Main Topic:

1) Much work remains to improve the EV user experience

2) The cure for EV anxiety is range accuracy and charging support

For more than a decade, automakers have struggled to develop vehicle interfaces that are as simple and rewarding to use as a smartphone. For electric vehicles, another challenge exists: making the EV experience as easy and convenient as with traditional vehicles. While both vehicle range and charging speed have come a long way, the overall experience may leave the new EV customer wondering if they've made a mistake.

Of course, charging is one of the main differences between living with an EV and living with an ICE. Fuelling stations are never far away and it only takes a couple minutes to extend your range by several hundred kilometres. Charging can take much longer and it can be difficult to find a charging station. OEMs have been integrating charging station search functions into their navigation-equipped EVs for years. Yet a charging station is not useful if it is occupied, out of order, impossible to locate, or requires a specific RFID card, despite onboard live information showing that the station should be ideal. All of these problems were experienced by SBD Automotive's vehicle testing team on a recent 1500 km trip through Germany, Austria, and Italy testing the latest EVs.

Perhaps a more important factor is knowing that you will safely reach your destination and whether or not you will need to charge en route. During SBD's testing, it was found that many EVs appear to use a simple algorithm to determine the remaining driving range of the vehicle, not taking into account driving styles, elevation gain/loss, traffic congestion, or anticipated HVAC demands. While an ICE may experience a modest range adjustment due to these factors, EVs are highly optimized and small adjustments can mean a drastic reduction or increase in the range of the vehicle. Further, if your EV unexpectedly runs low on battery charge, it may take a while to find a charging station, adding to the frustration and inconvenience.

> *"During our recent real-world evaluations, several models showed range estimation errors as high as 175% during short trips and 30% during long trips. Due to these inaccuracies, our testers were on several occasions unable to reach the originally-scheduled charging stations and had to stop prematurely to search for a closer station, adding over an hour to the trip each time."*
>
> *– Robert Fisher, Technical Manager, SBD Automotive (Germany)*

However, some automakers are beginning to implement solutions that truly support the customer's journey, providing accurate charging information and surprisingly accurate range predictions as well. During SBD's test of the Audi e-tron, the testers were pleasantly surprised by the vehicle's apparent consideration of navigation information, including traffic and terrain conditions on motorways, leading to more accurate range estimates. When there were inaccuracies, they were typically on the conservative side, ensuring that the driver had more range than the vehicle indicated. This sort of conservative algorithm may present the driver with a disappointing range estimate after entering the destination into the navigation system, however they'll likely reach their destination without incident and may even have a bit more range left than they had expected. This creates an overall positive journey experience for the customer.

The in-vehicle experience is only half the battle with an EV. Remote apps are critical to the EV journey as they allow the customer to remotely monitor charging status and range, as well as planning their journey with associated charging stops. Although SBD's test team were pleased with the e-tron's in-vehicle interface and charging-support features, the companion smartphone app rarely functioned correctly, highlighting problems with Audi's app and the remote interface to the vehicle. This is unfortunately commonplace for many automaker's companion apps.

> *"The expectation is that these systems have to operate with the same efficacy as a top-of-the-range smartphone connected system. The fact that most companion apps are below par leaves consumers wondering when the automotive world will catch up with modern technology."*
>
> *– Stephen Scales, Senior Consumer Research Specialist, SBD Automotive (UK)*

SBD's UX evaluation teams are commissioned by automakers and suppliers combining real-world testing and proprietary UX design best-practices to evaluate the latest vehicles and apps, guiding the auto industry to the development of more rewarding driving experiences.

SBD Automotive is a global consultancy focusing on innovative technologies and strategies that transform our mobility ecosystems for the better. To find out more about our real-world user experience evaluations, contact vertrieb@sbdautomotive.com.