

On Road Vehicle Breakdown Assistance (ORVBA)

ABSTRACT

On Road Vehicle Breakdown Assistance (ORVBA) is a reliable and user-friendly solution designed to assist individuals facing vehicle breakdowns, especially in remote locations. The system connects registered users with legally licensed and approved mechanics or towing services through a trusted digital platform. Every mechanic listed in the ORVBA system is verified and monitored to ensure fair practices, with strict guidelines against charging extra service fees. Users can share their feedback after availing services, helping maintain service quality and transparency.

In addition to on-ground assistance, ORVBA also integrates an intelligent AI-powered chatbot that provides instant support for all user queries related to bike or car issues. Whether it's troubleshooting a problem, getting maintenance advice, or understanding service procedures, the chatbot offers real-time guidance to enhance user experience and reduce dependency in urgent situations. This combined approach ensures that vehicle owners receive prompt, accurate, and trustworthy assistance wherever they are.

System Specifications

Hardware Requirements:-

Processor : Intel(R) 2.10GHz

Installed memory (RAM) : 4 GB

Hard Disk : 160 GB

Operating System : Windows (10,11)

Software Requirements: -

MERN React JS Software Languages

Front End : React JS, CSS3, Bootstrap

Back End : Express JS, Node JS,

Data Base: Mongo DB

Tools:

VS Studio

Mongo DB

Module List

System Modules

User modules:

- Register
- Login
- View Business Details
- Give Request
- Post feedback
- Make Whatsapp Chats
- Share location
- My Request
- My Profile
- Using AI-ChatBot

Admin modules:

- Login
- Approve Business
- View User Details

Business modules:

- Register
- Login
- Post Business Details
- New Request
- Update Request Status
- View Feedback

Module Description

The system after careful analysis has been identified to be presented with the following modules **User, Administrator and Business.**

User Modules:

1. Register:

Allows new users to create an account on the ORVBA platform by providing basic information such as name, contact number, email, and location details.

2. Login:

Authenticates existing users by verifying their email and password, granting access to their personal dashboard and system features.

3. View Business Details:

Enables users to browse through the list of registered and approved mechanics or towing service providers available near their location.

4. Give Request:

Allows users to send a service request for vehicle assistance, which will be directed to the nearest available and approved business.

5. Post Feedback:

After availing a service, users can provide feedback and rate the mechanic or towing service to help ensure quality control and user satisfaction.

6. Make WhatsApp Chats:

Provides a feature to directly initiate WhatsApp conversations with the mechanic or business for quick communication and assistance.

7. Share Location:

Enables users to share their location, ensuring accurate service dispatch and faster response time.

8. My Request:

Displays the list of service requests made by the user, along with their status (Pending, In Progress, Completed, etc.).

9. My Profile:

Users can view and update their personal profile information such as name, contact number, and email.

10. Using AI-ChatBot:

An integrated AI-powered chatbot helps users with queries related to vehicle problems, assistance procedures, and general FAQs about the platform.

Admin Modules:

1. Provide Approval:

Admin reviews and approves the registration of mechanics or towing businesses before allowing them to be listed on the platform.

2. View User Details:

Admin has access to all registered user details to monitor platform usage, resolve disputes, or ensure security compliance.

Business Modules (Mechanic / Towing Service Providers):

1. Register:

Allows service providers to sign up on the platform by submitting necessary documents and business details for approval.

2. Login:

Enables registered businesses to log in securely to manage their profiles and service requests.

3. Post Business Details:

Businesses can add and update their service-related information, such as service types, operating hours, location, and contact info.

4. New Request:

Displays new service requests submitted by users in the provider's locality, allowing them to accept and respond accordingly.

5. Update Request Status:

Businesses can update the current status of a user request, such as "Accepted", "On the Way", "Completed", etc.

6. View Feedback:

Businesses can view feedback and ratings provided by users to evaluate their service performance and improve if necessary.

Existing Solution:

Currently, vehicle breakdown assistance is typically provided through traditional roadside assistance services such as the Automobile Association of Malaysia (AAM) or third-party mobile applications like CarBengkel, BengkelHub, and MyAssist. These services allow users to request towing, fuel delivery, jump-starts, and minor mechanical repairs. Most of these platforms rely on a centralized call center, where the user must contact an operator, describe the issue, and wait for the nearest mechanic or service provider to be dispatched.

Additionally, some newer mobile apps use basic location tracking and manual feedback forms but do not feature real-time user interaction, AI chatbot support, or

integration with WhatsApp for direct communication. In many cases, workshop details are limited or not verified, and many apps are region-specific with minimal coverage in rural areas.

Disadvantages of Existing System

1. Lack of Real-Time Support:

Most existing systems do not offer instant chatbot or AI assistance, leaving users without quick guidance or first-level troubleshooting help.

2. Limited Service Coverage:

Many platforms only work in major cities, leaving highway and rural area breakdowns unsupported or with delayed response.

3. Dependence on Manual Intervention:

Users must often call a hotline and verbally explain their situation, which can be stressful during emergencies.

4. No Integration with WhatsApp or Location Sharing:

Most apps lack built-in WhatsApp support or direct GPS-based live location sharing, which could ease the process of finding the vehicle's exact location.

5. Unverified Service Providers:

Some applications list unverified or unlicensed mechanics, risking scams or poor service quality.

6. Poor User Experience & Interface:

The user interface in several existing systems is outdated or hard to navigate, especially for non-tech-savvy users.

7. No Feedback Loop or Rating System:

Many existing systems lack post-service feedback mechanisms, which limits transparency and quality control.

8. No Personalized Recommendations:

The absence of AI means users don't receive tailored advice based on vehicle type, location, or issue severity.

Proposed Solution:

The On Road Vehicle Breakdown Assistance (ORVBA) system is a smart, AI-integrated, location-based web and mobile application designed to offer seamless support for vehicle users facing mechanical issues or breakdowns in any part of India. The system connects vehicle users with verified, licensed mechanics and towing services available in their nearby locality. Users can register, log in, view available businesses, and send service requests directly from the platform.

An AI-powered chatbot is integrated into the system to answer common vehicle-related queries, offer troubleshooting guidance, and assist in service selection. The platform also features WhatsApp chat integration and live location sharing to simplify communication between users and service providers. Admins approve businesses, manage user details, and monitor the system to ensure service quality. Feedback and review mechanisms help maintain trust and prevent overcharging.

Advantages of the Proposed System

1. Real-Time AI Chatbot Support

Users receive immediate answers to queries and troubleshooting suggestions through a built-in AI-powered chatbot, reducing panic and wait time.

2. Verified and Licensed Service Providers

Only registered and admin-approved service providers are listed, ensuring trustworthy and high-quality service.

3. **24/7 Assistance Anywhere**

Users can access the service at any time, even in remote or rural areas, making it more dependable than traditional methods.

4. **WhatsApp Integration for Easy Communication**

Built-in WhatsApp chat functionality enables users to contact mechanics instantly without needing to switch apps.

5. **User Feedback System**

After availing a service, users can post reviews and rate the mechanic, increasing transparency and accountability.

6. **Admin Monitoring and Control**

Admins can approve businesses, view user activities, and monitor complaints, ensuring service integrity and quality control.

7. **Minimal Cost and Easy Access**

The system is open-source and free to download, with a lightweight interface for easy access via mobile phones and tablets.

8. **Multi-City Business Listing**

Vendors can register their services across multiple Indian cities, allowing broader support coverage for users.

9. **User-Friendly Interface**

Designed with ease-of-use in mind, the platform supports all types of users, including those with minimal technical knowledge.

CONCLUSIONS

In conclusion, the proposed On Road Vehicle Breakdown Assistance (ORVBA) system offers a highly effective solution for addressing emergency vehicle breakdowns. The application is designed to quickly identify and locate the nearest registered and verified service providers, significantly aiding users during urgent

situations. By offering direct contact information, and AI-powered support, the system enhances the overall user experience and proves to be more efficient than traditional or existing methods.

The application provides reliable assistance for a range of roadside emergencies, including mechanical breakdowns, towing needs, flat tire changes, and vehicle collisions. All service-related information is stored securely on the server, ensuring quick access and seamless coordination. Ultimately, the system is a practical and essential tool for ensuring safety and convenience on the road.

FUTURE ENHANCEMENT

1. Real-Time Tracking of Service Providers:

Enable users to track the live location and estimated arrival time of the mechanic or towing service after request confirmation.

2. Multilingual Support:

Introduce regional language support to cater to users from various parts of India, improving accessibility and usability.

3. Emergency SOS Button:

Add a panic/SOS button for users in distress to alert nearby services and family contacts instantly.

4. Service History and Rating Analytics:

Allow users to view their past service requests and detailed performance ratings of service providers for better decision-making.

5. Subscription Plans:

Introduce premium support options for businesses and regular users, offering faster response times and additional features.

6. IoT Integration:

Integrate with vehicle sensors to automatically detect breakdowns and send alerts to nearby service providers without user input.

7. Insurance Tie-ins:

Collaborate with insurance companies to directly link claim processes and offer bundled roadside assistance coverage.

