

# A Framework to Implement a Smart Road Secured Assistance Application for Women Drivers in Oman

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## ABSTRACT

This paper, explores the feasibility of developing a smart road assistance application (android based) for women drivers in Oman, understanding the critical requirements of the stakeholders and proposing a technical framework to meet their expectations. Usually, when women drivers are abruptly stuck in remote locations due to accidents or other issues, many have trouble getting secured assistance. These potential issues are the driving force behind proposing a road assistance app connecting the driver to the nearest service station or mechanic. The user can update the current location in the proposed technical framework, and the application can route the user to the nearest service station. The application can display the expected time taken by the service station staff to reach the location. The application can send a notification to the nearest service center once the requester has submitted the request. The driver can also perform a live tracking of the staff's location. Primary and secondary data will be used to develop the proposed application, which is expected to simplify the user experience in urgent situations. The proposed mobile app lessens traffic congestion that can result from halting a car in the middle of the road, as well as ensure driver safety and works to prevent any hazard that might arise on the road. This paper evaluates the design framework to be used for implementing location-based service to the requester and live tracking of service staff's route. This research also covers the challenges in implementing the proposed technical framework. Finally, this paper includes a few recommendations after studying the limitations of the proposed application.

## **Introduction**

Nowadays, travel is something that everyone does daily. When we travel, we use a range of cars, and since most of them are regularly used and subjected to a variety of situations, issues should arise from time to time. These defects in the cars can also be corrected by self-repair. Many people find it difficult to get help when their cars break down on the road. Helping individuals in need whose cars might break down on the highways and enabling the user to benefit from this program are motivated by these potential concerns. In today's world, most people commute to work and get around in their own cars. Many of us have car breakdowns while driving the worst experience is happening right now, as a result, the user must look for the closest mechanic as well as local shops that offer replacement parts when their car unexpectedly breaks down while they are travelling. The fact that we couldn't find a reputable repair at the time forced us to find an alternative mode of transportation. The motorist must then ask a bystander for help to solve the parking problem; however, the assistance may not be of high-quality technology, and he may also be unable to locate a bystander to assist him. Using this program makes it easier for users to find a mechanic nearby who might be able to fix their problem when they are unexpectedly stuck in remote regions. For those who might want assistance when traveling to far sites in isolated areas, as well as generally inside the Sultanate of Oman and in some other countries, it is a terrific solution. By submitting details about the car, its state, the type of problem, setting up a chat platform, and then paying

for the repair of the car at a fair price, the user can save time and effort by using this application to find a skilled technician. This initiative therefore helps those who aren't unsure of their automobiles and makes it easier for them to locate a speedy fix. The administrator can write notes for the mechanic and the type of service required, as well as review all the task data for the registered user and mechanic.

## Related Work

Existing applications for road vehicle breakdown assistance face several limitations and challenges, including:

1. Limited coverage: Existing applications may not cover all regions or areas, leaving some drivers without access to assistance.
2. Delay in response time: It can take a long time for a tow truck or mechanic to arrive at the breakdown location, which can cause inconvenience and frustration to drivers.
3. Lack of transparency: Drivers may not have a clear understanding of the status of their request for assistance or the estimated time of arrival of the tow truck or mechanic.
4. Safety concerns: Drivers may not feel safe waiting for assistance on the side of the road, especially at night or in remote areas.

The proposed application for road vehicle breakdown assistance aims to address these limitations and challenges by:

1. Providing nationwide coverage: The application will have a large network of service providers, ensuring that assistance is available in all regions.
2. Real-time tracking: Drivers will receive real-time updates on the status of their request and the estimated time of arrival of the service provider, reducing anxiety and uncertainty.
3. Reliable assistance: The application will partner with trusted and reliable tow truck companies and mechanics, ensuring a high-quality and timely response.
4. Enhanced safety features: The application will include safety features, such as roadside assistance cameras and emergency response buttons, to ensure drivers feel safe while waiting for assistance.

Overall, the proposed application aims to provide a seamless and reliable experience for drivers in need of road vehicle breakdown assistance, giving them peace of mind and reducing the stress and inconvenience of a breakdown.

## Methodology

It is possible to construct this system using a variety of methods. I opt for the agile strategy. Agile project management organizes projects into several phases. At every stage, continuous improvement is required, as is continuing stakeholder involvement. Teams move through the planning, implementation, and assessment phases as soon as work begins. It is a project management approach that calls for iterative and ongoing development. The foundation of agile project management is the notion that via quick and responsive adjustments, projects may be constantly improved throughout their life cycles. Because of its adaptability, flexibility, and focus on customer feedback, agile is one of the most popular project management methodologies. Because the development of the services and use offered by reaching all societal sectors is important for this app, this app helps users in the event of any car defects and enables the spread of these electronic services, which promotes the spread of these electronic services and reduces the incidence of vehicle issues.



### System Architecture

This app is designed to help women and people whose car may suddenly stop on the roads, which may cause them to be delayed and disrupted in places where they may go. And this application will be useful for them and can be used easily and quickly. All you must do is enter the vehicle's information and the app will display all available machinery near it that may be able to help. One of the features of the application is that the user can enter information about his vehicle, type of defect, location, and phone number. They can then locate and contact a mechanic near where they are located to address their issue. User can also view list of nearby auto repair garages. From this application, users can also make payments based on their services.

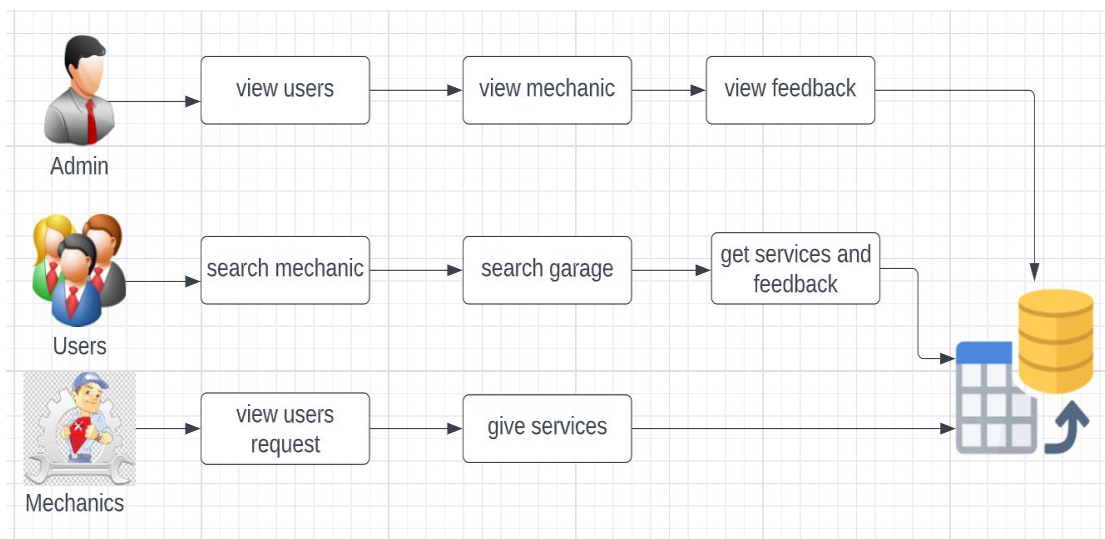


Figure 1. System architecture

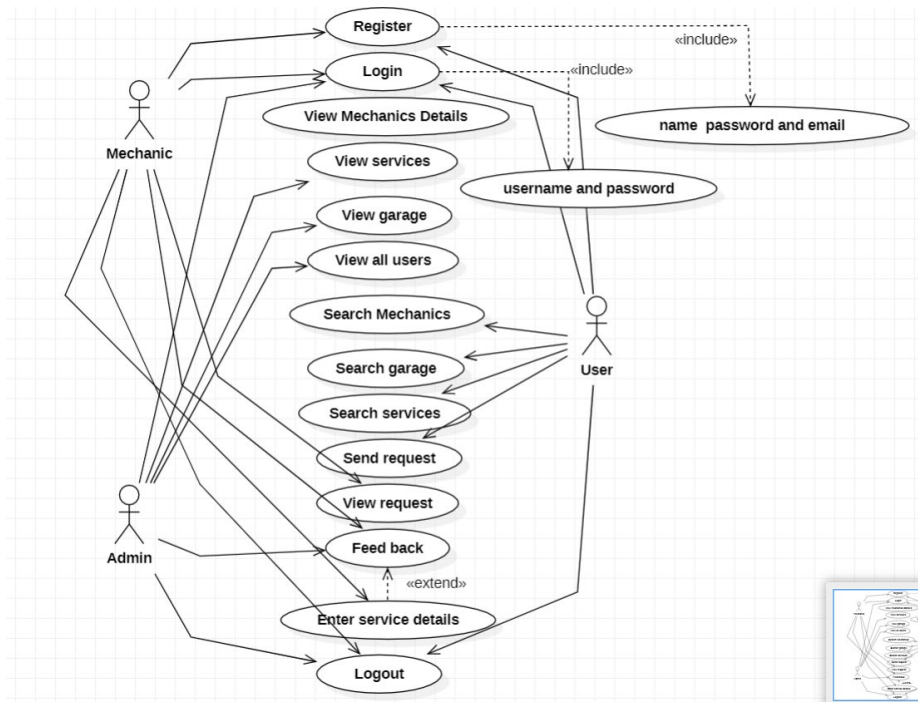


Figure 2. Use case diagram

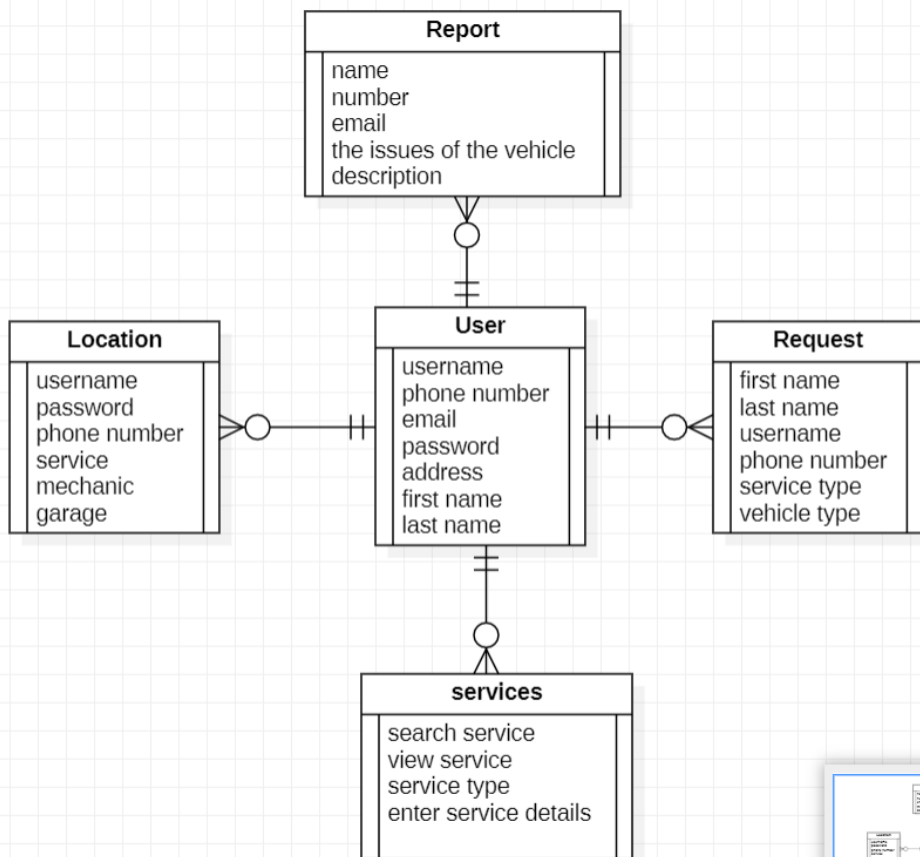


Figure 3. Entity Relationship Diagram

**Conclusion**

In conclusion, the proposed application for road vehicle breakdown assistance is a much-needed solution to the limitations and challenges faced by existing applications. By providing nationwide coverage, real-time tracking, reliable assistance, and enhanced safety features, the application aims to improve the experience of drivers in need of assistance and reduce the stress and inconvenience of a breakdown. The application has the potential to revolutionize the industry by providing a more efficient and reliable system for providing roadside assistance. With the increasing reliance on vehicles for transportation, a reliable and efficient breakdown assistance service is essential to ensure the safety and comfort of drivers. Thus, the proposed application has the potential to be a game-changer in the road vehicle breakdown assistance industry.

## Recommendation

It is impossible to forecast when a user would have a vehicle breakdown, even if the likelihood of a properly maintained car breaking down is low. The application created here promises to make a vehicle owner's life much simpler because, even in the unlikely event of a breakdown, the owner is confident that he will have a solution to the issue within a few steps of entering information into his smart phone and prevent himself from suffering a significant setback in such an undesirable situation. The suggested solution aims to offer the owner of a particular vehicle some peace of mind in the case of operational failure by serving as a form of protection against the unpredictable nature of a vehicle breakdown.

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