

# BLOCKCHAIN IN AUTOMOTIVE DOMAIN

Transparency, Interoperability, & Scalability



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The "*Blockchain*" is a revolutionary database that does away with the weaknesses of traditional solutions for storing big data. It provides a transparent record of the entire business network, allowing buyers and sellers of each vehicle to track where the vehicle is in its lifecycle. The blockchain as a technology is more of a ledger recording "*agreements*." It is a system which contains a continuously growing list of records, called blocks, which are linked and secured using blockchain-based *Public Key Infrastructure (PKI)* encryption. It also provides a complete history of "*deals*" made between two or more parties, in which the record cannot be altered retroactively without the alteration of all subsequent blocks and the collusion of the network.

### **Upstream Application**

The advantages of the blockchain are valuable, to say the least. Automotive manufacturers can partner with a blockchain service provider to create a unique ledger among its network of *original equipment manufacturers (OEMs)* as well. It can help them to address the issues related to parts quality and the cases of

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fictitious pickups to strengthen its logistics monitoring and control. Like, one can cut tracking time of a particular shipment or series of shipments from several days to seconds. With improved traceability, both automotive manufacturers and OEMs can ensure the authenticity of parts delivery at assembly level milk runs.

## Software-based Manufacturing

Software-based manufacturing based on blockchain can easily increase the manufacturing productivity and quality, significantly reduce the expenses for tracking in regards to warranty, maintenance and recycling purposes. Factors related to extra inspections about the product fabrication, version management, and recalls/callbacks would also, be simplified.

For an example, a unique sensor can be added to each and every parts pallet before it is shipped from *original equipment supplier* (OES)-end and tracks its real-time status and location, to ensure that the shipment complies with the *expected time of arrival (ETA)* at the assembly dock. All of this works in conjunction with the *Internet of Things (IoT)* to form an effective anti-counterfeit strategy by using countermeasure technologies based on blockchain principles, where each supply chain partner proactively takes part in updating the status (attributes) of the item as it traverses from point of manufacture to point of sale. The whole concept demands an extensive and exhaustive level of cooperation among automotive manufacturers, OEMs, software developers and cybersecurity firms at a scale that has never been achieved before.

## Downstream Application

### Vehicular Maintenance

On July 25, 2017, Renault, the French automaker [announced a pilot project](#) to digitized its car maintenance program, which uses blockchain as a shared ledger to log all car repair and maintenance history in one place. According to Renault, currently, the information about a vehicle's maintenance history is kept by a range of sources, including repair shops and dealerships, making it harder to keep track of new changes. By contrast, the blockchain-based digital maintenance log prototype puts all of this information in one place. The next pilot, it says, will focus on vehicle-based microtransactions – essential to integrating the IoT with the exchange of value.

### Automotive Finance & Vehicle Leasing



Automotive financing varies somewhat by the nature of the transaction, typically it includes a host of verification steps to which blockchain could be applied for efficiency gain over the traditionally cumbersome processes like customer bank validation along multiple phases of transaction set up in compliance with *know your customer (KYC)*, loan approval; review of multiple documents sourced from different locations; scoring and classifying risk; archiving of reviewed documents; etc. A blockchain-enabled smart contracts, which will allow these files to automatically negotiate payment on a new car lease and other terms and conditions with the prospective leaseholder, without the need for a middleman. It will also ensure the execution of secure crypto-payments to the necessary parties.

A dedicated blockchain system can also provide most-needed transparency of information about a vehicle's real wear and tear would help the auto finance provider to more accurately gauge the residual value of the vehicle as the lease approached its end of contract date. For example, an *On-board Diagnostic-II (OBD-II)* device connected vehicle over a defined mobile network, would enable capturing of data like driving behaviour events (mileage, hard break threshold exceeded), safety events (airbag deployed, part replacement warning), service events (annual service, part replaced), etc., and get sent to a shared ledger that all parties had access to, including the owner/leaseholder. This, in turn, would enable the auto finance provider to achieve a higher price at subsequent onward sale than would otherwise be possible.

## **Fleet Tracking**

The same fundamental of OBD-II devices can be deployed, riding over a blockchain infrastructure, which, in turn, can enable fleet companies to push & pull OBD-II messages, fetch the gyroscope inclination, along with GPS position of a vehicle or a fleet in real-time. Further, it can be enhanced and integrated with *Electronic Logging Devices (ELD)* in compliance with the *Federal Motor Carrier Safety Administration (FMCSA)* mandate, providing an all-in-one tool that streamlines every facet of a truck driver's job. A cloud-based, blockchain-driven fleet tracking can solve the key issues related to drivers, dispatchers, and fleet owners often face with the best hardware and software available in the market, while also fetching a reasonable rate of *return on investment (ROI)* in near future.

## **Conclusion: An Integrated Application**

Overall, a dedicated multi-tier interconnected blockchain platform based on the fundamentals of scalability and interoperability can benefit many stakeholders, like - *a shared ledger* - between automotive manufacturers, automotive dealerships, regulators, auto finance-cum-insurance companies, vehicle leasing companies, buyers, sellers and even garages, providing a higher degree

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transparency and trust in all kind of vehicular transactions, preventing disputes and lowering the overall cost of maintenance and services by tracking ownership, sale, and accident history. And, at the same time, it could significantly streamline processes, especially those that rely on regulatory and compliance approvals. The blockchain is all about bringing in transparency and efficiency into the existing systems which are running the upstream and downstream supply chains and making them more proactive and predictive.

### **About the Author:**

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