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ROAD ASSIST AND VEHICLE TRACK

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ABSTRACT

The **Road Assist and Vehicle Track System** is a software project designed to streamline vehicle management and maintenance for four main user types: workshop, spare parts, fuel, and users, with a single admin managing the system. It addresses the growing need for vehicle owners to better manage expenses, maintenance schedules, and vehicle profitability. Key features include vehicle registration, listing, tracking, and order management, along with detailed logs for repairs, maintenance, and fuel tracking. The system provides a comprehensive overview of vehicle status and allows users to generate and print reports, making it a valuable tool for both personal and business use.

Keywords: vehicle management, vehicle tracking, maintenance logs, expense tracking, workshop management, fuel management, vehicle registration.

INTRODUCTION

The vehicle industry has seen rapid growth in recent years, making vehicle management increasingly important. On the other hand, a lot of car owners are ignorant about managing and maintaining their vehicles. This project addresses the need for a unified platform to coordinate all vehicle-related tasks. The V Track System is designed to offer a comprehensive solution through a single application, making users aware of their vehicle expenses, profitability, and tax obligations. The system supports four user types:

Admin, Users, Workshop, Spare Parts, and Fuel. Its key functionalities include tracking vehicle transactions, managing orders, and searching for relevant information, all overseen by a single Admin.

Key Points:

- **Vehicle Coordination:** Provides a unified platform to monitor and manage all aspects of vehicle ownership.
- **User Awareness:** Educates users on vehicle expenses, profitability, and tax obligations.
- **Comprehensive Features:** Includes New Vehicle Registration, Listing, Tracking, Order Management, and more.
- **Log Management:** Tracks repairs, maintenance, and fuel logs for detailed expense reporting.
- **User Types:** Supports four primary user roles: Admin, Users, Workshop, Spare Parts, and Fuel.
- **Admin Control:** Single Admin manages user access and overall system operations.
- **Report Generation:** Allows users to generate and print detailed reports for record-keeping.

METHODOLOGY

The methodology for developing the **Vehicle Track System** consists of several key phases:

1. **Requirements Analysis:** Engage stakeholders through interviews and surveys to gather insights on their needs, and analyze competitors to identify feature gaps.
2. **System Design:** Create a Functional Specification Document (FSD) outlining system functionalities and roles, design the system architecture, and develop an Entity-Relationship Diagram (ERD) for the database schema.
3. **Prototyping:** Use wireframes and interactive prototypes to visualize the user interface and gather early feedback on usability.
4. **Development:** Select a technology stack (PHP, MySQL, Bootstrap, JavaScript) and adopt an Agile development approach. Implement the system in modules (User Management, Vehicle Tracking, etc.).
5. **Testing:** Conduct unit, integration, system, and User Acceptance Testing (UAT) to ensure the application meets all functional and user requirements.
6. **Deployment:** Set up a production environment, migrate data if needed, and launch the application while providing support during the transition.
7. **Maintenance and Support:** Offer user training, implement a feedback mechanism, and schedule regular updates to enhance performance and address user needs.
8. **Documentation:** Create technical documentation for developers and user manuals to assist end-users in navigating the system.

This structured approach emphasizes user-centered design, flexibility, and comprehensive testing to deliver an efficient vehicle management solution.

MODULES

User Module

The User section of the V-Track system provides a comprehensive and user-friendly interface for managing vehicle-related needs. New users can easily register and create an account, while existing users can log in with their credentials and utilize a password reset option if needed. Users can manage their profiles, including personal details and vehicle information.

Key functionalities include:

1. **User Registration and Login:** Simple account creation and secure login, with password recovery options.
2. **Profile Management:** Users can update their profiles at any time.
3. **Fuel Station Search and Ordering:** Ability to locate nearby fuel stations and order fuel conveniently.
4. **Booking Management:** Users can view and manage their bookings for fuel orders and workshop services, with notifications for updates.
5. **Workshop Locator:** Find the nearest workshops based on specific service needs, using search filters.
6. **Current Vehicle Problems Reporting:** Report and track vehicle issues, with detailed logs for each problem.
7. **Testing and Diagnostics:** Access vehicle testing and diagnostics to assess performance and health.
8. **User Support and FAQs:** Resources for troubleshooting and customer service contact options.

Workshop Module

The Workshop section of the V-Track system facilitates the registration and management of workshop services. New workshops can easily register and create an account, while existing workshops can log in securely and utilize a password reset option if needed. Workshops can manage their profiles to keep their information current.

Key functionalities include:

1. **Workshop Registration and Login:** Easy account creation for new workshops and secure login for existing ones.
2. **Profile Management:** Workshops can update their profiles at any time.
3. **Service Registration:** Ability to register services offered, specifying vehicle types and service fees.

4. **Service Search:** Workshops can find services based on vehicle type, service type, and location.
5. **Feedback Submission:** Workshops can provide feedback on their experiences within the platform.
6. **User Support and FAQs:** Access to resources for troubleshooting and customer support contact options.

Fuel Module

The Fuel Station section of the V-Track system is designed to streamline the management of fuel station services. New fuel stations can easily register and create an account, while existing ones can log in securely using their credentials. If a password is forgotten, a password reset option is available. Fuel stations can manage their profiles to keep their information up-to-date.

Key functionalities include:

1. **Fuel Station Registration and Login:**
 - Simple account creation for new fuel stations and secure login for existing ones.
2. **Profile Management:**
 - Fuel stations can edit their profiles at any time to ensure accuracy.
3. **Product Registration:**
 - Ability to register fuel products by submitting detailed information, including types and prices.
4. **Product Management:**
 - Fuel stations can search for, edit, and remove registered products as needed.
5. **Order and Report Sections:**
 - A dedicated section to view and manage orders, along with another section for generating reports on sales and inventory.
6. **Feedback Submission:**
 - Fuel stations can provide feedback on their experiences within the platform, contributing to continuous improvement.

Vehicle Module

The Vehicle section of the V-Track system is designed to facilitate the management of vehicle information for users. Each vehicle must register with the application to obtain a unique username and password, enabling secure access to its features. Once registered, users can log in with their credentials.

Key functionalities include:

1. Vehicle Registration and Login:

- Vehicles must register to receive a unique username and password.
- Secure login using valid credentials allows users to access their vehicle information.

2. Information Viewing:

- Users can view detailed information about their vehicle, including:
 - Vehicle name
 - Manufacture year
 - Model
 - Color
 - Cost

LITERATURE REVIEW

The literature on vehicle management and assistance systems reveals significant gaps in current offerings, which often fail to provide comprehensive solutions for vehicle maintenance, tracking, and emergency support. While existing systems enhance maintenance tracking and expense management, they lack integrated emergency assistance features, leaving users vulnerable during breakdowns or mechanical issues. Drivers often face challenges in locating reliable mechanics, particularly in remote areas, and many systems do not offer features for profitability analysis, preventing users from understanding the financial viability of their vehicles. Furthermore, effective user management through Role-Based Access Control (RBAC) is crucial for ensuring system security, allowing different user roles—such as administrators, mechanics, and vehicle owners—to have tailored access to functionalities based on their responsibilities.

The integration of order and inventory management can streamline procurement processes, enhancing service quality by ensuring spare parts are readily available when needed. Studies suggest that combining GPS technology with telematics can significantly improve safety, offering real-time vehicle tracking and route optimization, while also enabling predictive maintenance by analyzing vehicle performance data. Moreover, emerging technologies such as machine learning and artificial intelligence can provide

personalized user experiences, tailoring recommendations for services and spare parts based on historical data and user preferences.

Existing systems also lack comprehensive support for managing vehicle-related obligations, such as insurance and tax renewals, which can lead to increased costs and legal issues for vehicle owners. By providing alerts for these critical dates, a robust vehicle management system could help users avoid lapses in coverage and ensure compliance with regulations. The proposed V-Track system aims to address these shortcomings by providing a holistic platform that encompasses features like detailed maintenance logs, real-time emergency support, comprehensive expense tracking, and in-depth profitability analysis. Additionally, V-Track will incorporate user-friendly interfaces and mobile accessibility to ensure that users can manage all aspects of their vehicle ownership seamlessly and efficiently, regardless of their location. By leveraging modern technologies and integrating multiple functionalities into a single platform, V-Track aspires to enhance the overall vehicle ownership experience, making it easier for users to maintain their vehicles, access services, and ultimately achieve better financial outcomes.

EXISTING SYSTEM

Online vehicle assistance is not widely available now. Existing does not cover all the details of a vehicle or all the services required for a vehicle. The services provided by existing systems are very limited. It does not contain information on vehicle taxes, insurance, oil, etc., or their renewals. If their vehicles are broke down or run out of petrol or had any mechanical issue in remote locations or any long distant locations, they are unable to provide appropriate services for these issues.

DRAW BACKS OF EXISTING SYSTEM

- There are few services.
- we can't understand whether the vehicle is profit or not.
- Does not make any alerts about the renewal dates.
- It is not possible to find out the suitable mechanic for the desired service at remote location.
- Completely unaware the services that are available near to them.

PROPOSED SYSTEM

V-track is a site which coordinates all details about a vehicle. One can do everything related to their vehicle through this. It includes the expenses made by the vehicle, services required and so on. If a vehicle had any mechanical issue or broke down or run out of petrol user can search their desired service through v-track by giving their location. It will give the nearest location to acquire the service. They can also buy spare parts through this site by ordering. That is access to and the presence of services are made to known to the users with Google Maps Navigation System. It gives full details about insurance, tax, engine oil and it exactly makes alerts as the time draws near its renewal dates. Travelers are offered a wide range of support that they can take advantage of all at once.

ADVANTAGES OF PROPOSED SYSTEM

- Secure registration of user's and mechanics.
- Easy access to the data.
- The site is more user-friendly, reliable and flexible.
- Reduced manual work.
- Search mechanics based on different locations according to their needs.
- User can understand whether the vehicle is profit or not
- Able to order petrol, spare parts.
- Getting alerts about the renewal dates.
- Users and mechanics can give their ratings.
- Personalized Shopping: Use of machine learning algorithms for tailored user experiences.
- Integration of Emerging Technologies: Continuous improvement through advanced analytics and data visualization tools.

CONCLUSION

Vehicles have become a necessary need for a human being . Moreover every work, every one need a vehicle for transportation. Without them life would be very difficult .It saves time and also reduces our energy consumption in travelling from one place to another. Road trips are always fun and enjoyable . However in the unfortunate and un for seen event of a breakdown or road accidents what is needed is immediate help .Today most people are using their own vehicle to travel. While traveling most of drivers are face to trouble as vehicle breakdown cause to waste the user's valuable time . That is a worst experience . they have to face . When the vehicle breakdown on the road the driver has to search for a mechanic and have to see a spare parts shop near to their location. At this time if driver unable to search a good mechanic the have to ask someone's help. But that may be not good technological help for driver . So here comes th solution. Here I am proposing an on road vehicle management system for helping drivers in a virtual manner. This system provides emergency road side assistance services round the clock to ensure a pleasurable and uninterrupted journey virtually anywhere. This application is designed to enhance the user experience and ensure that users get immediate and hasle free service in the event of any vehicle breakdown. This makes possible efforts to locate and direct the nearest service provider to user's location.

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