



Let's Solve



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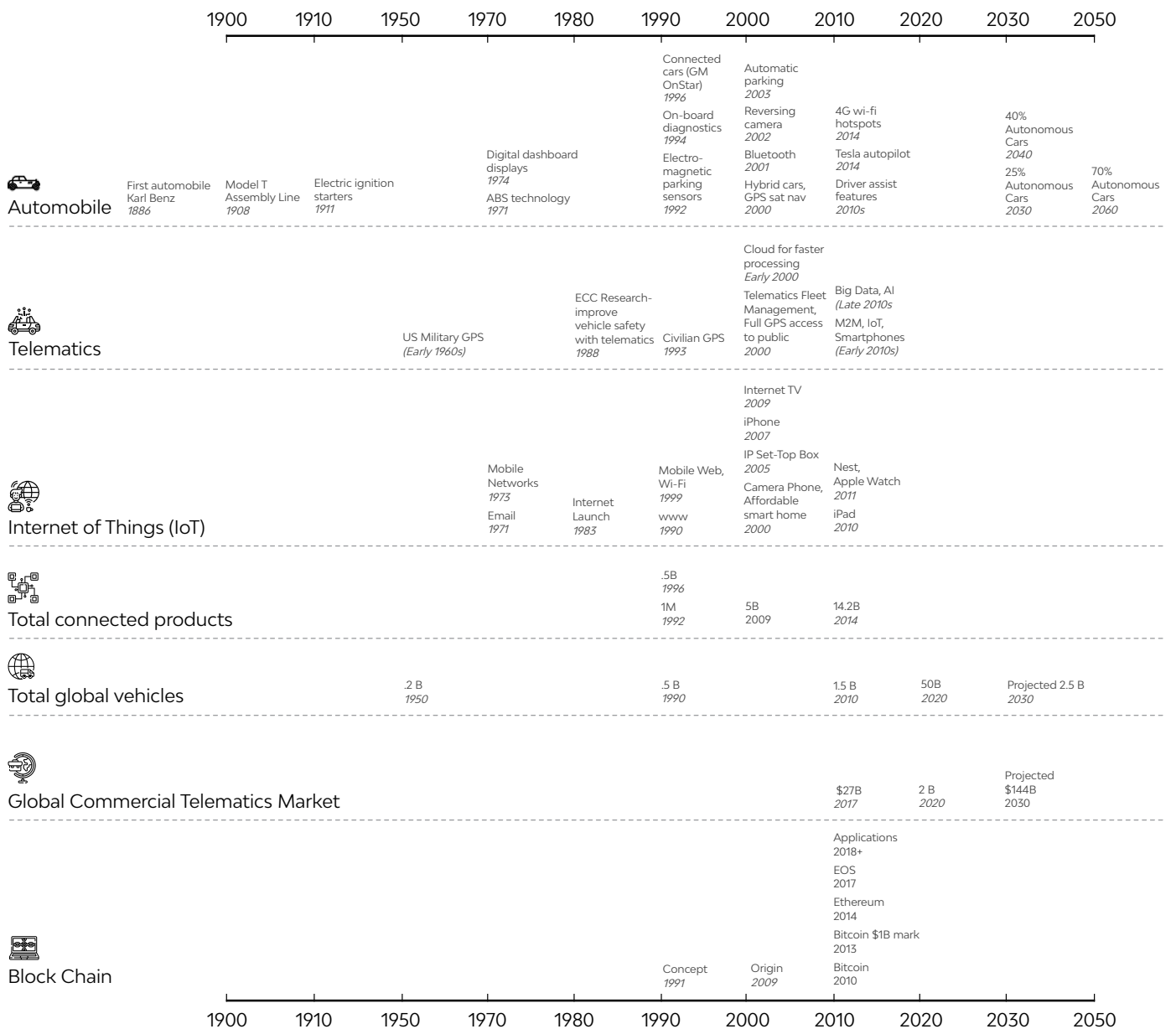
Point of View

Monetizing Vehicle Data through Blockchain

In this paper, we will focus on the potential role of blockchain as the backbone of vehicle data monetization. Experts believe that blockchain will play a vital role in expediting the realization of use cases.

Introduction – An era of automotive intelligence

The auto industry is making vehicles more intelligent with each new model being released off the conveyer belt. The advancement of the technology ecosystem that complements the telematics use cases, has the potential of generating USD 400 billion in revenue by 2030.¹



¹ McKinsey's Research Paper titled "Unlocking the full-life cycle value from connected car data", published on Feb 11, 2021. Available on: www.mckinsey.com/industries/automotive-and-assembly/our-insights/unlocking-the-full-life-cycle-value-from-connected-car-data

The value chain will evolve to comprise unlimited players. The players will provide offerings to generate revenue by providing additional value and reducing costs, or by improving security and safety. It is estimated that connected vehicles will conservatively generate 1 terabyte of raw data per car each day², ignoring the vehicle related data created by interacting IoT systems.

Experts are predicting that the automotive industry is ripe for disruption.

Data logistic challenges

The inevitable dependency on the availability and accuracy of the high-velocity data, brings forward challenges that the industry might not have solved for the scale, which is anticipated for the intelligent automotive era. The following are a few of the key drivers that will encourage industry pioneers to apply or innovate appropriate technology.

How do we collect the data?

Use cases stretching beyond previous geographical boundaries will bring forward unsolved data collection challenges. The IoT systems transacting with the vehicle will also generate high-velocity data that would have to be simultaneously centralized. Also, use cases will extend beyond direct transactions with vehicles such as reward programs, behaviour-based offerings etc., that will also need to be centralized.

How do we operationalize the data?

The data will have to be transformed through a well-architected information framework and infrastructure. The design needs to be simple to implement yet robust enough to sustain the test of time. The following are only a few of the challenges that need to be solved to transform data into operationally-consumable quality information:



Data Standardization

The key to an effective information architecture is its ability to define and enforce the mandatory standardization principles.



Data Quality & Governance

The ownership of the data will be the heart of the ecosystem. A sound information architecture has to enforce the accuracy of the data through established governance and service level agreements.



Data Compliance

The framework needs to be able to capture and regularly update and enforce compliance needs by established authorities. This gets more complicated as the vehicle may travel through multiple states demanding complicated amalgamation of compliance requirements.



Data Security

Beyond all of these aspects, it's a daunting fact that all this information could potentially be hacked. The selected technology enablers must ensure that the platform has the capability to keep ahead of ever improvising hackers.

² McKinsey's Research Paper titled "Unlocking the full-life cycle value from connected car data", published on Feb 11, 2021. Available on: www.mckinsey.com/industries/automotive-and-assembly/our-insights/unlocking-the-full-life-cycle-value-from-connected-car-data

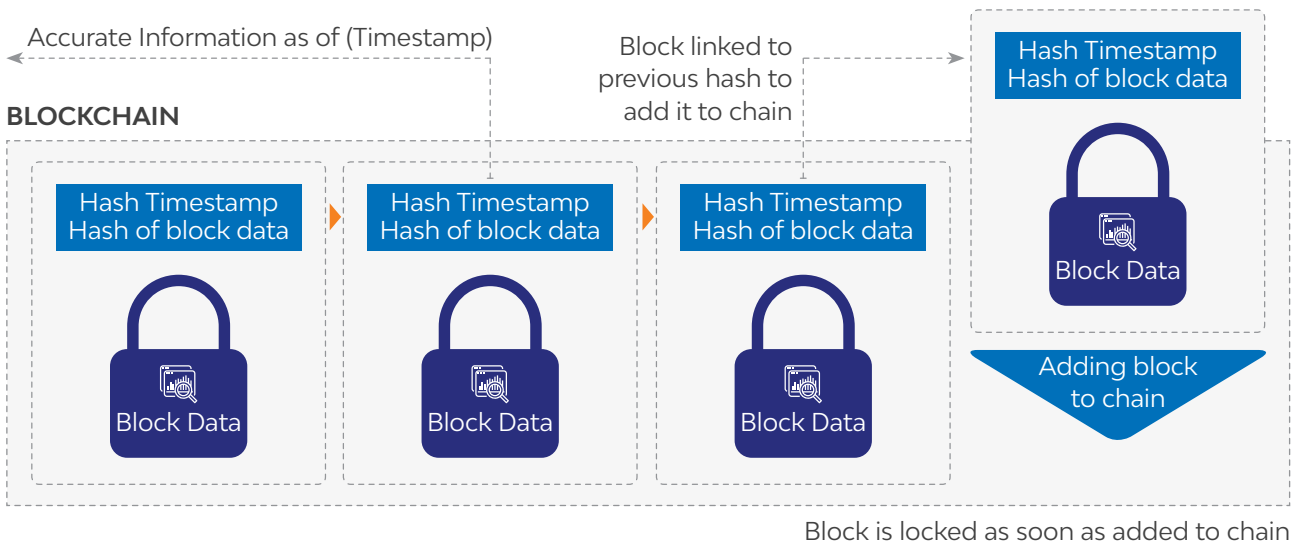
How do we design the availability of the data?

Once the operability of the data is understood, the next step is to ensure high availability of the data, keeping in mind that this data needs to be available 24/7. Based on national and international use cases, the meaningful data needs to be available for relevant entities across the globe. The delay or unavailability of data could have financial and compliance impacts. A platform that ensures high availability will pioneer the vehicle data journey.

Blockchain – The future backbone of data monetization

With bitcoins reaching USD 1 trillion by February 2021³, the success of blockchain architecture has been proven. The blockchain is definitely the preferred platform to realize automotive data monetization use cases, by providing appropriate technology applications. The following architecture pillars provide a promising opportunity to alleviate the challenges mentioned in the previous section.

- **Blockchain is a “chain of records”** – Any event that changes the information is stored as an additional block of information to the past information – which is linked sequential blocks of all previous events. The diagram below helps to simplify the concept:

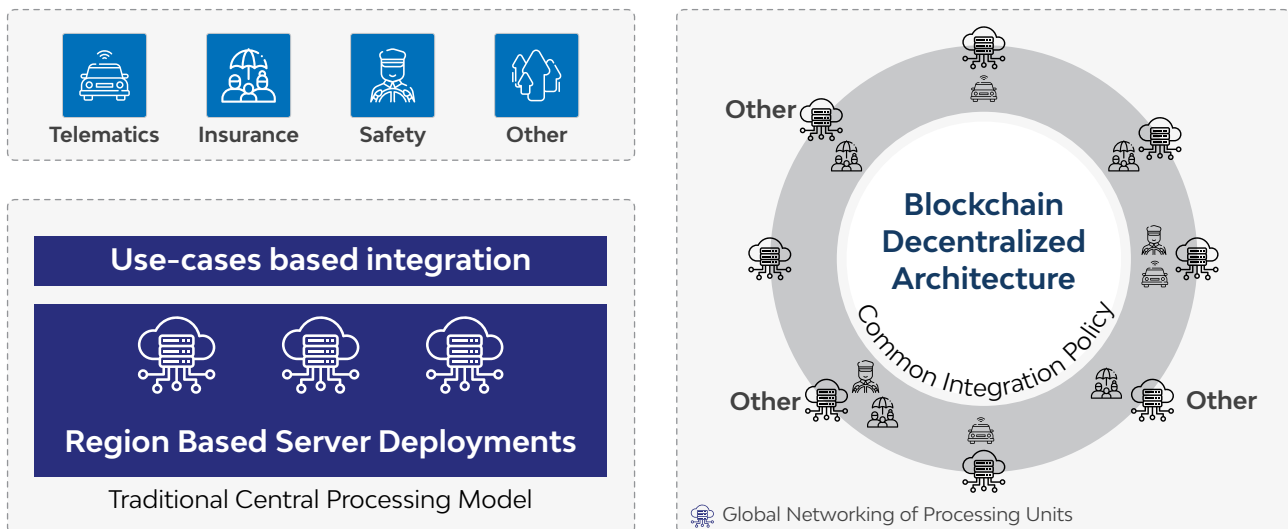


The power of this information architecture is in the simplicity of the design. This helps realize numerous security, traceability and compliance related use cases, in addition to basic design benefits. The blocks are locked as they are added to the chain and this ensures that information is frozen in time. The timestamp on the blocks provides the ability to generate information that could securely represent truth in the past. And this brings auditability into the thread of the design.

³CNBC's article on Bitcoin Market Capitalization.
Available on: www.cnbc.com/2021/02/19/bitcoin-hits-1-trillion-in-market-value-as-cryptocurrency-surge-continues.html

The following are a few of the areas where the chaining of blocks to create information can support auto-data monetization:

- ▶ With shared driving, the driver will frequently change the vehicles that they drive. Each change of vehicle would be an event that gets added to the driving history of blockchain. The blockchain could possibly be leveraged by usage-based insurance providers.
- ▶ The micro-level financial transactions by the connected vehicles' services would be an individual block. The simplicity of design will enable blockchain creation of multiple blockchains such as a vehicle's transaction history, a driver's transaction history or a service provider's transaction history.
- ▶ The blockchains can be shared with other service providers to create and offer attractive AI-based tailored offerings based on behavioral and pattern analysis – deployed on historic blocks of related blockchains.
- ▶ Compliance and audit use cases depend on the availability of historical changes to the data, which can be easily referenced with the blockchain.
- **Blockchain has decentralized architecture** – The decentralized model is not a new concept, however the blockchain technology has leveraged the concept to the maximum, as we know it now. The image below helps highlight the fundamental differences and advantages of the decentralized model.



The decentralized architecture model of blockchain significantly amplifies the fitness of the technology for automotive data monetization requirements.

The following are a few of the key highlights:

- ▶ Blockchain enables smart contracts, which will enable providers to expand beyond geographical and provider boundaries. For example, car-rentals operate with high dependency on third-party providers, who are limited geographically and within their company to provide the services. This typically binds the customer to service parameters and contracted providers. With blockchain enabling smart contracts, the services could be seamlessly transferred to competing service providers with better offerings, as customers move across service boundaries.

- ▶ A truly global service offering that can now be targeted and tailored geographically and to a customer's behavior. For example, international business travellers will carry forward their favorite entertainments and food preferences while ordering online, from connected automobile services across the globe. The blockchains of customer orders, choices and infotainment will be distributed across the globe to provide an uninterrupted user experience, as they drive different automobiles throughout the world.
- ▶ The payment transactions will be seamless as the customer blockchain will be available globally for security confirmation with financial institutions and backend transaction processing.
- **Blockchain is secure** – The encryption embedded in the design helps to secure data as most modern platforms do. However, the main strengths of blockchain architecture's ability to secure are as follows:
 - ▶ **Blockchain immutability** – The block that is attached to a blockchain cannot be altered and it is safe for eternity. Also, the replication of blockchain across the globe, enables the platform to detect any forced or unwilling alteration of the information through cross-verification with replicated blockchains. It is impossible for hackers to firstly trace all replicated copies and then make changes - all at the same time. Hence, it is potentially impossible to alter the data.
 - ▶ **Peer validation of new block** – Any new block that is added to the blockchain is validated by all the peers in the network including financial institutions designed to validate data. This strong validation also makes the security of blockchain the most robust amongst all of the latest available technologies.

Conclusion

The automotive industry is ripe for disruption and blockchain will shape the technology landscape as an enabler for the future use cases. The aspects of technology that will become critical as we move forward, will potentially be served by the secure and distributed architecture of blockchain. For all of us who have a vision of monetizing vehicle data, understanding of the capabilities of blockchain is no longer just an option, but crucial information for technology enablers.

About the Author



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Since 2001, Manojee has been architecting solutions by decoding complex business problems and ensuring optimum value realization. He executed multimillion-dollar global programs in a highly diverse environment and pioneered transformation through digitization and innovation. He led agile adoption by architecting tailored, adaptable processes and standards to support a transformation journey of many organizations.

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