

THE VEHICLE SERVICE MANAGEMENT SYSTEM

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ABSTRACT: Owners of vehicles can avoid unforeseen car problems by maintaining their vehicles regularly. Early detection of vehicle concerns is crucial to preventing them from developing into serious difficulties. Owners of vehicles frequently inquire about service at auto shops. Vehicle technicians examine crucial parts of the vehicle and fix problems to make sure they are in good condition and won't break down suddenly. The study was carried out by the researchers to evaluate the everyday activities and transactions carried out in auto repair facilities.

The researchers gathered preliminary data and discovered that the majority of auto repair companies or garages still handle their daily transactions manually. Customer records are still entered manually, as are transactions with clients, tracking of vehicle repairs as they are made, updates on vehicle services, and billing. The functioning of the garage and the response time to client inquiries will be slowed by the ongoing usage of manual procedures.

The researchers have identified a need to modernize how auto repair shops work. Customers and car garages will both profit from the system's installation. Utilizing the technology to run the company will help car garages expand and improve operational efficiency. Customers may do business for car service easily and comfortably.

Keywords: Vehicle Servicing, Monitoring, Sensors, Internet Things, Live Streaming

I. INTRODUCTION

Vehicles now play a significant role in daily life. The growth in car sales over time is seen in Fig. 1. The vast majority of individuals commute daily using the automobile. However, car maintenance is frequently disregarded. Regular maintenance helps ensure that the car runs smoothly and that fuel is used effectively. Another issue is that when automobiles are taken in for servicing or maintenance, it is presumed that repairs would be made carefully, but it has been noted that multiple vehicle accidents occur each year as a result of the neglect of repair facilities and car dealers.

When the car is handed over for repair, the problem of confidence is crucial. Customers are frequently taken advantage of under the name of service. A serious issue is the replacement of original parts with outdated ones. Additionally, it might be challenging for clients to confirm that the service providers are doing the tasks for which they are paying. Service providers take advantage of this circumstance and overcharge customers. The practice of "periodic vehicle maintenance," which mandates that the vehicle have periodic servicing and maintenance, is widely used.

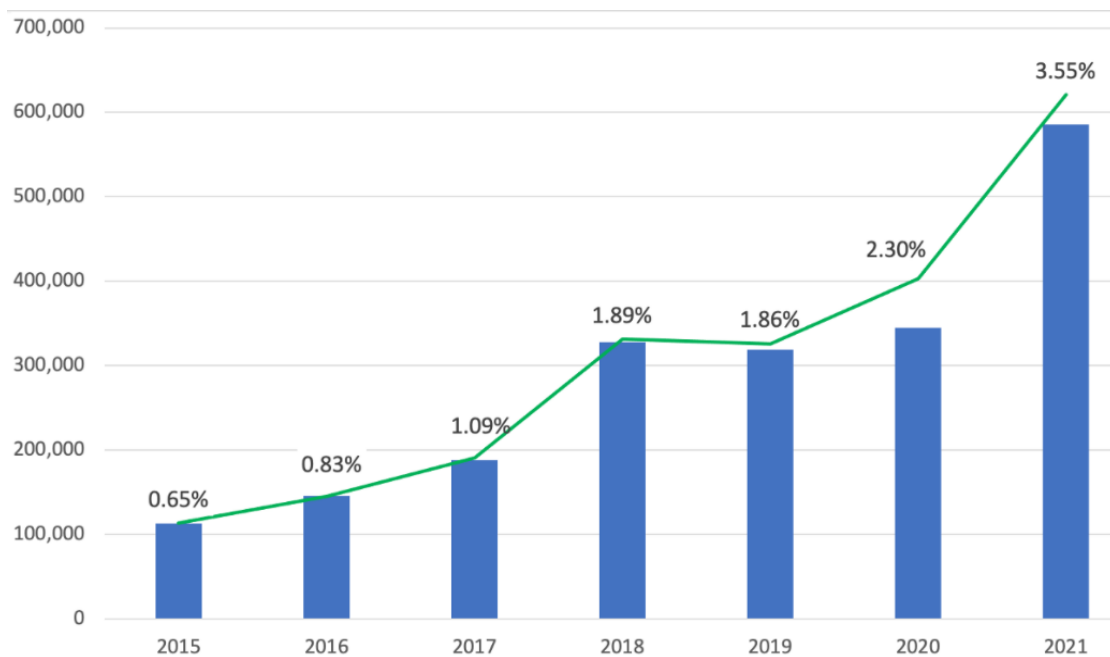


Fig.1 Car Sales

A vehicle's service life is typically determined by either a predetermined time frame or the mileage traveled. Generally speaking, it is advised to get the car serviced every six months or 10,000 kilometers. However, the problem with "periodic vehicle maintenance" is that it's difficult to determine which parts need to be repaired or replaced, which might lead to repairs or replacements of parts that are still in good shape. Predictive vehicle maintenance proves useful in this situation. This data is obtained from numerous built-in or customized sensors in the car that are used to keep track of the condition of various components.

To analyze and make decisions, this data is relayed via the internet, and the chance of failure in the future is then predicted. When a consumer uses this approach to choose when to service their automobile and which part to fix, it saves them a lot of time and money since it gives them transparency. A certain system could occasionally require maintenance or repair before the next scheduled due date. The solution effectively manages this problem since the user instantly receives a warning on their mobile application.

This prevents the buyer from having to pay more money for the additional damage the automobile would have sustained if the defective item had been driven. Given that the service center already has cameras installed, our solution makes advantage of such infrastructure. Following is a description of the following portions of the essay: The system's operational mechanism is explained in Section II. This study explains how forecasting may be used to anticipate a vehicle's failure.

II. LITERATURE SURVEY

Information from a variety of sources is included in the poll on this system. Some of the websites, IEEE papers, some related research papers, and even some project reports are among these sources. Modules, diagrams, literature, etc. from a study paper titled "Automobile Service Center Management System" by Prof. Shilpa Chavan from Pune University were very helpful in developing our project. Keywords like "Vehicle Service System," "Car Service System," "Automobile Service System," etc. were used to search the various websites. They were quite useful. There was a website called "Gaadizo" that was being analyzed.

It is primarily in Delhi NCR. Vikas Mitra, a former senior executive of the Honda Company, created it. Gaadizo has a variety of service centers, including those in Noida, Gurgaon, Ghaziabad, etc. This system included features like the assurance of authentic parts, a service warranty, simple service progress tracking, etc. The suggested system makes mention of the previously mentioned system and includes several additional characteristics that are:

- Offers slot reservations
- Auto Billing while customers choose the services.
- FAQs to answer any questions.
- Regular car maintenance.

The majority of research papers and references found throughout the study related to "Vehicle Tracking System," which was unhelpful, but there were also some incredible websites found, like "DreamzTech Solution," "CarZ," "The Bike Doctor," and many more, which competed with "Gaadizo." Slot booking to eliminate time consumption, auto-billing for transparency, FAQs for general questions, and navigation services to determine the precise location of the service center are the primary differences between the current system and the one that is being suggested.

The goal of the literature review is to reduce the damaging effects of traffic on the environment by optimizing vehicles used for transportation and using university management strategies in the freight sector.

Design/Methodology/Approach Before looking at options to enhance transportation operations, this study first evaluates the main restriction on vehicle use. Three crucial areas for increased effectiveness fall under the purview of this paper. Logistics effectiveness, vehicle use, and driver conduct and training are all mentioned as aspects of the sector. **Findings** There is already a developing body of official literature giving advice and assistance, and environmental considerations will impact how transport managers carry out their duties.

Data object representation in ER diagrams is not standardized. Each modeling methodology's nomenclature is used. Although Chen's original notation is frequently used in academic papers and journals, CASE tools and non-academic publications hardly ever utilize it. There are several notations used nowadays, but the most popular ones are IDEFIX, crow's foot, and Bachman.

Entities are shown as rectangular boxes in all notational styles, and relationships are shown as lines linking boxes. To express the cardinality of a link, each style employs a unique collection of symbols. Martin provided the notation that is used in this work. The majority of auto repair companies and garages still conduct their daily business using manual techniques. Customer records are still entered manually, as are transactions with clients, tracking of vehicle repairs as they are made, updates on vehicle services, and billing.

Both the car garages and the clients find this sort of transaction time-consuming. To handle repair requests and carry out other necessary tasks related to vehicle servicing, customers must personally visit garages. The functioning of the garage and the response time to client inquiries will be slowed by the ongoing usage of manual procedures.

III. METHODOLOGY

The building of the Vehicle Service Management System in Django is suggested in this essay. The solution will streamline the administrative tasks related to handling business transactions in a car garage. The following transactions are included in the list: recording customer records, tracking the status of car repairs, updating vehicle service orders, managing vehicle service schedules, maintaining maintenance logs, dealing with customers, and billing.

The suggested idea would do away with manual processes and transactions in auto repair facilities. The system will operate as a hub for transactions that can be accessed by clients and technicians working on vehicles, as well as monitored by an administrator. The suggested strategy would boost operational effectiveness and overall client happiness when it comes to receiving car service.

1Time-consuming: Since the initial booking and charge estimation are handled directly by the website, less time is needed to visit the store and complete these tasks.

2. Simple to use: Since it is a website, the client may access it without downloading any apps to their phone. The user doesn't need a laptop to open the website because it is also mobile-accessible.

3. Online customer system: The client won't need to travel since the website will facilitate the online completion of tasks.

The goal of the vehicle services is to give system users better information so they can maintain their sales, purchases, and stock information more effectively.

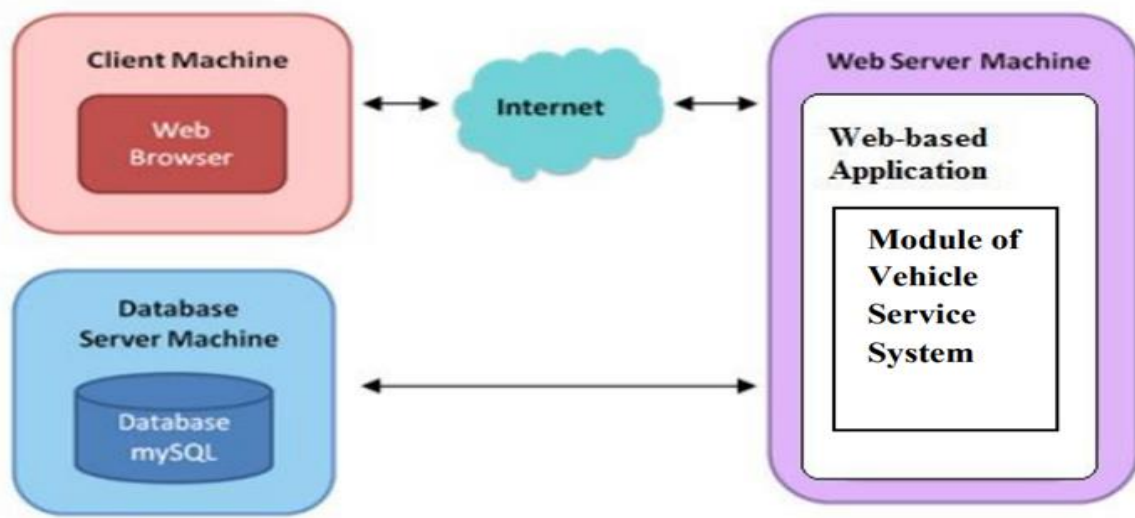


Fig 1: System Architecture

Two boards are available in addition to the main page: Admin, for example, a shop, and the Customer. Following login, the customer is provided with a variety of services by the login credentials. Give the shop or vehicle information before starting your work. Before distributing the assignment to the employees, the administrator will verify the car data, client details, and overhaul facts. The customer will submit his information, examine the area, add his adjusting information, and then wait for the opening to occur.

Modules

1. Admin Module
2. Customer Module
3. Mechanic Module

1 Admin Module

Dashboard: The admin may view all of the details in this part, including the total number of users registered, total inquiries, total mechanics, and total services. Using a customer's phone number, email address, or contact number, the administrator can search inquiries in this section. **Service Search:** The administrator can use the phone number, email

address, or contact number of a client to search for services in this area. Mechanics: The administrator can control mechanics in this area (add, delete, and update). the type of vehicle

The administrator can control the vehicle category in this area (add, delete and update) Reg Users: The administrator can examine and edit user details in this area. Service Demand: The administrator may add service charges (service fee and any extra parts fees that may apply) in this area. Based on status, the admin may view services (pending services, rejected services, and complete services). Admins can also approve pending policies. Client Inquiry The administrator can answer client inquiries in this section as well as view inquiries to which no customers have responded.

2 Customers Module

Dashboard Enquiry: Here, the user may complete the form and see whether or not his inquiry has received a response (which is done by the admin). Service Request: In this part, the user may complete the service form, check the progress of the service, see how much is being charged for the service, and print an amount slip (which is done by the admin). Users may also change their passwords, retrieve their passwords, and update their profiles.

3 Mechanics Module

The mechanic may examine the tasks the admin has assigned him in this section. He can also look up the attendance record. The vehicle's state is updated by the mechanic module, including whether or not it has been fixed.

IV. RESULTS

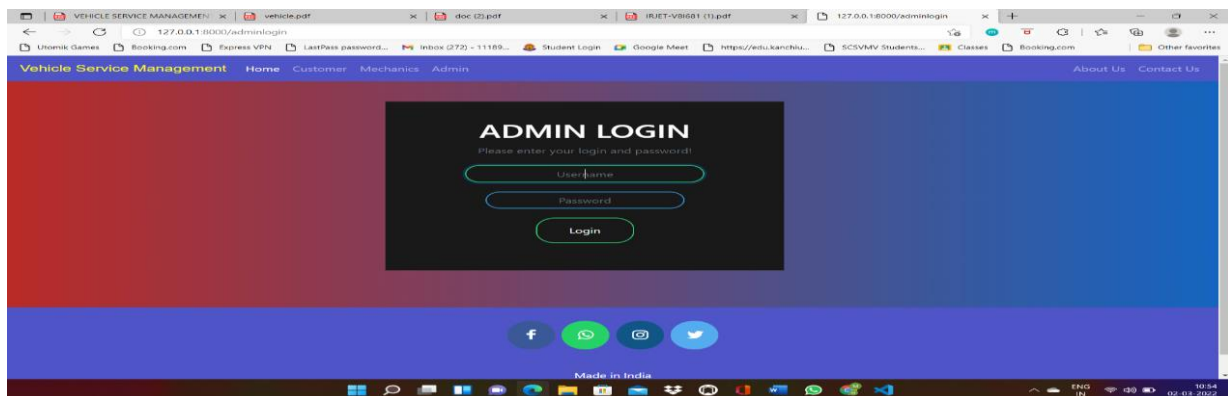


Fig.2 shows the admin login details i.e. Username and Password.

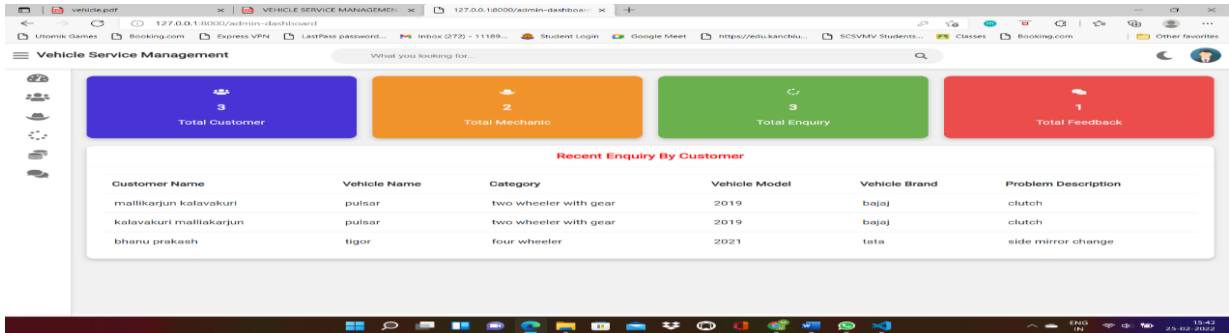


Fig.3 shows the number of customers and mechanics there and it also shows the number of inquiries and feedback made by the customer and mechanics.

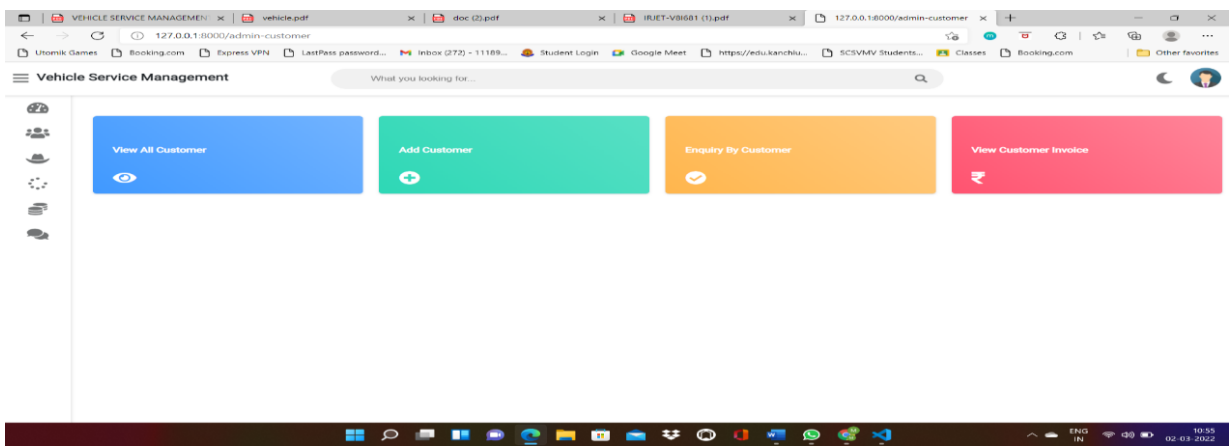


Fig.4 shows the details of the customer, adding the customer, inquiry made by the customer, and customer invoice.

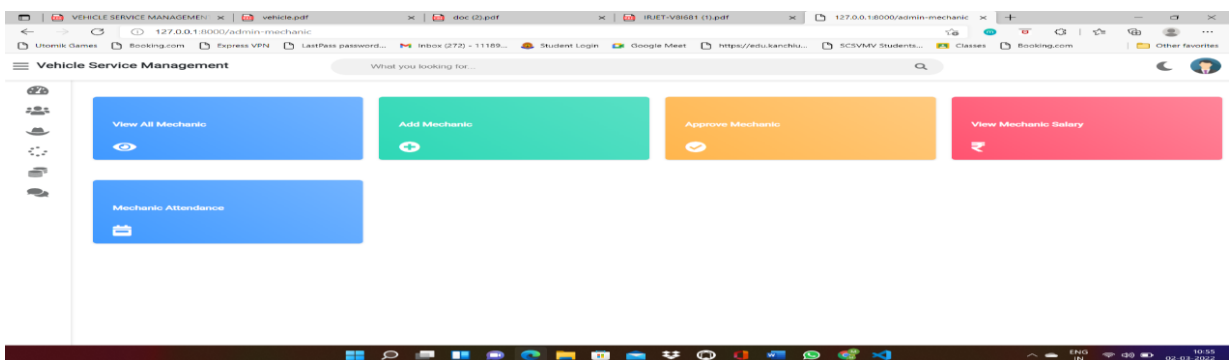


Fig.5 shows the details of the mechanic, their salary, and daily attendance.

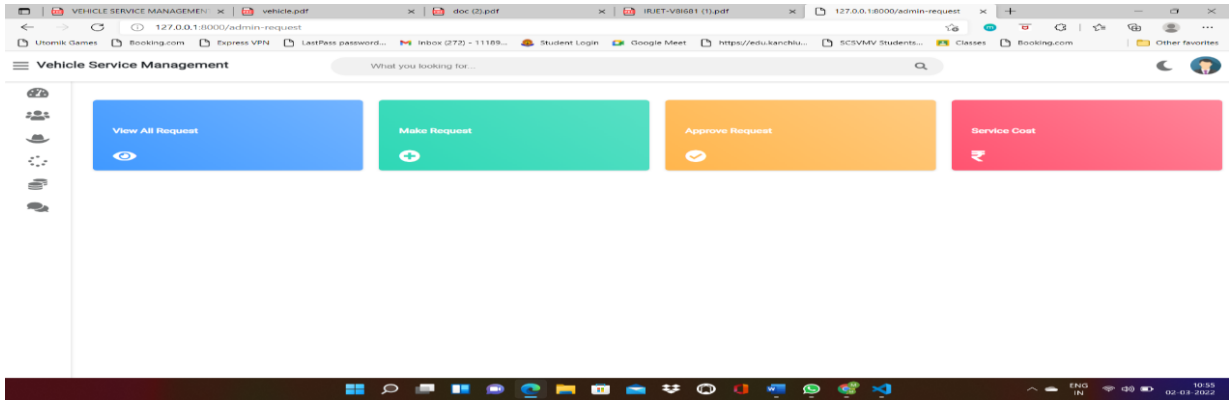


Fig.6 shows the requests made by the customers and approved requests by the admin. It also shows the estimated cost of the vehicle service/repair.

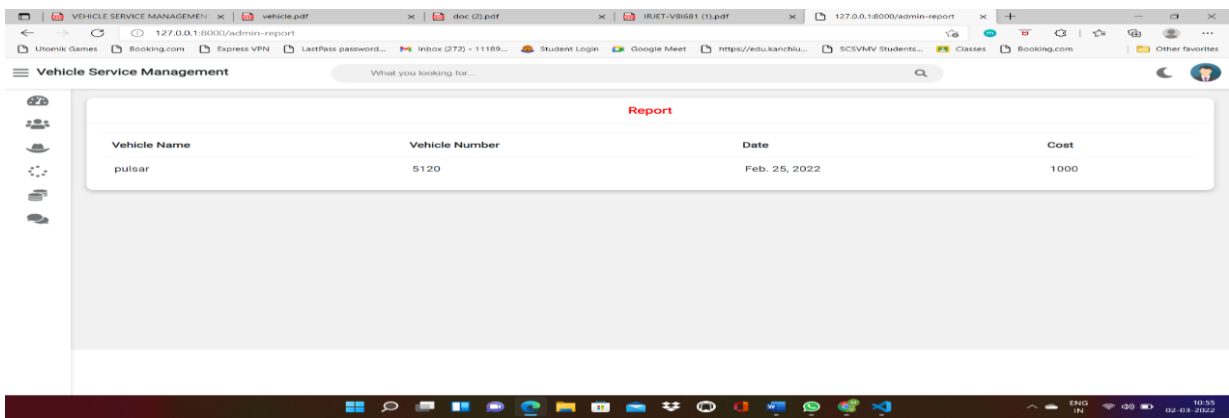


Fig.7 Shows the Reports of the vehicle.

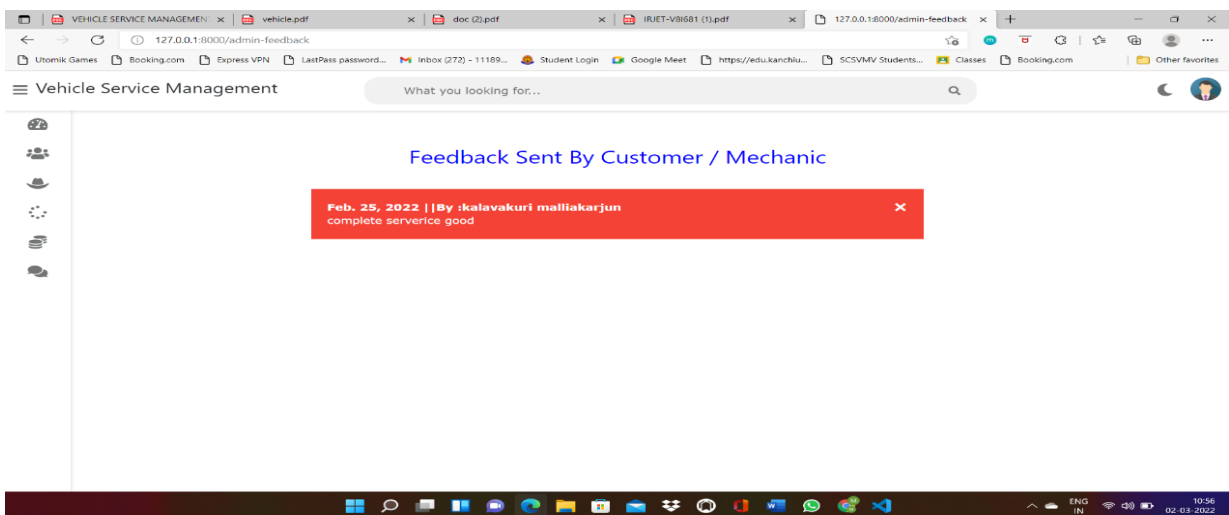


Fig.8 shows the feedback made by the customer and mechanic.

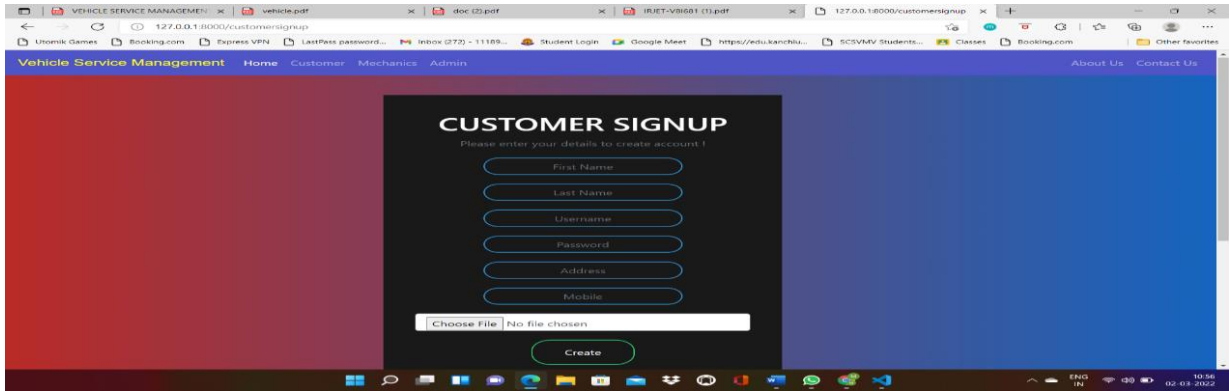


Fig.9 Customer Signup.

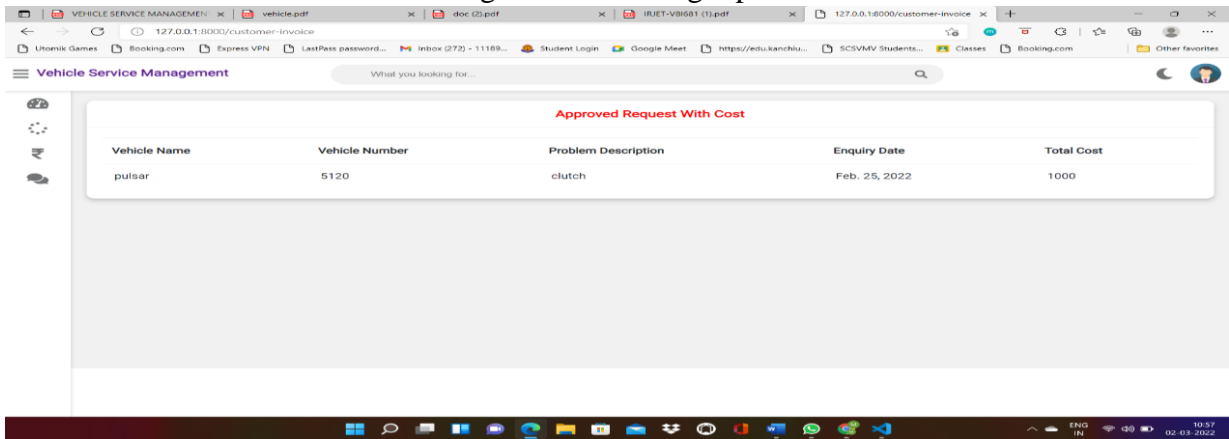


Fig.10 Shows the cost of the vehicle which has been completely serviced.

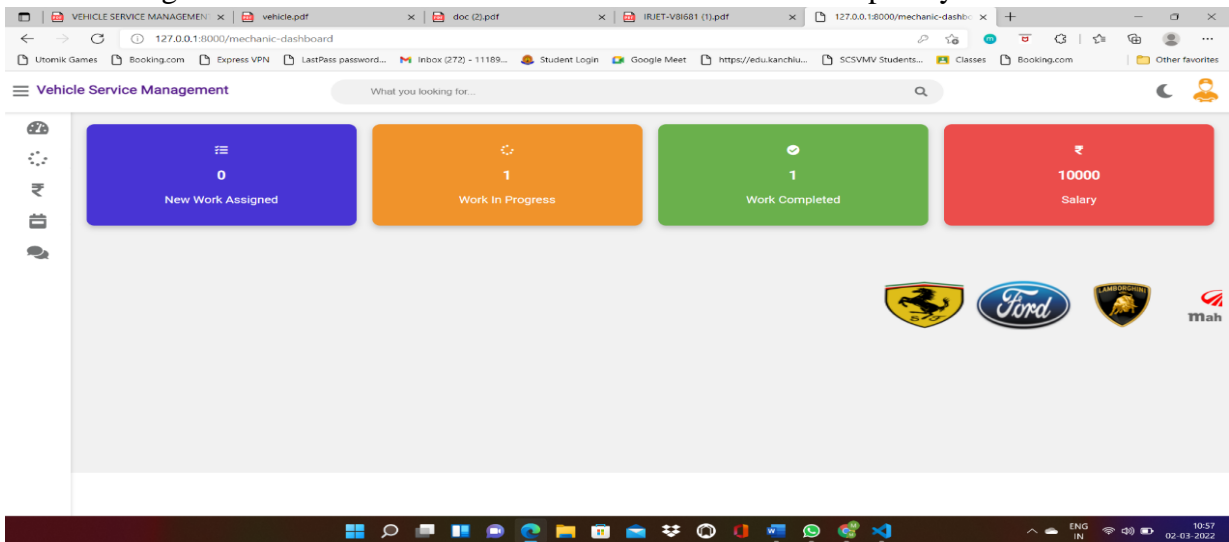
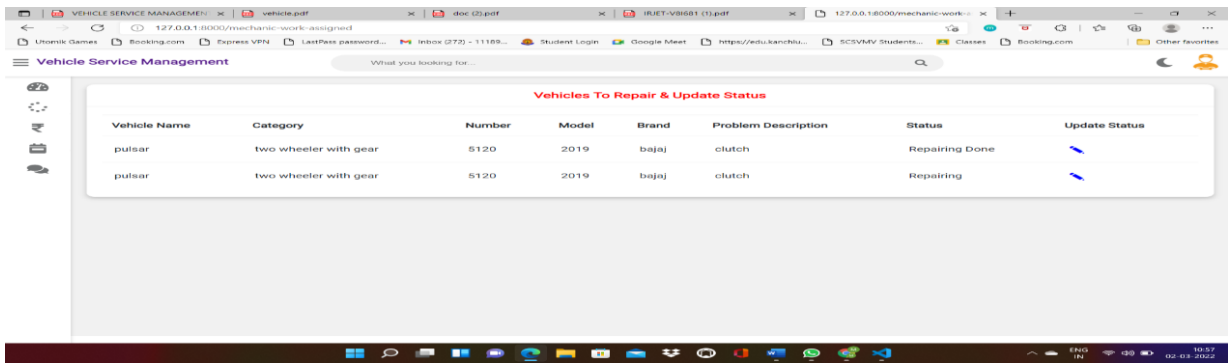


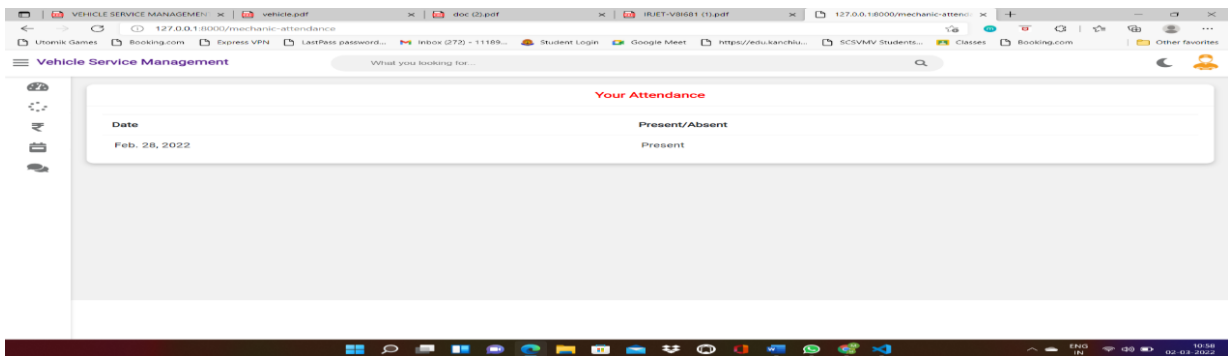
Fig.11 shows the number of works assigned to the mechanic and the number of works has been completed.



The screenshot displays a web interface for 'Vehicle Service Management'. The main heading is 'Vehicles To Repair & Update Status'. Below this is a table with the following data:

Vehicle Name	Category	Number	Model	Brand	Problem Description	Status	Update Status
pulsar	two wheeler with gear	5120	2019	bajaj	clutch	Repairing Done	
pulsar	two wheeler with gear	5120	2019	bajaj	clutch	Repairing	

Fig.12 shows the details of the vehicle name, model, problem in the vehicle, and status of the vehicle.



The screenshot displays a web interface for 'Vehicle Service Management'. The main heading is 'Your Attendance'. Below this is a table with the following data:

Date	Present/Absent
Feb. 28, 2022	Present

Fig.13 shows the attendance of the mechanic.

V. CONCLUSION

Effective Future adjustments may be made with ease because of how the package was created. The project's development has led to the following inferences. Efficiency is increased by automating the entire system. When compared to the current system, it offers a user-friendly graphical interface that is superior. Depending on their permissions, it grants the permitted users the proper access. It successfully gets over the communication lag. Our everyday lives revolve around our cars, which require routine maintenance to function well.

IoT automation makes the entire process of automotive service quick and smart. The above-mentioned technology not only keeps track of the condition of our automobile in real-time, but it also offers vital information and forecasts that enable us to estimate the cost and timing of the subsequent service. Even though this technology raises the cost of servicing, it stops service facilities from charging more and informs the client of all the modifications made to the vehicle. Overall, the consumer saves time and money with this method. The way we live and work has been dramatically changed by technologies like IoT and RPA.

It has simplified our lives. This technique lessens client effort while simultaneously improving the efficiency of our automobile. Predictive analysis may be enhanced by employing AI and different performance-enhancing techniques.

VI. FUTURE ENHANCEMENTS

This software eliminates manual labor and any associated issues. It is a simple approach to learning more about the many products that are available at supermarkets. Well,

my team and I have been working hard to provide a website that is better than the current one in terms of information on the different activities. However, we discovered that the job might be carried out more effectively.

The company, product id, product name, and the number of quantities available are the only information that is often provided when we seek information on a certain product. After receiving the information, we may reach the product firm's website by simply clicking on the name of the product. The option for searching is the next improvement we can make. From this website, we may easily search for a certain product firm. These two improvements are the best we can come up with for now.

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