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BATTERY MONITORING AND SWAPPING MANAGEMNET SYSTEM FOR ELECTRIC VEHICLE

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Abstract – Infrastructural development for charging is essential for the quick uptake of electric vehicles (EVs). Many obstacles to increasing the range of electric vehicles would be removed if access to such infrastructure were available. Electric vehicles can be powered effectively and with less waiting time at charging stations by using a battery swapping station (BSS) (BCS). The BSS, as opposed to the BCS, charges the batteries beforehand and gets them ready for changing in a fraction of the time.These charging stations have the ability to provide the power grid with special advantages because they can serve as a point of contact between EV owners and the power grid. This essay explores the advantages of building the BSS from a number of perspectives. As a result, a schedule for battery charging is offered from the viewpoint of the station owner. An illustration of the proposed model's potential to help BSS owners manage their assets by scheduling battery charging time is provided.

1. INTRODUCTION:-

A large-scale fleet of hybrid and electric vehicles can be installed successfully on a uniform platform thanks to research and development groups' recent focus on intelligently constructing the battery swap station (BSS) architecture (i.e. xEVs). Similar to how existing gasoline refueling stations quickly switch out or replace discharged batteries with partially or fully charged ones, the BSS's subsystem for electric vehicle (EV) deployment may be modified.

In contrast to the conventional EV recharging station approach, the BSS strategy has emerged as a possible technology since it provides a greater experience of business prospects for specific stakeholders. The fundamentals of BSS are covered in this essay, along with its infrastructure, processes, benefits over charging stations, and significant issues. The discussion of an S34X-smart switching station for xEVs concludes with a focus on BSS research. We are designing a system based on IoT and embedded systems using a variety of techniques. This makes it possible for the system's real-time use to become widely known.

2. LITERATURE REVIEW:-

Bogdan Electric Vehicles Battery Management Network Using Block Chain IoT, by Cristian Florea, 2020[1].

The IOTA tangle is used as the network and data layer of the application in this article, which results in a block chain implementation for an EV BMS.

Battery switching station for electric vehicles: potential and difficulties, Furkan Ahmad, Mohammad Saad Alam, Ibrahim Saad Alsaidan, Samir M. Shariff,2020[2],

This paper discusses BSS basics, such as infrastructure, procedures, advantages over charging stations, and critical challenges.

Autonomous Battery Swapping System and Methodologies of Electric Vehicles, Kwang Y. Lee 2019[3].

The Tesla battery swapping station was used as a case study in this work to examine a way of battery swapping technology. Technical hurdles that are common in commercializing this technology were also noted.

3. BLOCK FIA

GRAM:-

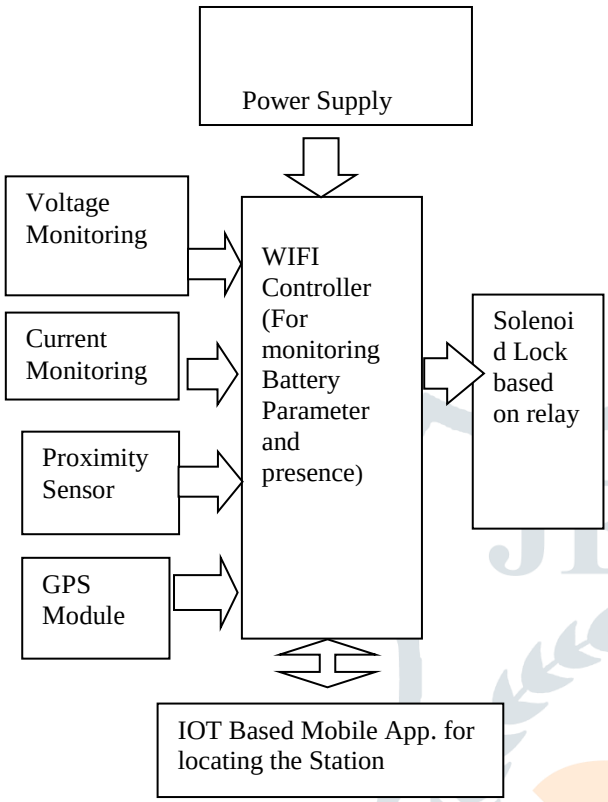

FIG. BLOCK DIAGRAM.

VOLTAGE SENSOR:-

In our solution, the voltage sensor continuously measures the battery's line voltage and transmits the data to the mobile app. so that the user can check the battery's voltage and availability from a distance.

CURRENT SENSOR:-

Our project's current sensor will continuously check the battery's current and transmit instructions to the mobile app. This displays the battery's remaining charge.

PROXIMITY SENSOR:-

Our project's proximity sensor will continuously check to see if the battery is in the Slot so that the user can decide whether or not the battery is in the Swapping Station.

GPS MODEULE:-

Small antennas and processors make up GPS modules, which use particular radio frequencies to directly receive data from satellites. The GPS Module of the Mobile App is utilized to find the Swapping Station**.**

ESP WIFI CONTROLLER:-

The project's brain and heart, the Node MCU continuously monitors sensor input, acts on the output side, and sends data to the Internet.

BATTERY (9V):-

The Electronic Parts and the Microcontroller are powered by a battery.

BLYNK APP:-

It is an open source Internet of Things (IoT) cloud platform that receives and manages information from NodeMCU and its sensors (Output Devices).

SOLENOID LOCK:-

Users can use the Mobile App to access the Swapping station, which is powered by a 9V DC power supply button.

4. ACTUAL WORKING:-

When the System is turned on, the Mobile App receives the Online Activation notification (Blynk) We'll design a dashboard on the Blynk App that displays the battery's availability, voltage, and percentage charge on the gauge. We may also track the Swapping station in real-time using a Google Maps widget. The UART Protocol is used by all of the sensors to transmit data to the controller, which then transmits it to the cloud using the MQTT Protocol. The mobile app receives the data from the cloud, allowing us to track parameters in real time.

5. CONCULSION:-

A battery performance degradation monitoring system for electric vehicles that is based on the Internet of Things. The intention is to show that the premise of the idea is achievable. The hardware for the battery monitoring device as well as a web-based user interface for battery monitoring are both being developed for the system. The system may provide data like position, battery level, and time via the internet by integrating a GPS system to determine the coordinate and display it on the Google Maps application. The system can be enhanced even further by adding more features.
The idea can be applied to smartphones by developing a mobile application that helps users keep track of their battery life and serves as a reminder when it comes to power decline. Ethernet outperforms GPRS in terms of improving internet connectivity.

6. REFERENCES:-

[1] S. Yonghua, Y. Yuexi, H. Zechun, “Present Status and Development Trend of Batteries for Electric Vehicles,” Power System Technology, Vol. 35, No. 4, pp. 1-7, 2011.
[2] L. Xiaokang, Z. Qionghua, H. Kui, S. Yuehong, “Battery management system for electric vehicles,” J.Huazhong Univ. Of Sci. & Tech. (Nature Science Edition). Vol. 35, No. 8, pp. 83-86, 2007.
https://getsetojo.com/blogs/blog/challenges-for-battery-swapping-over-charging-stations-for-evs-in-india.
https://static1.squarespace.com/static/59c3ed7b197aeabbd2a51a3b/t/5b2a51d76d2a73b431391cfc/1529500119708/TS18_Paper15768.pdf
https://doi.org/10.1108/ilt.1998.01850bab.013