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VEHICLE SERVICE MANAGEMENT SYSTEM

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Abstract: In today's era, vehicles are integral part of day-to-day life. Vehicle owners can minimize any problems or issues by regularly maintaining/servicing vehicles. Due to busy schedule of vehicle owner as well as long waiting time on service centre it is very difficult to get service of their vehicles within manageable time. By keeping the tight schedule of vehicle owner as well as service centre, we have developed a web application to automatize the entire service process. We have done thorough study of existing body of knowledge to evaluate the day-to-day activities/operations and transactions carried out within service centres. The researchers collected preliminary data and concluded that most of the service centres/garages still rely on traditional manual transactions. In this paper, authors have proposed an effective and efficient web-based portal for vehicle maintenance/service which can automatically control the entire manual process performed in the service centre while monitoring the repairs and services. Regular vehicle servicing is necessary to carry out checks different component of the vehicle in order to make sure proper and efficient operation of the vehicle. This system is beneficial for garage owners / admin user, mechanics and customers.

Index Terms **- maintaining/servicing, vehicle owners, automatize, transactions, effective, mechanics, customers, operations, garage owners.**

I. INTRODUCTION

With advancing globalization, transport plays an important role. Nowadays, vehicles are very crucial in transportation sector. Also, the number and uses of vehicles has been phenomenal in recent years due to population growth and human needs. Vehicle control therefore becomes a big and much more difficult problem to solve. Vehicle control systems are used for effective control. In today's world, the human population is growing in number. So, the vehicle they use will be more in number. Monitoring becomes a big challenge. Maintaining vehicle and data records is a complex task in a manual process and it is also difficult to generate reports. Also, customer satisfaction is a necessity.

Customer service and service management is a determining factor in choosing a particular dealership and ensuring customer loyalty. The day-to-day tasks of service dealers include service requests and planning, optimization of technicians, tools and parts, as well as their deployment and planning. We need an application that will provide an online platform to mechanics, administrators, and customers for garages. Therefore, the daily operations and transactions of the automobile service will be automated by this technology. Processes including managing vehicle service orders, maintaining maintenance records, managing client records and transaction records, service updates, and billing will all be electronically streamlined by the system. Managing service requests and keeping all kinds of data takes less time for the administrator, mechanic, and customer as a result of this. It is simpler to use software to automatically maintain car entries in the database than it is to do it by hand. It will have an easy-to-use UI that is straightforward to use.

II. LITERATURE REVIEW

For the literature review of this paper, we have referred to numerous sources like web-portal, journals and conference papers and even some project reports as well. Searching websites using keywords like "Vehicle Service System," "Car Service System," etc. proved quite helpful.

Analyses were done on a website called "Gaadizo" in Delhi NCR, for the most part. Former Honda executive Vikas Mitra developed it. There are many service centers operated by Gaadizo, including ones in Noida, Gurgaon, Ghaziabad, etc. The distribution of genuine components, a service warranty, simple service progress tracking, etc. were features of this system [4].

Most of the references found during the literature survey were relevancy to "Vehicle Tracking System", but unfortunately no use for our work, but we also found useful web portals such as "DreamzTech Solution", "CarZ", "The Bike Doctor" and many others.

Mazda has created a comparable application. The headquarters of Mazda Motor Corporation are located in Fuch, Aki District, Hiroshima Prefecture, Japan. This business created an application called "MyMazda." This software helped the user find and map out service centres, set up appointments, and get information about the car. Pepboys (http://www.pepboys.com) also

facilitates online vehicle booking services. They made it easy to choose vehicles, choose a place, choose a date, choose a time and make payments online using a credit card only. They also supply their services on a global scale. Also in current scenario, talking about day-to-day activities all the exercises and operations are performed manually in car repair shops. These tasks are either performed by garage owner for the mechanics, by mechanics for the customers or by admin(garage owner) for the customers.

Few tasks which are not performed by them include:

A) Admin

- Manually handle day to day transactions.
- Lack of proper customer records.
- No live Vehicle service updates.

B) Mechanic

- Lack of a proper mechanism of assigning tasks.
- No frequent sharing of vehicle service status updates.
- No robust records of completed services.

C) Customer

- Cannot give proper feedback
- Viewing bills and invoices
- No live vehicle service status updates.
- Explaining the repair task at hand

III. SYSTEM ARCHITECTURE

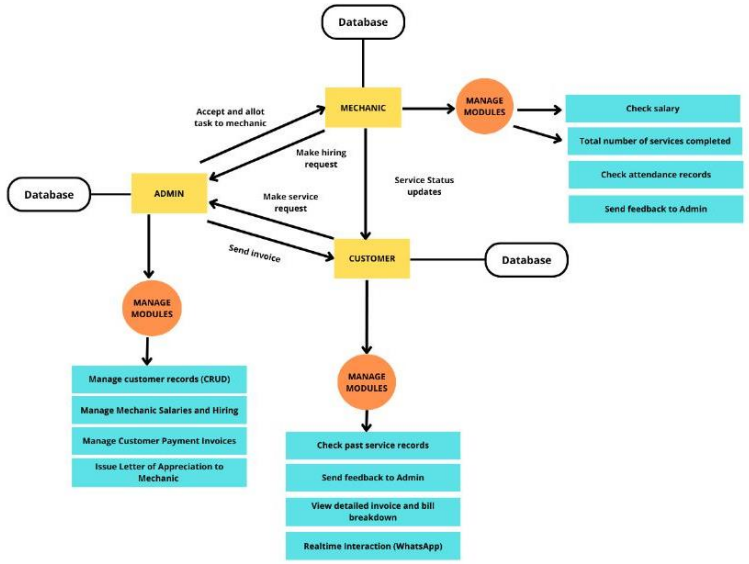


Figure 1: Proposed System Architecture

In addition to the main page, there are two boards: Admin, for example, shop, and customer. After logging in, various services are provided to the customer login. Before starting work, give the shop or car information. Before sending the assignment to employees, the administrator verifies the data about the vehicle and the customer's detailed data. The clients furnish his/her data, explores the area and other information & wait for responses. The proposed system comprises the following modules:

- Administrative Module
- Client Module
- Mechanic Module

IV. PROPOSED SERVICE SYSTEM

We have proposed a vehicular service management system that will solve some of the limitations of the existing system by streamlining the admin activities like handling day to day operation of the garage. These operations include handling customer service enquiries, hiring mechanics and assigning tasks to them, tracking the status of car service, tracking employee attendance, managing feedback from customers, and billing.

The proposed system would minimize manual processes and transactions in the unstructured automotive repair industry. This system enhances operational efficiencies & improves customer satisfaction with the frustrating and time-consuming vehicle service. This system would have several advantages over the traditional system. It would be less time-consuming as the initial inquiry, mechanic allocation, and cost estimation is handled entirely online. It will save time when the customer visits the store during service.

The website is simple to use because it has a very user-friendly interface as there is no need to download any application. The customer won't need to travel to the service center for every minor task as they can be completed online with ease. The main landing page of our website has all our general and social media information. The customer can contact the owner through WhatsApp directly from the website for ease of communication. The three main modules of our project are:

4.1 *Admin Module*

The admin (owner) can view details like the total number of customers, mechanics, enquiries, and feedback on the dashboard. The dashboard also shows information about the most recent enquiries made by customers. In the customer management section, the admin can add, update, delete customers, and view customer enquiries and also invoices. The owner can easily manage all the employees of his business with ease on the website. Adding a mechanic manually, updating their salaries, managing their attendance, and approving mechanic job applications are some of the features available to the garage owner. The admin can also issue a letter of appreciation to any mechanic for being a stand-out performer. It might help the mechanic gain some credibility for his future endeavors.

In the request/enquiry section, the admin can view, update the status, and delete any customer enquiry. The admin can also approve any pending customer request and assign a mechanic for the enquiry. The service cost can also be updated accordingly in this section. There is also a feedback section where the admin can check customer suggestions which helps to improve the services effectively.

4.2. *Customer Module*

In this section, the customer can create a new service request by providing relevant vehicle information and a problem description. The customer can get updated when the request is approved by the admin/manager and also get the approximate budget of the vehicle service. Using the invoice section, customers can manage all their service invoices easily. They can get a detailed breakdown of each component for all their services and also download the billing invoice on their local device with ease. Customers also have the feature to provide feedback to the garage owner regarding the service which can be used to solve customer queries effectively.

4.3. *Mechanic Module*

The mechanic module acts as a personal job portal where mechanics can enter their basic information and relevant skills to get a chance to work at the company. After receiving employment approval from the admin, the mechanic can log in to the portal. Over here the mechanic can keep a check on assigned work and its respective compensation. The mechanic can update the status of each service, on the portal to provide the convenience of live updates to the customers. There is also an attendance section that will help the mechanic in keeping a tab on the number of working days.

V. SEQUENCE DIAGRAM

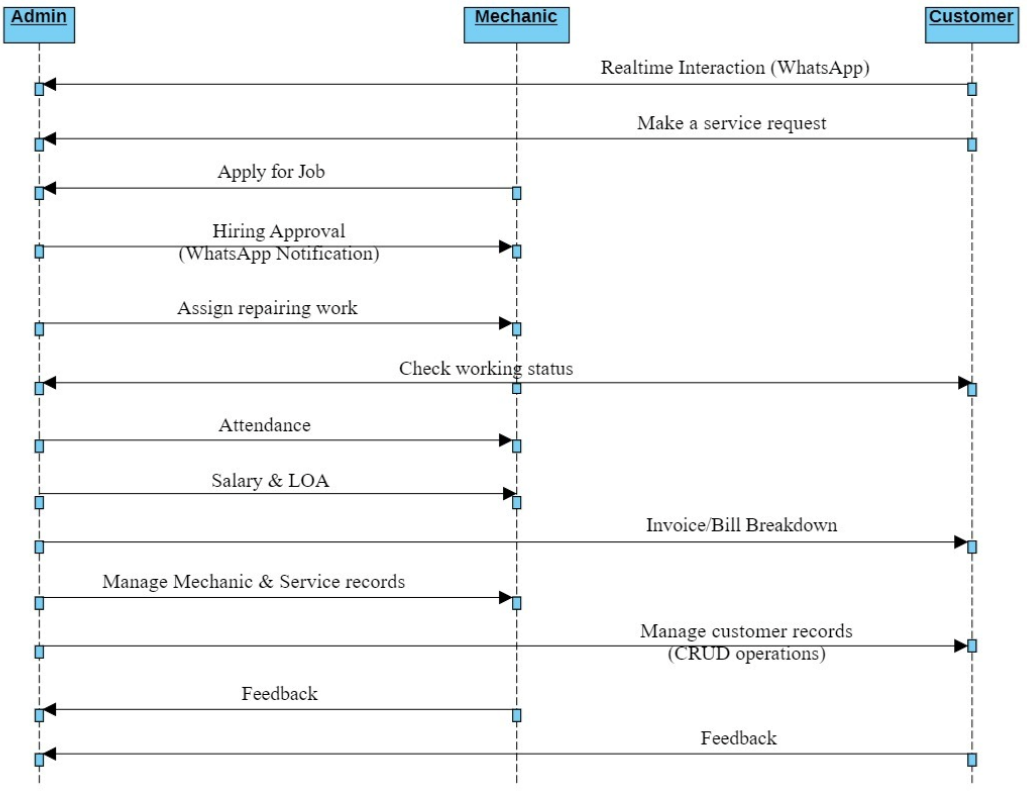


Figure 2: Sequence Diagram for Vehicle Service Management System

VI. RESULTS

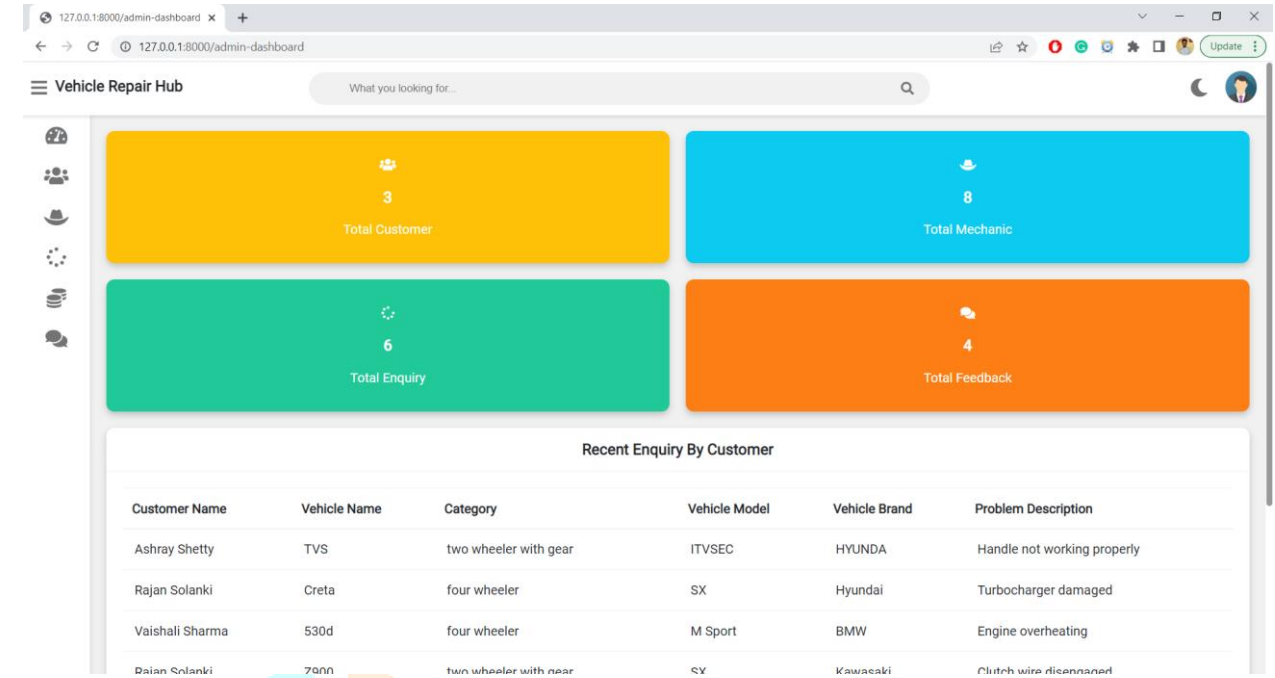


Figure 3: Admin dashboard with recent customer enquiry

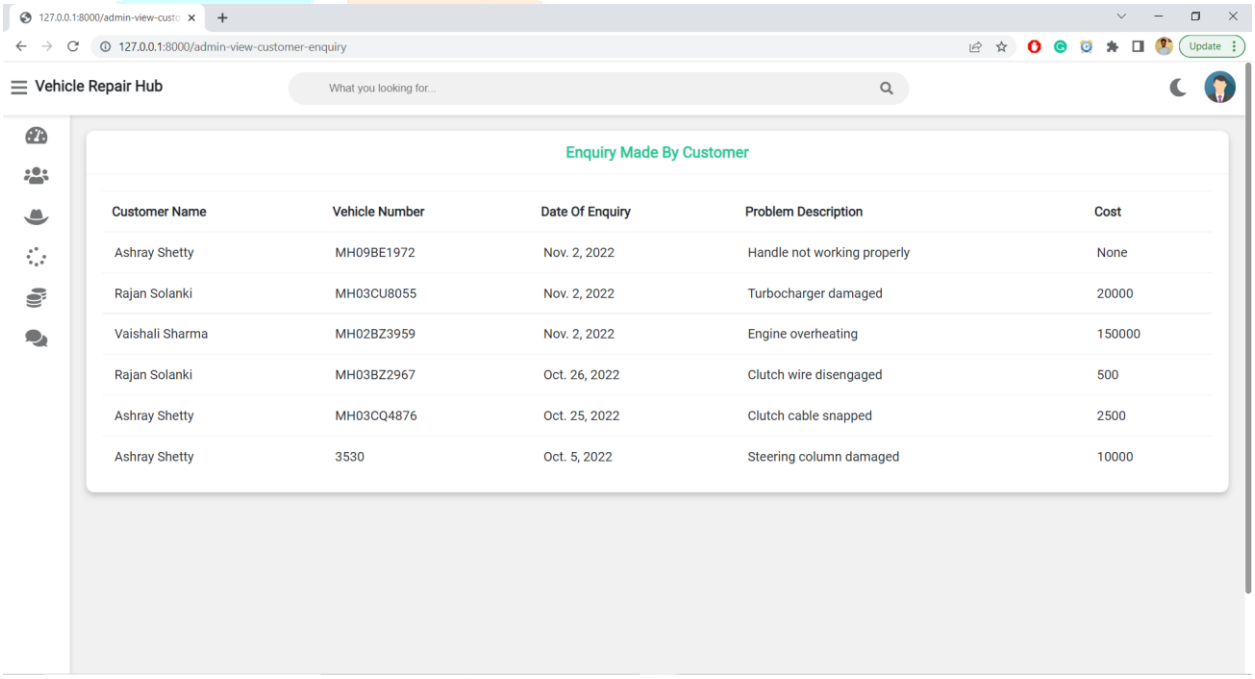


Figure 4: Admin can view customer requests and change and delete its status

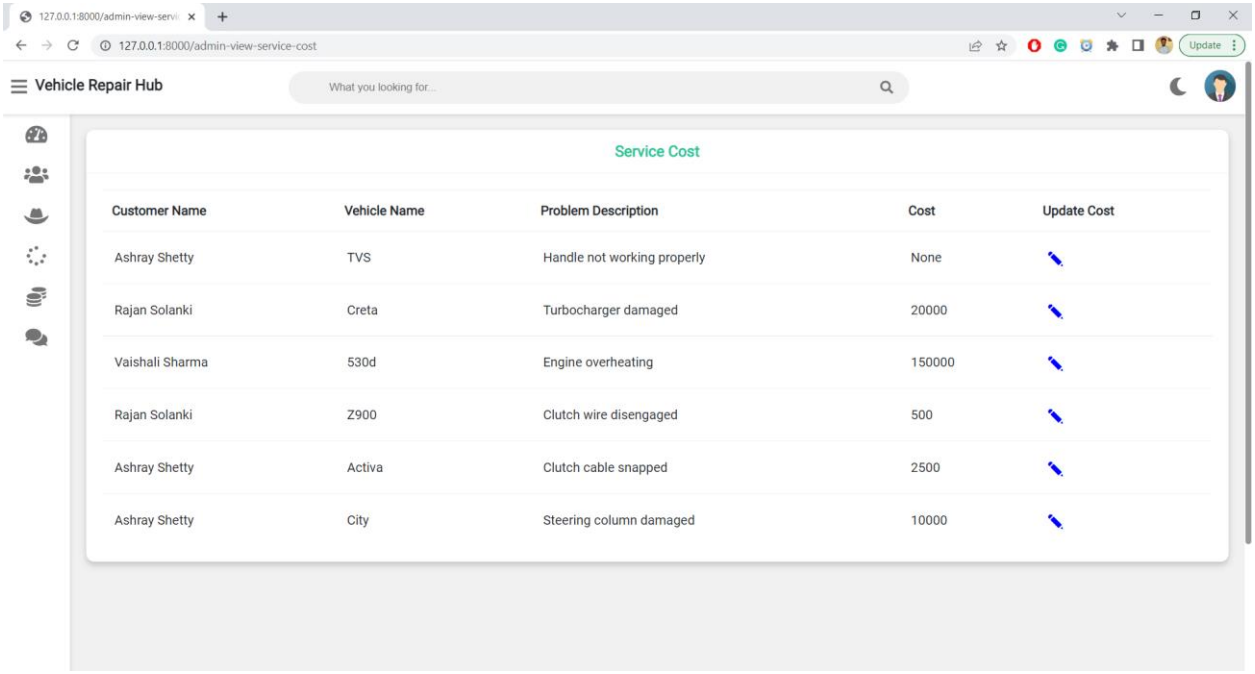


Figure 5: Admin can also update the cost according to requirement

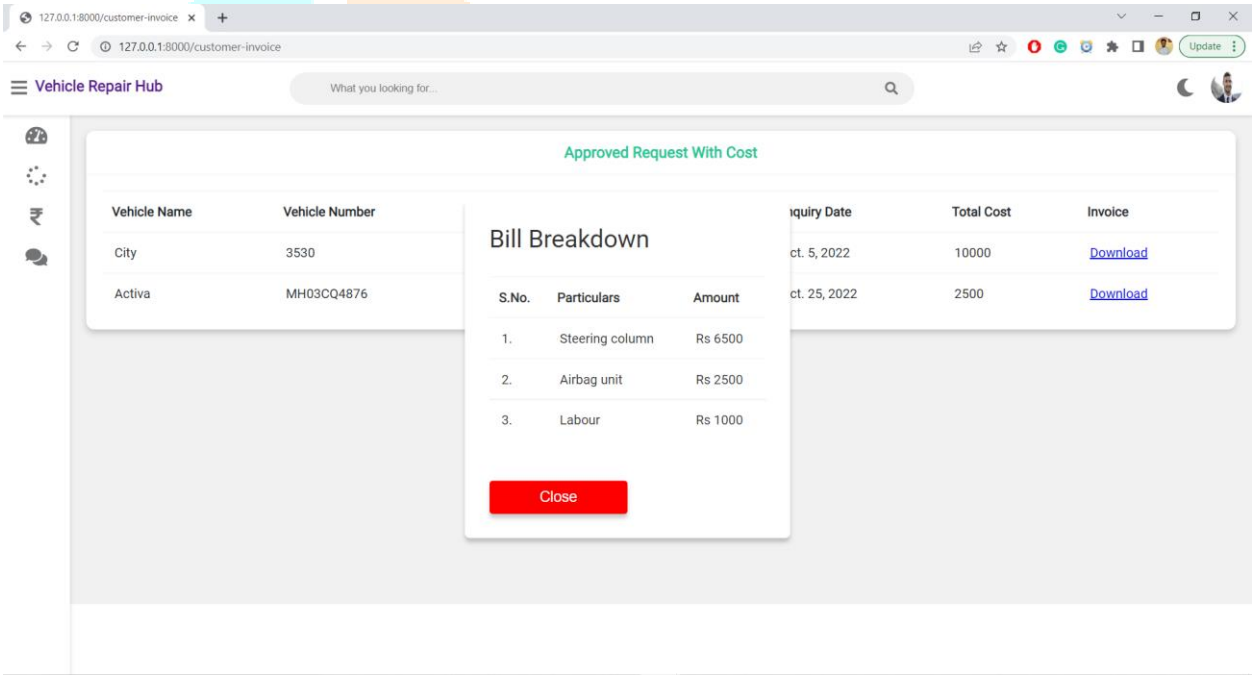
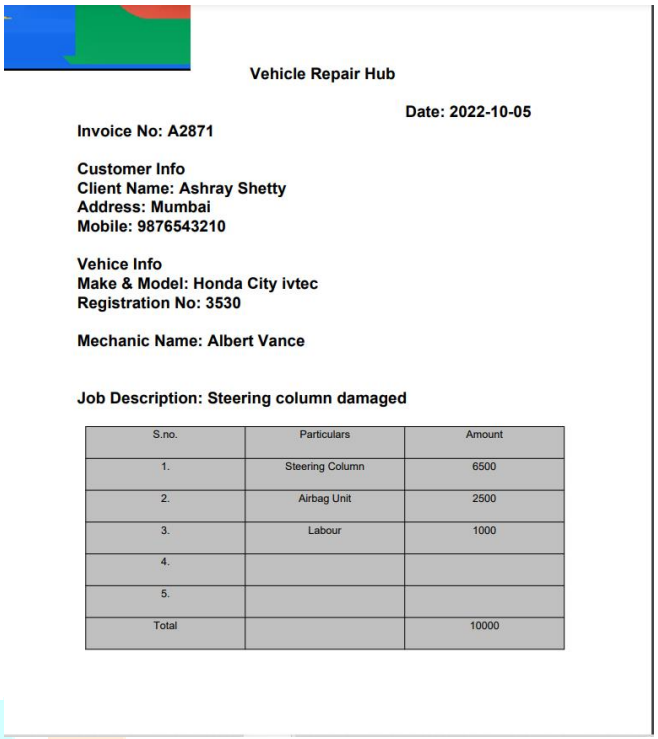


Figure 6: Customer can view the bill breakdown on clicking total cost



Vehicle Repair Hub

Date: 2022-10-05

Invoice No: A2871

Customer Info
Client Name: Ashray Shetty
Address: Mumbai
Mobile: 9876543210

Vehice Info
Make & Model: Honda City ivtec
Registration No: 3530

Mechanic Name: Albert Vance

Job Description: Steering column damaged

S.no.	Particulars	Amount
1.	Steering Column	6500
2.	Airbag Unit	2500
3.	Labour	1000
4.		
5.		
Total		10000

Figure 7: Customer can get detailed invoice of the vehicle service

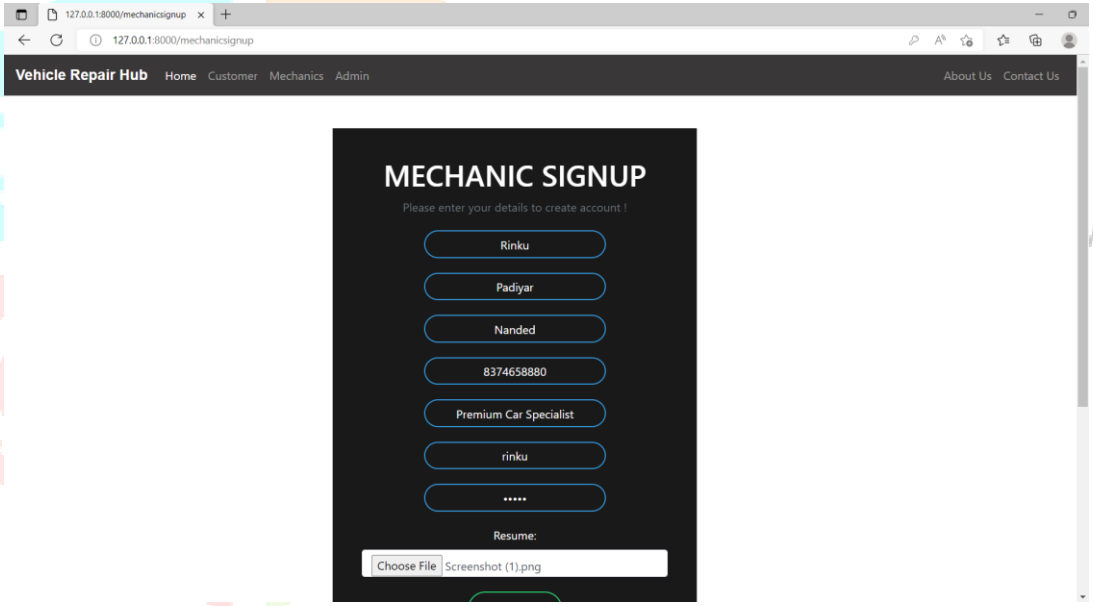


Figure 8: Mechanics can apply for job using the portal

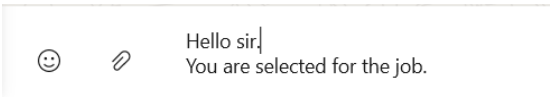


Figure 9: Mechanics are notified on WhatsApp when they are selected for the job

Letter of Appreciation

Date: 2022-10-26

This is to Certify that

Rinku Padiyar

has worked with Vehicle Repair Hub since 2019.

During his tenure, we found him very active and competent in executing all assigned tasks and services in a very efficient manner.

We wish him great success in all of his future endeavours.

With Regards

Pratham Solanki
Co-founder
Vehicle Repair Hub

This letter has been digitally generated by VRH Pvt Ltd

Figure 10: Letter of Appreciation issued to the mechanic

VII. CONCLUSION

By automating the entire system, efficiency is raised. It provides a more graphical user interface than the current system, which is user-friendly. It gives authorised users the appropriate access with their permission. The latency in communication is overcome satisfactorily. Future modifications can be made with ease. Our daily lives depend on our cars, which need regular maintenance to run efficiently.

The entire procedure of automobile service is swift and intelligent, thanks to IoT automation. This method reduces client work while enhancing the overall process's performance. Even while this technology increases the cost of servicing, it prevents shops from charging more and lets customers know about all the changes that have been made to their cars. Overall, using this strategy saves the consumer both time and money.

VIII. FUTURE ENHANCEMENTS

The technology might be changed to function on a huge network. Among other things, this comprises resolving utilized conflicts, protecting database integrity, and ensuring data consistency if it is scattered over several places. The project could be implemented by a company of medium size. A typical business won't continue to spend a lot of money on ledgers. On the other hand, this project will significantly cut expenses by utilizing standard and affordable supplies like databases and desktop applications. We have not yet integrated any payment options. We intend to make the payment method online in the future. This project's website can also be made into a mobile application. Through mobile apps, customers will be able to make reservations for vehicles on their smartphones.

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