

EXPLOITING VEHICLE USAGE DATA TO ESTABLISH DATA-DRIVEN SERVICES

The collection of vehicle usage data facilitates the generation of new digital services. In analogy to the Quantified Self movement, the American-dominated Internet industry has already spawned a plethora of startup companies backed by enormous amounts of risk capital, thereby demonstrating the high market value of vehicle usage data. A growing community of drivers expects to gain more driving insights and (better) access to their vehicle data, and a growing number of industries want to exploit the potential of vehicle usage data for other purposes as well.

The rise of the quantified self

Quantified self refers to willingly collecting data about oneself, including biological, physical, behavioural, or environmental data. While some users are just curious, others want to be able to act based on this data in order to improve their quality of life.

The quantified self has already become a major value generator through mobile applications available for Android and iOS. One successful Austrian quantified-self startup is Runtastic, which was acquired by Adidas in 2015 for about 220 million EUR. The sports performance data collected from Runtastic's users delivers actionable knowledge for Adidas to facilitate product design and product marketing.

Similarly, the data collected by modern vehicles holds a huge potential for further exploitation and value creation. However, the automotive industry is still in the early stage of leveraging this potential.

The potential of quantified vehicles

The potential to exploit vehicle usage data for purposes other than driving currently remains relatively untapped by car manufacturers. According to the EU project AutoMat (coordinated by Volkswagen research), the automotive industry has not yet been able to successfully establish an ecosystem for apps and services equivalent to that of smartphone manufacturers.

The AutoMat project mentions three reasons why OEMs are currently struggling. First, brand-specific business approaches dominate, which results in a lack of brand-independent vehicle data. Second, current proprietary vehicle services focus on the individual customer, which leads to privacy concerns, and there are few ideas for making anonymous vehicle data available for other services. And finally, the implied or required collaboration between OEMs on vehicle data and services is considered risky in terms of competition.



Figure 1: Showcasing Apps developed by the US start-ups Automatic, Mojo and Zubie

Tech startups to challenge car manufacturers

Digital innovation in the Quantified Vehicle domain is currently being driven by a steadily growing number of innovation-friendly startups, the majority of which are located outside Europe. They demonstrate the potential of current Web technology by launching novel platforms, providing application programming interfaces to access novel services, or offering apps and services for curious and tech-friendly drivers.

The dominant IT industry in the USA has already backed a few Quantified Vehicle startups with risk capital, reaching more than 20 million USD in some cases. Examples of highly funded startups include zubie.com, automatic.com and moj.io, all of which provide smartphone-powered analytics and services for vehicle drivers and other stakeholders.

Most of these require a basic and sometimes even branded hardware adaptor that is connected to the standardised vehicle On-Board Diagnostic (OBD) interface. The adaptor captures vehicle data and transfers it directly via embedded 3G/4G modem or indirectly via a connected smartphone to a cloud platform for analysis and service provision. Some startups allow third-party apps to be built on top of collected vehicle data, which is gathered not by a single vehicle but rather by a plethora of vehicles. In all cases, the receipt of valuable services motivates drivers to share their driving data.

Market approaches and offers

Beneficiaries of apps and services include vehicle drivers, road maintenance authorities, transportation companies, online content providers, public traffic authorities, vehicle engineers, insurance providers, and, of course car, manufacturers, to name but a few. For example, individual drivers may be empowered to assess their personal driving style on their smartphone and receive suggestions for improving this style in order to drive more safely or more cheaply; organisational customers, such as insurance companies, can provide new kinds of insurance contracts; and city planners can be empowered to make informed decisions based on the knowledge gained about traffic patterns.

To increase the customer value of such services, vehicle usage data could even be enriched with data from other sources, including weather data, traffic data, environmental data or map data, to name but a few.

Towards a Quantified Vehicle ecosystem

In order to ensure that the concept of Quantified Vehicles achieves its full potential, at least four different types of stakeholders must be considered:

- The primary end users (individual service consumers) are vehicle drivers who directly benefit from innovative products, visualisations, statistics, gamification aspects, and recommendations based on the assessment of their shared vehicle lifecycle data. Value generated on the individual level is an incentive to share personal driving data.
- Secondary end users (organisational service consumers) are organisations which indirectly benefit from collected and assessed vehicle lifecycle data from multiple vehicles by consuming special services (e.g. engineering, city planning, and advertising).
- Service providers are organisations which provide Quantified Vehicle services for primary and secondary end users, thereby ge-

nerating revenues (e.g. by providing fleet management services, traffic-style-dependent insurance services, vehicle maintenance prediction services).

- The cloud service provider (platform provider) operates the required infrastructure for the Quantified Vehicle ecosystem and enables service providers to establish services based on vehicle lifecycle data, as well as allowing primary and secondary end users to consume these services and share their vehicle lifecycle data in return.

Privacy and data protection as major obstacles

However, Quantified Vehicle ecosystems can only be successful if a critical mass of drivers shares their driving data. Hence, privacy concerns have to be addressed to support the emergence of third-party services with sufficient data in order to create representative statistics and knowledge for which a third party would pay.

Raising awareness about the kind of data a vehicle generates, processes, stores, and potentially transmits to a third party is an important task. The 'My Car My Data' campaign, launched by Federation Internationale de l'Automobile (FIA), educates car drivers about the potentials and pitfalls of connectivity. One strategy is to let the drivers decide what data to share with whom, as well as how it should be used and in what kind of third-party service. ■

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LITERATURE

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