EASING TRAFFIC CONGESTION IN CITIES

How the Use of Artificial Intelligence Solves the Four Biggest Challenges in Car-Sharing

How can promising areas for car-sharing be identified? How is it possible to ensure that car-sharing vehicles are always available exactly where they are needed? How is it determined when cleaning is required? And how can the service be further expanded to meet demand? The answer to all these questions is simple, at least at SHARE NOW: artificial intelligence (AI). This is an integral part of SHARE NOW's corporate strategy. With a fleet of 11,000 vehicles in 16 cities spread across eight countries, SHARE NOW is the largest car-sharing provider in Europe. Managing and controlling the vehicle fleet efficiently is only possible because decisions in the company are made based on data-driven analyses. A team of data engineers and data scientists develops AI-based and 100 percent self-developed software solutions for the mobility industry based on a centralized data lake. This helps to relieve traffic in cities through shared mobility.

In the following whitepaper, you will learn how AI is already optimizing car-sharing today and what opportunities intelligent data management will offer the mobility industry in the future.

CHALLENGE 1: FINDING THE IDEAL BUSINESS AREA

Car-sharing services only make sense where they are used. Therefore, the analysis of local conditions is a basic prerequisite for the successful establishment of car-sharing in large cities. But how can this be determined? A whole range of parameters is crucial for forecasting demand - from socio-demographic data such as age to the number of inhabitants, local employees, driving license holders and car owners, and the total number of available leisure facilities (points of interest) such as restaurants, suburban train stops, museums and supermarkets. These are determined at the district level and summarized in a detailed score using AI. However, the starting point for a location check is the human factor. Only areas that have been defined as attractive by local analysts from the SHARE NOW business development team are investigated and evaluated using AI.

But the application of AI does not end with the initial analysis for setting up the business area. In the long term, too, the business areas must continue to be examined for their attractiveness in order to expand or reduce the offering accordingly. Here, however, the data collected in the course of use is decisive. Areas, where the demand is permanently high, are subject to continuous, particularly focused evaluation as to whether expansion makes sense. If the areas are on the border of a business area, expansion is also examined.

CHALLENGE 2: ENSURE AVAILABILITY OF VEHICLES IN THE RIGHT PLACE AT THE RIGHT TIME

Even if the business area has been successfully defined, the fleet can only be efficiently utilized if the vehicles are actually in the right place at the right time. Demand prediction based on intelligent data management is also a prerequisite for optimal car-sharing. Based on AI, SHARE NOW can predict when and where how many cars are needed. Be it the rock concert that is ending or the bad weather that makes many switch to cars: The algorithms developed by SHARE NOW calculate demand at the street level. Particularly important for the algorithms are the parameters of time, place or public holiday, but also used figures such as how often pre-bookings are made. In addition, the algorithm continuously calculates a score for all vehicles, which provides information about the expected duration until the next rental. On this basis, AI-based predictions are made as to whether demand can be met by vehicle movements by the users themselves or whether service providers will have to drive them to locations with higher demand. The final decision is made by calculating the opportunity costs: If the costs for a so-called relocation trip by a service provider are lower than the lost income due to a non-rental, the car will be repositioned.

The aim is to reduce the use of service providers to a minimum and to have the vehicles always moved by the users. The same mechanism also applies when vehicles are parked at locations where demand is low. Here, too, SHARE NOW's algorithms calculate how long it is likely to take before another rental is required. If the duration is above a threshold, the affected vehicles are offered a discount. As a result, customers can get from A to B even cheaper and relocating trips are rarely necessary. This increases the sustainability of free-floating car-sharing and at the same time it increases the availability at locations and times when vehicles are needed more frequently.

If a price adjustment does not lead to a repositioning of the vehicles, service providers are commissioned with relocation trips. To carry out these trips efficiently, the repositioning is consolidated with the performance of all work involved — from refueling to maintenance — in a single step. This prevents unnecessary journeys. At the same time, SHARE NOW's software calculates the location where the vehicle is most likely to be rented in a timely manner.

CHALLENGE 3: OPTIMIZE CLEANING AND MAINTENANCE OF VEHICLES

The product experience is crucial to the success of car-sharing. Nobody wants to drive a dirty or — even worse — defective vehicle. To ensure that customers get a clean car, SHARE NOW has developed software solutions that predict when cleaning will be necessary. Predictive maintenance involves algorithms that use data on usage, the time of the last cleaning, the vehicle model, and — as the most important component — customer feedback in the app on the cleanliness of the vehicle and combine it in a machine learning process. For example, a larger vehicle that offers transportation needs to be cleaned more frequently than a smaller one. This data pool is supplemented by mileage and vehicle-specific data.

Using the data obtained, individual scores are developed per vehicle with the Dirtiness Prediction Score. The service team will get a report if vehicles fall below the specified minimum score requirements. An app, also developed 100 percent by SHARE NOW, is used to define order and a time period for the work to be done. The completion of the orders is also tracked via this app. To ensure that maintenance work can be carried out as resource-efficient as possible, the system groups the various tasks together and forecasts the time so that as many tasks as possible can be completed in one work step.

CHALLENGE 4: DEVELOPING SUPPLY IN LINE WITH DEMAND

Car-sharing thrives on being able to adapt quickly to changing customer needs. To ensure demand-driven further development, SHARE NOW must be able to make data-driven decisions daily. To ensure this, different departments work closely together. In addition to the business intelligence team, the operational and strategic departments have access rights to the data and can thus work together on projects and further developments. In-depth analyses can also be requested at any time and support the teams in developing forward-looking product improvements. Only the orchestrated interaction and continuous refinement of the individual algorithms makes the full AI potential usable.

To ensure that all-important business decisions are made based on the available data, regular discussions take place between executives and the business intelligence department.

The exchange aims to ensure that changes in the data pool can be addressed to the respective department as quickly as possible to derive appropriate actions.

The results show: The system works. Further developments often take only a few days. One key product enhancement that was made based on changes in demand and could be implemented within a few days is the pre-booking logic that SHARE NOW is the only industry player to offer. If a car is booked in advance, the SHARE NOW app checks whether a vehicle of the booked class is available nearby. In a few milliseconds, it predicts whether blocking the vehicle is worthwhile and whether the opportunity cost is lower than the cost of a positioning trip.

OUTLOOK: QUO VADIS AI IN CAR-SHARING?

ARTIFICIAL INTELLIGENCE MAKES MOBILITY PREDICTABLE

AI and the associated forecasts are becoming increasingly important to be able to manage vehicle fleets efficiently. To meet sustainability and flexibility requirements in the future, fleet operators and tech companies like SHARE NOW must continue to develop intelligent software solutions. There is great potential here, especially in the field of supply management. Solutions must be found that can identify even better what customers need, when and where exactly, to flexibly adapt the offer to these parameters and thus to the individual customer needs. Despite the already very successful relocation logic, the aim here is to further improve the availability of vehicles in high-demand locations.

In these areas, AI with its reliable calculations will play an even greater role and take sustainable mobility to the next level.

Another field of development closely related to availability and supply management is fleet planning. It is only through the insights gathered in the operational area that a more efficient fleet utilization and thus the optimal fleet size can be determined. In addition, AI will be able to further reduce ongoing costs. Accurate predictions of when and to what extent vehicles in the fleet need to be cleaned will help consolidate work steps and ensure even higher customer satisfaction.

AI also plays a central role in the field of autonomous driving. The conclusions that SHARE NOW has been able to draw from the continuous maintenance of algorithms and its in-house database over the past 13 years are already helping to plan for the trends of the future. Being able to forecast when, where and by whom a vehicle will be needed is the prerequisite for autonomous car-sharing.

AI is therefore not only currently relevant for SHARE NOW, but will also be an even more important part of the company's strategy in the future. Since the 100 percent self-developed software solutions function in a modular ecosystem, the pioneer and European market leader in free-floating car-sharing can also support other mobility companies in their traffic turnaround towards more sustainable and innovative fleet management.

ABOUT SHARE NOW

As market leader and pioneer of free-floating car-sharing, SHARE NOW is represented in 16 major European cities with around 11,000 vehicles, including 2,900 electric vehicles. More than three million customers already use the service. SHARE NOW offers a sustainable solution for urban mobility and makes a significant contribution to reducing traffic congestion in cities. Each car-sharing car replaces up to 20 private cars in urban traffic. SHARE NOW operates purely electric fleets in four locations and is with a total of four partially electric cities Europe's largest provider of electric free-floating car-sharing. The fleet portfolio consists of vehicles of the brands BMW, Citroën, Fiat, Mercedes-Benz, MINI and smart. The company is one of five mobility services that emerged in 2019 from the joint venture between the BMW Group and Daimler AG. The company is based in Berlin.

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