

# A Survey on “Electric Vehicle Charging Station App”

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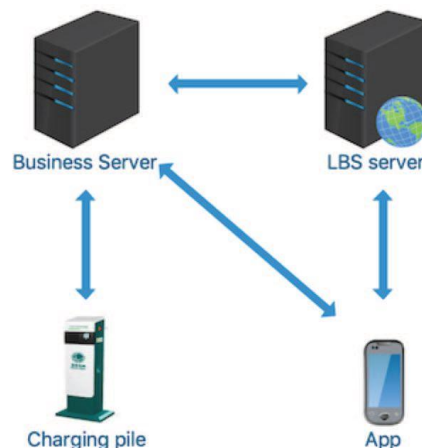
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**Abstract:** The latest innovations like electric cars are vying for attention. Less childcare, fuel economy and convenience are some of the benefits it has. The U.S. Environmental Protection Agency has stepped up with its recent efforts to reduce greenhouse gas emissions that cause global warming and to prevent price increases for petroleum products. In addition, the cost of photovoltaic electricity is falling rapidly. Therefore, it is suggested that photovoltaic energy will be cheaper in the future. But in Japan, the largest amount of power generated by solar technology has had a devastating effect on its electrical infrastructure. This concept provides constant power for EV charging stations. It also offers some opportunities to generate electricity from eco-friendly EV charging stations. Electricity is used to charge the electric car. This article also presents the power management and control system for the electric vehicle charging station. Wind turbines and solar photovoltaic arrays are used together to replace the energy of oil and reduce pollution from carbon emissions.

**Keywords:** Electric Vehicle Charging

## I. INTRODUCTION

Currently there are not enough payment centers in India and it is difficult for people to find payment centers that can save time and money. Power plants need places such as parks, shops and communities. Clubs, buildings or parking lots of public or commercial places are where you can find private and semi-public charging stations. Therefore, it is difficult for EV users to find nearby charging stations. Finding a place to charge is a challenge, but so is fast charging because electric cars take time to charge. EV users find this inconvenient because it takes a long time and requires a dedicated place to charge the EV. India also saw an increase of 4,444 new registrations, so this number is not clearly visible on the virtual map. India's electric car market is expanding, but the number of charging points is declining. This makes it difficult for users to find good payment sites. Customers who buy electric cars must manage them differently than customers who buy old cars. People need to find help to find a parking space; such as using an app that finds a place to pay for an electric car. We can save time by using the electric parking location app instead of searching on your own. Because of this issue, we have to plan when to charge (charge) these vehicles, but with our schedule we can find nearby EV charging stations. This article will explain the application for the detection of power plants. Electric car charging station finder app will show you charging stations near us and near your location.



EV owners will benefit greatly from the application in terms of time savings. In this project, we will create a tool that will be useful for customers and employees who pay parking fees. Thanks to the app, all previous customers can pay for their cars from the vending machine. The app provides a friendly and easy-to-use interface for customers and vendors.

## II. LITERATURE SURVEY

1. Dr. Omar A. Ibrahim and Khalid J. Mohsen developed and implemented a web-based location service for Android mobile devices using Google Maps. This article describes an Android application designed to allow smartphone users to add, remove and view specific locations on an online map. The program also provides simple navigation functions such as displaying directions for the shortest route between sources and calculating work and distance as well as travel time. To provide the solution, the program integrates and uses Google Maps API, Google Directions API, PHP, JSON and MySQL.

2. A mobile GPS navigation system based on Google Maps has been developed and commissioned. The Google Maps API by L. Zhijian and H. Li provides many tools to add custom content to Google Maps. We may communicate with Google Maps services using standard Application Programming Interfaces (APIs). This way we will be able to build anything from a simple venue-based website, iOS and Android apps.

The Google Maps API provides many tools to add content to the original Google Maps, and many websites are searchable based on the Google Maps API. Assisted Global Positioning System (A-GPS), the cutting-edge technology for mobile services, has won the favor of mobile phone users. This article introduces a mobile phone navigation system that provides functions such as Google map search and search, bus search and local mobile phone quick location. This document describes the operating procedures and main procedures of the system. The Nokia N73 then displays the test results.

3. In the article "Web-Based Application and GPS-Based Mobile Cross-Platform Cargo Tracking System" by P. Cooper and A. M. Qadir, Global Positioning System (GPS) is used to run the web-based application. The GPS system has more than 30 navigation satellites in Earth orbit.

We know where they are because they keep sending us signals. Your phone's GPS receiver searches for these signals. After determining the distance to four or more GPS satellites, the receiver can determine your location. Cross-platform development has become popular among developers, providing a unified framework that can run on multiple systems simultaneously, saving money and time. It eliminates the need to write code for each platform separately.

## III. SYSTEM IMPLEMENTATION

### 3.1 Existing Methodologies

We aim to create an application that helps users find power plants and achieve customer satisfaction using their unique features. Here we review the process we used to complete the project. Our team finds many relevant sites, some of which are app related. We categorized the data and selected the ones related to the topic of the article. Research using relevant keywords. Review the discussion topics for each application and select topics that can be used in class to complete the classification.

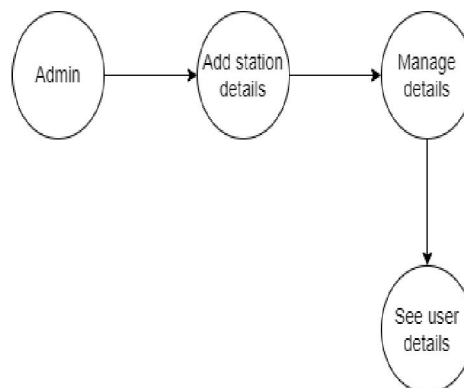


Fig. Work flow diagram

We filter the data before we start the design and build this application. Our team started to create applications by combining ideas from selected sources and using them in order according to our project needs. Our EV finder app will

feature EV charging station, firebase email authentication, navigation system, slot allocation and deletion system, profile management for users and vendors, online payment, new parking and maintenance and profile management system. The main tasks that a user or seller can perform are listed below.

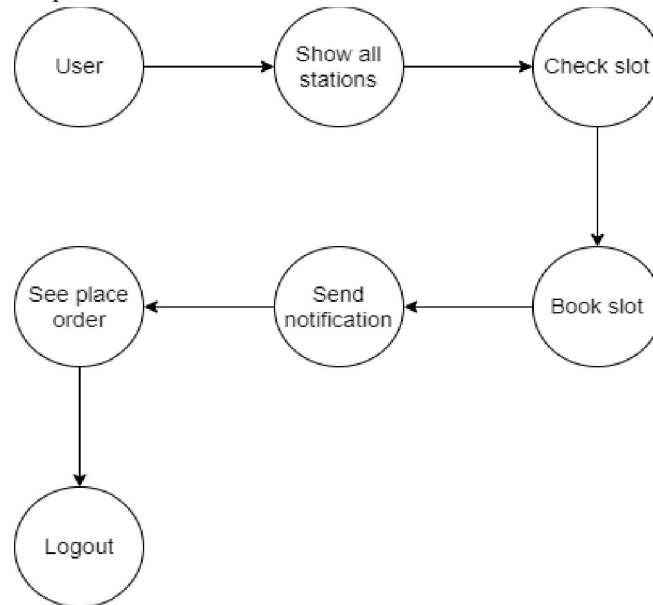


Fig. Work flow diagram

#### IV. METHODOLOGY

##### User can interact with:

Map and navigation are included. You can book slots, delete slots, and add stations.

##### Customers can contact:

- Booking List
- Ability to Remove Bookings
- Ability to Add Stations

##### Profile Selection:

When customers or vendors open the application, we must first choose whether we are a user (electric vehicle owner) or a manufacturer (electric vehicle owner charging station).

##### A. Map Activity:

After selecting a user and logging in, the first task in the application is the job report. This page includes a complete map, icons for all currently open locations, and a separate list of all locations. Users can select nearby locations.

- Station : This function will be active when you press the next stop. This function contains all information about parking, including parking view, location and distance from user's home. There are parking spaces, a rental fee feature, and an hourly EV fee.
- Slot Booking : This action will be enabled when a book is opened. This process requires you to fill in certain information to save the payment location, including the vehicle manufacturer, model, charger type and charging time.
- Navigation Feature : From the user's current location, this will take them to the station. This will launch Google Maps and provide turn-by-turn directions.

**B. Booking List Activity**

This activity contains information about every user's reservations at charging stations, and users can also cancel reservations from here.

**C. Profile Activity**

- **Contribute Feature :** The user can utilise this function to add additional stations to the app's database and map. This function helps with the inclusion of new stations in India, as the EV industry is growing and new stations are popping up there.
- **Profile :** This has all information of user such as name, live user location and you can edit it also.

**V. SYSTEM DESIGN**

**Proposed System Architecture:**

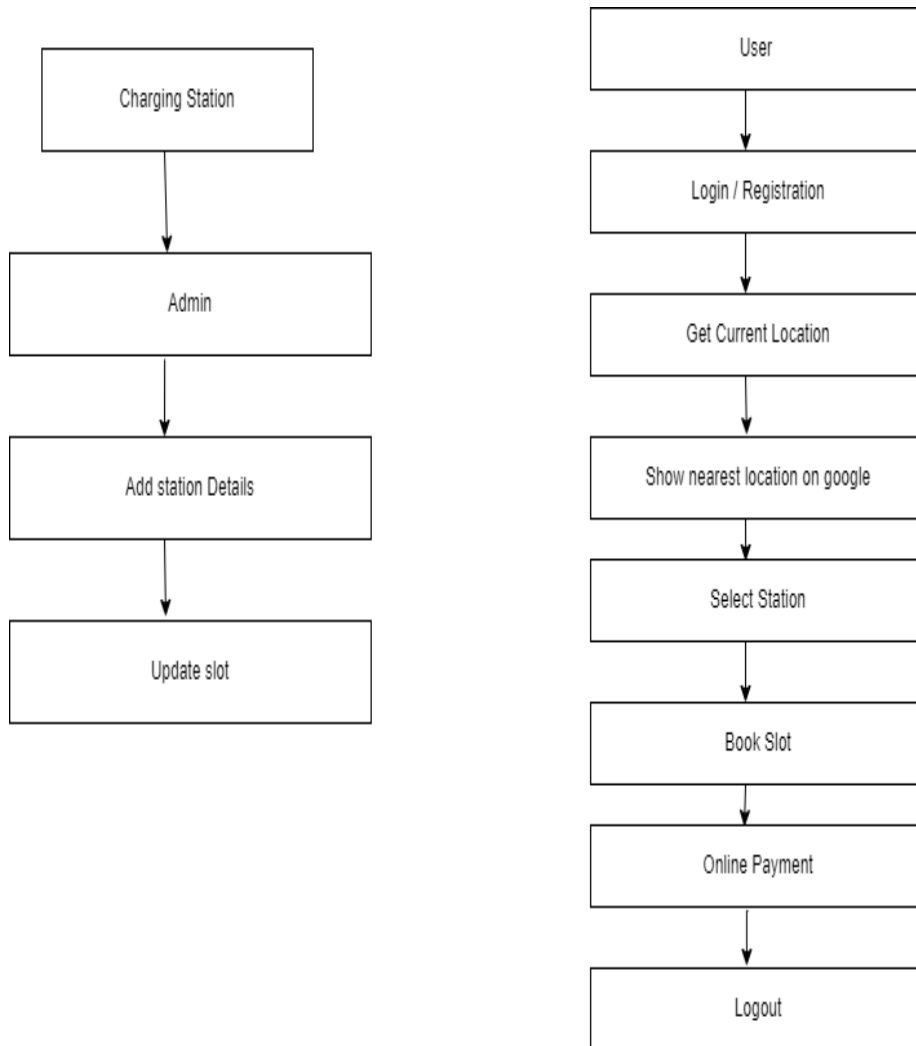


Fig. System Architecture

## VI. CONCLUSION AND FUTURE SCOPE

### 6.1 Conclusion

As the number of electric vehicles on the roads increases, the issue of electric vehicle charging becomes even more important. Solar panel charging stations, accumulators and additional services are a real option to meet the daily charging needs of all connected EVs. PID can be used to control current and voltage to deliver the required voltage, keeping the DC voltage of the facility constant. To make the design and algorithm robust, the site's design and power management are discussed and analyzed in MAT-LAB / Simulink, including 2 5 different operating modes and states of the EV recommendation.

### 6.2 Future Scope

Its main purpose is to charge the battery of the electric car to control the movement of the car. While most batteries can only charge direct current (DC) power, some electric vehicles (EVs) convert alternating current (AC) into electric current and send this energy to the vehicle's port.

## REFERENCES

- [1]. Location Information Service Platform Based on GPS/BaiduMap [J]. Huang Wenhui. Computer application & Software.2015
- [2]. Yongmin Zhang, Lin Cai, " Dynamic Charging Scheduling for EV Parking Lots With Photovoltaic Power System," 2017 IEEE 86th Vehicular Technology Conference (VTC-Fall), 2017, pp. 1–2.
- [3]. G.R.Chandra Mouli, P.Bauer, M.Zeman, "System design for a solar powered electric vehicle charging station for workplaces," Applied Energy Volume 168, 15 April 2016, pp. 434–443.
- [4]. S. Akshya, Anjali Ravindran, A. Sakthi Srinidhi, Subham Panda, Anu G. Ku- mar, " Grid integration for electric vehicle and photovoltaic panel for a smart home," 2017 International Conference on Circuit ,Power and Computing Tech- nologies (ICCPCT), April 2017.
- [5]. Gautham RamChandra Mouli, Peter Vanduijsen, Tim Velzeboer, Gireesh Nair, Yunpeng Zhao, Ajay Jamodkar, Olindo Isabella, Sacha Silvester, Pavol Bauer, Miro Zeman, " Solar Powered E-Bike Charging Station with AC, DC and Con- tactless Charging," 20th European Conference on Power Electronics and Ap- plications (EPE'18 ECCE Europe), 2018, pp. 1–10.
- [6]. Wajahat Khan, Furkan Ahmad, Mohammad Saad Alam, "Fast EV charging station integration with grid ensuring optimal and quality power exchange," International Journal of Engineering Science and Technology, 2017. Volume 22, Issue 1, February 2019, pp. 143–152.
- [7]. Mukesh Singh, Praveen Kumar, Indrani Kar, " A Multi Charging Station for Electric Vehicles and Its Utilization for Load Management and the Grid Sup- port, " 2013 IEEE Transactions on Smart Grid, 2013, pp. 1026– 1037
- [8]. N. Shlayan, K. Challapali, D. Cavalcanti, T. Oliveira and Y. Yang, "A novel illuminance control strategy for roadway lighting based on greenshields macroscopic traffic model", IEEE Photon. J, vol. 10, no. 1, Feb. 2018.
- [9]. H. Belkamel, K. Hyungjin, K. Beywongwoo, Y. Shin and S. Choi, "Bi-directional single-stage interleaved totem-pole ac–dc converter with high frequency isolation for on-board EV charger", Proc. IEEE Energy Convers. Congr. Expo, pp. 6721-6724, Sep. 2018.
- [10]. D.M. Kim, P. Benoliel, D.-K. Kim, T. H. Lee, J. W. Park and J.-P. Hong, "Framework development of series hybrid powertrain design for heavy-duty vehicle considering driving conditions", *IEEE Trans. Veh. Technol*, vol. 68, no. 7, pp. 6468-6480, Jul. 2019.
- [11]. Hengbing Zhao, Andrew Burke, "An intelligent solar powered battery buffered EV charging station with solar electricity forecasting and EV charging load projection functions," 2014 IEEE International Electric Vehicle Conference (IEVC), December 2015, pp. 1–7.