AN INCENTIVIZED AND CONNECTED PLATFORM FOR ELECTRIC VEHICLES

Original equipment manufacturers (OEMs) of electric vehicles (EVs) are in the crosshairs of customer privacy regulations. At the same time, agile upstarts are using technologies that make EVs safer, greener, and more innovative. Traditional automotive incumbents should create connected vehicle platforms that give customers a greater say in what data they choose to share, all while fostering an app ecosystem that births entirely new business models.

Plug-in vehicle sales will rise to 20.6 million in 2025 from 6.6 million in 2021, taking plug-in vehicle share to 23% of new passenger vehicle sales globally from below 10% over the same period, according to BloombergNEF. More than three-fourths of these plug-in vehicles will be fully electric.[1]

Every mile driven by an EV generates a trove of information about the driver and the vehicle. When this data is kept secret, this not only introduces privacy concerns, but also reduces innovation, and ultimately, safety.

On the flip side, accessible data from an EV, including its battery (its most valuable component), leads to new business models. An ecosystem of drivers, insurers, OEMs, and app developers can use this data innovatively — for customers, EV upstarts, and large OEMs. For example, a platform that ingests battery data and feeds it to the driver enables real-time guidance about using the EV's energy more efficiently.

How to build a cross-industry data-centric OEM platform?

Open telemetry enables "observability" of system components and helps inspect batteries and the overall driving performance. Once certain data is known – say on remaining battery charge – it is fed into artificial intelligence (AI) models to enhance battery efficiency (should drivers slow down on bends, and by how much, for instance).

The platform offers vehicle-to-vehicle (V2V) communication, a potent technology, especially with edge technology. Here, client data is processed at the periphery of communication networks – in this case, on the vehicle rather than the cloud – and allows cars to respond to events quickly. Information exchange is nearly instant and direct, thanks to faster response times and low latency.

In this paradigm, a wireless communication device provides and receives useful data, which makes driving and operating a vehicle more optimal. For example, these systems dynamically map roadway conditions to assist drivers for high-risk routes.
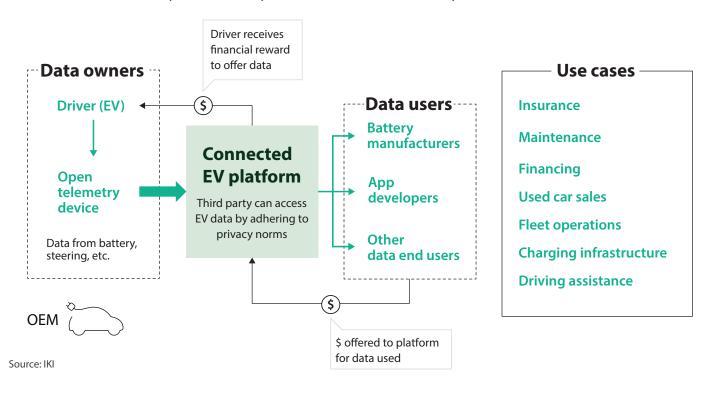
More data implies more incentives to build applications (see Figure 1).

Developers use data to build adjacent OEM services, such as more efficient, real-time parking. With blockchain underpinning how data is stored and distributed, drivers are incentivized to offer more of their own information. This enhances driving efficiencies (in terms of battery cost, driving risk, and warming to the planet), and drives innovation for ecosystem players.

OEMs should innovate quickly, as some firms have already entered this space. Take DIMO, for instance: with 17,000 vehicles added to its platform already, this blockchain startup is taking on the proprietary data platforms of the likes of Tesla and Porsche by providing data feeds to more stakeholders. Its mission is to give car owners more control over their data.[2]

Figure 1. Connected vehicle platform for OEMs

The power of an open data, connected vehicle platform for OEMs

Source: IKI

DIMO incentivizes data providers with compensations. Not only does it pay drivers for submitting data to the platform, but also helps build an ecosystem for developers and data end users, such as battery manufacturers. These players access and use network data and introduce new driving features such as optimal A/C current for charging and discharging before a long trip. It also aims, in the long run, to create a greener planet by giving EV vehicles an even stronger business case. This will lead to many use cases, including insurance, maintenance, financing, used car sales, fleet operations, and charging infrastructure. And then, the acceptance of autonomous vehicles will see new heights.

This platform will also help utility firms understand load patterns across different days, hours, locations, and charging stations; and offer incentives and recommend subscribers about when and where to charge their vehicles. The ability to control these parameters will become critical, as renewable sources contribute more power to the grid.

The idea behind this technology is to replatform vehicle data transactions into a marketplace that rewards drivers for contributing to better and safer products in the future. Apps and services will be seeded for EV manufacturers and electric utilities, helping vehicles charge with clean power, and drivers figure out how to switch to zero-emission vehicles.

What's really driving this shift?

Data sharing is counterintuitive for many organizations because data and privacy only seem to work when confined within the parameters of a particular product or service. But sharing data from EVs in a privacy-preserving fashion leads to better

products and innovation. For example, a battery manufacturer supplying batteries to Toyota, Hyundai, Volkswagen, and others can study what parameters determine battery efficiency without knowing the vehicle owner or vehicle identification number (VIN).

Privacy-preserving data sharing leads to innovation and better products

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Despite some inadequacies at present, blockchain is promising. It provides an immutable digital audit trail of data transactions and helps businesses and individuals agree about the true state of affairs within a market without relying on a costly intermediary.[3] By collating data on battery performance (and other metrics), EV drivers and other market participants have immediate, verifiable access to data that was reserved earlier by big OEMs.

OEMs must comply with regulations

Though large OEMs are yet to build this technology at scale, there are many reasons why this might happen soon.

OEMs — from big EV companies to tellers of farm equipment like John Deere — are in the crosshairs of privacy regulations. Many new outfits convened by industry bodies and even parliaments globally want them to be more transparent about how they use customer data gathered from their vehicles.

A recent discussion on social media and across partisan lines in the U.S. is the "right to repair" movement, spearheaded by the Repair Association, a lobby group. This law forces OEMs to provide drivers with the same service documentation, tools, and spare parts, as to authorized

service providers. Its application for data is quite visible, extending the powers of the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act to ensure OEMs open their data universe for whomever it is required.

Porsche, the German carmaker, has made data privacy, and the capture and wrangling of data for the benefit of its drivers, integral to its growth strategy.[4] For instance, the carmaker is transparent about why it seeks specific information, how long the data is retained, and which of its business partners may access it. Though, for many, this is just a means to comply with GDPR, Porsche has used the regulation to innovate more deeply. For instance, if drivers consent to collect their car data, they can view details such as vehicle's electric charge level and statistics about previous trips on a mobile app.

Other OEMs may follow suit. But many want to keep their data locked in the confines of the vehicle, in fear that opening the black box and sharing with others in their ecosystem will invite further regulatory scrutiny and destroy their business model. Others fear that with their vehicle data to hand, innovative upstarts will swallow market share and make them uncompetitive.

This thinking is wrong.

With more data accessible to customers and app developers, the EV industry, for one, will grow faster, giving the likes of Tesla more business. With incentive mechanisms built on decentralized systems, crowdsourced solutions lead to more efficient batteries and a better charging supply network. With AI working on these huge datasets, customers get more insights on battery health, parking, and how the source of power generated fits

into the circular economy. Of course, major carmakers make their money by keeping important IP and data a secret. They want data from users but prefer not to share it outside. But, as Porsche demonstrates, giving customers the ability to share their data discriminately with third party suppliers (as frequently as they want) strengthens ESG credibility and association between firms and drivers. A Porsche ID registers preferences in cars and mobile apps and maintains a meaningful customer relationship in the long haul.[5]

And with data shared more freely, more insights are created and curated in the datasets gathered from the Internet of Things; this explains why the global market for connected vehicle data will grow from $17 million last year to $11 billion by 2030, with $9 billion of that in personal data, according to Gartner.[6]

Growth, but not at all costs

It's not just regulatory upheaval spearheading the open data EV movement. The amount of potential innovation, risk, and data privacy regulations weren't clearly understood. Also, EVs and connected vehicles had a very slim market share.

But things are changing.

Global electric car sales more than doubled last year to 6.6 million, about one in 12 new cars sold, according to a recent tally from the International Energy Agency, a global forecaster.[7]

While EVs do not have carbon emissions, their batteries don't last forever and are made of lithium, cobalt, and other minerals that need appropriate disposal and better recycling strategies. They also need more environment-friendly mining processes. Open data certainly helps here, enabling OEMs meet science-based targets such as the Science Based Targets initiative (SBTi).

More EV data is also good for utility companies, which are currently faring rather poorly in the minds of the populace due to high energy prices globally. On the demand side, the load on utility infrastructure will increase due to vehicle electrification. Having a better charging infrastructure with more data about who's charging, when and where, will help utilities forecast load patterns, and design the incentives mechanism to control the demand on the grid. This alone would be a good reason for customers to share the data from their vehicles.

Also, car safety is paramount. With autonomous driving and driverless navigation systems, drivers want to know lots of things about their cars, including the remaining battery charge on a motorway. Unpredictability in the battery lifecycle causes anxiety, and customers are prepared to pay for solutions such as DIMO and Penta Security that make the whole process easier.

Penta Security is a Korean information security company that has created an open data platform for vehicle safety reasons. While their solution helps in battery recycling, their focus is more on data collection and vehicle security. Regular overcharging leads to battery failure and unpredictability. Penta Security detects abnormal behavior during charging and discharging processes to help vehicle owners take timely action. The platform also collects data on temperature, charging time, and maintenance status. Using AI, the platform can analyze between 100 and 150 data points per battery. "Battery data is a key resource for the development of the electric vehicle market, such as predicting electric vehicle risks, recycling batteries, and saving repair costs. We will protect drivers and contribute to the development of the battery industry," said Sangkyu Shim, CTO Penta Security.[8]

Imperative data and software

Now that the open data initiative is growing in importance,[9] firms like Porsche and other OEMs open the black box for regulators to look inside how EV components work. This spurs ongoing debate and encourages discussions on data and software ownership. Projects like these ensure big OEMs don't take their status for granted. In fact, Tesla owners now connect DIMO and other telemetry devices to their vehicles using a mobile app.[10] This helps them understand parameters such as range in cold weather, battery degradation with frequent supercharging, and charging at the most optimal time on the electric grid.

Customers want to know how firms use their data, even if it's for better services and entertainment. This growing customer power, teamed with much greater performance of exponential technologies such as AI, telematics, and blockchain, creates an environment where OEMs listen carefully to what buyers say.

Through the Mobility Open Blockchain (MOBI) Initiative, giant players such as BMW, Ford, GM, and Groupe Renault, seek an ecosystem where businesses and customers have more control over their driving data.[11] Although the initiative is predominantly for autonomous vehicle and mobility services, more EV-centric use cases will underpin its innovations going forward.

Toward more innovation and better business outcomes

Clearly, an open data, connected vehicle platform fosters innovation and market share. We discussed how ESG effectiveness (the ability

of ESG projects to meet their goals) directly correlates with technology effectiveness, and that ESG-oriented firms are more human- and data-centric.[12] That means, OEMs can create profitable and planet friendly markets by making cars that closely align with customer expectations.

Privacy enhancing technology then takes center stage. People want to stay assured that their personal information is safe and used for the intended purpose.[13] If not, they will leave, taking sales with them. According to HBR Analytics and Mastercard data, respondents to a recent survey said that data protected and kept private is the most important element of a perfect customer experience, followed by on-time delivery, and products that meet expectations.[14]

Open data, connected vehicle platform promotes digital transformation and creates new opportunities

With connected vehicles, the problem gets harder to fathom. And then, higher security standards, consumer education, and further integration of connected platforms in the EV market become the solution.

Connected vehicle platforms will lead to significantly greater incentives for drivers to use their vehicles, creating a virtuous feedback loop of more innovation and better business outcomes.

These technologies enable faster processing on the vehicle, almost-instant data sharing for moment-by-moment driving, and products that can share data to make cars and batteries more efficient. OEMs should use them to increase their appeal to customers while leveraging innovation from smaller players to create an ecosystem that works for everyone.

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