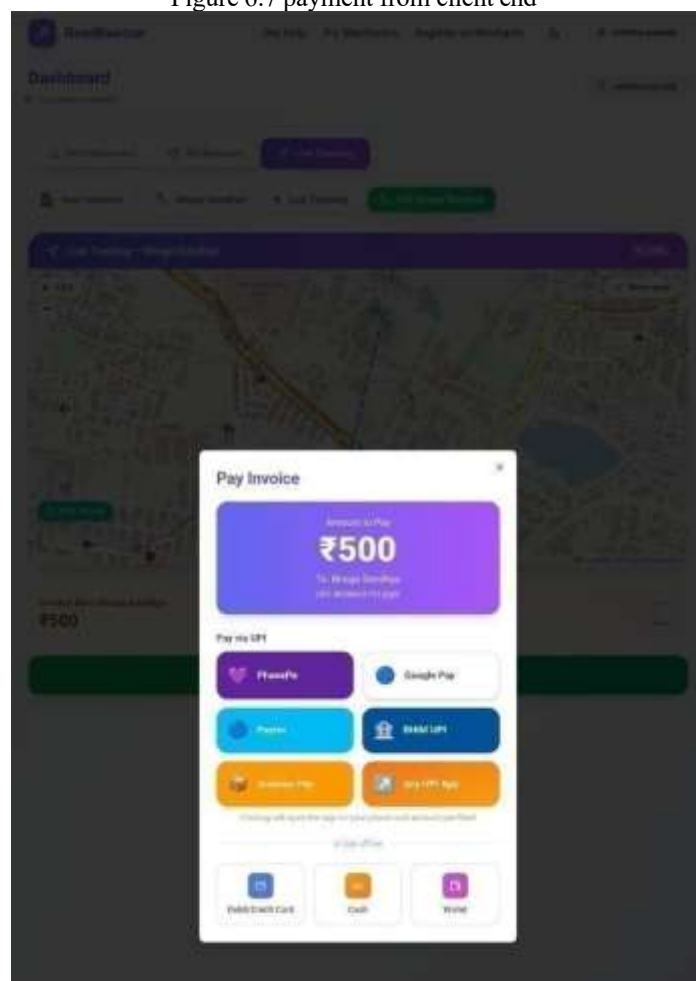


Figure 6.7 payment from client end



VI.COMPARATIVE ANALYSIS WITH EXISTING SYSTEMS

Most of the time, traditional roadside assistance systems use phone calls, local contacts, or looking for mechanics nearby. These methods can work in places you know. They take a long time and don't work well in emergencies, especially in remote areas. They don't offer real-time tracking, automated service allocation, or easy communication, which slows things down and makes things harder for users. Some modern apps and web-based platforms use GPS to find mechanics. These systems make it easier to get help. There are still some things they can't do. They often don't have real-time tracking, have limited communication options, and need to be connected to the internet. Users can't always keep track of the mechanics' movements or guess when they'll arrive, which makes things uncertain in emergencies. Mobile-based help systems work better. Give users a better experience than old-fashioned ways. But they usually only work on Android or iOS devices. This makes it harder for people who use platforms to get to them. Many of these systems also don't have payment options or good service management features, which makes the process less efficient.

Some systems have ways for users to rate and give feedback on services to make them better. These help users choose mechanics, but the systems still don't automatically assign the closest mechanic. They don't offer a full solution. Most current solutions don't allow for safe payments or keep accurate service history, which makes them less useful. The Vehicle Breakdown Assistance System that has been suggested solves these problems by offering a complete solution.

It uses GPS to find the user's location and send the nearest available mechanic, which cuts down on response time by a lot. With map services, the system lets users track the mechanic's movement and estimated arrival time in real time. The system also lets users and mechanics talk to each other, which makes it easier to coordinate service. It keeps track of service history and offers safe payment options, which makes things more clear and easier for users. The platform is a web-based app, so it can be used on any device without any restrictions. In general, the proposed system is a better option than traditional and existing systems because it is more efficient, reliable, and easy to use. It combines real-time tracking, communication, and secure transactions with automation into a platform that offers a full roadside assistance solution for today's users.

VII. FUTURE ENHANCEMENTS

Making an app can improve the system. This will make it easier for users to get notifications, find their way around, and get to places. You can add a feature that lets you send SMS messages when you're not online. This lets people still ask for help even if they don't have internet. The system will work well even if the internet is slow.

Putting AI into the system can help find problems with cars before they happen. This will cut down on breakdowns. The system can be made to support languages. This will make it easier for users from areas to use. These changes will make the system work better be easier to use and be more reliable. The system will be more helpful, with these improvements. The mobile app and AI features will make it more efficient.

VIII. CONCLUSION

This project is a way to help people when their vehicle breaks down. It connects people with mechanics who're close by in real time. This means people do not have to wait for a time to get help when they need it. The project has some useful features like a way to talk to mechanics, a safe way to pay for services and a way to track where the mechanic is. All these features make it easy and safe for people to get help when their vehicle breaks down. The system is also easy to use. It saves people a lot of time. People can even give feedback on the service they got which helps make sure that the service is good.

IX. REFERENCES

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