EV Charging Station
Predictive Analytics
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Literature Review

In our recent years, we have seen a sudden shift in the public perception and upcoming trends. One such example of a rising trend is the increase in the purchase of Hybrid and Electric Vehicles. This new product category has certainly drawn a lot of consumers and has created an increased demand for such automotive goods. Hence, our project is focused on studying the future of this growing category and forecast the necessary infrastructure (EV Charging Stations) required to meet the predicted demand. Hence, a good strategic plan in synergy with having a thorough understanding of the future trends in the automobile industry is of the paramount importance. Increasingly we have noticed that a lot of the automobile manufacturers are introducing more electric/hybrid vehicles and reducing their reliance on fuel combustion technology. The international focus on Climate Change has forced a lot of companies to adopt a more eco-friendly business model and explore a business avenue that is more environmentally conscious. As per the research study conducted by the "IEEE" in September 2020, it was found that the Machine Learning models along with Deep Neural Networks, were used to carry out the charging behavior analysis and predicting its future demand . Although the study was not able to suffice its desired quality of research due to lack of high dimensional and EV charging datasets. Hence the ML models lacked sufficient training due to insufficient data (Shahriar et al., *Machine Learning Approaches for EV Charging Behavior: A Review* 2020). At the time of the study there were only two publicly available datasets and the rest were all held by commercial companies. In order to have a better study for a research project it would be important to find the latest possible datasets which would consist of a large set of records along with being high-dimensional. We would also have to use more than one dataset so consolidate all of the required data for an accurate predictive model.

In addition, the global market share of Electric Vehicles is predicted to dynamically grow over the course of the next decade and make the industrial-age vehicles obsolete. According to a detailed study conducted by Deloitte, "Global EV forecast is for a compound annual growth rate of 29 per cent achieved over the next ten years: Total EV sales growing from 2.5 million in 2020 to 11.2 million in 2025, then reaching 31.1 million by 2030" (Woodward et al., *Electric vehicles Setting a course for 2030* 2020). Hence, it is imperative for us to accurately predict and plan for the future trajectory. Therefore, an in-depth study is essential to plan for the infrastructure necessary to induct this newer green technology. The study by Deloitte Insights suggests that not only would the EV be instrumental in reducing fuel emissions but also make the cost of

transportation more affordable to the public (Woodward et al., *Electric vehicles Setting a course for 2030* 2020). Lastly, Electric Vehicles allow many other primary energy sources such as nuclear, wind, solar etc. to be used in their electric form. Thus, allowing more flexibility and less interdependence on vested energy sources.

References

Shahriar, S., Osman, A. H., & Nijim, M. (2020). (rep.). *Machine Learning Approaches for EV Charging Behavior: A Review* (pp. 1–14). The Institute of Electrical and Electronics Engineers.

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