BLOCKCHAIN TECHNOLOGY: A POTENTIAL GAME CHANGER FOR AUTOMOTIVE INDUSTRY

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INTRODUCTION:

Over the last 50 years, automobiles have continued to be a means of both transportation and personal expression. The more transformative change is on the way. The car of the future will be connected which would be able not only to monitor in real time its own working parts and the safety conditions around it but it will also be able to communicate with other vehicles and with an increasingly intelligent roadway infrastructure. These features would be sought for all cars, which would make them less like metallic structure but more like integrators of multiple technologies having productive data centers and ultimately making them components of a larger mobility network.

The breeder automotive industry is a complex ecosystem with multiple parties involved in the design, production, distribution, marketing, financing, selling, servicing of vehicles etc. With the rise of autonomous cars and multiple devices communicating with each other, it has become necessary that these interactions and transactions exist on an immutable database of shared, secure, and highly authenticated data. Blockchain technology is a viable solution to innovations such as vehicle-to-vehicle communication, secure data transactions, component provenance, location tracking and it is as well a gateway to new products and services. Automotive industry is changing, and blockchain technology will make a significant impact on that change.

WHAT IS BLOCKCHAIN?

Blockchain is a technology that enables distributed public ledgers to hold immutable data in a secure and encrypted form that in a way ensures that transactions can never be altered. Whereas Bitcoin and other crypto-currencies are the existing examples of blockchain usage, the “distributed ledger technology” (DLT) is finding a broad range of uses. In a nutshell, blockchain is a technology that enables secure decentralized transactions with few

or no intermediaries. It form basis on a decentralized database, a transaction history, a consensus mechanism and an automated digital contract execution platform in which transactions between participants take place and are recorded.

The Prominent features of Blockchain technology are:

i. **It is near real time -** enabling almost instant settlement of recorded transactions, removing friction and reducing risk.
ii. **Reliable and available –** As multiple participants share a blockchain, it has no single point of failure and is resilient in the face of outages or attacks.
iii. **Transparent –** The transactions are visible to all participants, with identical copies maintained on multiple computer systems, increasing the ability to audit and trust the information held.
iv. **Irreversible -** it is possible to make transactions irrevocable, which can increase the accuracy of records and simplify back office processes.
v. **Immutable -** It is nearly impossible to make changes to a blockchain without detection, increasing confidence in the information it carries and reducing the opportunities for fraud.
vi. **Digital** - almost any document or asset can be expressed in code and referenced by a ledger entry, meaning that blockchain technology has very broad applications

BLOCKCHAIN IN AUTOMOTIVE INDUSTRY

Blockchain has moved beyond its original application in crypto currency and the financial services industry into a number of other industries. It has now reached a level of maturity where the automotive industry is starting to evaluate its potential application. The areas where Blockchain finds its application in automotive industry are:

1. **Manufacturing processes:** A manufacturing plant must coordinate effectively with multiple tiered suppliers, 3rd party logistics and transportation companies to ensure timely delivery of parts and optimized inventory levels. There are many advantages of blockchain technology throughout the automotive manufacturing process. The

blockchain can be used to store data starting from bills of lading for vehicle components, quality-inspection records created during the manufacturing process to WIP information for each vehicle assembly from start to finish. A car manufacturer has to wait several weeks or months before it receives payment for a shipment of vehicles from an importer/distributor/dealer. Because of multiple parties controlling different steps in the chain it is a heavy flow of paperwork. A system based on Blockchain would ensure greater transparency of information between the multiple parties for accuracy and faster processing of banking documentation, ultimately reducing the settlement period.

2. **Supply Chain:** The automotive supply chain is a kind of complex scenario consisting of various suppliers, distributors, dealers, regulatory agencies, insurance companies etc. A Blockchain based system would be able to provide transparency of information between the different parties thus improving just-in-time logistics, reducing erroneous orders and raising inventory turns. Blockchains are extremely secure, making them ideal for record keeping between different parties. Dealings between raw material suppliers, automotive suppliers, OEMs, dealers, repair shops, online aftermarket retailers and the likes often involves more than one party and they need to reach an agreement on the deal. Instead of each party verifying, validating and reconciling transactions themselves, blockchain allows them to work with a single source of truth.

   Car parts could be lost in delivery, stolen, replaced, damaged, etc. By the use of blockchain concept, the manufacturer will have a complete follow-up of these pieces. In the case of a recall, blockchain would also facilitate the procedure since it carries the information on the origin of the piece. One could control if any modifications have been made to the part or if a manufacturing defect occurred.

3. **Finances:** All processes that require manual data insertion include transactions or transaction costs, as well as revisions, among other things, could be streamlined using Blockchain technology. The Blockchain technology would accelerate these processes and keep it updated during the lifecycle of a car. The provider of auto

finance generally has no idea of the actual driving behaviour of car drivers or the vehicle's service history. A system based on Blockchain would enable driving patterns and service events to be sent to a shared ledger that all parties have access. The information made available using blockchain about a vehicle's wear and tear would help the auto finance provider to more accurately gauge residual value of the vehicle. The auto financing includes a host of verification steps to which blockchain could be applied for better efficiency gains.

4. **Secure Communication:** Blockchain technology has an obvious application in the area of secure communication, both vehicle-to-vehicle and object-to-object. In the future, autonomous vehicles will communicate with other vehicles, traffic lights and other unauthenticated devices. Blockchain technology could be applied to secure this communication to ensure that it only occurs between relevant entities so that same cannot be hacked by unauthorized outsiders. In the connected car space that includes software-based navigation, vehicle-to-vehicle (V2V) communications, and a host of other services that can affect vehicle safety and passenger security. One can use blockchain to keep safe the data sent and received by systems. The heightened level of encryption prevents hackers from viewing or using this data. With the rise of autonomous cars and millions of devices communicating with each other. There is a need that these interactions and transactions exist on an immutable database of shared, secure, and highly authenticated access. The information on a ledger that is shared between automotive OEMs, parts distributors, dealers, service mechanics, insurance providers and others form a possibility that parts and equipments within a car autonomously sense its own needs. For instance, a car communication network could advise the driver about the need for repair, contact remote users for updates or nearby suppliers for replacement parts. It could negotiate pricing and appointments for service and then process the respective payment for services.

5. **Vehicle safety and data security.** The vehicles are getting more connected nowadays, which make them more susceptible to potentially deadly cyber attacks. Thanks to blockchain's strong cryptographic roots that cannot be reverse-

engineered, it is the perfect place to store data since it cannot be changed. A common practice by an unethical car dealer is to sell a showroom vehicle and not to report the sale to the bank, which had provided the loan for the vehicle. This practice allows a dealer to have working capital to bridge payroll and suppliers. If the bank finds it on time, it will take immediate action against the dealer. However, because the car is sold legally, the bank has no claim on the vehicle. At the same time, the financing to the dealer has been spent and must be written off. With transparency of the data, the asymmetry in information that allows this practice will not happen. Blockchain provide this expected instant transparency and gains value as more stakeholders opt-in.

6. **Electric Vehicle:** As electric cars become more prevalent, it will require a new machine-to-machine (M2M) infrastructure that includes energy providers, charging station owners, automakers, parts suppliers and car owners. No one enterprise can manage the intricacy to unite stakeholders, and no single entity should possess the platform, which would create a monopoly.

BLOCKCHAIN TECHNOLOGY'S PRESENT STATE OF AFFAIRS IN THE AUTOMOTIVE INDUSTRY:

The applications of blockchain technology certainly have strong cases for changing many aspects of the automotive industrys. The clearest manifestation of blockchain revolution gaining momentum in the automotive sector was the launch of MOBI (Mobility Open Blockchain Initiative) in May 2018 that brings together major automakers (BMW, General Motors, Ford and Renault) and leading blockchain and technology startups and premier organizations such as IBM, Accenture, and ConsenSys.

In February 2019, a two-day colloquium that brought together all members of MOBI took place at the BMW Group IT Centre in Munich. The event was primarily intended to promote and develop common standards for applying blockchain and distributed ledger technologies (DLT) in the mobility industry. The founders of MOBI hope that they can use blockchain technology to shape a future of mobility that is greener, safer, and improves the quality of life in the cities. Only with a set of clearly defined universal standards can

the stakeholders develop an open, independent platform that would enable the industry-wide application of blockchain technologies.

One can find a variety of different blockchain initiatives already in place from the leading manufacturers. Some notable mentions are:

1. Ford has launched a blockchain pilot on IBM platform to ensure ethical sourcing of cobalt. By tracking the supply chain of cobalt on the blockchain, Ford hopes to ensure that companies are not using child-mined cobalt in lithium-ion batteries.

2. Volkswagen is building a blockchain-based tracking system to prevent odometer fraud that is widespread in the automotive industry. Making sure that dishonest car sellers can't manipulate odometers to produce deceptive mileage values, will help the buyers to save money.

3. Hyundai has announced a new partnership with IBM to advance the use of blockchain technology and cloud-based AI. IBM will focus on creating a new supply chain financing ecosystem using open source Hyperledger Fabric. The project aims to automate manual processes, reducing cost and lead time, and, through that, improving customer experience.

4. Innogy SE which is a subsidiary of German energy conglomerate RWE has recently announced that it is launching blockchain powered charging stations for electric cars across the nation through its startup venture Share & Charge. This initiative would help owners of the electric cars to get their vehicles charged at charging stations set up by innogy Innovation Hub's startup venture Share & Charge. This app would be the world's first e-mobility community platform that would be based on blockchain technology.

Various emerging technologies that had a huge impact on other industries might have passed the automotive industry, but when it comes to blockchain there is already a handful of companies investing in this technology. According to a study by IBM published at the end of 2018, 62% of automotive executives are convinced that blockchain will be a disruptive force in the auto industry by 2021. The same study also found that 54% of so-

called Auto Pioneers plan to implement their first commercial blockchain network at scale within the next three years.

CONCLUSION:

We have been through some pretty remarkable applications of blockchain technology and can say with certainty that many aspects of the automotive industry are about to change. However, innovators are really only just beginning to scratch the surface of blockchain application in the automotive sector. The automotive market of the future will be starkly different from that of today. It will need to be more integrated and offer on-demand and personalised services that will include autonomous, shared and connected cars. Blockchain has the potential to play a major role in underpinning the industry transformation that is coming. We expect that interest will grow over the next two to three years as more businesses explore blockchain opportunities, which will develop into detailed enterprise strategies.

Sources:

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