Blockchain for mobility services

Personalized mobility through secure data

IBM Institute for Business Value

Driving changes

Car-sharing, ride-sharing and ride-hailing aren't new. Uber and other personal mobility services have redefined how people move from place to place. And now these services are beginning to redefine traditional car ownership itself. As people move from one vehicle to another, their personal information and preferences need to follow them, so the car they use feels like their own. Blockchain is defined as a shared, immutable ledger, and it can address many of the challenges that new types of personal mobility present.

Customer-driven personal mobility

Mobility is about more than just cars. Consumers are demanding customized mobility options based on their individual and lifestyle preferences. Automation, artificial intelligence, digital commerce and the Internet of Things (IoT) are fundamentally redefining how vehicles operate, and vehicle usage and ownership models may change entirely. The ripple effect of these disruptive changes will drive changes in overlapping industries such as insurance, energy, travel and oil as well.

According to a recent study from the IBM Institute for Business Value, the use of the personal car as the primary mode of transportation will decrease by 5 percent over the next 10 years.[1] The actual usage time of most cars is limited. But with new options for vehicle access, people no longer have to pay up-front for a car that is likely to be parked most of the day. Instead, drivers and passengers can pay for access through a mobility service. For example, car2go is a car-sharing system that doesn't have fixed rental locations. The company is also expanding to commercial fleets to improve capacity utilization and lower costs.

Giving up car ownership doesn't have to mean giving up personalized mobility. People expect to have the same personal experience of using a car whether they own it or not. They want the car to behave like other personal devices, with the ability to access their favorite entertainment and information, shop, book hotels or even monitor their health.

Sophisticated consumers have high expectations for personalized interactions because of their experiences with other industries such as retail, where personalization and customized choices are widely available. As vehicles become more software-oriented, the ability to personalize the in-vehicle digital experience becomes possible in cars as well. Using data about an individual, a vehicle can offer the personalized experience people desire. The car then becomes just another smart device that also happens to move them around. However, for these in-vehicle, personalized experiences to become viable, it's critical for data to be secured reliably.

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Secure consistent data transfer

What is self-sovereign identity?

Self-sovereign identity is the concept that people and businesses can store and control their own identity data. They can then provide it to those who need to validate it without having to rely on a central repository of identity data.[2]

In the future, a secure ledger based on blockchain can be used to manage vehicle data, personal preferences and transactions. With blockchain, distributed ledgers are shared across a scalable group of individuals and institutions. It brings trust, transparency and auditability to participants. Data that is associated with an event or transaction is time-stamped, appended to the record preceding it and made available to authorized participants in real time. Because records can only be added using rules agreed to among the participants, they can't be circumvented by individual actors. The data then becomes part of a reliable, unbreakable chain of trust.

In the context of personal mobility, blockchain can be used to identify the digital identity of a driver, a rider and a car. The configuration and preferences of a specific car can be locked to an individual's identity. This identity moves from one car to another. So one day a driver might be behind the wheel of a BMW, but tomorrow she may be driving a Volkswagen. The driver's preferences for horsepower, entertainment and even insurance rates transfer with her from car to car.

New business models and smart contracts

Blockchain also can manage micropayments for the driver to charge the car, and pay for tolls or parking. All of this information is connected to the identity of both the driver and the specific car. With blockchain, it's possible to securely identify who was using a car in a given timeframe, which allows new business models to emerge, such as pay-per-mile. With the ability to attribute driver responsibility, insurance companies can calculate rates based on mileage and driver behavior. With a persistent driving profile, the insurance risk model changes based on the way an individual drives. This approach incentives people to drive better so they avoid burdensome insurance costs.

Blockchain also acts as a mechanism to hold business logic as smart contracts, which will enable providers to expand beyond company borders. Current car-sharing operations are limited because they depend on third-party organizations. For example, if a driver rents a car out of pool and picks it up in specific city, he can only drive within a defined radius because currently the contract must be ended where it started. The driver must return it to the originating city to close the contract. With smart contracts, more companies can be engaged to provide other services, such as recharging, cleaning and keeping the pool of cars working. The process could be automated and decentralized through enablement of smart contract technology.

Because a driver's profile is a valuable dataset, management is important. Security, authentication and privacy are crucial to services that are enabled by blockchain, encryption and the use of smart contracts. For both ethical and regulatory reasons, companies will have to govern and monitor the blockchain network.

Personal mobility options beyond car ownership

Car-sharing: Short-term car rental where people have access to unattended vehicles. Fuel and insurance are included in this type of service. Car2Go and Zipcar are examples of car-sharing services.

Ride-sharing: A type of carpooling that uses private vehicles. Shared rides are arranged on short notice between travelers with a common origin or destination. BlaBlaCar and vRide are examples of ride-sharing services.

Ride-hailing: On-demand access to drivers who provide rides for a fee with their private vehicles. Gett and Didi are examples of ride-hailing services.

Driving new business

Case study: Car eWallet

Car manufacturer ZF Friedrichshafen, investment bank UBS and IBM are working to develop a blockchain-based mobile payment system for the automotive industry.[7] Car eWallet is a digital assistant in the car that allows secure and convenient payments on the go. The use of blockchain prevents the need for a third-party vendor or central computing hub to process transactions and commands, and allows a reliable and unchangeable data record. A secure blockchain infrastructure will show vehicle information to authorized users, and carry out tasks and transactions.

Consumers are pushing the changes in the automotive industry, so it's not a matter of if mobility changes will happen, but when. According to a recent automotive industry report from the IBM Institute for Business Value, of the more than 16,000 consumers surveyed, traditional car ownership models won't meet consumers' future expectations.[3] Of the respondents 39 percent said car-sharing is a very important option for the future and 36 percent said ride-hailing was.[4] Even peer-to-peer car renting was a viable option with one out of three people saying they were very interested.[5]

69% of industry executives rated "creating new services-based offerings" as a significant growth area for the industry.[6]

Moving forward

In the future, automakers should consider new options securing data and promoting trust. Here are some questions to consider as you move forward.

- Where are you on your blockchain journey? To what extent has your organization considered application of blockchain to specific functions and activities?

- How will you provide security and trust in handling people's data?

- How can you create a sense of brand ownership and brand love as consumer behavior shifts from owning cars to using them?

- In what ways can you provide consistent experiences across different regions with different data-sharing rules?

- How do you use self-sovereign data management to enable seamless, compliant and sustainable data sharing among customers, vehicles and service providers?

Experts on this topic

Julian Fieres

Head of Strategy, Business Development, M&A - Division E-Mobility at ZF Friedrichshafen
julian.fieres@zf.com
linkedin.com/in/julianfieres/

Dele Atanda

Digital Innovation Officer, Global Lead, Automotive, Aerospace and Defense IBM Global Business Services
dele.atanda@uk.ibm.com
linkedin.com/in/deleatanda/

Oliver Gahr

Program Director Innovation, Blockchain and IoT, IBM Research and Development
GAHR@de.ibm.com
linkedin.com/in/oliver-gahr-27873135/

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