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Offgrid and Hybrid Charging Stations for Electric Vehicle

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Abstract: *In Recent years car companies like TATA, TESLA introduced and launches new electric cars in the market. For charging these cars some of the stations are also set up. But considering the current situation, these cars take at least 15 minutes to half an hour to charge. If station is full and all the slots are filled previously then other customers have to wait for a long time. Our idea is to develop a system which will solve these kinds of issues. We are developing a system in which we going to connect all the electric car charging stations together. By using our system user can find the station according to their choice and it will be useful for those who want to travel for long distance with their EV cars and it will be time saving. It will be very easy to use. If the given time slot is available then your place for the given slot will be booked. Otherwise system will ask to enter the new time schedule. In this system user has to pay some percent of amount online to confirm their booking. Our system will also provide shortest map route to reach at given station. Our system will also provide interface for charging stations to view all available slots as well as booked slot lists and manage slot timing. We are going to develop this system for web based devices. To develop this system, we are going to use time-slot allocation techniques as well as Google maps API for direction sensing. Our chatbot system will Control software via vocal commands. With the help of online payment gateway user can pay money quickly. Also the feature of choosing offgrid & hybrid charging will be there. By using the system peoples will save their so much time and they can view and book appropriate station easily.*

Keywords: Electric Vehicle, Slot, Map, Payment, Stations

I. INTRODUCTION

Global warming and the depletion of fossil fuels due to excessive energy consumption have become urgent global concerns. To combat these issues, the installation of renewable energy systems, independent of fossil fuels, is crucial. In Japan, the government's implementation of Feed- in Tariffs (Fit) has led to rapid adoption of photovoltaic systems. However, the increased output from these systems has negatively impacted system frequency and voltage distribution. Consequently, the Japanese government is reevaluating the Fit system. Additionally, the cost of photovoltaic installation is decreasing annually, indicating a significant drop in future PV power prices. This study proposes the use of EV charging stations as aggregators, primarily purchasing power from PV systems in smart houses and supplying power to electric vehicles (EVs) and smart houses. These charging stations require fixed batteries for electricity trading. In this project, we aim to provide a platform for customers to book charging slots at available charging stations according to their needs. The system offers various features, including an AI chatbot for vocal command- based station bookings, mapping capabilities for direction sensing, digital payment options, as well as notifications, emails, and SMS alerts for each activity. Electric vehicles can be charged using different types of charging infrastructure tailored to specific locations and requirements. This chapter emphasizes the importance of considering local planning and implementation for EV charging networks, highlighting the technical aspects and standards of EV chargers.

1.1 Motivation

The motivation behind Charging Stations for Electric Vehicle projects is to drive widespread adoption of electric vehicles by addressing range anxiety, promoting environmental sustainability, fostering technological innovation, reducing

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dependence on fossil fuels, stimulating economic growth, and aligning with government policies for a cleaner and more sustainable transportation future.

1.2 Objective

Develop a widespread and accessible charging infrastructure. Mitigate range anxiety and promote electric vehicle adoption. Reduce carbon emissions through the use of clean energy sources. Foster technological innovation in charging solutions. Optimize energy distribution through smart grid integration. Raise public awareness and support government policies. Stimulate economic development and job creation. Ensure inclusivity and accessibility for diverse user groups. Facilitate collaborations between public and private entities. Enhance the overall user experience for electric vehicle owners

II. EXTERNAL INTERFACE REQUIREMENT

Hardware Interfaces

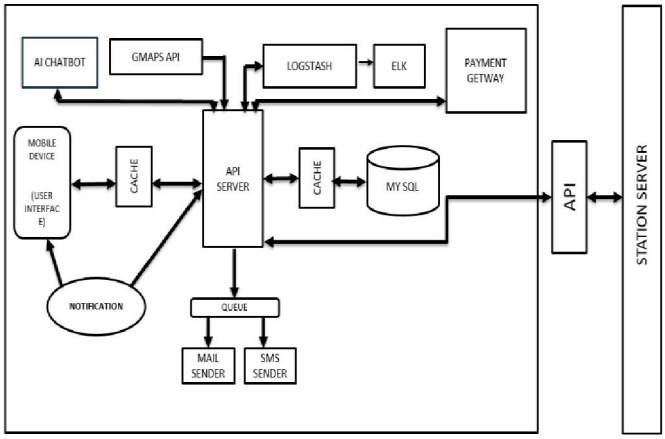
- Processor - Intel i3/i5/i7
- Speed - 3.1 GHz
- RAM - 4 GB(min)
- Hard Disk - 40 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mouse
- Monitor – SVGA

Software Interfaces

- Operating System - Windows 7/8/10
- Front End - HTML, CSS, Bootstrap
- Database - My SQL
- IDE - VS Code
- Language - Python

III. SYSTEM ANALYSIS

ARCHITECTURE



In the module, the user first will look into nearby stations when the electric vehicle needs to get charged by logging into system. With the help of chatbot the user will interact. In the next step, from the database user will get stations and will able to book slot. Further, if you are booking slot user will need to pay with the help online payment gateways. We will also get notifications that slot is booked through mail and sms. In the next step, gmap will show the shortest route to station

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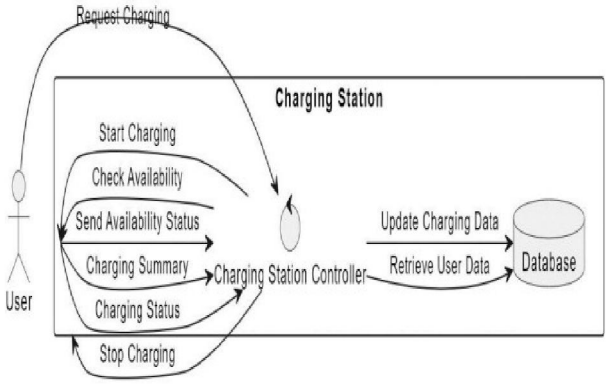
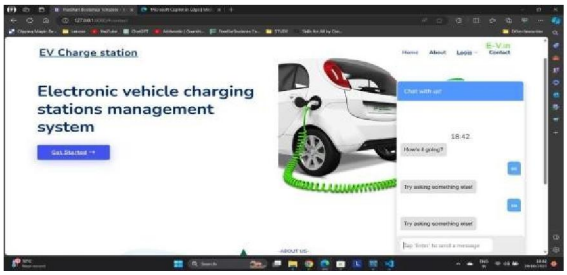
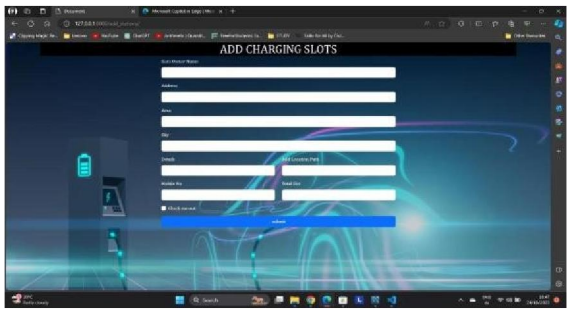
DATA FLOW

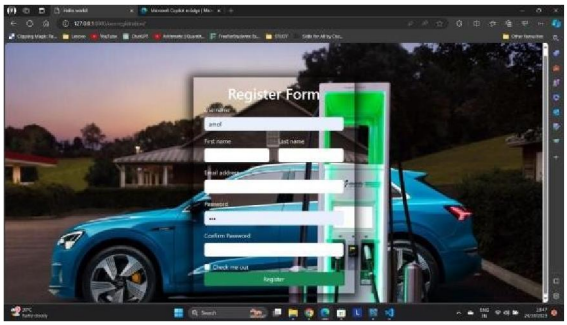
The flow of data in our system



IV. OUTPUT







V. CONCLUSION

The System is developed as a "Offgrid & Hybrid Charging Stations for Electric Vehicle" with approach of web application development. The system also proposes the booking of charging slot according to the type of charging socket to car. This system also contains the chatbot for query solving as well as GMAPS API for direction sensing.

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REFERENCES

[1] A Comprehensive Review on Off-Grid and Hybrid Charging Systems for Electric Vehicles GAUTAM RITURAJ 1 (Member, IEEE), GAUTHAM RAM CHANDRA MOULI 1 (Member, IEEE), AND PAVOL BAUER 1 (Senior Member, IEEE) accepted 13 April 2022

[2] Achmadfitro: Shortest Route at Dynamic Location with Node Combination-Dijkstra Algorithm

[3] Subhash S, Prajwal N Srivatsa, SiddeshS: Artificial Intelligence Based Voice Assistant: Fourth World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4).

[4] Binod Vaidya1, Hussein T. Mouftah:Smart Electric Vehicle Charging Management for Smart cities: IET Research Journals, The Institution of Engineering and Technology