

Garage Management System of Web Application for Customer Service

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Abstract— The Garage Management System, as described in this article, allows the user to keep track of all garage operations. It's a web-based service that lets you keep track of your garage's inventory, get repair estimates, and arrange deliveries, among other things. It records the vehicle's service history as well as the amount of time it spends in the mechanic's shop. It also maintains track of the inventory of car parts. It will keep track of all vehicles that have been serviced and will be able to send clients service reminders based on their service dates. The Garage Management System's admin access is limited. Supervisors, receptionists, and principals, among other users, will be able to be tracked by the administration. It's a clever online Web App that can assist garage owners in keeping track of what happens in their garage. The garage management system provides service to customers based on their needs. The initiative's main purpose is to reduce physical work. Engineers might be assigned to this application for their respected job.

Keywords: Garage Management, Appointment Book, Frontend, Backend, Database, Automobile Industry, UI/UX, Administration

I. INTRODUCTION

The user will be able to keep track of all garage operations with the help of this Garage Management System. Administrators, principals, receptionists, and supervisors are among the users of the web-based platform. Other users will be granted access to specific modules by the administrator. Users must log in and manage the system's operations. The supervisor should have access to the garage's spare parts inventory. Users may view which cars are now being serviced and which ones need to be notified for service. The user will also be able to keep track of how much time he or she spends at the mechanic shop. The technology will also allow you to pay for the repair or service. The device can also look for car spare components that the garage has to provide. The user interface was created using HTML and JSP. It has a user-friendly online interface.

The primary goal of this article is to demonstrate the project Garage Management System's requirements. "Garage Management System" is the best programme for organising garage work estimates, selling and buying components, and automobiles. It will provide you complete control over your garage at a glance. Garage management software supports in the attainment of auto shop goals by automating activities, storing client car history, and maintaining a database of other dealers and consumers. Auto repair shops can use garage software to manage their entire infrastructure. The document includes a comprehensive list of the client's functional and non-functional requirements. DFD, ER diagrams, and UML are all used in this project.

II. LITERATURE SURVEY

In this paper [1,] we created an application to provide a platform for users who wish to take services at its location as well as in an emergency, enhancing its commercial worth.

Many video feeds from inner parking garages were used in this study [2] to test and operate a proposed concept for a smart parking system based on image processing. This paper [3] utilises MVC architecture to develop an MVC-based e-sourcing system architecture, which was then used to develop an innovative e-sourcing system to address the problems that consumers and salespeople face in the current car sourcing system. The authors [4] created an Online Management System for Automobile Services web application, which is a website that can run on any browser on a mobile, tablet, or computer, with the goal of discovering the various factors that affect the servicing and maintenance process of a car and looking for ways to reduce the time required. An effective vehicle service management system is proposed in this work [5], which can automate the entire service process while monitoring changes and activities conducted on the vehicle. It also considers predictive vehicle maintenance, or anticipating when vehicle components (such as brakes) will require repair. In this work, the authors [6] have automated the showroom, as well as scheduled and separated the one organization into parts and controlled it successfully with characteristics such as one of the most important aspects of the project is the client- salesperson contact. The authors of this study [7] used an Artificial Neural Network in MATLAB to finish the scheduling procedure at an automotive repair shop. The flow, structure, and operation of the Automobile Service Center Management (ASCM) system are depicted in the proposed paper [8]. ASCM is a time-saving and cost-effective application since it is user-friendly (i.e. easy to use) and available for free on the Android Store.

III. TOOLS AND TECHNOLOGY

A. Software configuration:

- Operating system: Windows XP Professional
- Environment: Eclipse IDE
- Frontend: CSS, HTML, JavaScript, JSP
- Backend: MySQL, Java

B. Tools Used

- My SQL Workbench
- Eclipse IDE

C. Technology

1) Database:

A database, sometimes known as an electronic database, is a collection of data or information that has been properly structured for efficient computer search and retrieval. Data storage, retrieval, modification, deletion, and other data processing procedures are all made as simple as possible in the database. Records and papers must be structured in order to access information from the database. Users access the database's information mostly through queries. A database management system (DBMS) has the advantage of allowing additional associations to be formed and used to answer queries based on the basic relationships supplied by tables.

2) *Backend -*

Servlet: Servlet Technology is used to built webapplications. Servlet technology creates web applications using the Java programming language. Web applications are utility programmes that run on a web server and generate dynamic web pages. A dynamic page could be anything from a page that displays the current time to a website that randomly selects a photo to display.

- 1) MySQL: MySQL is one of the most well-known technologies in today's current big data era. Oracle built MySQL, a structured query language-based relational database management system (RDBMS) (SQL). A database is a collection of data that has been logically structured. A relational database is a digital repository for data arranged according to the relational paradigm. Rows and columns make up the tables in this model, and data element connections are all logically arranged.
- 2) Frontend – HTML, CSS, Javascript, JSP and jQuery:
- 3) HTML: In its most basic form, HTML stands for HyperText Markup Language. HTML programming allows people to use the internet to communicate their thoughts with the rest of the world. Pages feature a simpler, more straightforward element structure, making them easier to build, edit, and debug—as well as to automate the identification of crucial online resources. One of the three most important tools for creating a website is HTML: The structure of a website, including how text, graphics, and other information will appear, is defined by HTML. HTML is the primary language used by websites and web-based information. It enhances a browser's understanding of a document's or files' structure and style for internet viewing.
- 4) CSS: CSS is used to improve pages for responsive web design and to generate more complicated graphics like hover effects, as well as to alter simple things like colours, fonts, and spacing. A style sheet tells the web browser how to display certain types of material.

A style sheet tells the web browser how to display certain types of material. CSS style sheets are all cascading, which is an important concept to comprehend. Every web page is influenced by at least one style sheet, even if the designer hasn't used any. The User Agent stylesheet contains the browser's default styles.

- 5) JSP: Java Server Pages (JSP) is a server-side programming language that allows developers to create dynamic, platform-independent Web applications. JSPs have access to the whole Java API family, including the JDBC API, which allows them to connect to business databases. This article will show you how to create web apps using Java Server Pages in simple and easy stages.

IV. DESIGN

A. Database Design (ER Diagram):

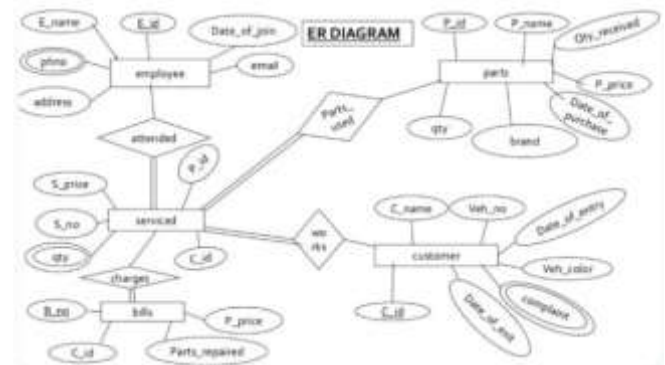


Fig. 1: Database Design (ER Diagram)

B. Database Schema

- Customer (Customer_ID, F_Name, L_Name, Contact_no, Location, Gender, Comment)
- Vehicle (Vehicle_ID, Vehicle_Date, Model_No, Vehicle_name, Vehicle_Problem, Noplate, Customer_ID)
- Payment (Payment_ID, Payment_Name, Amount_paid, Pay_Date, Mode_of_payment, Received_by, Customer_ID)
- Mechanic (Mechanic_ID, Department, Job_Cost, Lname, Fname)
- Appointment (App_ID, Customer_ID, Mech_ID, App_date)
- Administrator (ID_No, Name, Password, Email)

V. EXPERIMENTAL WORK

A. Frontend & UI/UX

HTML, CSS, JSS, and JSP are used to create the UI/UX. Admin, Garage Owner, and User all have login access at the navigation bar on the homepage.

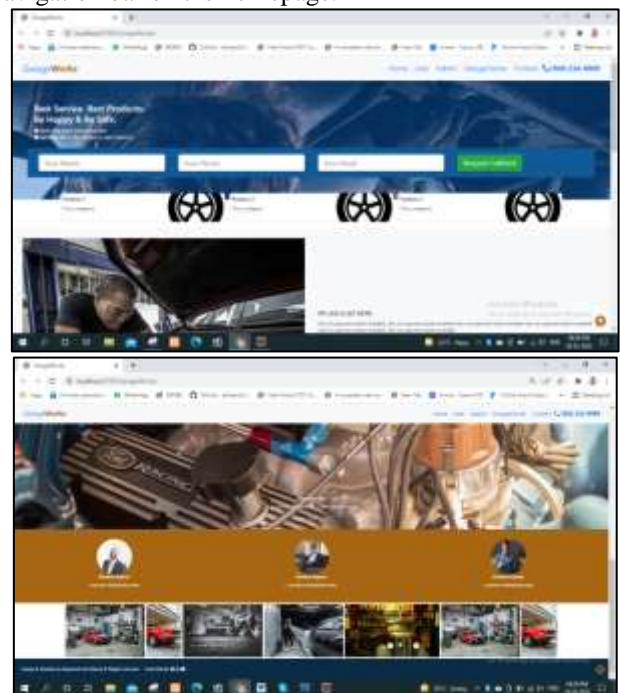


Fig. 3: Garage Management System Homepage

B. Servlet and MySQL

Servlet is used for the backend, and MySQL is used for the database. Three different tables for Admin, Garage Owner, and User are constructed for login. HTML performs password validation on the password field.



Fig. 4: MySQL table for Administrator (Admin table)



Fig. 5: MySQL table for User



Fig. 6: MySQL table for Garage Owner



Fig. 7: MySQL table for enquiries



Fig. 8: MySQL table for services

Query used for creating these tables are:

- 1) create table administrator (id VARCHAR((20) NotNull, Password varchar(20) Not Null);
- 2) create table users (email VARCHAR((100) Not Null, name VARCHAR((45) Not Null, phone VARCHAR((15) Not Null, password VARCHAR((20) Not Null, photo LONGBLOB);
- 3) create table garage (email VARCHAR((100) Not Null, name VARCHAR((45) Not Null, gname VARCHAR((45) Not Null, phone VARCHAR((15) Not Null, state VARCHAR((45) Not Null, city VARCHAR((45) Not Null, sec_vill VARCHAR((45) Not Null, shop_no VARCHAR((45) Not Null, password photo1 LONGBLOB, photo2 LONGBLOB status VARCHAR((45) Not Null);
- 4) create table enquiries (id int Not Null, name VARCHAR((45) Not Null, phone VARCHAR((15) Not Null, email VARCHAR((100)Not Null);
- 5) create table services (id int Not Null, garage_email VARCHAR((100) Not Null, service VARCHAR(100));

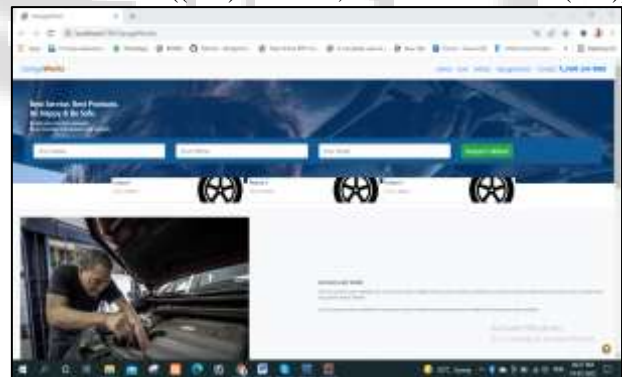


Fig. 9: Home Page

In Home Page appear the Request Callback Options so User can easily Request for Callback. The Request Callback form uses the POST method and is written in JSP. After Callback Request All of the data will be recorded in the enquiries database table. MySQL is used to generate the auto increment enquiries id. After Callback request will be shortly connected to customer from Garage Works Management System Side.

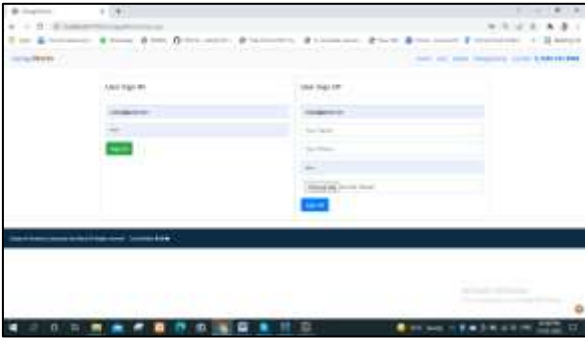


Fig. 10.1: User Login page

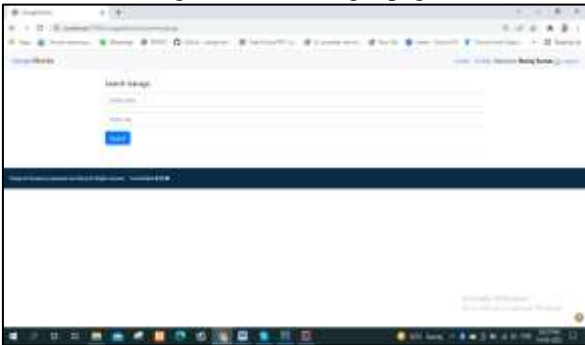


Fig. 10.2: User Module after Login

The User form uses the POST method and is written in JSP. All of the data will be recorded in the Users database table. MySQL is used to generate the auto increment user id. The user may quickly search for open garages in a specific city using the state and city names, and both the client and the mechanic will receive notifications on their dashboards.



Fig. 11.1: Admin Module



Fig. 11.2: Admin Module after Login

The Admin Modules uses the POST method and is written in JSP. Admin Id and Password recorded in admin table and Admin manage the Garage Works. Admin Firstly verify the garage then decide Approve or Reject after Garage approved by Admin All of the Garage data will be recorded in the garage database table. The user may quickly search for

open garages in a specific city using the state and city names, and both the client and the mechanic will receive notifications on their dashboards.

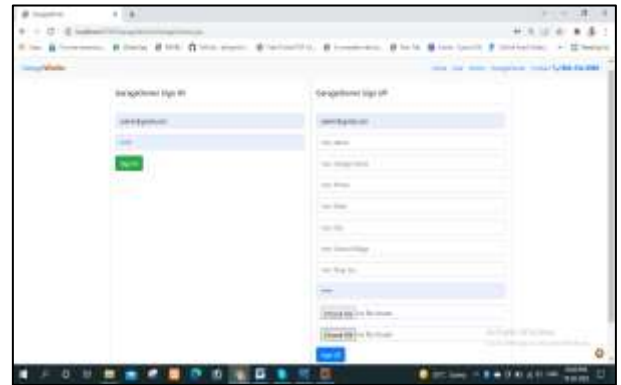


Fig. 12.1: Garage Owner Login page

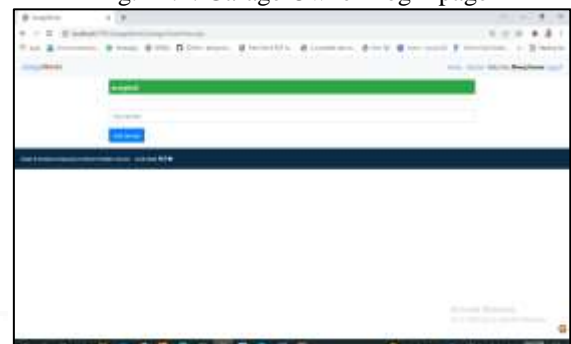


Fig. 12.2: Garage Owner Module Add Service Section



Fig. 12.3: Garage Owner Module See Added Service

The Garage Owner Modules uses the POST method and is written in JSP. Garage Owner Id and Password recorded in garage table and Garage Owner manage the Garage Works. Garage Owner can Add Services data will be recorded in the services database table. The user may quickly search for open garages in a specific city using the state and city names, and both the client and the mechanic will receive notifications on their dashboards.

VI. FUTURE SCOPE

It could be housed on cloud services in the future to make it easier to implement and more effective. It may also have some guiding significance in terms of combining other embedded technology to make it a more intellectualized application.

VII. CONCLUSION

The vehicle sector benefits from the "Garage Management System" in this paper because it makes Garage Bookings more convenient for users, provides a better interface, and saves time by scheduling an appointment ahead of time. This system is required to address all of the flaws in the present garage maintenance system, in which the complexities of the management process for vehicle services are minimized for the convenience of car owners. Automobile owners can use this technology to get regular information about their vehicles' servicing. This website makes car maintenance a breeze. When a car breaks down in an unfamiliar location, car owners can use this technology to locate all nearby garages. As a result, the system tries to improve the current system and give a more user-friendly experience effective approach to manage automotive maintenance.

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