cleancar

SOFTWARE DEVELOPMENT

Building a New Data Solution to Drive Environmental Efficiencies in Mobility

The Virtual Forge was responsible for creating a new technological solution for CleanCar, a smart analytics platform that can help fleet operators assess the costs and benefits of switching from ICE to EV fleets. The challenge was to valuate the previous solution from the ground up to be capable of handling the large data influx.

The Brief

Concern about the environmental impact of internal combustion engine (ICE) vehicles is growing fast. In response, government policy has now swung decisively in favour of promoting the adoption of electric vehicles (EV) and other ultra-low emission vehicles.

However, there remains significant confusion about the total cost of EV ownership/operation and there are concerns about range, performance and practicality.

CleanCar is a smart analytics platform that provides granular data to help fleet operators assess the costs and benefits of switching from ICE to EV fleets.

The platform provides a whole life cost analysis, suggests suitable EVs and highlights the environmental benefits of switching. It then sets out a tailored fleet conversion plan that maximises savings while minimising operational risk.

The Challenge

The challenge presented to The Virtual Forge involved around the entire rebuild of the technological solution behind the CleanCar service and analysis. To deliver the necessary statistics to the user regarding the costs and benefits of switching, the solution needed large data sets to create the required calculations and analysis.

The legacy software that was used gathered the data from physical dongles connected to the UV chargers from the user's car. Through GPS capabilities, it recorded the journey and grouped several data points that were converted by algorithms in reports.

"The amount of influx data generated was massive, and the previous solution was not capable of delivering the data outputs with the needed efficiency." says Dave Palmer, lead software developer for The Virtual Forge who was part of the team that built the new solution. ***"The software couldn't process, analyse and display the data correctly, generating vast amounts of technical issues, while being very difficult to update."***

CleanCar needed a technology partner that was capable of delivering a new personalised solution, built with solid bases that could handle the necessary information with ease for a more tailored and customised service.

The Goals

CleanCar needed a technology partner that was capable of delivering a new personalised solution.

01
built with solid bases

02
capable of handling the necessary information with ease for a more tailored and customised service

The Development

The Virtual Forge had to rebuild the entire solution, using the appropriate technologies and methodologies to create a more robust, fit for purpose service that could prevent further technical issues while being able to deliver all the data outputs.

The team analysed and corrected the original software solution, fixing minor bugs and ensuring that it stayed active and able to deliver the necessary tailored services. This process led to a better understanding of what was needed, and created the necessary knowledge for further enhancements and improvements.

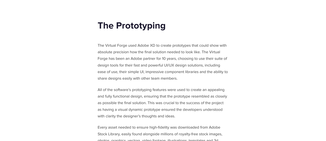
Afterwards, following agile/SCRUM working methodologies, The Virtual Forge team developed the solution that would deliver the promised efficiency.

The Prototyping

The Virtual Forge used Adobe XD to create prototypes that could show with absolute precision how the final solution needed to look like. The Virtual Forge has been an Adobe partner for 10 years, choosing to use their suite of design tools for their fast and powerful UI/UX design solutions, including shared assets, their library of high-quality component libraries and the ability to share designs easily with other team members.

All of the software's prototyping features were used to create an appealing and fully functional design, ensuring that the prototype resembled as closely as possible the final solution. This was crucial for the success of the project as having a visual dynamic prototype ensured the developers understood with clarity the designer's thoughts and ideas.

Every asset needed to ensure high fidelity was downloaded from Adobe Stock Library, easily found alongside millions of royalty-free stock images, photos, graphics, vectors, video footage, illustrations, templates and 3d assets.



The Technology

The Virtual Forge built a whole new system to ensure that technical issues concerning all the data influx were a thing of the past.

Big is recognised Amazon Web Services partner, with considerable expertise and knowledge of their ecosystem. The Virtual Forge uses AWS to create high quality agile solutions. Utilising the AWS toolkit to develop, debug, and deploy .NET applications, AWS Lambda functions were used to provide accurate vehicle data, and processes location data, registering devices and providing an API to the mobile app, which was written in Java Script. Both the Android and iOS mobile applications were written in React Native, while the web dashboard was written in React.

To ensure a fluid data transmission and a correct database infrastructure, Amazon RDS and SQS services were determinant, while Amazon Cognito ensured accurate and secure login authentication.

The Benefits

The rebuilt and improved CleanCar system offered a number of widely acknowledged advantages that were clear to the user and significantly increased their entire experience.

Overall, the rebuilt solution generated an enhanced way of delivering the wished benefits from changing from fossil fuel vehicles to electric/hybrid vehicles through real-life gathered data.

01
The use of the appropriate technologies translated into a much more resilient and optimised system. The data influx was now generated not only by the physical dongles, but also by a mobile app. Data from mobile devices or dongles was integrated in real-time, automatically updated and analysed as soon as it entered the system.

02
Users were able to log journeys with their smartphones using a CleanCar mobile application, while obtaining vehicle recommendations in a much faster, fluid and optimised process.

03
Utilising geo-location mapping, the solution was now able to obtain the user's location, their driving style and average mileage. This enhanced journey recording allowed it to offer the user the hybrid or electric vehicle that was most appropriate for their specific use.

04
The user was also able to compare different vehicles for added information regarding their buying choice. The application could automatically "pick a winner" from the different choices delivered by the user, by analysing all the provided data gathered throughout the recorded journeys.

05
Several features, like automatic "start and stop" journey recording, were also introduced. By detecting whether the user was operating a car, the solution could now start and stop the recording automatically.