



Tokens for personal mobility

Enabling automated transactions in real time

What's a token?

Tokens are a versatile new form of value that can facilitate seamless transactions within a given usage domain such as commerce. A token typically only exists digitally and is governed by a blockchain. Tokens are secured through encryption and represent a type of value. Versatile and programmable, tokens exhibit features that can be useful in the machine-to-machine economy. As the reach of automation and digitalization extends further across the automotive industry and vehicles gain autonomy, the role and importance of a token as a form of exchange is destined to rise.

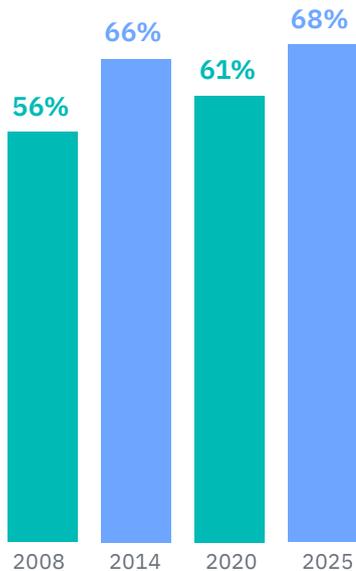
Types of tokens

Tokens are sometimes called “cryptocurrencies,” “crypto tokens” or “crypto assets.” In essence, tokens represent a specific value or utility that can be traded. Tokens began with the introduction of Bitcoin and its clones in 2008 and accelerated in 2014 with the introduction of Ethereum, the first major general-purpose network to support the issuance of tokens. Tokens enable the creation of open, decentralized networks. Developers are building new networks for a wide range of uses in many industries, including automotive and mobility services. Three primary types of tokens exist:

- A *payment token* describes a store of currency value such as Bitcoin. Like a paper US dollar bill, this type of token can be used as currency. Its value is linked to the demand for the token. Tokens differ from fiat currencies, such as the US dollar, in their supply. The dollar supply is dictated by the monetary policies of the US government. The issuance, governance and supply constraints are set by a central authority, the Federal Reserve. With tokens, the supply is dictated by the monetary policy and governance of their associated protocol. It’s enforced by decentralized blockchain networks through the laws of cryptography and mathematics.
- A *utility token* is used for functions in a system. It’s specific to that particular system or protocol, such as a token to access a specified amount of cloud storage. A utility token acts like a ticket to access a certain number of goods or services.
- A *security token* is used to represent ownership or an interest over the issuer’s assets or property. These tokens may be considered an offer of shares or units of a collective investment scheme or a debt owed by the issuer.

Monetizing opportunities

Figure 1
Technology progress



- Automotive 2020: Clarity beyond the chaos
- Automotive 2025: Industry without borders

Source: IBM Institute for Business Value.

Technology progress was rated by industry executives as the highest external force related to digital, vehicle and the enterprise in two IBM Institute for Business Value studies about the future of the automotive industry (see Figure 1).¹

Automakers are exploring how technology can enable new monetization opportunities and business models that include tokens. Using tokens lowers payment barriers and reduces the complexity of current systems that are

based on layers of legacy technology. Because tokens offer instant settlement, car owners can make their vehicles available for new uses. For example, if a vehicle is programmable and connects to the internet, it can issue and receive tokens and participate in a mobility network. Tokens can enable ecosystem interoperability, which makes it possible for semi-or fully autonomous vehicles to buy and sell new types of services. These vehicles can use tokens when needed to independently access energy, data, route information, parking, servicing or toll roads.

Using payment tokens in place of currency

In the automotive marketplace, tokens can be used for automated, real-time, immutable settlements and micro transactions. For example, suppose a car is co-owned by a small group of friends. The car could be automatically serviced with the service costs distributed among the owners, so the crypto wallets of all parties are automatically debited for the correct amount. These payments could be granularly and transparently calculated in a way that promotes equitable sharing. Each person would be charged based on how much he or she used the vehicle.

Customers could use payment tokens with any partner in the network, which might include repair shops, auto parts suppliers, insurance companies, car-sharing services and car

dealers. By taking advantage of decentralized blockchain technology, it's possible to pay securely and agree to complete fulfillment of service obligations.

One example of the advantage of using blockchain technology is in micro-billing. The minimum denomination size of a token is typically in the millionth of a unit. For applications such as per-second billing for parking, the small size offers a big advantage. For example, suppose the cost of 30 minutes of parking in off-peak periods is US 60 cents. That's 2 cents per minute or 0.03 cents per second. With typical currencies, implementation of per-second billing for parking is impossible, but paying in tiny increments is feasible with tokens.



46%

of consumers surveyed by the IBM Institute for Business Value were highly interested in the ability to pay for things directly through their cars.²



44%

of consumers surveyed by the IBM Institute for Business Value were highly interested in specifically purchasing concierge services directly through their car.³

Mobility Open Blockchain Initiative (MOBI)

IBM is collaborating with BMW, Bosch, Ford, General Motors, Groupe Renault and a number of other companies on a new transport organization called the Mobility Open Blockchain Initiative (MOBI).⁴ The group will explore the use of blockchain to help make transportation safer, more affordable, and more widely accessible. MOBI will explore how blockchain can be used in the new digital mobility ecosystem to meet customer demands. A few of the projects MOBI will initially focus on include secure mobility commerce, usage-based mobility pricing and payments and vehicle identity, history and usage.

Using tokens to enable usage and ownership

Utility tokens are like credits that enable owners to consume services within a system. For example, a ride-sharing service provider might issue utility tokens that enable it to fund the provisioning of the service. The buyers of the token then consume the ride-sharing services over time. Token holders would be able to use the utility token to pay for rides or even sell the tokens if they don't want to hold onto them. The token's purpose in this instance is to improve the ease with which ride-share services are provided and to enable token buyers to consume rides.

Security tokens are like shares that give people ownership of an asset, service or network. For example, suppose a community wants to create its own mobility service. The group decides to crowd fund the service and raises USD 2 million to fund a fleet of community-owned cars. That debt is repaid to owners over time through the token's change in value, which is driven by the earnings from providing the service. Security tokens are potentially more liquid than conventional securities and bring other immutable programmability benefits.

Creative ways to combine tokens

The applications for tokens go far beyond simple car ownership. Tremendous opportunities exist for new mobility business models, providers, products and services. For example, a token issued to distribute ownership of a fleet could also enable token holders to use it to consume services provided by the fleet. At the same time, it also could enable token holders to buy services from other partners within the fleet's ecosystem. In this case, a single token could operate in all three ways: as a security, utility and a payment token. Tokens can be used to transact in different ways within an ecosystem. By combining multiple types of tokens with different types of transactions, countless new options and business models become possible.

Enabling transactions in real time is the desire, and tokens will be a key enabler. Payment, utility and security tokens each have their purpose and value.

As you develop your token strategy, you should consider these questions:

- What type of mobility experiences are you trying to deliver to customers, and what role can tokens play in enabling them?
- In what geographies are you planning on operating with tokens, and have you, or are you, able to engage the regulators in that market early?
- What type of token makes most sense based on the experience you're trying to deliver, your business goals, the geography of the pilot and the regulatory landscape?

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Notes and sources

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- 3 Ibid.
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