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Smart Platform for PUC Vendors about PUC Expiration & Reminders

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Abstract: ***Air pollution caused by vehicular emissions is a significant environmental and public health concern, and regulatory measures, such as Pollution Under Control (PUC) certificates, are implemented to monitor and control vehicle emissions. However, the majority of the people fail to renew their PUC certificates because they don't get any reminders, unlike reminders sent by insurance companies, The PUC vendor have to manually send the PUC expiration reminder message to the client.***

The PUC vendors often have to keep track of their clients using notebook and pen and manually check the expiration dates of certificates daily, which can be a time-consuming and error-prone process. These inefficiencies can lead to a poor customer experience, increased workload for PUC vendors, resulting in lack of compliance with PUC regulations and potential fines.

The proposed platform provides a smart and innovative online platform designed specifically for PUC vendors to streamline their operations and improve compliance with PUC regulations. The platform is built using the MERN (MongoDB, Express.js, React, Node.js) stack, providing a modern and scalable solution for PUC vendors to manage their clients and send PUC expiration reminders via SMS and WhatsApp.

The platform includes various features such as a centralized database for storing client information, automatic PUC expiration reminders through SMS and WhatsApp, and a user-friendly interface for PUC vendors. This platform aims to enhance the efficiency and effectiveness of PUC vendors by reducing manual paperwork, minimizing errors, and improving customer service. It is expected to contribute to better compliance with PUC regulations, leading to reduced vehicular emissions and improved air quality.

Keywords: SIPNA COET, PUC VENDORS, MERN STACK, NODEJS, REACTJS, MONGODB, WHATSAPP API

I. INTRODUCTION

The Pollution Under Control (PUC) refers to the process of measuring and controlling the amount of pollution emitted by vehicles. It is a mandatory requirement in many countries, including India, to ensure that vehicles meet the prescribed emission standards and do not contribute to air pollution. In India, PUC certification is issued by authorized PUC centers that conduct emissions tests on vehicles to ensure that they meet the prescribed norms. The use of PUC certificates is important for several reasons. Firstly, it helps to reduce air pollution, which can have adverse effects on human health and the environment. Secondly, it ensures that vehicles are maintained in good condition, which can improve their performance and fuel efficiency. Thirdly, it helps to enforce regulations related to emissions and encourages vehicle owners to take responsibility for their impact on the environment. In summary, Pollution Under Control is a measure to control the amount of pollution emitted by vehicles, and its use is mandatory in many countries, including India, to reduce air pollution and enforce regulations related to emissions.[1]

The Indian government has mandated the Pollution Under Control (PUC) certificate under the Central Motor Vehicles Rule, 1989. According to The Motor Vehicles Act, a PUC Certificate is mandatory to drive a vehicle in India. Not complying with the rules and regulations can attract penalties under Section 190 (2) of The Motor Vehicles Act. The PUC is a certification mark that is provided to vehicles that undergo the PUC Test successfully.

But still the majority of the people fail to renew their Pollution under Control (PUC) certificates because they don't have any reminders by PUC centers unlike reminders sent by insurance companies. Mr K. Vinod Kumar Kanumala, a road safety expert, said, "Earlier most of the people used to stick the PUC certificates on their vehicles which used to remind them of their renewal date but these days nobody does so. Majority of them fail to renew their certificates because of no reminders."

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He said, “People even forget to renew their insurance but insurance companies help them by sending them reminders on a regular basis before the deadline. Similarly, PUC vendors should send reminders to the people to get renewal of their PUC certificates. The RTO’s m-Parivahan app has about 1 crore users now and the app should be upgraded in such a way that it can send reminders about the renewal of insurance as well expiration of PUC certificate.” [2]

Currently, there is no automatic system to send the PUC certificate expiry message to vehicle owner. The PUC vendors often have to deal with high volumes of paperwork and data, making it difficult to efficiently manage their operations. As the customer base grows, this manual approach becomes difficult to manage. This can lead to frustration and burnout for PUC vendors. This can result in reminders being sent late or not at all, leading to customers' PUC certificates expiring. This approach can lead to errors, delays, and poor customer service, making it difficult to efficiently manage their operations.

The proposed system addresses these challenges faced by the PUC Vendor and proposes a smart and innovative online platform specifically designed to streamline their operations and improve compliance with PUC regulations. The platform will include features such as a centralized database to store client information, automated PUC expiration reminders through SMS and WhatsApp, and a user-friendly interface for PUC vendors for managing their customers.

The primary objective of this project is to develop a comprehensive and efficient system that helps PUC vendors manage their clients, track PUC expiration dates, and send timely reminders to ensure compliance with PUC regulations. The system aims to reduce manual paperwork, minimize errors, and improve customer service, leading to increased compliance and reduced vehicular emissions. The platform also includes advanced analytics and reporting functionalities, allowing PUC vendors to monitor compliance, generate reports, and gain insights from emissions data.

II. OBJECTIVE

The objectives of the project are as follows:

1) To remind the vehicle owner about PUC Certificate expiration.

The first objective of the project is to develop a smart platform that sends automated reminders using SMS and WhatsApp to vehicle owners about the expiration of their PUC certificates. This will help to ensure that vehicle owners are aware of their PUC status and take necessary actions to renew their certificates on time, thus promoting compliance with the PUC regulations.

2) To ensure the vehicle owner have their PUC renewed on time.

The second objective is to provide a system that helps vehicle owners to renew their PUC certificates on time. By receiving timely reminders, vehicle owners will be more likely to renew their certificates on time, reducing the risk of penalties and fines for non-compliance.

3) To develop user friendly software for the PUC vendors for managing their clients.

The third objective is to develop a user-friendly software platform for PUC vendors to manage their clients. By providing PUC vendors with a centralized platform for managing their clients and tracking their PUC status, the platform will help to reduce errors and save time for the vendors, resulting in increased efficiency and better customer service.

4) To increase the awareness in general public about pollution being emitted from their respective vehicles.

The fourth objective is to increase public awareness about the importance of PUC compliance and the impact of vehicle emissions on the environment. By providing vehicle owners with timely reminders about their PUC status and encouraging them to renew their certificates on time, the platform will help to promote a culture of compliance with PUC regulations and reduce the levels of pollution emitted by vehicles on the road.

III. PROBLEM STATEMENT

The PUC vendors face several issues and challenges, including managing a large number of clients, manually by using pen and notebook, track the PUC expiration dates of customers, and sending reminder. This manual approach can lead to errors, delays, and poor customer service. Additionally, PUC vendors often have to deal with high volumes of paperwork and data, making it difficult to efficiently manage their operations. The problem statement of this project is to address the inefficiencies and difficulties faced by PUC vendors in managing their clients and sending them PUC expiration reminders. The current manual approach is prone to errors and requires a significant amount of time and resources. Therefore, there is a need for a more efficient and automated system to manage PUC certificates and track their expiration dates.

As the customer base grows, the manual approach becomes increasingly cumbersome and difficult to manage. This can lead to frustration and burnout for PUC vendors. This manual approach also lacks automation, meaning that PUC vendors must manually send reminders to customers. This can result in reminders being sent late or not at all, leading to customers' PUC certificates expiring.

To address these challenges, this system proposes a smart and innovative online platform specifically designed for PUC vendors to streamline their operations and improve compliance with PUC regulations. The platform will include features such as a centralized database to store client information, automated PUC expiration reminders, real-time notifications through SMS and WhatsApp, and a user-friendly interface for PUC vendors.[3]

IV. METHODOLOGY

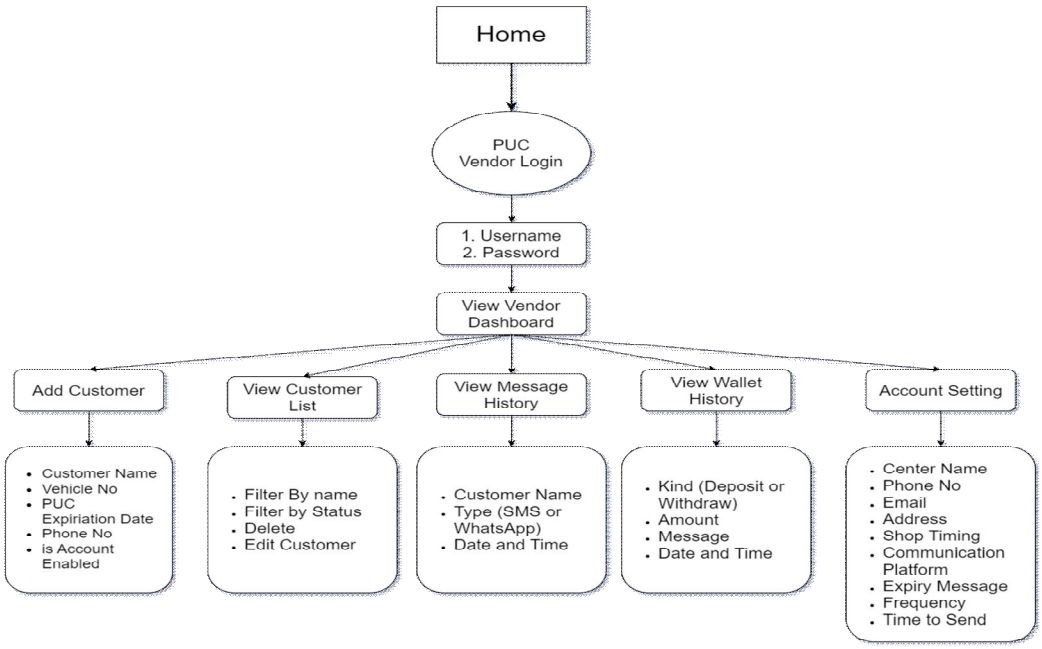
The methodology of this project involves developing a web-based application. The system will use a centralized database to store the customer information. It will include features such as automatic reminders for PUC renewal, and customer tracking.

The methodology used for developing the Smart PUC Monitoring System using MERN stack involves the following steps:

1) *Requirements Gathering:* The requirements of the system are gathered from the stakeholders and documented.
2) *System Design:* The system design is created based on the requirements gathered in the first step. This involves the creation of a data model, API design, and UI design.
3) *Development Environment Setup:* The development environment is set up with the required tools and technologies. This includes installing Node.js, MongoDB, and React.
4) *Backend Development:* The backend development is carried out using Node.js and Express. The API endpoints are created for handling requests from the frontend and interacting with the database.
5) *Database Development:* The database is developed using MongoDB. The data model created in the system design is implemented in the database.
6) *Frontend Development:* The frontend is developed using React. The UI design created in the system design is implemented in the frontend.
7) *Integration and Testing:* The frontend and backend are integrated, and the system is tested for functionality and usability.
8) *Deployment:* The system is deployed on a server and made available for use.
9) *Maintenance:* The system is maintained and updated as required to ensure its smooth operation. [4]

V. DATA FLOW DIAGRAMS

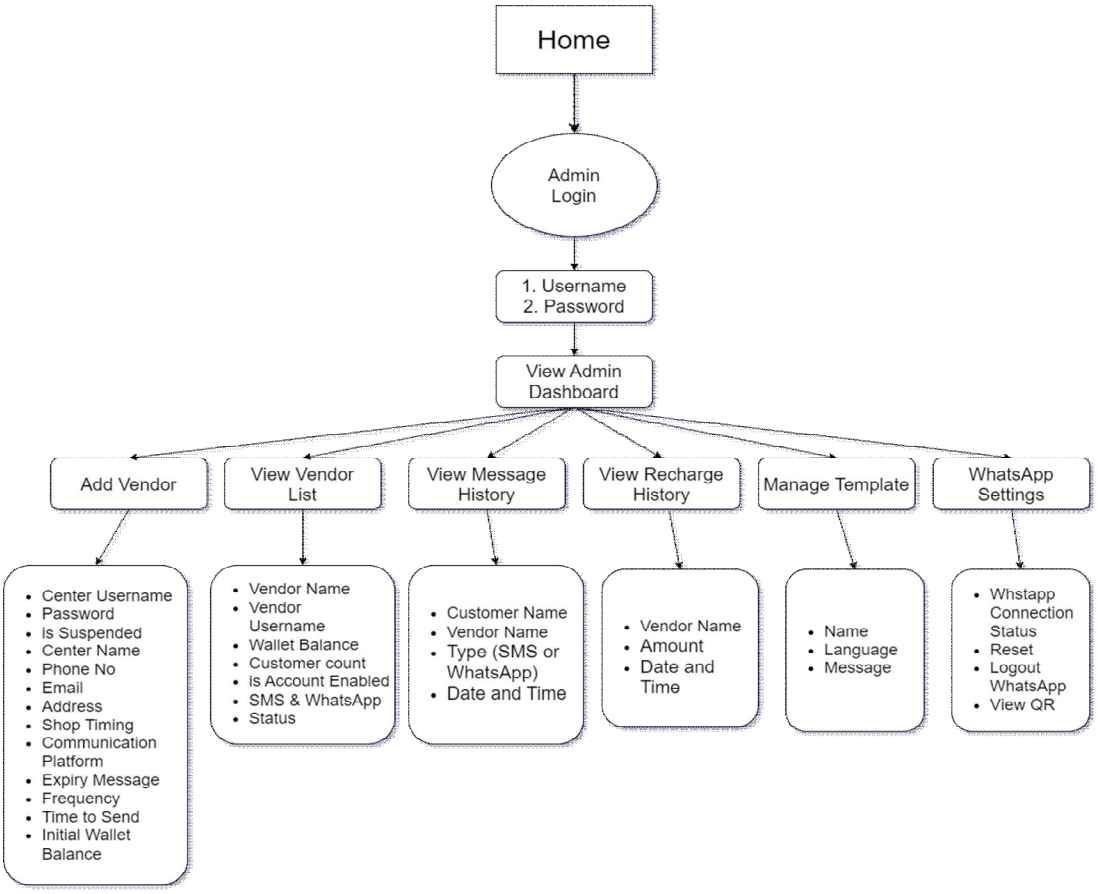
1) The data flow diagram for PUC vendor is as follows:



The PUC Vendor Module is as Follows:

- Login: The user can log in to their account by providing valid credentials.
- View Dashboard: The user can view their dashboard that displays a summary of the number of customers, the number of PUC certificates that will expire soon, and the wallet balance.
- Add Customer: The user can add a new customer by providing their details such as name, phone number, and vehicle registration number.
- View Customer List: The user can view the list of all the customers and their details such as name, phone number, and vehicle registration number.
- Delete Customer: The user can delete a customer from the list.
- Edit Customer: The user can edit the details of a customer such as name, phone number, and vehicle registration number.
- View Expiring PUC Certificates: The user can view the list of PUC certificates that are going to expire soon.
- Enable/Disable Customer Account: The user can enable or disable a customer account if needed.
- View Message History: The user can view the history of messages that were sent to the customers.
- View Wallet Recharge History: The user can view the history of wallet recharges.
- Edit Account Settings: The user can edit their account settings such as name, password, and phone number.
- Modify Communication Platform (SMS and WhatsApp): The user can choose between sending messages via SMS or WhatsApp.
- Edit Expiry Message: The user can edit the message that will be sent to the customers before their PUC certificate expires.
- Edit Message Sending Frequency and Time: The user can edit the frequency and time at which the messages will be sent to the customers. [5]

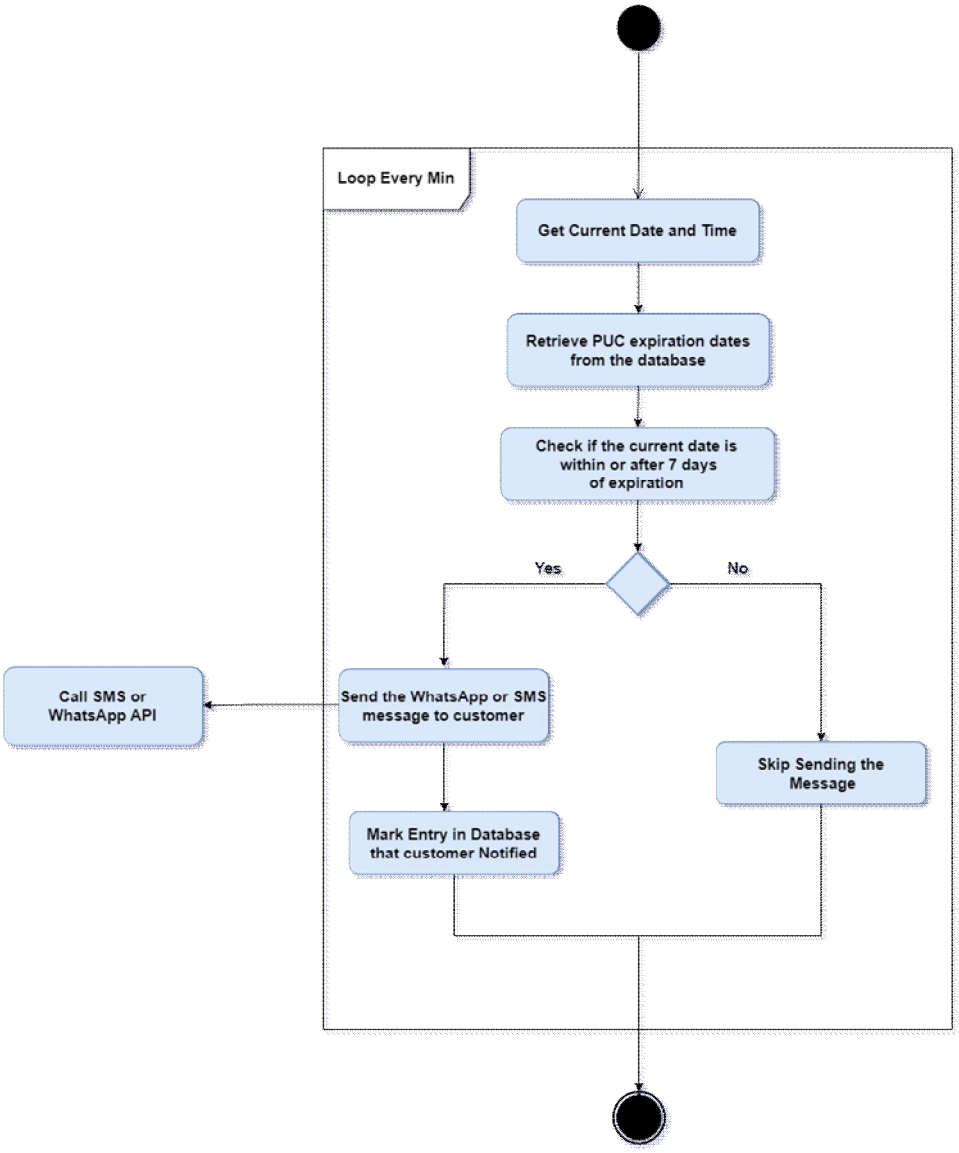
2) The data flow diagram for admin is as follows:



The Admin Module is as Follows:

- Add New Vendor: The admin can add new vendors to the system, including their contact details and other relevant information.
- Edit and Manage Existing Vendor: The admin can modify the details of existing vendors, such as their contact information, account settings, and other relevant information.
- Delete Vendor: The admin can delete vendors from the system if necessary.
- Recharge Vendor Wallet: The admin can recharge the wallet of a specific vendor to ensure they have enough credit to send PUC reminders to their customers.
- View Global Message Sent History: The admin can view the message history of all vendors and customers in the system.
- View Vendor Recharge History: The admin can track the recharge history of vendors in the system.
- Manage Message Templates: The admin can create and manage message templates to be used by vendors when sending PUC reminders to their customers.
- Edit WhatsApp Setting: The admin can configure and modify the WhatsApp settings used by vendors to send PUC reminders to their customers. [6]

VI. ACTIVITY DIAGRAM



VII. RESULTS

The Home Page of the Platform is shown in figure 1.

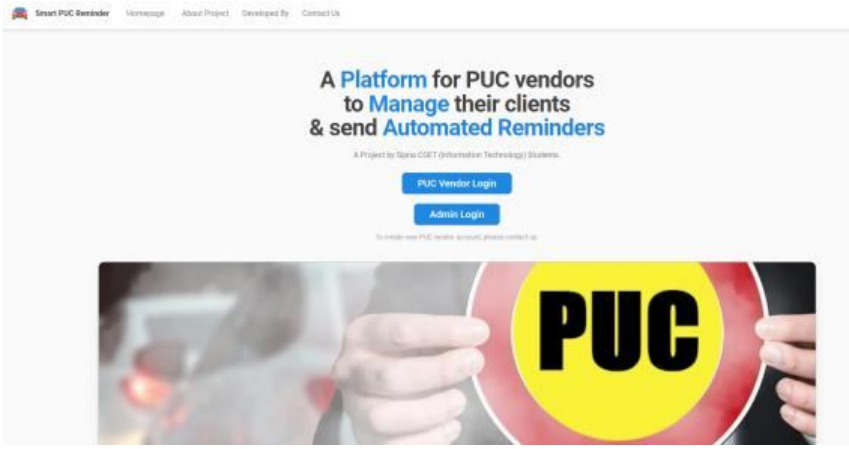


Figure 1 - Home page

The PUC Vendor Login Page adding username and password is shown in figure 2.

Figure 2 – Vendor Login Page

The PUC Vendor Dashboard which show the Expiring PUC certificates is shown in figure 3.

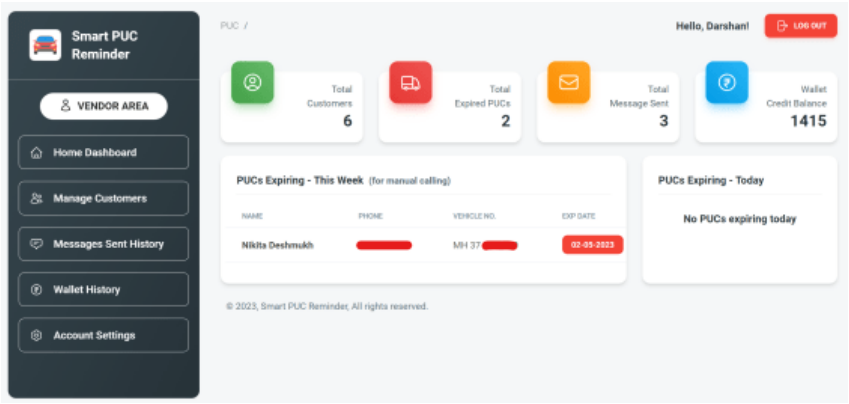


Figure 3 – Vendor Dashboard Page

The manage customer page lists all customers along with their information, is shown in Figure 4.

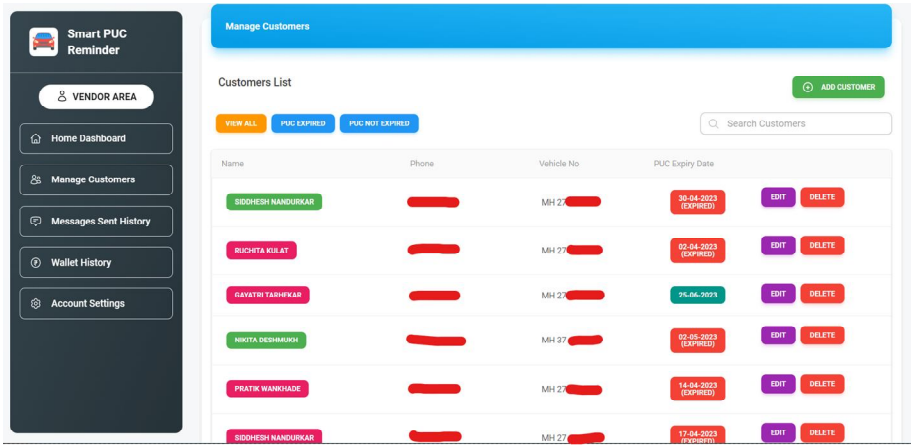


Figure 4 – Manage Customers Page

A new customer can be added from add customer page, is shown in Figure 5.

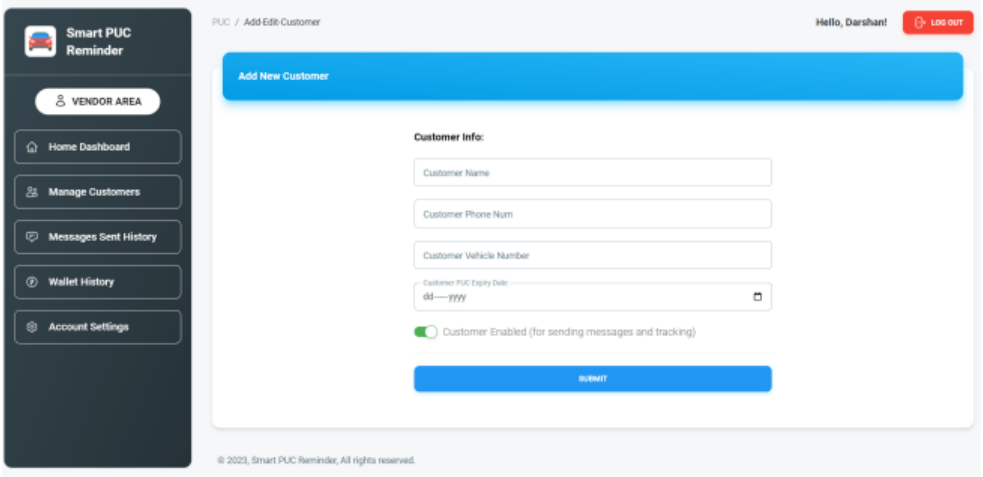


Figure 5 – Add Customer Page

The account settings of PUC Vendor can be modified from the Account Setting Page, is shown in Figure 6.

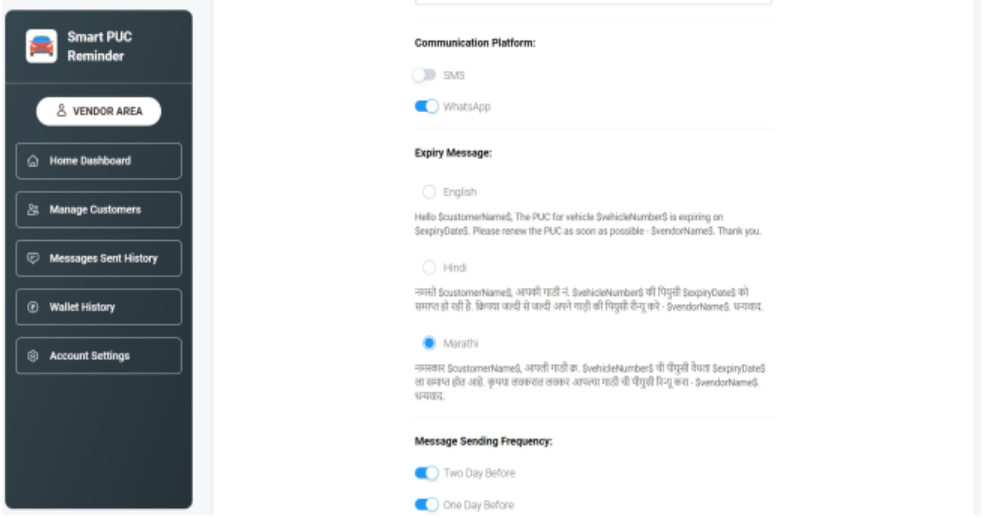


Figure 6 – Account Settings Page

The Admin Login Page adding username and password is shown in Figure 7.

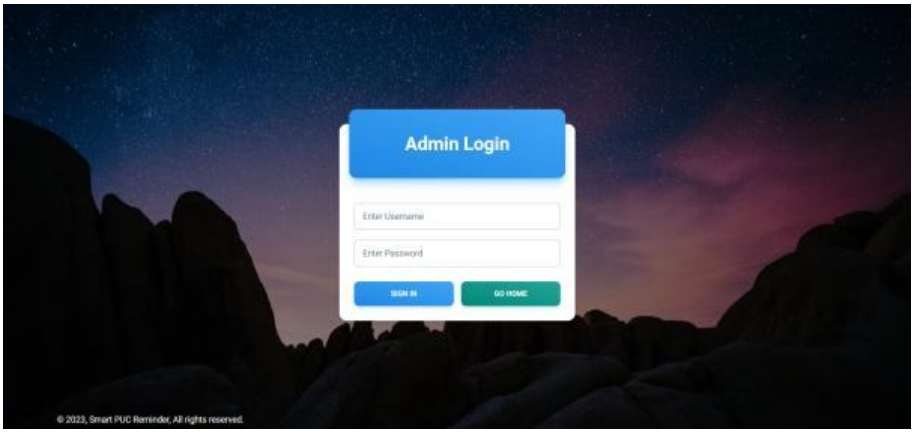


Figure 8 – Admin Login Page

The Admin Dashboard which show the various parameters is shown in figure 9.

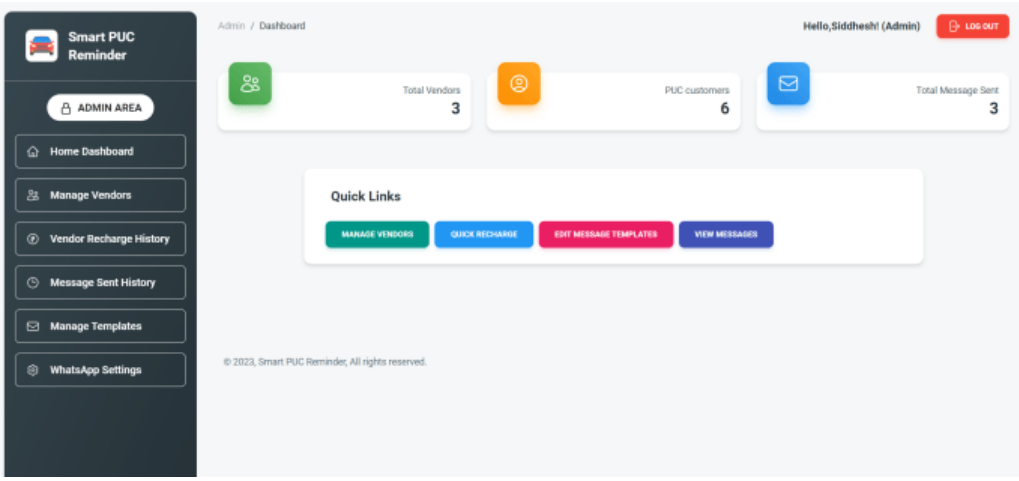


Figure 9 – Admin Dashboard Page

The manage vendor page lists all vendors along with their information, is shown in Figure 10

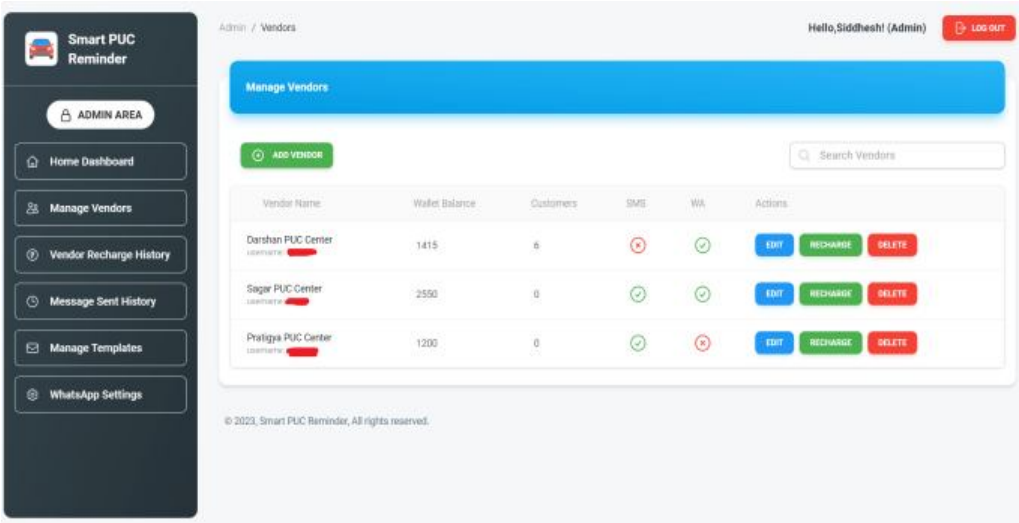


Figure 10 – Manage Vendors Page

A new vendor can be added from the Add new Vendor page, is shown in Figure 11

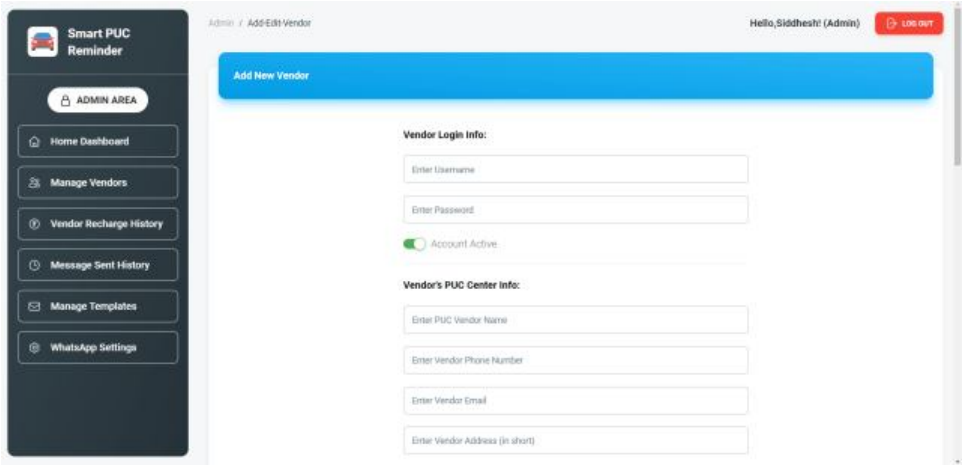


Figure 11 – Add new Vendor Page

A new message template can be added or the existing template can be edited or deleted on manage message template page, is shown in Figure 12

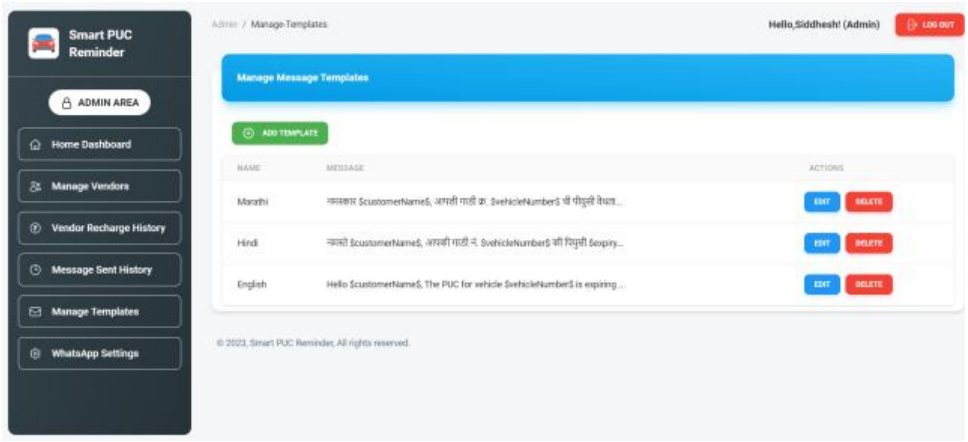


Figure 12 - Manage Message Templates Page

The message sent history page shows all the messages sent by the system to customers, it is shown in Figure 13

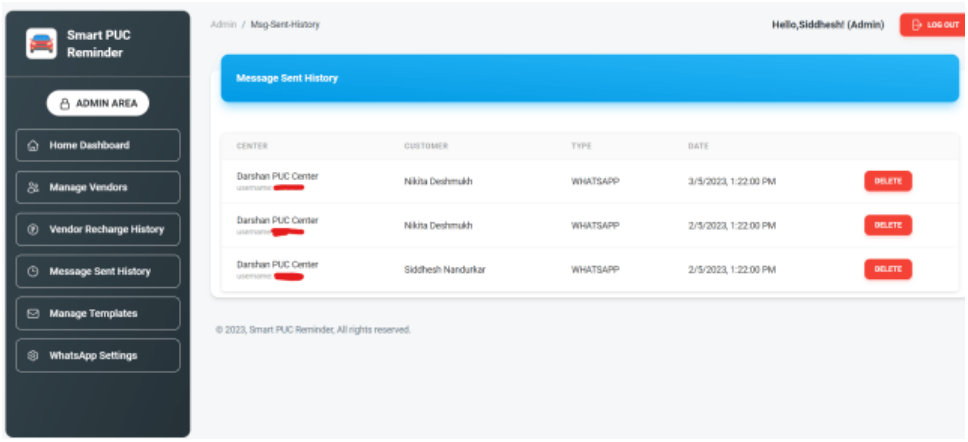


Figure 13 Message Sent History Page

The reminder message of expiring PUC certificate, which is sent to the customers using SMS and WhatsApp, it is shown in Figure 14.

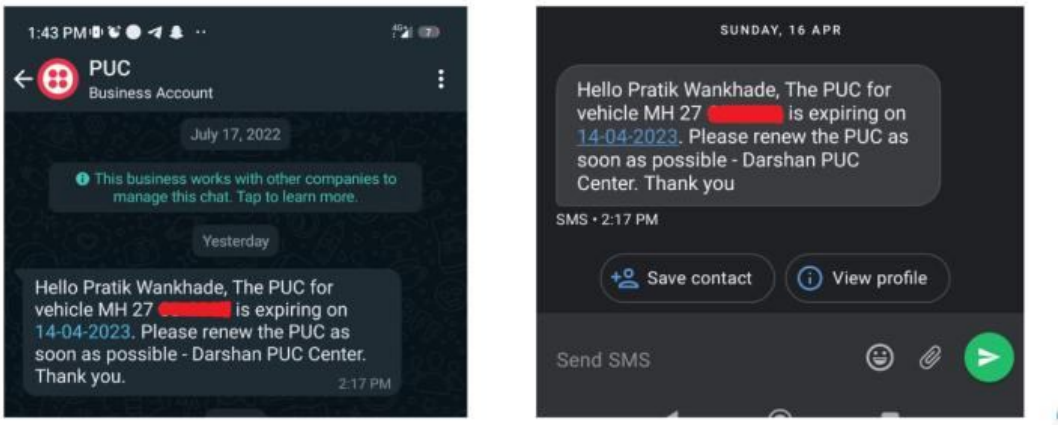


Fig 14 – WhatsApp and SMS Message

VIII. RESULTS

The Smart Platform for PUC Vendors about PUC Expiration & Reminders is an innovative project that aims to address the challenges faced by PUC vendors in tracking their customers and sending timely reminders for PUC certificate expiration. The project is designed to automate the process, reducing the burden of manual tracking, and providing easy access to customer information from anywhere with an internet connection.

The platform provides several advantages, such as improved accuracy, scalability, accessibility, and automation, leading to increased customer satisfaction, reduced errors, and saved time and effort for PUC vendors. It also offers various features such as real-time tracking of PUC certificates, automated reminders to customers, and the ability to generate reports, making it a comprehensive solution for PUC vendors.

Overall, the Smart Platform for PUC Vendors is a valuable tool by providing an automated, scalable, and accessible solution, it can help PUC vendors streamline their operations, reduce errors, and improve customer satisfaction, leading to a more sustainable and profitable business model.

REFERENCES

[1] Saurabh Dandapat, Tamojit Ghosh, Uday Shankar, Swati Maitra, Bhargab Maitra, “A relook at the pollution certification of in-use vehicles in India and a way forward” Asian Transport Studies, Volume 6, 2020, 100020,ISSN 2185-5560,

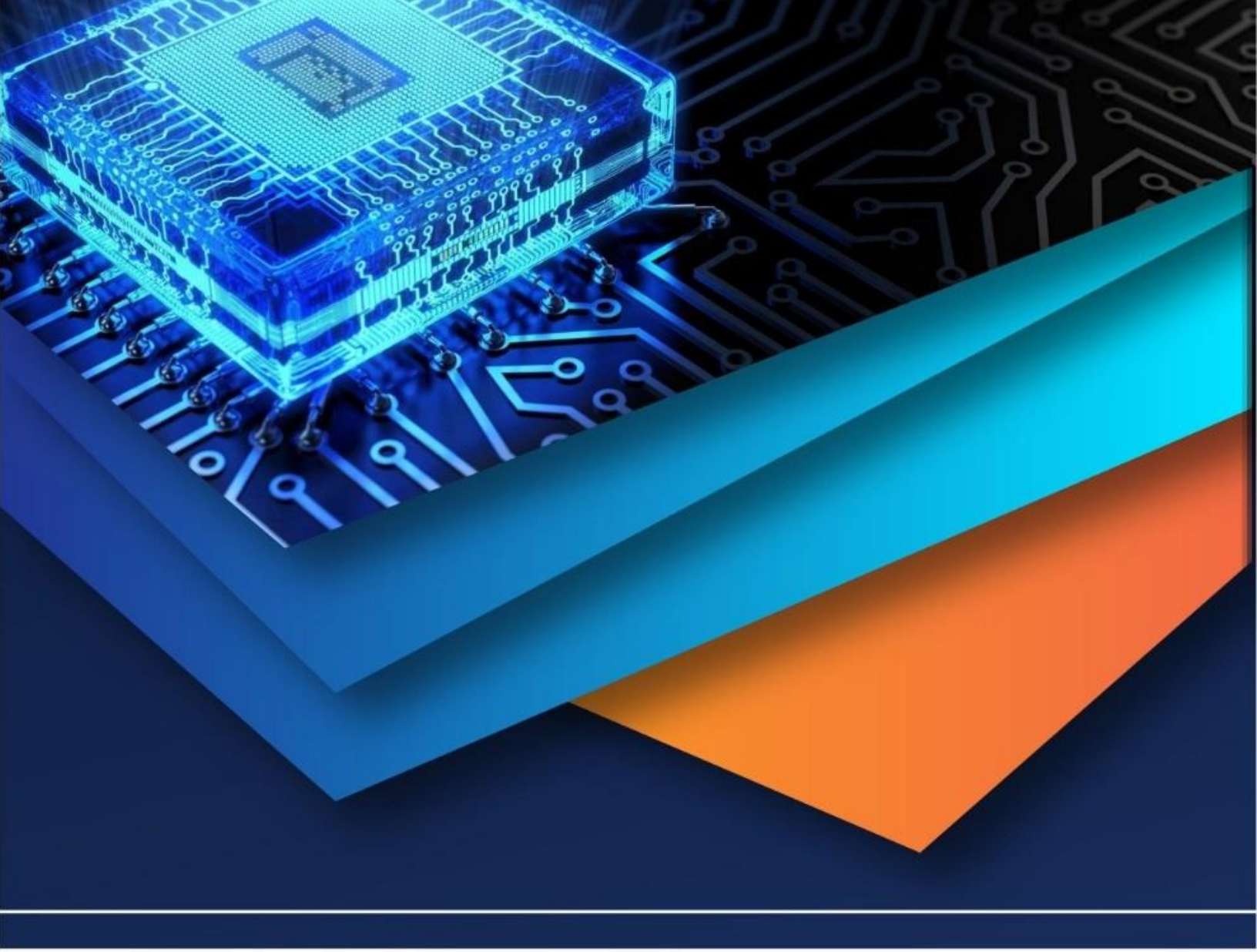
[2] Deccan chronicle “Experts demand PUC reminders” (2018) - https://www.deccanchronicle.com/nation/current-affairs/250618/experts-demand-puc-reminders.html

[3] “PUC - Pollution Under Control” (2009) - https://www.team-bhp.com/forum/street-experiences/69835-puc-pollution-under-control.html

[4] Monika Mehra, Manish Kumar, Anjali Maurya, Charu Sharma, Shanu. (2021). “MERN Stack Web Development” Annals of the Romanian Society for Cell Biology, 25(6), 11756–11761. Retrieved from http://www.annalsofrscb.ro/index.php/journal/article/view/7719

[5] Jayasiri K.C.N, Thathsarani W.R.V.K., De Silva D.I., Vidhanaarachchi S (2022) “Design and implementation of an automated hospital management system with MERN stack” - International Journal Of Engineering And Management Volume: 12, Issue: 5 (197-202)

[6] Diwakar, Nagothu & Adarsh, Pentapati & Reddy, Sabharinadh & Raju, Gumpula & Kiran, Sai & Sharma, Vikas. (2021). E-Commerce web Application by using MERN Technology. International Journal for Modern Trends in Science and Technology. 7. 1-5. 10.46501/IJMTST0705001.



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