**Problem Description**

Nowadays the preservation of the environment is gaining more and more relevance for a significant portion of people in the EU and the rest of the world. One major challenge is the reduction of transport-related greenhouse gas emissions, which represent the second-largest share of total emissions in the EU. A prospect for greener mobility is the use of electric vehicles (EV), however many people are still heavily prejudices against the use of EVs, a major concern being the fear of not being able to reach the desired destination due to running out of battery capacity.

Therefore, it is common to use parking spaces in public and private spaces including charging stations, as we provide with on our parking sites. Considering the increasing popularity of EVs, we consequently have to consider their impacts on the power grid at high traffic locations, since there are constraints on the site’s power capacity.

Thus, as a business and data mining goal, we must find a way to optimize and evaluate the utilization of the charging infrastructure. Accordingly, we define key performance indicators that provide us with relevant information on the performance on the public and private parking sites and display them in a comprehensible manner for management. Moreover, we use the data we have on both sites from the previous years’ charging sessions to be able to predict future utilization demand by means of machine learning to be able to adequately manage power allocation. As a result, using data-driven insights, we aim to improve operational performance, provide an improved user experience and pave the way towards sustainable mobility.

**Site Characteristics**

The raw data set is divided into charging sessions from two distinct charging sites. One is a private site, used by the workforce of a company, the other one is a publicly accessible university parking space. Since we can assume that the two sites comprise relevant differences in their manner of utilization and demand, we regard them separately. First, it is necessary to define which site is public/ private.

Assuming the weekends should differ significantly between the two sites since one is only accessible to employees who most likely primarily use it on working days, we analysed the total amount of sessions per weekday between the two sites.

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Indeed, it can be seen, that site 1 of the data set exhibits far less sessions on weekends compared to site 2. Thus, we shall pose the initial thesis that site 1 represents the private site and site 2 represents public site.

To prove this thesis further, we analysed the average time a customer uses the respective parking space. Since a typical working day consists of around 8 hours, we assumed that the private site should show this pattern. The data shows that the average session at site 1 takes around 7 hours and 12 minutes, while on site 2 it takes around 5 hours and 52 minutes. So, site 1 fits the assumption of being a workplace, considering there are also part-time workers that do not work a full 8-hour day. The shorter time frame can be argued to be more fitting to the irregular and possibly short-timed nature of parking sessions at a public site.

We also regarded the median charging time for both sites. Site 1 has a median value of 8 hours and 7 minutes, while site 2’s value is at 5 hours and 2 minutes, further showing a typical 8-hour session for the alleged private site.

Concluding, we defined site 1 to be the private parking site, whereas site 2 in the data set comprises the public site.