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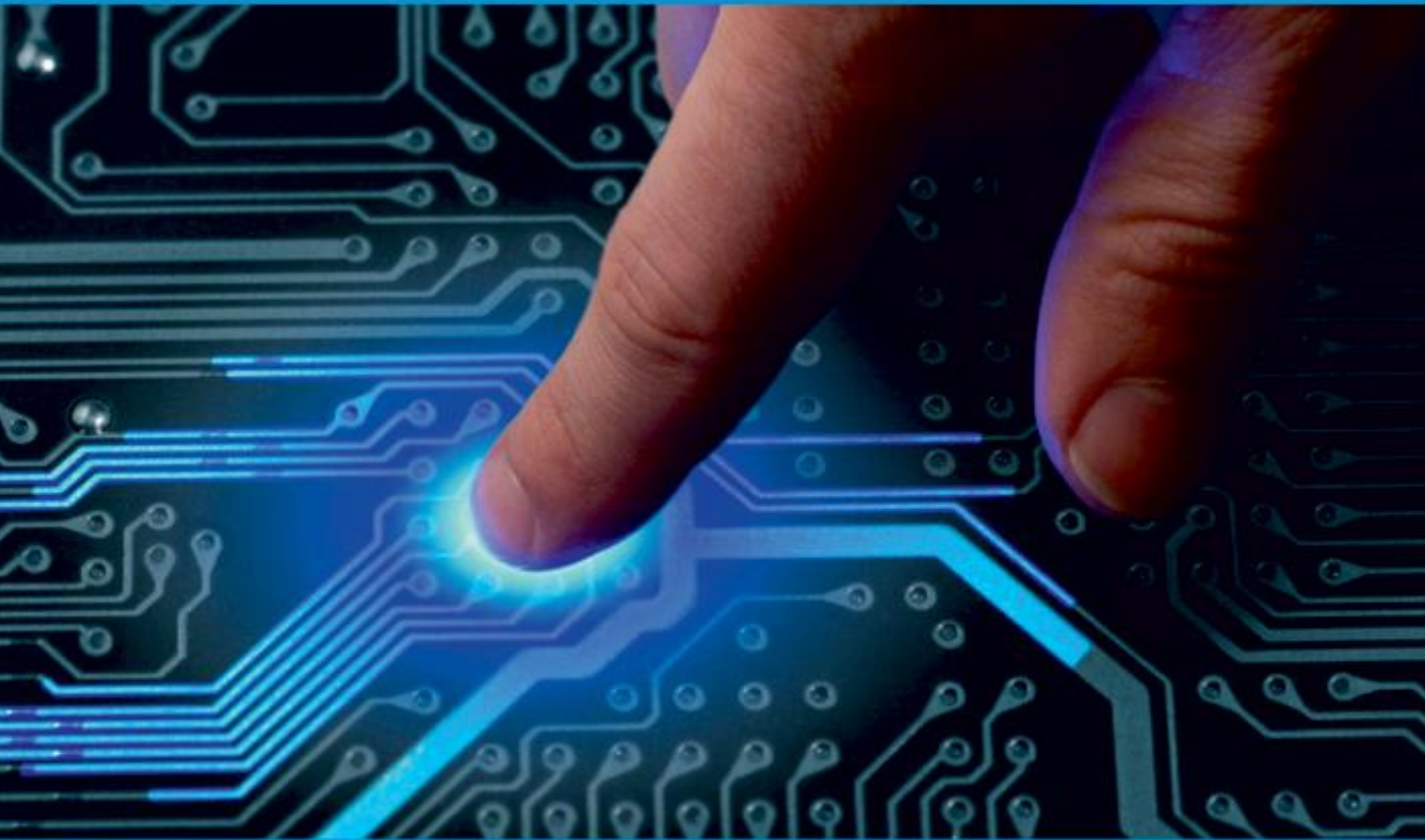

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Balancing Stackholder Interests in IMOCS-Based EV Charging Station Planning Optimization

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ABSTRACT: Automotive manufacturers like TATA have launched new electric automobiles on the market along with the construction of charging stations. However, the current charging duration varies from 15 to 30 minutes, which might cause delays when the stations are completely utilised. Our idea entails linking every electric car charging station into a single network to overcome these problems. Users can quickly find and choose their chosen station, which is especially useful for long-distance driving in electric cars and ultimately saves time. When slots are available, the system allows users to reserve them; otherwise, it prompts them to choose a new time.Online booking confirmation requires a portion of the cost. Our technology also shows the quickest path to the chosen station and gives charging stations a management interface to control open and reserved slots. Our Android-based solution makes use of time-slot allocation strategies and the Google Maps API to sense direction. Through our chatbot system, voice instructions may be used to operate the programme, and an online payment gateway speeds up transactions. By utilising our technology, consumers can find and reserve suitable charging stations quickly and with a significant time savings.

KEYWORDS: Smart management, charging slot, EV Cars, Map,Chatbot.

I. INTRODUCTION

The use of fossil fuels and global warming have both increased recently. global warming and the twin, serious challenges of fossil resource depletion caused by careless energy consumption. Fossil-fuel-free renewable energy systems must be installed in order to address these problems. The government's Feed-in Tariffs (Fit) programme has accelerated Japan's adoption of solar power. The increased output from these systems has, however, had a negative effect on the voltage distribution and system frequency.As a result, the Fit system is currently being reviewed by the Japanese government. Additionally, photovoltaic installation costs are falling yearly, portending much cheaper PV electricity costs in the future. In this study, it is suggested that EV charging stations be used as energy aggregators, primarily for the purpose of transmitting power from PV systems in smart homes to EVs and smart homes. These charging stations need fixed batteries to exchange electricity.

With this initiative, we hope to give customers a platform where they can plan charging sessions at available charging stations to suit their needs. An AI chatbot, mapping capabilities for direction sensing, digital payment alternatives, and notifications alerts for each activity are just a few of the features the system provides.Different charging infrastructure types, each suited to certain places and needs, can be used to recharge electric vehicles. By emphasising technical details and EV charger standards, this chapter emphasises the importance of considering local design and execution for EV charging networks.

II. LITERATURE SURVEY

This paper [1] Cloud based Smart EV Charging Station Recommender Sarika P.R,Shivraj P 2022,Random Forest Algorithm (RFA) is applied for finding stations that are near the vehicle location; Linear Search Algorithm (LSA) for filtering stations that satisfy the user requirements.

[2] Electric vehicle charging station planning with dynamic prediction of elastic charging X. Bai, Z. Wang, L. Zou, H. Liu, Q. Sun, and F. E. Alsaadi 2021 In this study in this study, a novel approach based on the dynamic forecast of charging demand has been developed to address the problem of planning EV charging stations.

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[3]Optimize strategy of wireless charger node deployment based on improved cuckoo search algorithm Y. Wang, F. Wang, Y. Zhu, Y. Liu, and C. Zhao 2021 In this paper, we have proposed model and algorithm's accuracy and efficacy are also confirmed.

[4] Cuckoo search algorithm for multiobjective optimization of transient starting characteristics of a selfstarting HVPMSM. L. Wang, H. Guo, C.D. Shaver, and N. Bianchi 2021 This survey aims a multiobjective optimization strategy based on QRSM and the Cuckoo search algorithm is proposed in this study.

[5]Stochastic planning of electric vehicle charging station integrated with photovoltaic and battery systems D. Yan and C. Ma 2020 In this paper,the modelled charging demand of the charging station was made more realistic by taking into account a variety of EV charging behavior, charger configurations, and charging assignment models.In this paper,the modelled charging demand of the charging station was made more realistic by taking into account a variety of EV charging behavior, charger configurations, and charging assignment models.

[6]Optimal planning of charging station based on discrete distribution of charging demand. Daniel Nahmias, Aviad Cohen, Nir Nissim, Yuval Elovicia 2020 In this work,the use of SAR data for rice identification at various sites in northern Vietnam is demonstrated.

[7]Agentbased aggregated behavior modeling for electric vehicle charging load K. Chaudhari, N. K. Kandasamy, A. Krishnan, A. Ukil, and H. B. Gooi 2019
we study suggested a simulation model to forecast EV charging demand based on a number of key parameters.

[8]Influence of electric vehicle access mode on the static voltage stability margin and accommodated capacity of the distribution network Nir nissim, aviad cohen1, jianwu, andrealanzi, liorrokach, Yuval elovici and lee giles 2019. In this study, We research, the behavior of buses, t-taxis, and private vehicles were taken into account when developing the prediction model for the demand for charging power for electric vehicles.

[9]Current weakening control of coreless afpm motor drives for solar race cars with a three-port bi-directional dc/dc converter V. Rallabandi, D. Lawhorn, J. He and D. M. Ionel. This paper proposes the use of a coreless axial flux permanent magnet machine, which has the attributes of low stator mass, negligible core loss and virtually zero cogging torque, as the propulsion motor. A three-phase inverter with its dc bus fed from a three-port DC/DC converter, which accepts inputs from a solar panel and battery powers the propulsion motor.

III. PROPOSED SYSTEM

Problem Statement

To design and develop a web-based application to book the charging slot to charge the electric vehicle. The system also proposes the slot booking according to charging socket type.

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Block/Architecture Diagram

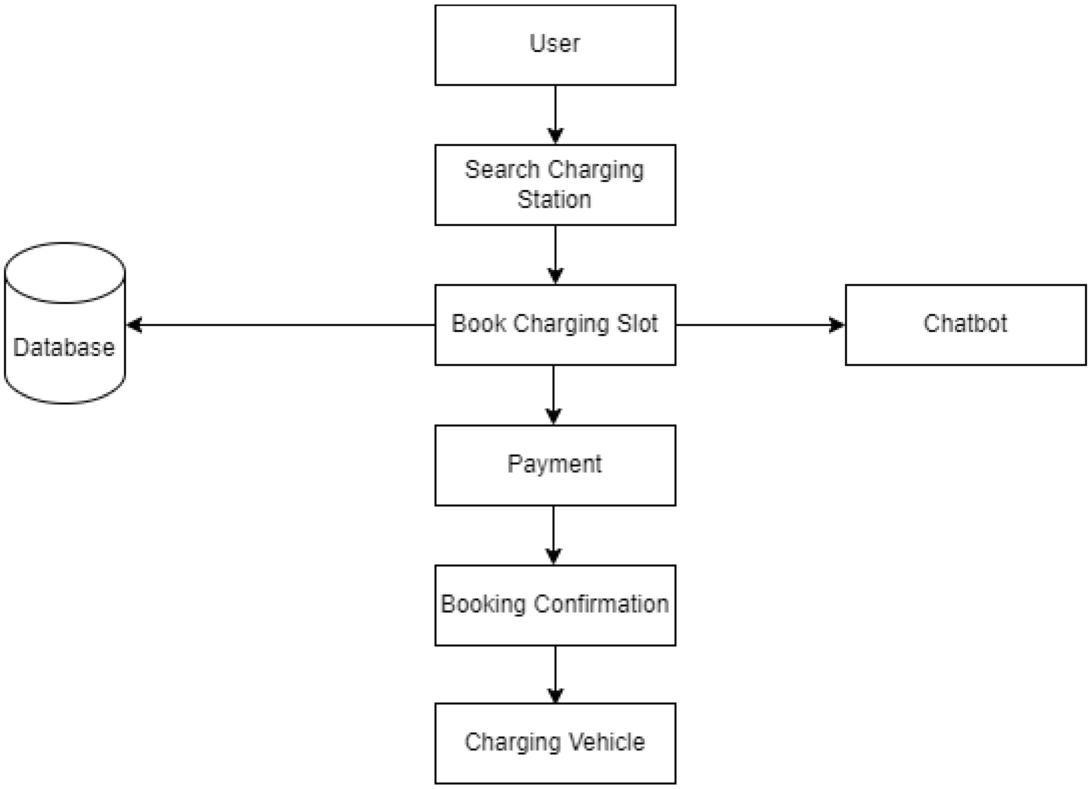

Figure 1. Proposed System Architecture

Hardware and Software Diagrams

Hardware Requirements:

1. Processor - Intel i3/i5/i7
2. Speed - 3.1 GHz
3. RAM - 4 GB(min)
4. Hard Disk - 40 GB

Software Requirements:

1. Operating System - Windows 7/8/10
2. Application Server - Apache Tomcat7/8/9 /10
3. Front End - HTML, CSS, Bootstrap, JSP
4. Language - Java
5. Server side Script - Java Server Pages.
6. Database - My SQL
7. IDE - Eclipse

Algorithm/Workflow of System

As small-sized superconducting magnetic energystorage (SMES) system is commercially available at present, thefunction and effect of a small-sized SMES in an EV chargingstation including photovoltaic (PV) generation system is studied inthis paper, which provides a practical application of small-sizedSMES. The comparison of three quick response energy storagesystems including flywheel, capacitor (super-capacitor) and SMESis also presented to clarify the features of SMES. SMES, PVgeneration system, and EV battery are connected to a commondc bus with corresponding converters respectively. Voltage sourceconverter (VSC) is used for grid-connection. With characteristicof quick power response, SMES is utilized to maintain the dc bussteady. During the long-term operation

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of EV charging station,an energy management strategy is designed to control the energytransfer among PV units, SMES, EV battery, and power grid. TheEV charging station system is modeled in MATLAB/SIMULINKand simulation tests are carried out to verify the function andperformance of SMES.

IV. RESULTS

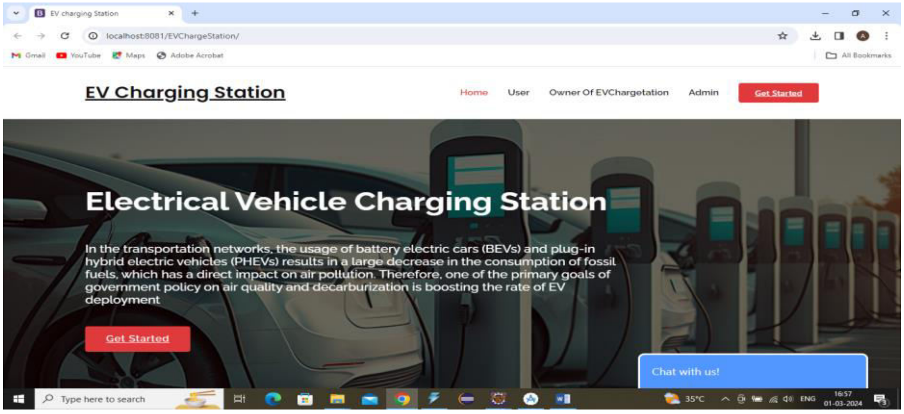

Fig. Output No 1

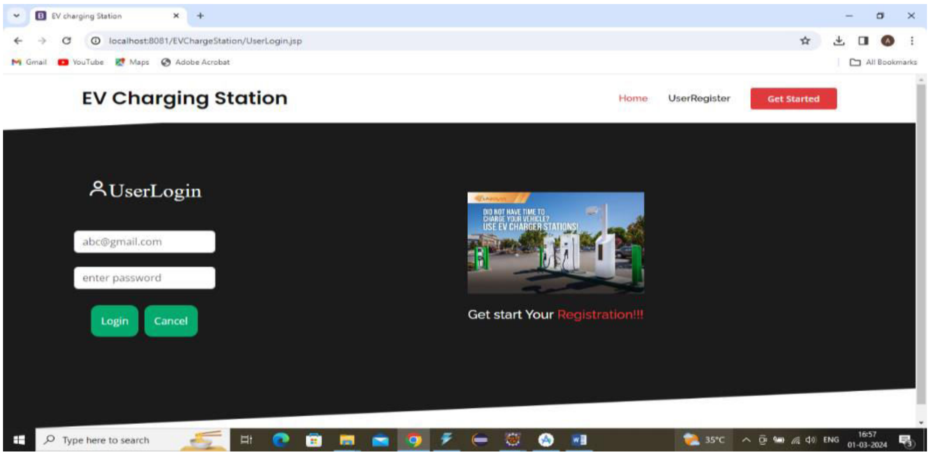

Fig.Output No2

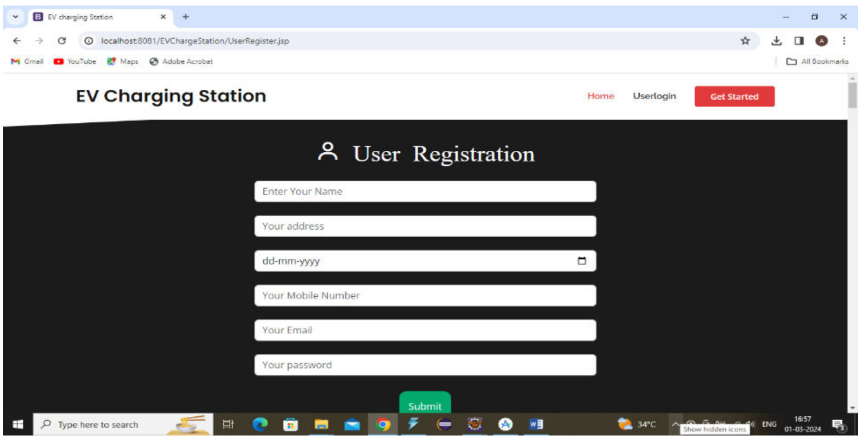

Fig.Output No 3

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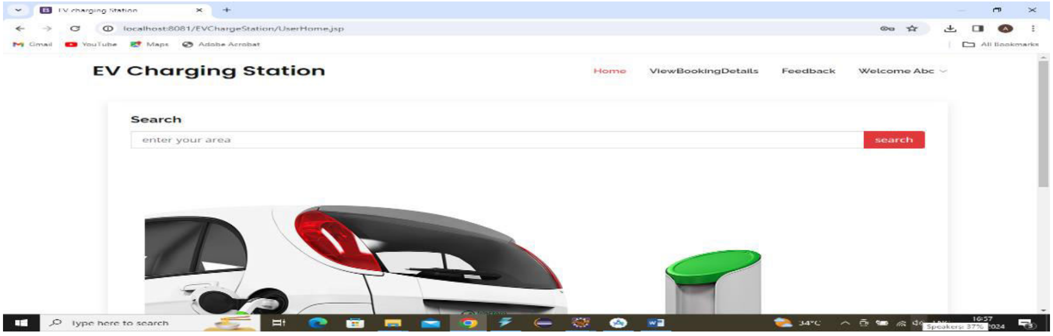

Fig.Outtput No.4

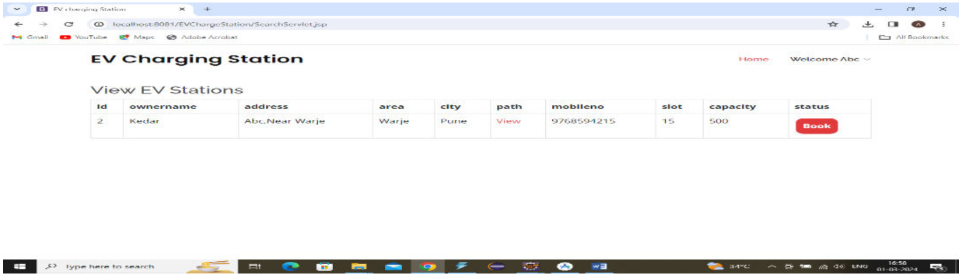

Fig.Output No.5

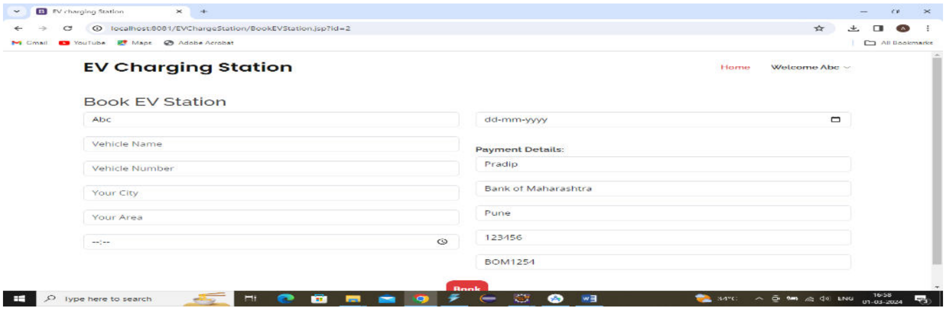

Fig.Output No.5

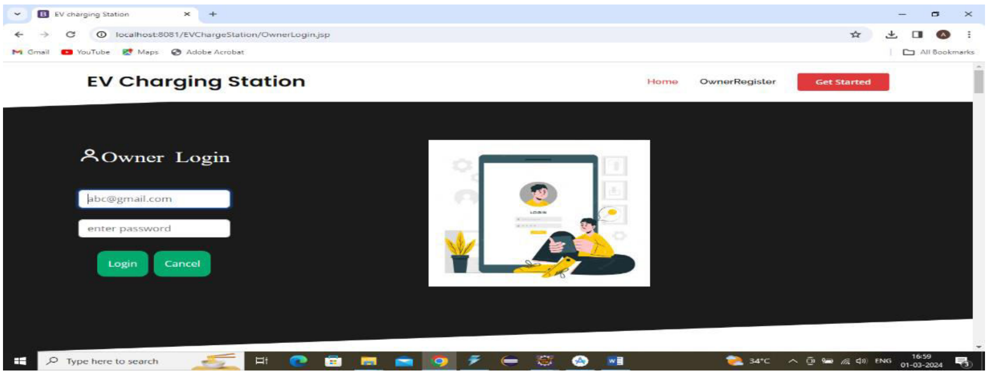

Fig.Output No.6

V. CONCLUSION

We used a novelmethod to web application development to construct the "Smart Management of EV Charging Stations" solution with success. The system's ability to reserve charging spaces based on the precise sort of charging

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socket the automobile needs is one of its primary features. The system includes an AI chatbot that can answer questions and offer assistance to improve user interaction and support. This chatbot automates the process of gaining access to charging stations and guarantees a seamless user experience. The system also makes use of the GMAPS API to deliver precise direction sensing. This feature improves convenience and effectiveness by making it simple for users to go to and find the closest charging station. In conclusion, the system for "Smart Management of EV Charging Stations" uses a web application methodology. It provides charging slot reservation based on charging socket types, an AI chatbot for question answering, and effective direction detection through the GMAPS API. This complete solution seeks to streamline the management of EV charging stations and enhance the user experience in general.

We used a novelmethod to web application development to construct the "Smart Management of EV Charging Stations" solution with success. The system's ability to reserve charging spaces based on the precise sort of charging socket the automobile needs is one of its primary features. The system includes an AI chatbot that can answer questions and offer assistance to improve user interaction and support. This chatbot automates the process of gaining access to charging stations and guarantees a seamless user experience. The system also makes use of the GMAPS API to deliver precise direction sensing. This feature improves convenience and effectiveness by making it simple for users to go to and find the closest charging station. In conclusion, the system for "Smart Management of EV Charging Stations" uses a web application methodology. It provides charging slot reservation based on charging socket types, an AI chatbot for question answering, and effective direction detection through the GMAPS API. This complete solution seeks to streamline the management of EV charging stations and enhance the user experience in general.

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