# On Road Vehicle Breakdown Assistance

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*Abstract :* **The On Road Vehicle Breakdown help (ORVBA) app is a revolutionary solution designed to alleviate the common frustrations and anxieties associated with roadside vehicle breakdowns. Traditional models of roadside assistance often suffer from limited mechanic networks and cumbersome processes, leading to prolonged wait times and heightened stress for drivers. The ORVBA app addresses these shortcomings by leveraging cutting-edge location-based technologies, a comprehensive mechanic database, and transparent real-time tracking tools. At the core of the ORVBA app is its ability to quickly identify individuals in need of roadside assistance based on their location. Using GPS and mapping technologies, the app pinpoints the exact location of a stranded vehicle, enabling swift response times and efficient service deployment. On Road Vehicle Breakdown Assistance (ORVBA) is going to be a good solution for the people who seek help in the remote locations with mechanical issues of their vehicle. Users of the On Road Vehicle Breakdown Assistance will be the registered public and they will be getting connected with the particular mechanic through the trustworthy On Road Vehicle Breakdown Assistance (ORVBA) system. Because only the legally licensed and approved mechanics are enlisted in the On Road Vehicle Breakdown Assistance (ORVBA) system. Also they are under monitoring by the ORVBA system for not charging any extra service fee from the users as every user is updating their feedback about the availed service through ORVBA system.**

*Keywords: Roadside assistance, Remote locations, GPS, Mechanic database, Real-time tracking, Swift response, Efficient service, Registered users.*

## 1. INTRODUCTION

The worst kind of inconvenience are vehicle breakdowns, which can happen at any time, leaving one extremely stressed and disrupting their plans. This is particularly true in situations where malfunctions happen in isolated locations or distant from established technician networks, where it may seem impossible to receive help quickly. Although they operate well in many situations, traditional roadside assistance models' limited network reach can cause them to fail in these isolated or unfamiliar places, leaving stranded vehicles without access to timely aid. Introducing the On Road Vehicle Breakdown Assistance (ORVBA) app, a ground-breaking fix meant to reduce the annoyances caused by car malfunctions. For drivers in need, this cutting-edge software acts as a lifeline by quickly and easily linking them with local mechanics who are ready to help. Through the utilization of state-of-the-art location-based technology and an extensive database of knowledgeable specialists, ORVBA optimizes the help-seeking procedure, guaranteeing that drivers obtain the assistance they require at the optimal moment. The capacity of ORVBA to significantly cut down on stranded motorist wait times is the key to its efficacy. By utilizing an advanced matching algorithm, the app locates and sends the closest and best-suited mechanic to the breakdown site as soon as possible, saving you time while you're stuck on the side of the road. In addition to easing drivers' immediate stress and discomfort, this also avoids potentially deadly scenarios that could develop from extended exposure to hazardous or remote areas. Additionally, ORVBA seeks to address the widespread anxiety that frequently accompanies auto repairs, especially when done in a new environment. Through the app, drivers can easily acquire necessary repair services from anywhere, giving them the ability to take back control of their situation and handle breakdowns with confidence. Drivers can relax knowing that assistance is only a few touches away, whether they find themselves stranded in the middle of an unknown city or on a deserted stretch of highway.

## 2. Literature Survey

The main aim of the current work is to build a platform which provides immediate local assistance during a vehicle breakdown. A connected environment accessible by both commuters and service providers, specific to a geographical region is designed and investigated. The platform is accessed through a connected cellular device. A dedicated hardware is attached to the vehicle, to

collect vehicles' environmental parameters. The information collected along with the type of assistance required, is shared among the local service providers through telemetry protocol. The real-time practicability of the proposed solution is validated through a prototype model. The measured values have been compared with existing solutions in terms of parameters such as, total time required, mobile battery drain and tracked location accuracy. The difference between using a Representational State Transfer (REST) protocol and Telemetry protocol is also equated. Vishnu Kumar and Aswath present a revolutionary method aimed at meeting the urgent demands of drivers who experience vehicle breakdowns in their March 2021 study. Their main goal is to create a platform that would enable timely local help that is customized for particular areas. This platform is mostly accessed by cellular devices and functions inside a networked environment that is available to both service providers and commuters. On Road Vehicle Breakdown Application (ORVBA) is going to be a good solution for the people who seek help in the remote locations with mechanical issues of their vehicle. Users of the On Road Vehicle Breakdown Application will be the registered public and they will be getting connected with the particular mechanic through the trustworthy application system. Because only the legally licensed and approved mechanics are enlisted in the On Road Vehicle Breakdown Application (ORVBA) system. In an existing system there are users who have their own mechanic database which is very minimal. And also they have no idea if their vehicles broke down or had any mechanical issue in remote locations or any long distant locations from their known mechanic shops. In a proposed Here the users of On Road Vehicle Breakdown Application (ORVBA) system can search for a list of mechanics at any location or the nearby locations which will help them in unexpected situations raised by the mechanical issues of their vehicles. Elakkiya R. and Bavithra present the On Road Vehicle Breakdown Application (ORVBA) in their May 2020 proposal as a potential fix for people having mechanical problems with their cars in out-of-the-way places. The ORVBA system is designed to help people who are in need of help in remote or unfamiliar regions by providing a dependable application platform that links users with mechanics who are dependable. The rigorous screening procedure that ORVBA employs for mechanics hired into the system is one of its main characteristics. The ORVBA database only contains mechanics who are duly licensed and approved, guaranteeing that users get help from reliable experts. This is in contrast to current systems, which frequently provide users with restricted access to mechanics and little guarantee regarding their qualifications or dependability. The authors point out that one significant drawback of the existing systems is the small mechanic database that users have access to. This restriction becomes more troublesome when users encounter malfunctions in far-off or isolated areas, where they might not have access to dependable mechanics. On the other hand, ORVBA gives customers access to an extensive directory of mechanics in each particular area, enabling them to get help no matter where they end up stuck. The suggested ORVBA system gives customers the option to look for mechanics locally or in their immediate area, which can come in handy in case of an unforeseen breakdown. This functionality fills a vital need for people who have mechanical problems while driving by improving the accessibility and ease of roadside help. All things considered, Elakkiya R. and Bavithra's ORVBA proposal is a noteworthy development in the field of roadside assistance, providing a dependable and easily accessible alternative for drivers in need. With its extensive mechanic database and intuitive interface, ORVBA has the power to revolutionize how people handle car problems and offer comfort and prompt support when it counts most. It introduces a comprehensive solution to address the challenges faced by individuals encountering mechanical issues with their vehicles in remote or unfamiliar locations. The On Road Vehicle Breakdown Application (ORVBA) is designed to cater to the needs of registered users who require immediate assistance from reliable and legally licensed mechanics. One of the key advantages of the ORVBA system is its ability to connect users with verified mechanics through a trustworthy application platform. Unlike existing systems that may have limited or unverified mechanic databases, ORVBA ensures that only legally licensed and approved mechanics are enlisted in its system.

### 3. OVERVIEW OF THE SYSTEM

**3.1 Existing system**

Many times, the shortcomings and inefficiencies of the current roadside assistance system are highlighted. Usually, drivers rely too much on a small circle of reliable mechanics or conventional roadside assistance providers, which can be inadequate, especially in isolated or unfamiliar places. Because of this dependence on a small network, help can not be easily accessible when it's most required, leaving drivers exposed and stranded. When a breakdown occurs, drivers have to take on the difficult responsibility of actively seeking assistance. Making several calls, frequently in tense situations, to clarify the situation and seek aid is part of this process. Being stranded on the roadside is a stressful scenario, and such endeavors can be time-consuming and frustrating.The current system of roadside assistance is limited. Drivers frequently rely on a narrow network of trusted mechanics or traditional roadside service, which may be unavailable in remote or unfamiliar areas. When dealing with a breakdown, actively searching for help, making contacts, and explaining the situation can be time-consuming and stressful. Furthermore, there is sometimes a lack of clarity about when aid will arrive, which can increase anxiety for stranded vehicles. The difficulties are compounded by the fact that the arrival timing of relief is often unclear. This simply serves to increase drivers' worry and frustration because they are left in a state of ambiguity about when assistance will arrive. Drivers may feel alone and powerless as a result of this lack of transparency, which exacerbates the already unpleasant circumstances. All things considered, the present roadside assistance program does a poor job of efficiently and effectively helping drivers in need. Its dependence on a limited pool of service providers and the laborious and stressful procedure of contacting support emphasize the need for a more dependable and efficient way to handle malfunctions quickly and painlessly.

**3.2 Proposed system**

The proposed system is an Android app that overcomes the constraints of the current system. The app provides access to a large number of mechanics in diverse areas, improving the likelihood of receiving rapid assistance. Furthermore, the app incorporates GPS technology to allow users to quickly locate the nearest accessible mechanics, expediting the breakdown process. The software also offers real-time tracking and updates, allowing users to monitor the mechanic's progress and receive predicted arrival times, thereby eliminating tension and ambiguity. The suggested solution marks a substantial development in the domain of roadside help, offering an Android app designed to overcome the constraints and limitations of the current system. Fundamentally, the software increases the chances of getting quick assistance wherever the breakdown occurs by giving consumers access to a large network of mechanics across several regions. The suggested system's usage of GPS technology is one of its primary benefits; it allows users to easily and quickly find the closest accessible mechanics. The program uses GPS technology to automate help-seeking, doing away with the necessity for manual searches or depending on experienced technicians. This minimizes delay and discomfort by guaranteeing that drivers can quickly connect with mechanics nearby while also saving important time. The app provides users with real-time tracking and updates so they can keep track of the mechanic's work and get estimated arrival times. This feature reduces the stress and uncertainty that come with typical roadside assistance services by improving transparency and clarity. The app fosters trust and reassurance in users by giving them access to real-time information regarding the status of their assistance request. This guarantees that drivers stay informed and in control of the breakdown process. All things considered, the suggested Android app offers a thorough and effective response to the problems with the current roadside help system. With the use of technology, the app gives drivers a convenient and dependable way to handle breakdown issues quickly and efficiently. It also streamlines assistance requests and expands access to mechanics. The suggested system could completely change how drivers traverse roadside assistance with its intuitive UI and cutting-edge capabilities, guaranteeing that support is always .

**3.3  Software Requirements:**

| | |
|---|---|
| Software's | :Java , Php |
| OS | : Windows/Mac |
| IDE | :Android studio |
| Framework | :Java JDK |
| Front-End | :HTML, CSS, and Bootstrap |
| Back-End | :Angular JS, PHP, MYSQL |
| Tool | :Android Emulator |

**3.4  Hardware Requirements:**

| | |
|---|---|
| Operating system | :Windows 7 |
| RAM | :8 GB |
| Hard disc or SSD | :500 GB |
| Processor | :Intel 3rd generation or high or Ryzen |

**4.  Technologies Used**

**4.1 Java Programming Language**

Java is a widely-used, versatile, and robust programming language known for its platform independence, object-oriented approach, and extensive ecosystem of libraries and frameworks. Developed by Sun Microsystems (now owned by Oracle Corporation), Java has become a cornerstone in software development, powering a wide range of applications from desktop software to web applications, mobile apps, enterprise systems, and more. One of the key strengths of Java is its platform independence, achieved through the use of the Java Virtual Machine (JVM). This allows Java programs to run on any device or operating system that supports the JVM, making Java applications highly portable and adaptable across different environments. The "write once, run anywhere" philosophy of Java has made it a popular choice for developers seeking cross-platform compatibility. Java's object-oriented programming (OOP) paradigm enables developers to create modular, scalable, and maintainable code by organizing functionalities into reusable objects. This promotes code reusability, abstraction, encapsulation, and inheritance, facilitating the development of complex and structured software solutions. The Java Standard Edition (Java SE) provides core libraries and APIs for general-purpose programming, including functionalities for input/output operations, networking, multithreading, collections, and more. Java Enterprise Edition (Java EE) extends Java SE with additional features and libraries for building enterprise-level applications, such as servlets, JavaServer Pages (JSP), Enterprise JavaBeans (EJB), and Java Persistence API (JPA) for database interactions. Furthermore, Java has a vast ecosystem of third-party libraries and frameworks, such as Spring, Hibernate, Apache Struts, and JavaFX, which streamline development processes, enhance productivity, and provide solutions for specific domains like web development, database management, GUI design, and more. Java's strong community support, extensive documentation,

regular updates, and backward compatibility ensure that developers have access to resources, tools, and technologies that facilitate efficient and effective software development

## 4.2 Hyper Text MarkUp Language(HTML)

HTML, short for HyperText Markup Language, is a fundamental building block of web development. It provides the structure and layout for web pages by using a series of elements or tags that define different parts of the content. HTML is a key component of the front-end development stack, working alongside CSS for styling and JavaScript for interactivity. One of HTML's primary functions is to create the structure of a web page. This includes defining headings, paragraphs, lists, links, images, tables, forms, and other elements that organize and present content. Each HTML element is enclosed within opening and closing tags, with attributes used to provide additional information or modify the element's behavior. HTML is a markup language, meaning it. uses tags to mark up or describe content. These tags help structure the content and provide semantic meaning to elements, which is crucial for accessibility and search engine optimization (SEO). HTML is designed to be a platform-independent language, meaning web pages written in HTML can be viewed on different devices and browsers without significant changes. Modern HTML standards, such as HTML5, also incorporate features for multimedia elements , and improved support for responsive web design. Overall, HTML serves as the backbone of web development, providing the essential structure and organization for creating dynamic and interactive web pages that are accessible, user-friendly, and compatible across different platforms and devices.Certainly, here are three more paragraphs expanding on HTML. HTML plays a crucial role in creating accessible and inclusive web experiences. Semantic HTML elements, introduced in HTML5, provide meaningful structure to content, making it easier for screen readers and other assistive technologies to interpret and present information to users with disabilities. Another important aspect of HTML is its integration with CSS (Cascading Style Sheets) for styling and layout. While HTML defines the structure and content of a web page, CSS controls the presentation and appearance. CSS rules can be applied to HTML elements to define properties such as colors, fonts, margins, padding, layout positioning, and responsiveness. This separation of structure (HTML) and style (CSS) allows developers to create visually appealing and responsive designs that adapt to different devices and screen sizes, providing a consistent user experience across platforms. Furthermore, HTML forms a foundation for building dynamic and interactive web applications when combined with JavaScript.

## 4.3  Cascading Style Sheets(CSS)

CSS, which stands for Cascading Style Sheets, is a fundamental technology in web development used to style and format HTML elements on web pages. Unlike HTML, which focuses on the structure and content of a webpage, CSS is responsible for the presentation and appearance aspects, such as layout, colors, fonts, spacing, and responsiveness. One of CSS's primary functions is to apply styles to HTML elements. This is achieved by using CSS selectors to target specific HTML elements and defining styling properties such as color, font size, margins, padding, borders, background colors or images, and more. CSS rules can be applied directly within an HTML document using `<style>` tags, or they can be stored in separate CSS files and linked to HTML documents for better organization and reusability. CSS offers a wide range of selectors to target elements based on their attributes, IDs, classes, hierarchy, and more. This flexibility allows developers to create custom styles for different parts of a webpage, ensuring consistent design patterns and visual coherence across the site. CSS also supports inheritance, where styles applied to parent elements can be inherited by their child elements, reducing the need for redundant styling code.

## 4.4 AngularJS

AngularJS, commonly referred to as Angular 1, is a popular open-source JavaScript framework maintained by Google. It is specifically designed for building dynamic and interactive single-page web applications (SPAs) by extending HTML's capabilities with additional functionalities and features. One of the key features of AngularJS is its use of two-way data binding, which establishes a connection between the model (data) and the view (UI). This means that any changes made to the model automatically reflect in the view, and vice versa, without the need for manual DOM manipulation. This two-way data binding simplifies development and enhances the responsiveness of web applications, as changes made by the user or through code are immediately propagated throughout the application. Another important aspect of AngularJS is its use of directives, which are HTML attributes or elements that extend HTML syntax and provide additional functionalities. Directives allow developers to create reusable components, handle DOM manipulation, perform data binding, and interact with external libraries or plugins.

## 4.5 Hypertext Preprocessor

PHP, which stands for Hypertext Preprocessor, is a widely-used open-source server-side scripting language primarily designed for web development. It is versatile, powerful, and known for its ease of integration with HTML, making it a popular choice for building dynamic and interactive websites and web applications. One of the key strengths of PHP is its ability to generate dynamic content on web pages. PHP code can be embedded directly within HTML files using special tags allowing developers to mix PHP code with HTML markup seamlessly. This enables the creation of dynamic web pages that can display different content based on user input, database queries, server variables, and more. PHP also supports various data types, variables, operators, control structures, and functions, providing developers with a wide range of tools for data manipulation, calculations, and logic implementation.

Another advantage of PHP is its extensive support for interacting with databases. PHP can connect to various database management systems (DBMS) such as MySQL, PostgreSQL, SQLite, Oracle, and others, using database-specific extensions or libraries like PDO (PHP Data Objects) and MySQLi (MySQL Improved). This allows developers to perform database operations such as querying, inserting, updating, and deleting data from web applications, making PHP a suitable choice for developing data-driven and content management systems. Furthermore, PHP offers a rich ecosystem of libraries, frameworks, and CMS (Content Management System) platforms that streamline development and enhance productivity. Popular PHP frameworks like Laravel, Symfony, CodeIgniter, and Yii provide MVC (Model-View-Controller) architecture, routing, templating, authentication, and other features that facilitate the development of scalable and maintainable web applications. CMS platforms like WordPress, Joomla, and Drupal leverage PHP to create dynamic websites with customizable themes, plugins, and content management functionalities, catering to a wide range of use cases and industries.

*Economical Feasibility:*

The On Road Vehicle Breakdown Assistance (ORVBA) project demonstrates strong economic feasibility through several key factors. Firstly, the platform promotes cost savings for drivers by facilitating direct connections with nearby mechanics, thereby reducing towing expenses and minimizing the need for extensive travel to seek assistance or procure spare parts. This streamlined process translates into tangible savings in terms of both time and money for drivers, enhancing their overall experience and reducing the financial burden associated with vehicle breakdowns. Additionally, ORVBA contributes to increased operational efficiency by significantly reducing the time taken to access roadside assistance. The platform's efficient matching system and real-time communication capabilities ensure prompt responses and quicker resolution of vehicle issues, leading to lower labor costs for drivers and minimizing potential income losses due to extended downtime. Furthermore, ORVBA prioritizes service quality by only listing licensed and verified mechanics on the platform. This commitment to quality assurance not only improves the reliability of assistance provided but also reduces the likelihood of recurring breakdowns and associated repair costs for drivers.

*Technical Feasibility:*

The technical feasibility of the On Road Vehicle Breakdown Assistance (ORVBA) project is robustly supported by leveraging existing technologies and infrastructure to deliver efficient and effective roadside assistance services. The development of ORVBA involves creating mobile applications for Android and iOS platforms, employing standard programming languages such as Java, Kotlin, and Swift, along with software development kits (SDKs) and integrated development environments (IDEs). These tools enable the creation of user-friendly interfaces and feature-rich applications that cater to the needs of both drivers and mechanics. Furthermore, ORVBA utilizes GPS and location-based services to accurately determine the user's current location, providing real-time information about nearby mechanics and service providers. This integration involves leveraging APIs and mapping services like Google Maps or Mapbox to display interactive maps, route information, and navigation guidance. Additionally, a robust database management system (DBMS) is implemented, utilizing technologies such as MySQL, PostgreSQL, or MongoDB to securely store and manage user data, mechanic profiles, service requests, and feedback.

*Social Feasibility:*

The social feasibility of the On Road Vehicle Breakdown Assistance (ORVBA) project is rooted in its potential to address societal needs, promote safety, and enhance convenience for drivers and mechanics. Firstly, ORVBA ensures accessibility and inclusivity by providing a user-friendly interface that caters to individuals with diverse needs, including those with limited mobility or unfamiliarity with local mechanics. This inclusivity fosters a sense of empowerment and ensures that all drivers can access reliable assistance during roadside breakdowns, regardless of their background or circumstances. Safety and security are paramount in ORVBA, as the platform connects users exclusively with licensed and verified mechanics. This emphasis on partnering with trained professionals reduces the risk of encountering unqualified service providers, instilling confidence in users and contributing to overall road safety. By prioritizing safety, ORVBA contributes positively to the well-being of drivers and promotes a sense of security in handling vehicle-related emergencies. ORVBA also empowers drivers by giving them control over the assistance process. Through features such as real-time communication with mechanics, scheduling appointments, and accessing spare parts, drivers can actively participate in decision-making and ensure that their vehicle needs are addressed efficiently.
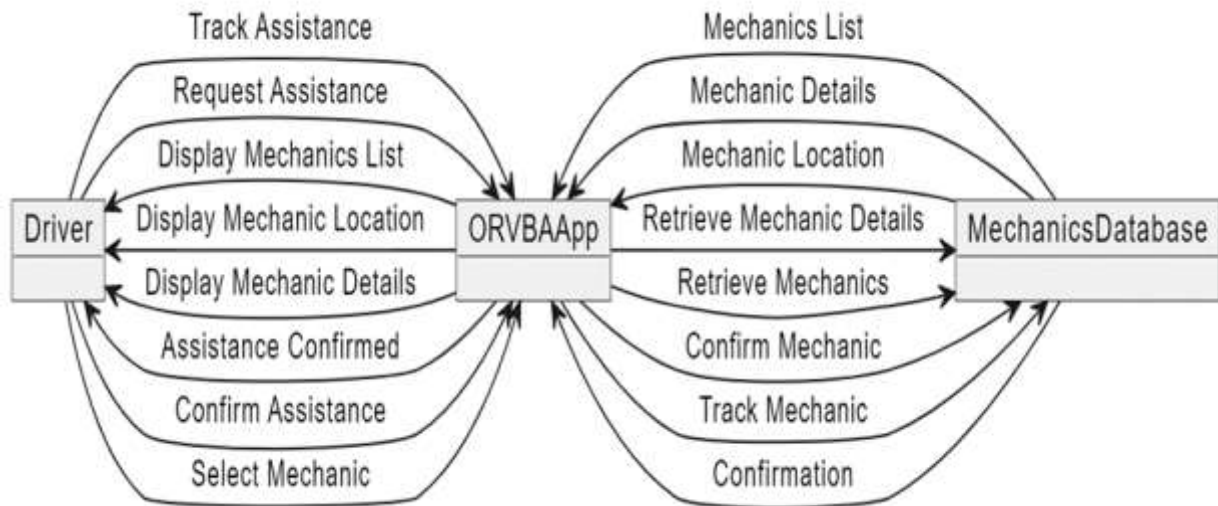
5. **Architecture**
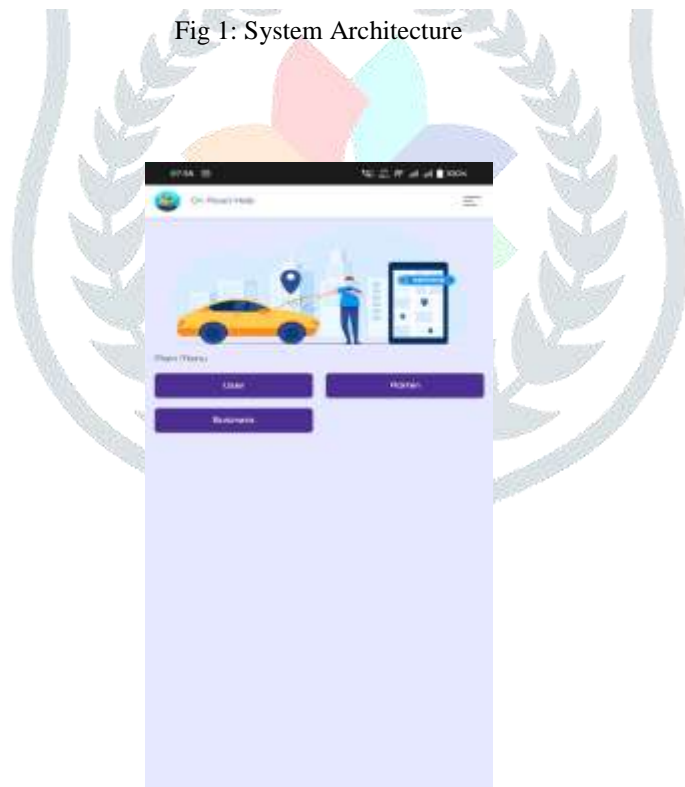


Fig 1: System Architecture

6. **RESULTS SCREENSHOTS**
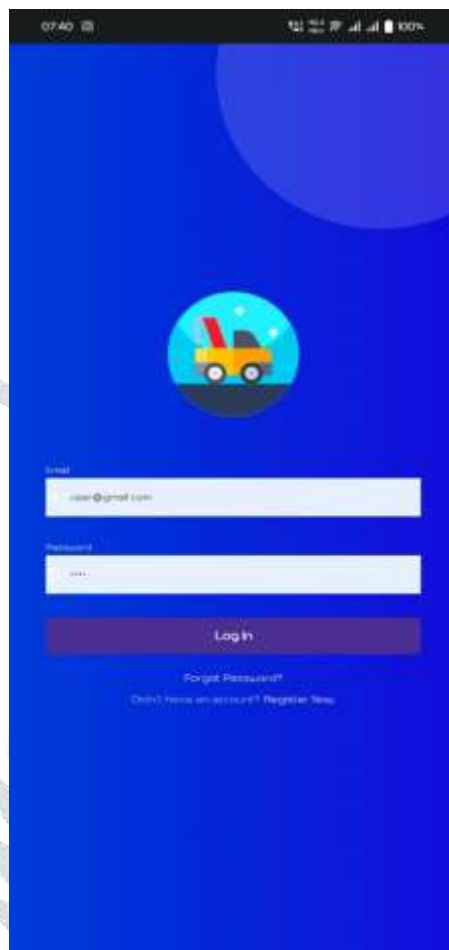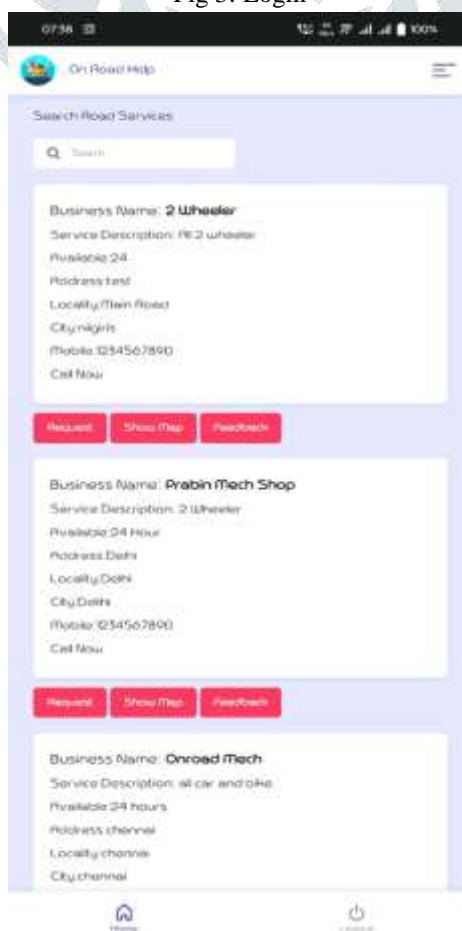


Fig 2: ORVBA Application

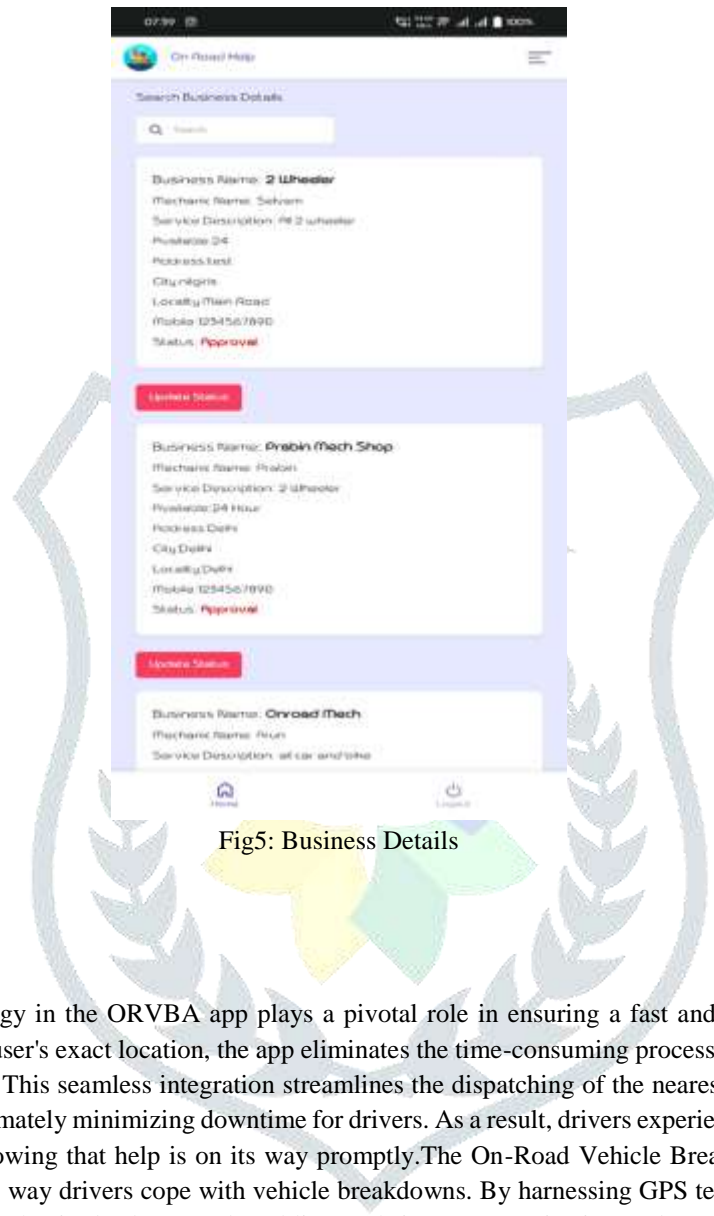Fig 3: Login



Fig 4: User Service

Fig5: Business Details

## 7. CONCLUSION

The integration of GPS technology in the ORVBA app plays a pivotal role in ensuring a fast and efficient response to vehicle breakdowns. By pinpointing the user's exact location, the app eliminates the time-consuming process of manually relaying location information to service providers. This seamless integration streamlines the dispatching of the nearest available mechanic, leading to quicker response times and ultimately minimizing downtime for drivers. As a result, drivers experience reduced stress and anxiety during breakdown situations, knowing that help is on its way promptly.The On-Road Vehicle Breakdown Assistance (ORVBA) app promises to revolutionize the way drivers cope with vehicle breakdowns. By harnessing GPS technology, providing seamless integration with an expansive mechanic database, and enabling real-time communication and tracking, ORVBA transcends the inherent limitations of traditional roadside assistance models. The proposed system significantly reduces wait times, empowers drivers with immediate access to assistance, and promotes transparency throughout the repair process.

## 8. FUTURE ENHANCEMENT

On-Road Vehicle Breakdown Assistance (ORVBA) app has a promising future. Integrating sophisticated technology such as car diagnostics, AI-powered troubleshooting, and augmented reality might dramatically change how breakdowns are handled. Expanding the service options by supporting a broader range of automobiles, providing customisable service plans, and introducing preventative maintenance capabilities would increase the app's popularity. Using the acquired data can reveal useful insights about breakdowns, optimize services, and even enable predictive maintenance. Finally, by forming connections with roadside assistance providers and insurance organizations, as well as cultivating a community based on user ratings, your app can position itself as a whole car support ecosystem. The On-Road Vehicle Breakdown Assistance (ORVBA) app holds immense potential for revolutionizing the way breakdowns are managed in the future. By integrating advanced technologies such as car diagnostics, AI-driven troubleshooting, and augmented reality features, the app can significantly enhance the efficiency and effectiveness of handling breakdown situations. Expanding service options to encompass a wider range of automobiles, offering customizable service plans, and incorporating preventative maintenance capabilities would attract more users and boost the app's popularity. Leveraging the data collected from users can unlock valuable insights into breakdown patterns, enabling the optimization of services and even facilitating predictive maintenance strategies. Furthermore, establishing partnerships with roadside assistance providers, insurance companies, and fostering a community centered on user ratings and feedback would position the app as a comprehensive car support ecosystem, catering to the diverse needs of drivers and enhancing overall customer satisfaction.

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