



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 2, February 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.118

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Survey on Smart Management of EV Charging Stations with Chatbot

Nikam Abhishek Madhukar, Kadu Rahul Nitinrao, Joshi Shubham Dattatray, Suryawanshi
Shivprasad Sudhakar, Prof. Tanuja Mulla

Department of Computer Engineering, Smt. Kashibai Navale College of Engineering, Pune, India

ABSTRACT: Recent years have seen the introduction and launch of new electric vehicles by automakers like TATA and TESLA. Some stations are also built up to charge these vehicles. However, given the current circumstances, it takes these cars at least 15 to 30 minutes to charge. Other consumers must wait a long time if the station is full and all the available slots have already been taken. Our goal is to create a system that will address problems of this nature. We are working on a system that will link all of the electric vehicle charging stations together. Our technology allows users to search for stations in accordance with their preferences, which is helpful for people who wish to drive EVs large distances and saves time. The use of it will be quite simple. If the requested time window is available, your spot will be reserved for that time. Otherwise, the system will prompt you to enter a new timetable. To finalise their reservation via this technique, users must pay a portion of the whole fee online. Additionally, our system will offer the quickest map path to get to a particular station. Our solution will also give charging stations an interface to examine all open slots, as well as listings of booked slots, and to control slot time. This system will be created for Android-based devices. We will use Google Maps API for direction sensing and time-slot allocation techniques to build this system. Our chatbot system will use voice instructions to operate software. The consumer can easily pay money with the aid of an online payment gateway. People may view and book the right station quickly and easily by using the system, which will save them a great deal of time.

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

I. INTRODUCTION

In recent years, global warming and the depletion of fossil fuels due to mass consumption of energy resource has become an increasingly recognized world problem. To control these problems, the installation of renewable energy systems, which do not depend on fossil fuels, is an effective countermeasure. In Japan, since the government has introduced Feed-in tariffs (Fit), the introduction of photovoltaic systems has been expanded rapidly. However, the output power from increased number of photovoltaic systems is extremely large and tends to have a bad effect on the system frequency and distribution voltage. To address this problem, the Japanese government has begun reconsidering the Fit system. Adding to this problem, the cost of PV installation is decreasing year by year. Therefore, in the future, the price of PV power is expected to decrease greatly. In this study, EV charging stations that near- exclusively purchases power from PV systems on smart houses and sells power to electric vehicles (EV) and smart houses is proposed as an aggregator. The EV charging station has the need to utilize a fixed battery for electricity trading.

- As we know EV Automobiles going to be future of the world but these machines need charging stations for charging.
- In this project work, system will provide the platform to book charging slots to available charging station according to need of customer.
- In this system user will get facilities like AI chatbot to book station via vocal commands, Maps features for direction sensing, Digital payment option, Notifications, Mails and SMS of each activity.

II. RELATED WORK

This paper [1] 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. Gallium nitride (GaN) devices are used in the threeport converter, allowing very high switching frequencies thereby reducing the size of the transformer which provides galvanic isolation between the two sources and output. The three-port converter ensures operation of the solar panel at its maximum power point and also allows bi- directional power flow between the propulsion motor and battery depending on operating conditions. Operation over a wide range of speeds, which is required by the solar race car application, is achieved by the new approach of current weakening. This method involves raising the dc bus voltage of the motor side inverter at speeds exceeding the rated.

As small-sized[2] superconducting magnetic energy storage (SMES) system is commercially available at present, the function and effect of a small-sized SMES in an EV charging station including photovoltaic (PV) generation system is studied in this paper, which provides a practical application of small-sized SMES. The comparison of three quick response energy storage systems including flywheel, capacitor (super-capacitor) and SMES is also presented to clarify the features of SMES. SMES, PV generation system, and EV battery are connected to a common dc bus with corresponding converters respectively. Voltage source converter (VSC) is used for grid-connection. With characteristic of quick power response, SMES is utilized to maintain the dc bus steady. During the long-term operation of EV charging station, an energy management strategy is designed to control the energy transfer among PV units, SMES, EV battery, and power grid. The EV charging station system is modeled in MATLAB/SIMULINK and simulation tests are carried out to verify the function and performance of SMES.

Having a network [3] of fast charging stations seems necessary in order to make EVs more attractive and to achieve larger uptake of them. Currently, 50 kW quick chargers that can charge a typical EV in about an hour are commercially available. However, a 240 kW fast charging level which can charge a typical EV in 10 minutes has been introduced in standards. It is expected that this high power fast chargers will be available in near future. A charging station must supply charging power in multi-megawatt levels when multiple EVs are being fast charged simultaneously. Here, charging station topology plays a crucial role in enabling future growth and providing fast charging with best quality of service, lowest cost and minimum grid impact. This paper presents a topological survey of charging stations available in the literature. Various charging station topologies are presented, compared and evaluated based on grid support, power density, modularity and other factors.

Electric vehicles (EVs)[4] are being introduced by different manufacturers as an environment-friendly alternative to vehicles with internal combustion engines, with several benefits. The number of EVs is expected to grow rapidly in the coming years. However, uncoordinated charging of these vehicles can put a severe stress on the power grid. The problem of charge scheduling of EVs is an important and challenging problem and has seen significant research activity in the last few years. This review covers the recent works done in the area of scheduling algorithms for charging EVs in smart grid. The works are first classified into two broad classes of unidirectional versus bidirectional charging, and then, each class is further classified based on whether the scheduling is centralized or distributed and whether any mobility aspects are considered or not. It then reviews the key results in this field following the classification proposed. Some interesting research challenges that can be addressed are also identified.

In order to interface one PV port[5], one bidirectional battery port and one load port of PV-Battery DC power system, a novel non-isolated three-port DC/DC converter named Boost Bidirectional Buck Converter (B3C) and its control method based on three domain control are proposed in this paper. The power flow and operating principles of the proposed B3C are analyzed in detail, and then the DC voltage relation between three ports is deduced. The proposed converter features high integration and single-stage power conversion from both photovoltaic (PV) and battery ports to the load port, thus leading to high efficiency. The current of all the three port is continuous, so the electromagnetic noise can be reduced. Furthermore, the control and modulation method for B3C has been proposed for realizing Maximum Power Point Tracking (MPPT), battery management and bus voltage regulation simultaneously. The operation can be transitioned between conductance mode and MPPT mode automatically according to the load power. Finally, experimental verifications are given to illustrate the feasibility and effectiveness of the proposed topology and control method.

II. PROPOSED SYSTEM

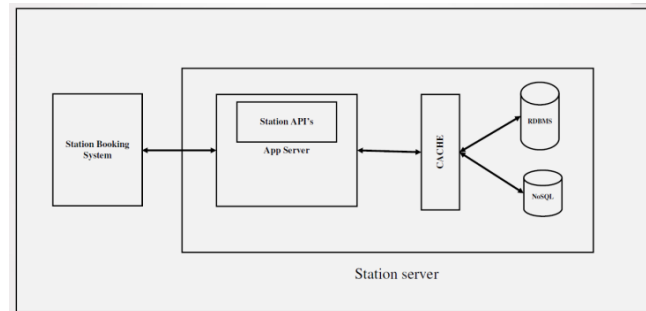


Figure 1. System Architecture

As small-sized superconducting magnetic energy storage (SMES) system is commercially available at present, the function and effect of a small-sized SMES in an EV charging station including photovoltaic (PV) generation system is studied in this paper, which provides a practical application of small-sized SMES. The comparison of three quick response energy storage systems including flywheel, capacitor (super-capacitor) and SMES is also presented to clarify the features of SMES. SMES, PV generation system, and EV battery are connected to a common dc bus with corresponding converters respectively. Voltage source converter (VSC) is used for grid-connection. With characteristic of quick power response, SMES is utilized to maintain the dc bus steady. During the long-term operation of EV charging station, an energy management strategy is designed to control the energy transfer among PV units, SMES, EV battery, and power grid. The EV charging station system is modeled in MATLAB/SIMULINK and simulation tests are carried out to verify the function and performance of SMES.

III. CONCLUSION

In this research work, we have learned effective reservation management and efficient allocation of time slots of charging stations. We learned to develop Virtual Personal Assistant (VPA). This research has given the idea of shortest route



search system by modifying the combination node algorithm to the dynamic location used in general such mobile phone asonline transportation. Along with that we got the knowledge about the implementation of payment gateway in a system.

REFERENCES

1. V. Rallabandi D. Lawhorn J. He and D. M. Ionel "Current weakening control of coreless afpm motor drives for solar race cars with a three-port bi-directional dc/dc converter" 2017 IEEE 6th International Conference on Renewable Energy Research and Applications (ICRERA) pp. 739-744 Nov 2017.
2. Y. Liu Y. Tang J. Shi X. Shi J. Deng and K. Gong "Application of small-sized smes in an ev charging station with dc bus and pv system" IEEE Trans. on Applied Superconductivity vol. 25 no. 3 pp. 1-6 June 2015.
3. M. Ahmadi N. Mithulananthan and R. Sharma "A review on topologies for fast charging stations for electric vehicles" 2016 IEEE International Conference on Power System Technology (POWERCON) pp. 1-6 Sep. 2016.
4. J. C. Mukherjee and A. Gupta "A review of charge scheduling of electric vehicles in smart grid" IEEE Systems Journal vol. 9 no. 4 pp. 1541-1553 Dec 2015.
5. H. Zhu D. Zhang B. Zhang and Z. Zhou "A nonisolated three-port dc/dc converter and three-domain control method for pv-battery power systems" IEEE Trans. on Industrial Electronics vol. 62 no. 8 pp. 4937-4947 Aug 2015.
6. A. Hassoune M. Khafallah A. Mesbahi and T. Bouragba "Smart topology of evs in a pv-grid system based charging station" 2017 International Conference on Electrical and Information Technologies (ICEIT) pp. 1-6 Nov 2017.
7. B. Honarjoo S. M. Madani M. Niroomand and E. Adib "Non-isolated high step-up three-port converter with single magnetic element for photovoltaic systems" IET Power Electronics vol. 11 no. 13 pp. 2151-2160 2018.
8. S. Bai D. Yu and S. Lukic "Optimum design of an ev/phevcharging station with dc bus and storage system" 2010 IEEE Energy Conversion Congress and Exposition pp. 1178-1184 Sep.2010.
9. H. Zhu D. Zhang B. Zhang and Z. Zhou "A nonisolated three-port dc/dc converter and three-domain control method for pv-battery power systems" IEEE Trans. on Industrial Electronics vol. 62 no. 8 pp. 4937-4947 Aug 2015.
10. H. Zhu D. Zhang Q. Liu and Z. Zhou "Three-port dc/dc converter with all ports current ripple cancellation using integrated magnetic technique" IEEE Trans. on Power Electronics vol. 31 no. 3 pp. 2174-2186 March 2016.
11. SunTech Power STP235-20-Wd [online] Available: <https://www.freecleansolar.com/235W-solar-panels-Suntech-STP235S-20-Wd-mono-p/stp235s-20-wd.htm>.
12. CREE C3M0065090D MOSFET [online] Available: <https://www.wolfspeed.com/c3m0065090d>.
13. Infineon IPW90R120C3 MOSFET [online] Available: https://www.infineon.com/dgdl/Infineon-IPW90R120C3-DS-v01_00-en.pdf?fileId=db3a3043183a955501185000eld254f2



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.118



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 **9940 572 462**  **6381 907 438**  **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details