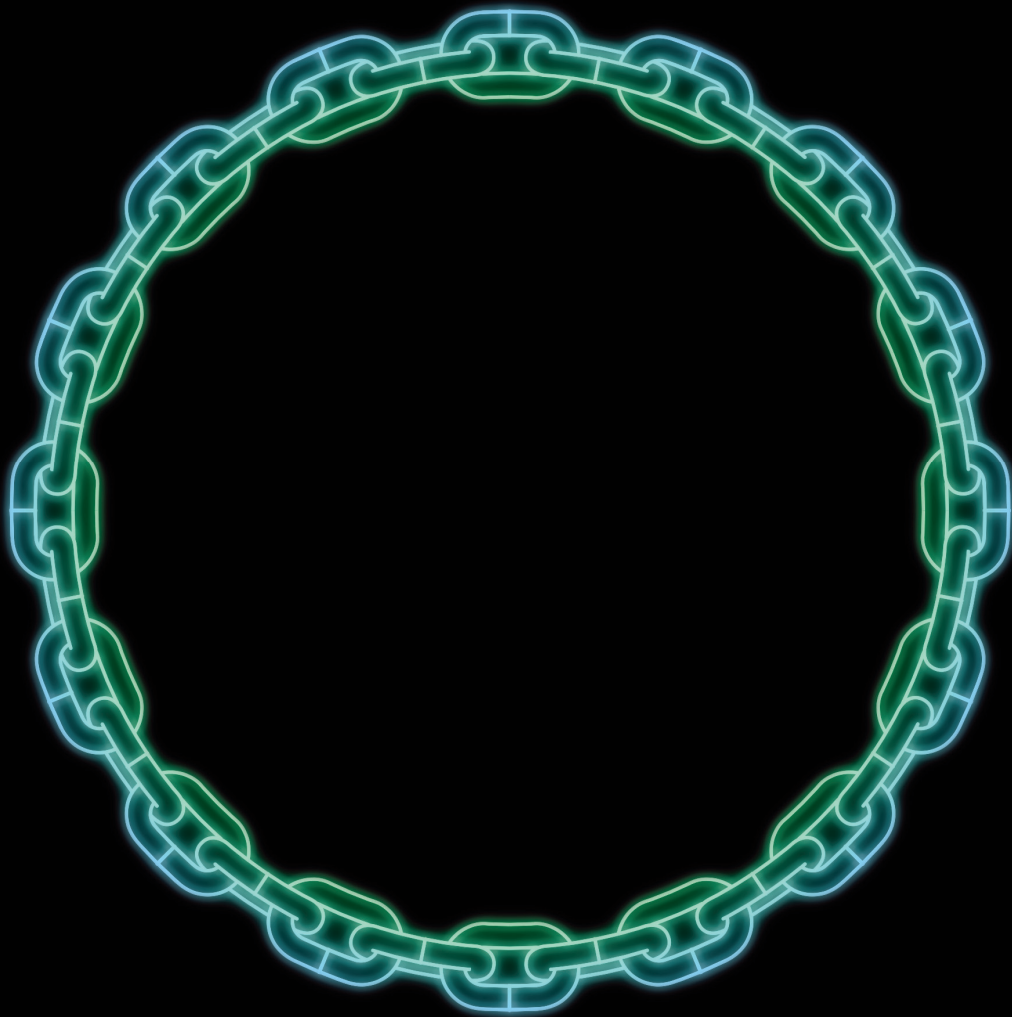


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Blockchain @ Auto Finance

How blockchain can enable the
Future of Mobility

Future *of*
Mobility

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Envision the future

It is 2030. In the western world, direct car ownership has declined radically, as sharing solutions dominate the ecosystem. Mobility operators own and manage large fleets of 24/7 connected vehicles that users can easily access through their wearable devices or smart-phones.

On the fleet manager's books, a car is now an asset that needs to be used constantly in order to bring significant returns. In addition, providing a frictionless experience to users and reducing operating costs is essential. To achieve this, the car is selfmanaging in providing the service, conducting its own maintenance, and handling its own P&L, financing, and payments independently.

During its whole lifetime, the vehicle's status is tracked on a blockchain in which the parties concerned can verify the relevant information regarding the car at any time, in an environment that enhances transparency while guaranteeing privacy. In this way the fleet manager can verify all transactions affecting the car and also its financing status. The car user can be sure that previous renters have properly released usage rights without necessarily seeing who the previous user was, or what he or she did with the car.

Autonomous cars are equipped with fully functional mobile payment wallets that are connected to the wider financial and transactional system, thanks to blockchain technology. This enables the cars to bill endcustomers directly for the use of the car and for the various services they may have used (e.g. drive-in, in-car entertainment, road tolls, on-demand insurance). Electric cars in the fleets will be able to leverage usage behavior to recharge during periods of low use. Moreover, the cars know their maintenance frequency and independently schedule and carry out their appointments with the service providers, reducing downtime and revenue losses.

Blockchain will also make it possible for the car to be completely autonomous from the financial point of view.

Setting the scene

Up to 2013, most people who had heard about blockchain were avid speculators trying to monetize the high volatility of the crypto-currency Bitcoin. In recent years, blockchain has become one of the hottest technologies in C-suites globally, with more than US\$ 1.7 billion of investment in the last three years. Although the financial services industry was the first mover, other industries have quickly followed, either sensing the huge opportunity or at least worrying about being left out by innovative start-ups.

Use cases have emerged in disparate areas from the basics of payments solutions and identity management to more complex uses. Travel operators or even Airbnb hosts can reinvent room booking processes thanks to smart locks that automate payments. Chemical, pharmaceutical, and food companies can track

perishable goods and check their preservation status along the chain of custody. Artists and media operators can publish copyright material directly on the blockchain to enable seamless micro-payments for every download. And the list goes on.

Up to the present, one of the industries that has only scratched the surface of what blockchain can mean is the automotive and captive finance industry, currently focused on the unprecedented changes already storming to the core of their traditional business models. But car sharing, autonomous driving, and the countless other exciting challenges that the automotive industry is facing should not obscure the impact that blockchain can have for the whole eco-system. This involves not only OEMs (Original Equipment Manufacturers) and end-consumers but also dealers, financiers, and ultimately anyone who deals with mobility services.



Figure 1: Key facts on blockchain (Deloitte analysis, 2017)

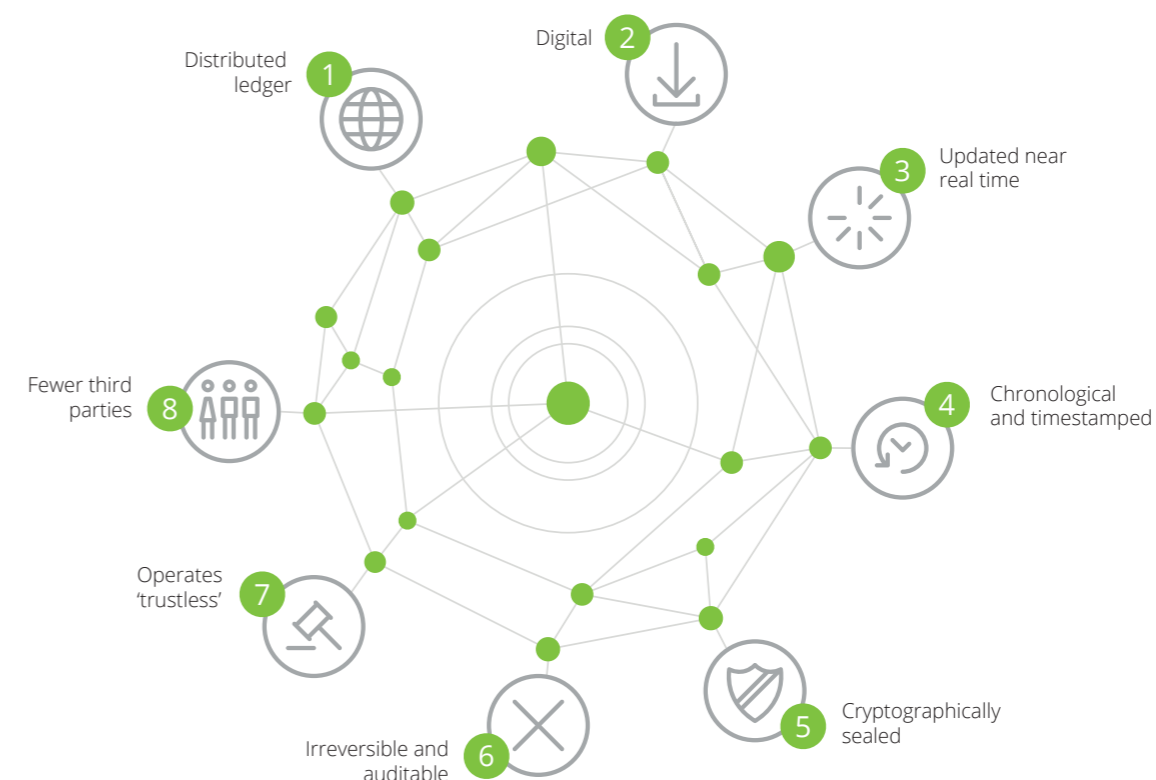


Figure 2: A blockchain's key characteristics (Deloitte analysis, 2017)

A blockchain can be defined as a digital, chronologically updated, massively duplicated and cryptographically sealed record of data transfer activities within a network of participants. A few of the most relevant features of blockchain technology are as follows:

- Blockchain has created unprecedented scarcity in the digital world: a “digital object” is directly transferred to the recipient, without any possibility for the sender to retain it, forge it or retransfer it at will
- Blockchain permits the secure transfer of digital assets directly from point to point, without the need for a trusted intermediary

- Blockchain transactions are irreversible and immutable, and do not permit external censorship, as long as the network is strong and secure enough

Leveraging its decentralization paradigm, blockchain technology has the potential to solve many trust requirements that today burden a large number of business processes and interactions, by clearly recording all historical and current ownership rights of a given asset at any time without requiring any intermediaries. This is why blockchain's potential for disruption and the reduction of costs is enormous: with the appropriate set-up, the technology can be applied to a variety of business areas, and the automotive and mobility ecosystem is no exception.

The fundamentals of blockchain

Deloitte has already explored in depth the mechanics of blockchain in several publications. This publication will therefore just give a quick overview of the main characteristics of blockchain, while referring avid readers to more specific publications¹.

¹ Blockchain. Enigma. Paradox. Opportunity (Deloitte, 2015); Bitcoin Fact. Fiction. Future (Deloitte University Press, 2014)

Future of Mobility – impact on automotive and captive finance

Like many other industries before them, OEMs and their captive finance companies are facing – in addition to the overall trend towards digitalization – two parallel disruptive trends. One is a change in customer demand from ownership of the car to the use of it (e.g. car sharing and ride hailing). The other one is the emergence of autonomous cars.

Deloitte has produced a series of Thought Leadership papers on this “Future of Mobility” by deriving four scenarios that could coexist. This publication does not elaborate on these developments in detail and directs the interested reader towards these publications.

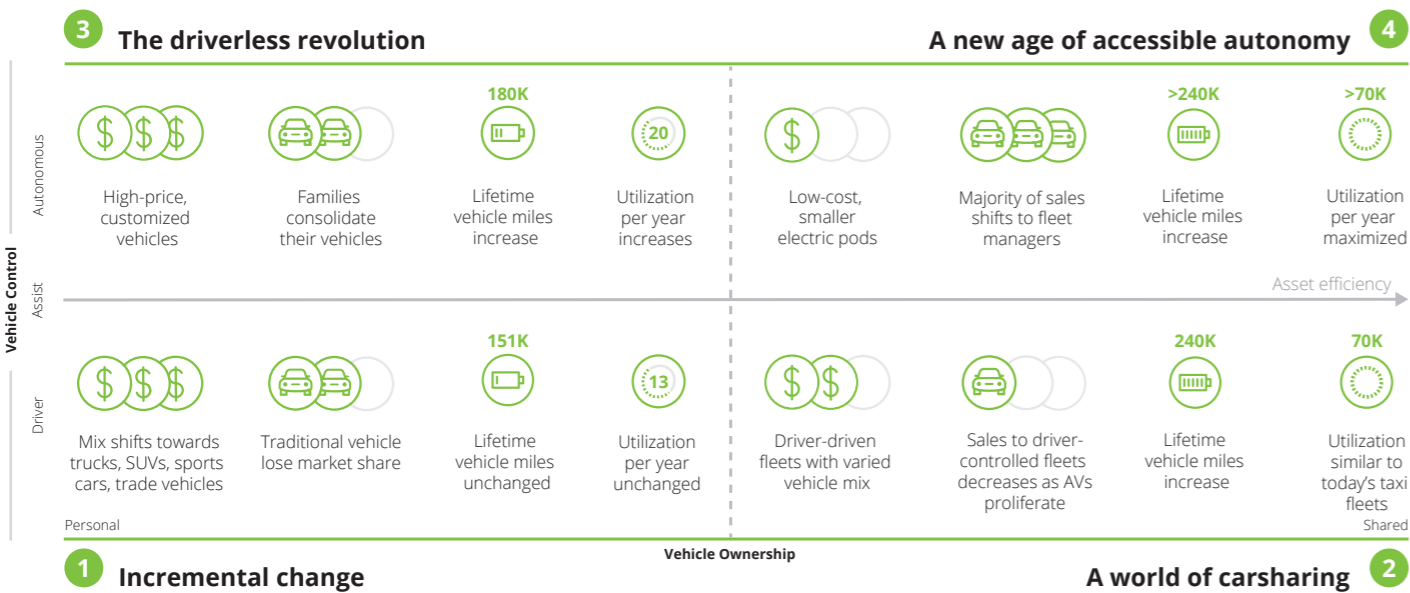


Figure 3: Future of Mobility: potential states; source: The Future of Mobility (Deloitte University Press, 2016)

Automotive companies have always been providers of mobility. Their traditional business model appeared fairly simple and included the production of the car by the OEM and the sale of the car – mostly to retail customers – through a physical dealership network. Captive finance companies stepped in to provide sales financing to customers to an extent where – at least in the western world – more than 75 percent of new car sales were enabled by credit finance or leasing, with captive finance companies having the major share of this market. This resulted in these companies contributing an average of 20% to 25% to their groups’ profits, while on average half of the total assets of European automotive groups consist of their captive finance companies.

This business model is being challenged more and more. Already today two thirds of the roughly three million new car sales in Germany are going to corporate customers, with most European markets showing a similar trend. Within this corporate channel the relevance of fleet managers either as subsidiaries of banks or as independent players is increasing continually. Combined

with the increasing demand for autonomous and shared fleets, this business model change poses a huge threat to automotive companies, who risk losing, to mobility providers and fleet managers, the customer access they traditionally held. These new players can leverage their size and bargaining power to obtain discounts from auto suppliers and influence buying behavior and brand selection by the end customer.

Several automotive companies have already reacted and are increasing their activities in the fleet management environment to avoid being reduced to the role of hardware providers. In the end, the winners in this race for customer contact will be those companies who are able to provide a seamless customer experience at a limited cost.

Blockchain can become the enabling technology for automotive companies to reach this goal and to maintain a key role as the direct provider of mobility services to end customers.

Leveraging blockchain – selected use cases

Blockchain already enables a number of use cases in diverse areas of the automotive ecosystem. This publication provides an overview of the most promising areas for automotive and automotive captive companies.

Identity management

In the context of an increasingly sharing-oriented environment, identity management is going to be crucial for the success of the newly emerging business models and there are two main aspects to identity management in the future of mobility servicing.

On the one hand, fleet managers and service providers will want to gain as much information as possible on users, both in the onboarding phase and during vehicle usage. This will be crucial in enabling customized offers on auto financing, insurance, spot offers, and even for an accurately discriminated fleet access: serial car wreckers or new drivers, for example, will not be able to access the highend models of a fleet. On the other hand, user awareness of data privacy is rising continually and the monetization

of valuable client data is likely to change radically as users are increasingly careful about sharing data without getting value in return.

Blockchain can intervene on both sides of the equation. Several digital identity platforms based on blockchain are already active in the market, with use cases ranging from authentication and customer on-boarding for generic services to know your customer (KYC) and anti-money laundering (AML) checks in financial services. Most of these platforms are based on the principles of user empowerment and control and selective and secure transfer of sensitive data. It is not hard to imagine the auto ecosystem heavily leveraging these solutions for fleet access and usage monitoring and vehicle financing and insurance.

Deloitte’s Smart-ID platform

Deloitte has developed a shared Smart Identity platform that uses blockchain technology to challenge the traditional ways of proving identity, by allowing users to create a universal digital identity and offering new ways for individuals, organizations, and even devices to obtain and use verified identity credentials to transact with one another. The graphic outlines the customer journey of this platform.

Users can create and store identity attributes such as an ID reference, driving license, or passport, which can be endorsed by third parties to form verifiable credentials for use in any digital interaction. The platform offers vast opportunities for the automation of identity-linked processes such as customer registration or KYC.

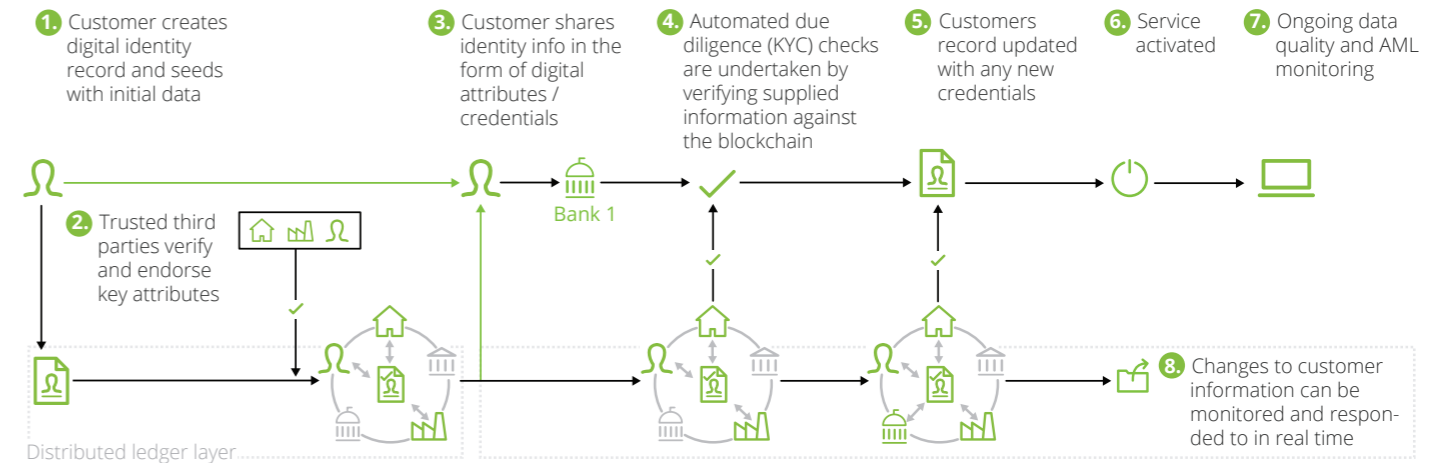


Figure 4: Deloitte’s Smart-ID platform

Payments

Mobility services are increasingly combined with financial activities. Even in today's property-based model many aspects and moments of car usage are linked to transactional activities. A sharing oriented ecosystem will additionally need to provide automobiles with transactional independence. Any automobile must be capable of managing the transactions that take place while consumers are using it, both to send and to receive funds.

There are therefore many prototypes leveraging blockchain technology already under development to equip the car with a wallet which will help to increase the ease of its use. Sample use cases permit an electric car to connect with the charging station and directly settle the charges and enable the car to receive direct payments for the usage of the car in a sharing environment.

The enhancement of having a wallet directly embedded in the vehicle will have a major impact on future business models: the car might be enabled to independently purchase services during usage, whether for road tolls on the highway or for drive-ins and on-demand insurance such as "pay per use" and other on-demand services. In addition to this, the low transaction fees when using a blockchain can also open up the possibility of exploring new business models based on a new, cost-effective concept of micro-payments such as in-car sales of media content or additional services.

Property / Car history

Blockchain permits the tracking of physical objects in time and place, and a market traditionally opaque such as the automotive market could benefit a great deal from this. Blockchain can permit tracking all information regarding a car (mileage, accidents, inspections, changed parts, etc.) in a secure and reliable network that can be accessed by any potential buyer. There would be an unprecedented incentive to be transparent, as a market with better and more accurate information would be beneficial for all players involved: owners, producers, service providers, financiers, and insurers would all share the same set of information and be able to drive down costs and increase service throughout the car's lifespan.

In particular, financiers of car purchases would benefit enormously from such an accurate source of information, as the valuation of used cars would be much more accurate, allowing for better estimates of residual values and consequently resale values.

Some European countries are already analyzing whether blockchain could help to digitalize official car registration and the attendant document management.

Loyalty

Blockchain technology can have an impact on the top and bottom lines of loyalty programs, by offering advantages in their operations as well as granting higher end-customer satisfaction. Operational benefits from using blockchain technology compared to "traditional" loyalty programs include faster transactions, easier integration of external partners, and the simplified incorporation of other loyalty programs. Moreover, blockchain and smart contracts permit the programming of rules into the tokens/reward points systems, enabling – for example – the seamless exchange of points from different partners in the same loyalty scheme.

These higher flexibility characteristics of the program will increase the ease of customer onboarding and more active user engagement in the loyalty platform, thus ensuring a closer relationship with the end-customer.

Back-office - Finance and Operations

Blockchain has been shown to improve process efficiency, especially in managing those processes which include multiple players as well as intermediaries and where significant exchange of information, data, or cash flows is required. A sample of areas where use cases and prototypes are already active and can bring significant efficiency include:

- Global intra-company payments and group treasury/ reconciliations (see focus box)
- Custody of vehicle title, especially for cross-border and fleet management
- Secure digital signature for global exchange of sensitive documents
- Digitization of paper-intensive negotiation processes (e.g. financing contracts for large fleets)
- Automation of processes with a low need for human intervention (e.g. standardized decisions on insurance reimbursements)

Blockchain is not yet suitable for more complex processes or for processes with a higher need for human intervention, but the evolution of the technology needs to be watched, as the potential for further and more extreme automation is already present.

Global payments use case

The transfer of assets has always been an expensive and slow process. This is particularly true for cross-border payments. Blockchain technology is able to speed up and simplify this process while also reducing costs significantly.

Deloitte has built a working prototype in which customers can send money across borders despite only knowing the receiver's phone number or email address. The goal was to show how blockchain and other exponential technologies (e.g. cloud or distributed databases) can remove the friction that exists in today's banking equation.

Conclusion

The Future of Mobility will be characterized by a higher proportion of autonomous cars in shared fleets. This will imply that the cars are not only the platform for mobility but become digital ecosystems offering various additional services such as in-car entertainment and location-based services, similarly to how smartphones work today. More and more competitors from other industries such as telecommunication providers, social media companies, or e-commerce platforms will compete for customer access within and around the car.

Customer intimacy and loyalty, the ability to collect, understand and use customer data and also efficient processes will become even more relevant to success in the mobility industry of the future. Major requirements to be successful in this new environment are to gain the trust of the customers and to provide the processes and technical infrastructure for a seamless

customer experience. OEMs and their captive finance companies can leverage their brands to provide a strong level of trust that is superior to most of their future competitors.

Blockchain offers the technological potential to enable the required innovative business models and underlying processes by leveraging a redefined concept of user-centricity based on the new “decentralized trust” paradigm. Although the exploration of blockchain enabled use cases is still in its infancy, with the technology still on a steep evolutionary curve, the possibilities, especially in the key areas of customer identity management and payment solutions, are enormous.

We at Deloitte are ready to accompany you on this exciting journey of discovery: do you want to shape the future with us?



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