CarBlock

FUTURE TRANSPORTATION DATA ALLIANCE

Whitepaper

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2. Summary

CarBlock is a decentralized blockchain platform and ecosystem that serves the entire automotive and transportation industry. While the internet has enabled the flow of information, Carblock will do the same for data and assets. This increased access to data will enable businesses to make better decisions and stimulate a more efficient operation for them on CarBlock, while also attract individuals, teams, universities and research institutions to join the ecosystem and eventually change the entire automotive and transportation industry.

The premise for CarBlock's inception is that from the beginning of the 21st Century, digitalization, networking, and big data have driven tremendous changes in the automotive industry and its peripheral industries[1]. CarBlock will be first incubated by the world's leading connected car device company, nonda (No NDA Inc) and then will later conduct its operation independently. The team behind CarBlock took nonda from a small Silicon Valley startup and grew it to being one of the world's leading connected device companies. The team firmly believes that traditional mindsets regarding the automotive and transportation industries will inevitably be disrupted. We will share more details about those insights later in the whitepaper.

CarBlock's ecosystem is built based on extensive research and investigation. Based on that information, we work off of the following fundamental principles:

> **The ownership and interest of all data should belong to the data provider**, in most circumstances, the car owner. First, this is where the regulations are headed (especially in most Western countries), and second, car owners are the foundation of CarBlock's ecosystem and serve as the link between business and data. Our expectation is that Blockchain and its decentralized nature will provide the perfect solution for these scenarios.

CarBlock will not profit as the middleman in the data marketplace. On the contrary, CarBlock will ensure the free circulation of data and decrease the friction during this process. The purpose of transaction consumption is to merely cover the cost of the system. CarBlock will even subsidize individuals, teams, universities and research institutions with creative capacity if the organization perceives the potential of those offerings to better the ecosystem.

Data circulation will create a mutually beneficial situation for all participants within CarBlock's ecosystem.

- Car owners can earn token rewards for providing data and in return, receive a more tailored, or reduced, pricing based on the data they provide. This allows participants to enjoy more creative services and products built from the provided data.
- Automotive and transportation companies can gain enormous amounts of data, which will ultimately drive competition and force companies to come up with better, more targeted, products and services built on the data received via CarBlock. Given that the data itself is sanitized (no personal data will be shared), CarBlock will be the most efficient platform to connect car owners with service providers.
- All innovators will have to access to the data they've been longing for, and build more creative services and applications upon it. Actually, CarBlock team has already developed some creative services in the US market and received amazing feedback. We used tire pressure data and cross analyzed it with gas consumption to save millions of dollars of gas fee for our users. We created a tax deduction service based on drivers' mileage logs and helped them to save over $1,000 in tax payment each year. We are further assured by these attempts that with the help from data, more amazing things will be created by innovators.

As veterans in the connected car industry, we believe that applications and services built on car data will present a massive, disruptive force in the industry. However to date, the development hasn't reached its full potential yet. The reason why is due to the lack of consensus among data owners, collectors, and demanders, leaving interests that are impossible to share equitably. In the past, data owners couldn't trust the entity to protect their privacy and have no incentives to share it with them, this is the main reason that no one has built this technology. These are the reasons we've created CarBlock to solve data circulation problems in the automotive industry through blockchain technology.

3. The Disruptive Power of Connected Cars and Connected Car Data

> "Connectivity will have a more dramatic effect on cars than any other automotive technology in the last century."
> - Tom Rivers, Vice President of Global Marketing Connected Car, an automotive connectivity specialist at Harman International, a Samsung Company"
>
> For the purpose of this white paper, we herein define a connected car as a car that is equipped with internet access or outfitted with smart hardware that taps into the internet or wireless LAN and provides benefits to the driver.

The vast majority of auto industry experts concur that connected cars and connected car data will be a disruptive force in the auto industry and its peripheral industries. This chapter highlights the auto industry's major changes and future trends.

3.1 How Smart Devices and the Mobile Internet Are Changing the Automotive Industry

Smart devices and the mobile internet have had a major impact on the century-old automotive industry. Not only have they made the collection and analysis of vehicle driving data possible, they have also dramatically changed people's driving behavior with the introduction of various intelligent electronic systems and driving assistance systems.

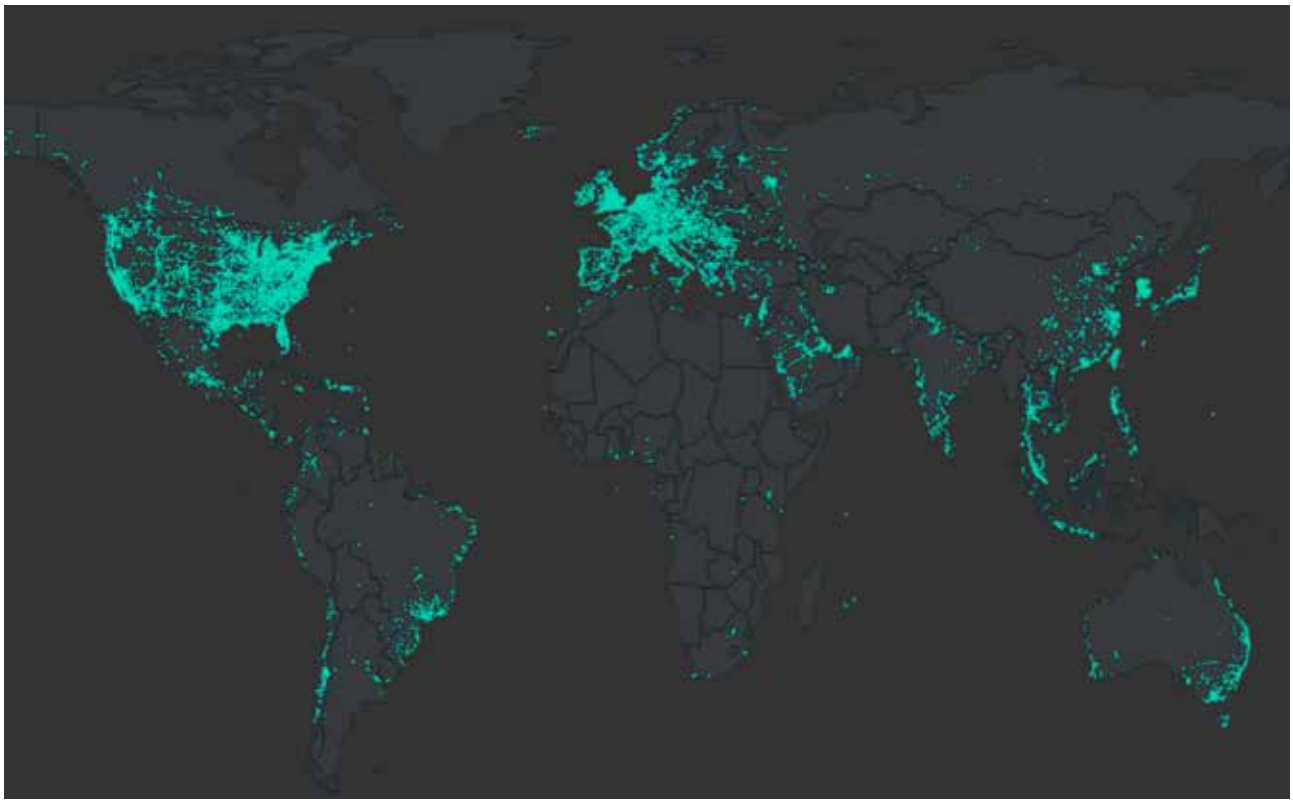

Figure 1. nonda global user map

Let's imagine an extreme future scenario where all cars on the road are self-driving cars and the car owners are just passengers. When that happens, a couple of interesting problems arise. Do people still need to own their cars? Should insurance cover the car or the passenger? Should the owner decide whether the car needs maintenance? Is the auto company selling a car or a transportation service? All previous practices and market dynamics become obsolete in this kind of future.

Of course, this extreme scenario won't come to fruition that quickly, but it makes practical sense to start addressing the questions, changing dynamics, and problems that such a future holds. With the continuous development of intelligent electronic systems and driving assistance systems, it’s only a matter of time before self-driving cars are everywhere.

3.2 Accurate Data Modelling To Replace Traditional Data Analysis

When it comes to vehicle data, traditional data analysis no longer appears adequate. We're currently seeing emerging trends in which connected car data modelling can more accurately represent a vehicle's real profile and therefore serve as a more reliable source of information for making decisions about insurance quotes, vehicle maintenance, and used car transactions.

While the old way of doing business is still very much alive, a company with data modelling capabilities can have a huge competitive advantage over others and thus potentially redefine the automotive landscape. For instance, an insurance company with vehicle driving data could offer a more tailored and competitive package to their customers while maintaining a higher profit margin compared to their competitors. We are seeing early signs of this in North America from a startup called Metromile[2] that is able to offer competitive insurance quotes by allowing its customers to purchase insurance based on their driving mileage. With the continued advancement and adoption of connected car technology, data will undoubtedly become a driving force for the entire transportation industry.

3.3 Understanding the Connected Car Ecosystem and Its Potential

The connected car system is essentially an ecosystem in which each party interacts and collaborates through data. The auto industry is already a mature industry with different parties contributing and consuming data. Data enables the different parties in the ecosystem to form synergies, achieve progress, and make transportation safer and more convenient.

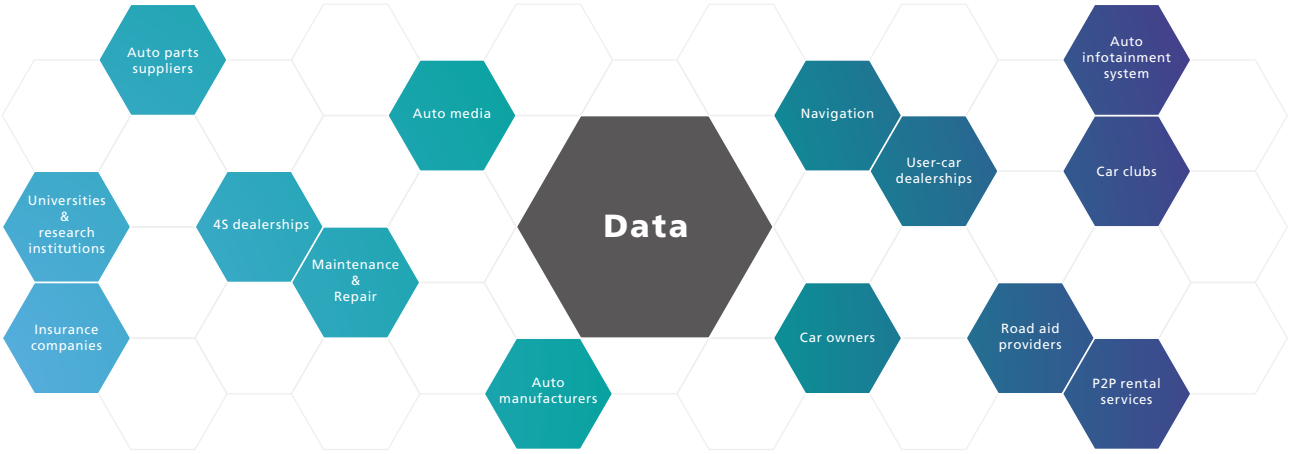

Figure 2. Connected Car Ecosystem

The connected car market holds immense potential. According to Accenture's report[3], the global connected car market will reach $840 billion in 2025 (excluding car manufacturers) with China estimated to take up 26%[4] of that market.

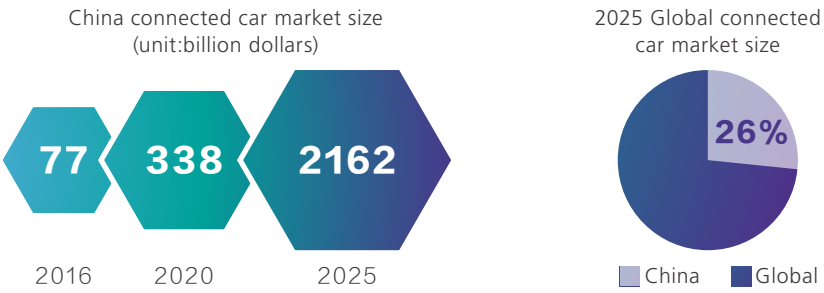

Figure 3. Accenture's report on the connected car market

4. The 4 Core Data Problems in the Connected Car Ecosystem

While the connected car market is poised for growth, the market is currently fragmented and hindered by the following problems which CarBlock aims to solve with a blockchain solution.

4.1 Data Ownership - The Conflict Between Corporate Interest and Data Privacy

Vehicles have enabled people to be more mobile and more free than ever before, so inevitably driving has become a core part of people's daily lives. North Americans are estimated to spend over 20% of their lives in the car. Vehicle and driving data can be used to derive insights about people's lifestyle and preferences and is therefore invaluable. Without advanced data encryption and strict authorization, there is a huge potential threat to people's personal privacy and safety.

Being that the automotive industry is a highly market-driven industry, it's not surprising to hear that companies are facing increasing pressures from consumers to protect their privacy and data. So how can companies protect their users' privacy and regulate data access? This is a key problem that the connected car industry has been trying to solve but with minimal progress, leaving big question marks around the best ways to handle connected car data collection and storage.

The topic of car data ownership has always been very controversial. Almost all car manufacturers have begun to pre-install Telematics Box (T-Box) into vehicles to collect data. Yet, car owners believe that vehicle data is rightfully theirs and is a matter of personal privacy. Consumers are reluctant to trust privacy commitments from car manufacturers and other commercial companies. As a result, there is a clear consumer need for a solution that

ensures that the vehicle data belongs to the car owner.

4.2 Data Collection - The Difficulty in Collecting and Transferring Data Accurately

There's a common misconception that with the introduction of advanced sensors and controllers in newer cars, most cars are already connected and that the data collection process is not only simple but also automatic.

However, the actual reality is that there are 250 million personal vehicles on the road in the United States today with an average age of 11.5 years[5], so most cars are not equipped with the latest tech to handle automatic data collection. With only 7 million new cars (excludes trucks) being sold every year for the past 5 years, it'll take many more years before the majority of cars on the road have been replaced by those equipped for data collection. Tesla, for instance, the epitome of the newest in automotive technology, has an annual shipment of merely 84,000 units[6].

Given the status quo, the current solutions for collecting, transferring, and storing vehicle data is complex, inefficient, and inadequate.

4.3 Data Incentives - Data Contributors Receive Zero Benefit

Unquestionably, the rights to use and distribute data should belong to the person who contributes the data. Yet, when we drive, the data we generate often does not belong to us. For instance, the navigation software knows where we are going and pushes relevant ads. Advertisers, in turn, give money to the navigation company. We, as data contributors, do not receive anything in return. This is precisely why the connected car industry has made little progress; users are not motivated to provide relevant data without proper incentives.

While manufacturers and companies have tried to keep things quiet for fear of losing revenue streams, consumers are becoming increasingly aware of the privacy invasion and are now demanding rights to their personal data.

– In the North America, debates over whether it's right for companies to profit from personal data are all over the media[7].

– In China, people were livid about Alipay's privacy invasion of their annual spending data[8].

We believe that companies' ability to profit freely from user data will dramatically change in next two to three years and CarBlock will help to significantly speed up that process.

4.4 Data Allocation - Data for the Creation of Transportation Applications Is Nonexistent

When Waymo (formerly Google's autonomous vehicle project) expanded its fleet to 100 vehicles in December 2016, it reported collecting 3 million miles of data in May 2017. Now, the company collects data from hundreds of vehicles each day[9]. Managing such a large fleet with road tests in real conditions requires significant investment, which makes getting valuable data a game only giant companies can afford to play. While there is vehicle data available to small companies, the data is extremely scattered and insufficient in scale to provide any significant value for building transportation applications.

In fact, the lack of access to vehicle data has prevented individuals, teams, universities, and research institutes with innovative ideas from making headway into building useful future transportation applications.

The current boon in the mobile internet ecosystem exemplifies what can be achieved when a community of individual developers and startups have the resources they need to develop applications for users around the world. The same thing can happen with the connected car industry when an open platform such as CarBlock is created to enable simple, cost-effective, and safe circulation of real-world transportation data. By doing so, people in the ecosystem can develop their ideas and foster breakthroughs in the connected car industry.

The viability of connected car applications ultimately relies on an infrastructure that can support the safe and automated circulation of massive amounts of vehicle data.

5. Core System Design

5.1 CarBlock Architecture

The CarBlock architecture is made up of 3 layers and 5 core modules as illustrated below:

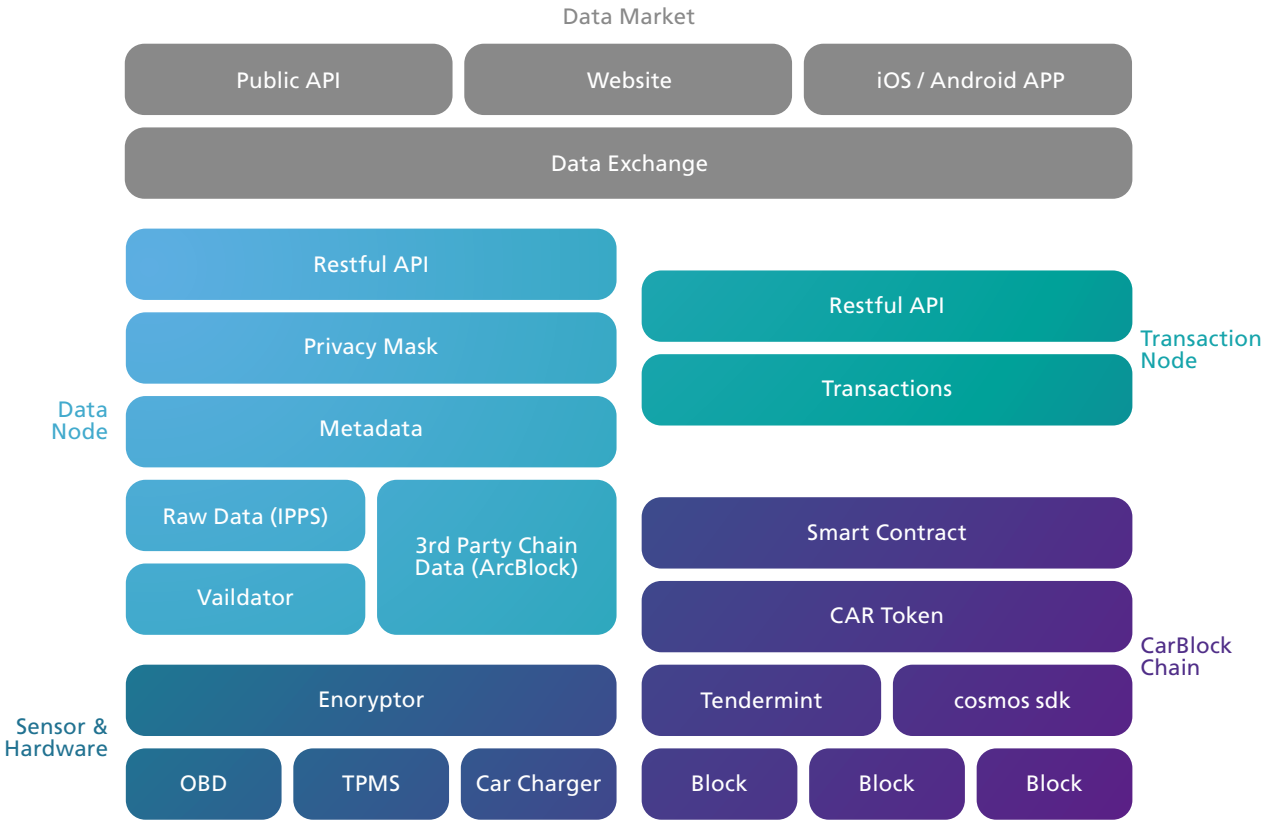

Figure 4. The CarBlock Architecture

In the following three sections, we will walk you through a detailed breakdown of the core components that make up the CarBlock architecture. First, we describe the need to create our own CarBlock Chain in order to meet the particular needs of the connected car industry. Then, we delve into how car data is collected and stored in the CarBlock Chain and lastly, how data is traded via smart contracts.

5.2 CarBlock Chain - A Vertically Integrated Chain

The CarBlock Chain is a vertically integrated chain built for the automotive industry (see the CarBlock Architecture diagram in Figure 4). This chain provides the core blockchain modules and functionalities, such as virtual machines, accounts and wallets. In our initial design, we leaned towards building the CarBlock chain on Ethereum in order to focus more on our core business. However, as we delved deeper into the project requirements, it became clear that Ethereum was no longer a plausible solution due to the following issues:

The High Cost of Gas Consumption

Data trading is one of the core facets of the CarBlock ecosystem. All transactions are to be driven by smart contracts (as discussed in the "Trade & Smart Contracts" section) in order to ensure that the transaction process is transparent, fair and trustworthy. Gas consumption of Ethereum, however, is an hindrance to this fair transaction process for the following reasons:

- The cost of Gas consumption for calling a smart contract is very high.
- Moreover, Gas is consumed every time a smart contract is called, regardless of the

outcome. It's like as if your real estate agent wanted to charge you a commission, regardless of whether your bid for a house was accepted or failed. How would you respond?

Lack of Sidechain Maturity

Sidechain was a concept created by the Blockstream team[10]. Essentially, it's the protocol of letting transactions run only on the side chains with the participation of a few nodes. Only the final result will be merged into the main chain. The purpose for this method was to allow assets to be circulated among Bitcoin and other blockchains, while reducing the number of transactions that occur on the main chain.

> Sidechains provide several benefits to the CarBlock system. One of the main benefits is that unlike Bitcoin, most connected car scenarios involve only a few participants and therefore there is no need to inform an entire network. This means that most smart contracts can run on sidechains, which in turn can help mitigate the potential of congestion in the CarBlock system. Unfortunately, sidechains are still in the initial prototyping stage on the Ethereum platform. To wait for the sidechain technology to mature on Ethereum is a risk to the CarBlock project that we cannot afford[11].

As a result, we decided to build our own CarBlock blockchain in order to solve the limitations of the Ethereum platform and to optimize for the needs of the connected car industry. Initially, the CarBlock Chain will follow the smart contract structure designed by Ethereum, and build the test network to solve two major issues - Gas consumption and sidechains, and do some optimizations based on the needs of the connected car industry.

When Ethermint (based on Tendermint[12]) becomes mature, the CarBlock Chain nodes can be migrated to a version that is similar to Ethermint[13]. Additionally, the strength of Ethermint is its compatibility with COSMOS-SDK[14] and seamless integration to COSMOS ecosystem[15], so that CAR Token can be circulated across different chains to ensure the maximum amount of data flow.

Finally, The CarBlock Chain, built on Tendermint, will also provide a large number of TPS to accommodate the enormous volume of connected car transactions. After migrating to Ethermint, the consensus will be based on a POS solution proposed by Tendermint. Initially, there will be 2 nodes with the plan of adding 1 to 5 nodes per year, up to 100 nodes after being online.

5.3 Data Collection & Storage

The IoT hardware and sensor module is the lowest layer of the CarBlock architecture. For example, nonda's ZUS Smart Car Charger can provide vehicle ignition/shutdown data and battery voltage data. The Smart Vehicle Health Monitor can collect engine data and the Smart Tire Safety Monitor can track tire pressure and temperature. The original signal collected by the sensor will be encrypted by the hardware and become the encrypted raw data, which is then transmitted via Bluetooth to a smartphone or directly from the networked module on the device. Different kinds of data are important for different business scenarios.

The Data Node's core function is to store the connected car data in the CarBlock architecture. The bottommost Validator first verifies the authenticity of the data that's coming from the hardware. Then, the data will be stored in two parts:

The first part is the Metadata, which contains only the information used for the query and indexes to the corresponding raw data, such as Merkel Hash[16] on IPFS. Metadata will also include validation data such as data stored on IPFS using the same "copy proof[17]" technology as Filecoin[18] for on-premise raw data storage and validation (storage availability).

The second part is the Raw Data, which has two formats:

1. CarBlock will use the IPFS protocol to have all the information provided by the Validator be stored on IPFS.

   IPFS storage has three different plans:

   - The data provider provides storage as part of the default plan. Despite the fact that different types of data require different sampling granularity and time length, our algorithm can store data with just 10 GB of storage space and still produce sufficient value. Thus, it is feasible to store data directly on people's personal mobile devices. We also believe that data providers will be incentivized (discussed further below) to provide storage space. The benefit of this solution is that it allows hundreds of thousands of nonda's existing car

owners to become data providers and enjoy the benefits without the need to change equipment, which will greatly help jumpstart the CarBlock ecosystem.
- Third parties (e.g. CarBlock Foundation) provide the storage service nodes in the IPFS network. As long as data providers are willing to transfer part of the data profit, they can use storage service nodes provided by third parties. To start, the CarBlock Foundation can serve as a third-party storage provider.
- The device provides storage. In the near future, the CarBlock team plans to release a new generation of connected car devices with built-in storage in order to support more powerful data capabilities and functionalities.

On the IPFS layer, CarBock will use Proxy Re-encryption[19] to implement data encryption and access control. When the raw data is stored into IPFS, it will be further divided into two parts: the encrypted string for the random key K (EDEK) and the data file encrypted with key K, as shown in the following figure:

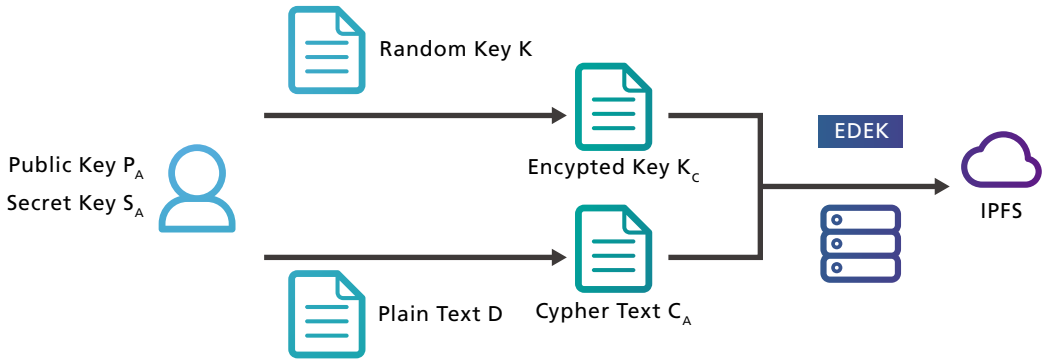

Figure5. Encrypt data & save to IPFS

When data demander wants to access and decrypt the data, it needs to initiate a request to the data provider. If the data provider agrees, it will send a rekey to the Proxy:

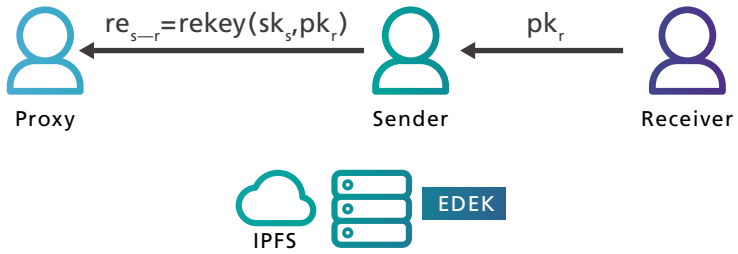

Figure6. Data user requests to access & decrypt data

In this scenario, there can also be some third-party services, such as verifying the identity of requester, providing access log service, and so on, which will not be further discussed here.

Next, the data demander will initiate a request to Proxy, and get a rekey-ed EDEK copy. Together with the private key, the data demander can now decrypt and access the raw data.

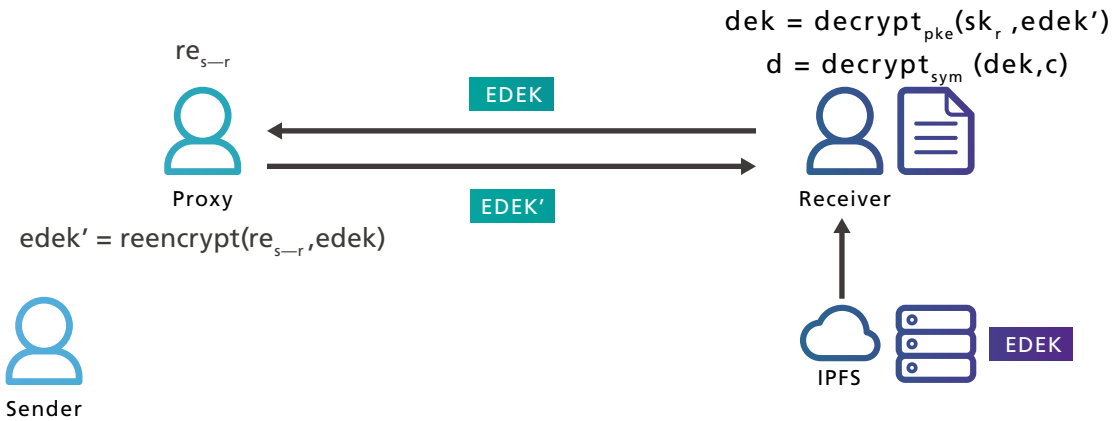

Figure7. Data user decrypts data by working with Proxy

With Proxy Re-encryption, we can achieve one-time data encryption + multiple-times authorizations, and ensure that:

Only the authorized party can use its own key to decrypt and access the original data;

The authorized party can only access the specified data from data provider, but not all data;

And fortunately, there is already an implementation of Proxy Re-encryption in the decentralized world - Nucypher KMS[20]. The CarBlock team can thus use the existing services and further ease the whole development process.

2. CarBlock also supports third-party connected car data sources. Through the use of inter-chain access technologies such as ArcBlock[21], we will enable third-party data to flow and make a profit in the CarBlock ecosystem in order to foster collaboration with more eco-partners. In fact, the CarBlock team has already drafted an inter-chain access design before deciding to adopt ArcBlock's plan since we trust ArcBlock's professionalism and are more interested in focusing our resources on our vertical industry. But in the event that ArcBlock's development is delayed and poses a risk to CarBlock's progress, we will have two alternatives to solve the problem:
- Invest resources into ArcBlock's GitHub, and help to implement the modules for the inter-chain access to eco-partners' data.
- Or CarBlock will adopt the original design to implement the specific inter-chain access requirements.
In summary, CarBlock plans to adopt a common interface design for third-party connected car data sources, allowing the underlying implementation to work in a plug and play approach and achieve loose coupling.

Above the Metadata is the Privacy Mask, which is a privacy protection module that is designed specifically for connected car data. We will discuss this further in the Data Trading stage.

5.3.1 The Importance of Valid Data

Transportation data is of immense value for the building of applications. Consequently, those who provide data will be rewarded in the form of CAR Tokens (see the following chapter). When there are rewards, there is undoubtedly a possibility of cheating. Individuals may seek to game the system by generating huge amounts of fake data to earn tokens. To protect the CarBlock community against such fraud, CarBlock has designed two types of data validation.

5.3.11 Valid Data Collection

CarBlock requires the data provider to assume two roles - that of the data collector and storage provider. The data provider is a node in the IPFS network and is responsible for storing data. This typically consumes one to three times as much storage as his/her collected data (extra storage space will be used to backup other miners in the community data). This design helps prevent data collectors from forging fake data in large quantities to avoid wasting large amounts of storage resources. For the miners who want to generate huge amounts of fake data for community rewards, they will have to pay significant costs for the storage themselves while their data may still be ultimately rejected and therefore worthless.
In addition, used car trading is an important use case for CarBlock. Fake driving data increases the apparent usage of the vehicle, which reduces the vehicle's valuation. As a result, miners are unlikely to want to cheat.

In the data collection phase, CarBlock has a data validator to ensure that the data is collected by the real IoT sensor. In the data trading phase, the data purchaser also has the right to request a sample from the smart contract as a reference for the validation test. If any fake data is found, it will terminate the execution of the contract, and the fake data "miner" will not be obtain any reward via the smart contract.

CarBlock also performs KYC verification for miners and the corresponding vehicle identification (VIN). Any miner who falsifies the sensor data will be punished by the foundation and permanently expelled from the trading market.

5.3.12 Valid of Data Storage

CarBlock deploys decentralized data storage verification nodes to perform routine storage verification tasks. The verification node can verify the

integrity of the data stored in a way that is more efficient than downloading all the data. Proof of storage is generated as a response protocol to the verification node by sampling a small block of random data blocks and submitting a small amount of data. It is the same as FileCoin, which is also based on IPFS.

5.3.2 Mining and Proof of Work

As discussed already in the previous section, CarBlock's data providers (car owners) act as miners in the ecosystem. Like Bitcoin, CarBlock's miners compete with each other for token rewards. But unlike Bitcoin, CarBlock's miners prove their work by contributing connected car data. Mining efficiency is directly related to the value of the data contributed, which in turn provides valuable transportation data to data users and helps to improve transportation technology. This approach creates a strong incentive for miners and motivates them to collect as much vehicle data as possible and store them in order to share with data users.

In the CarBlock ecosystem, the miner community will receive a fixed number of tokens each day, and the main factors that determine each individual's gain are:

- Data dimension (v), the diversity of data provided by different types of sensors;
- Time span (t), the time span that data is continuously supplied;
- Data volume (x), the amount of data that a "miner" provides;

When we are building the mining mathematics model, we think there is a very useful model available for both the Data dimension (v) and the Time span (t) parameters, which is the cumulative distribution algorithm of the exponential function[22] as commonly used in artificial intelligence calculations. Specifically, there is a basic form of calculation, as well as a variant form as shown below: The cumulative distribution function[23] is given by

$$F(x;\lambda) = \begin{cases} 1 - e^{-\lambda x} & x \geq 0, \\ 0 & x < 0 \end{cases}$$

Alternatively, this can be defined using the Heaviside step function, H(x)

$$F(x;\lambda) = (1 - e^{-\lambda x})H(x)$$

The purpose of the above calculation is: on one hand, users should be encouraged to keep contributing (e.g. purchase more sensor devices, and provide data for as long as they can); and on the other hand, the gain should decay after reaching a certain level, so that there are no big miners monopolizing the mining output, which is an issue in Bitcoin and other Blockchain communities, and more new miners will be welcomed to join the CarBlock ecosystem.

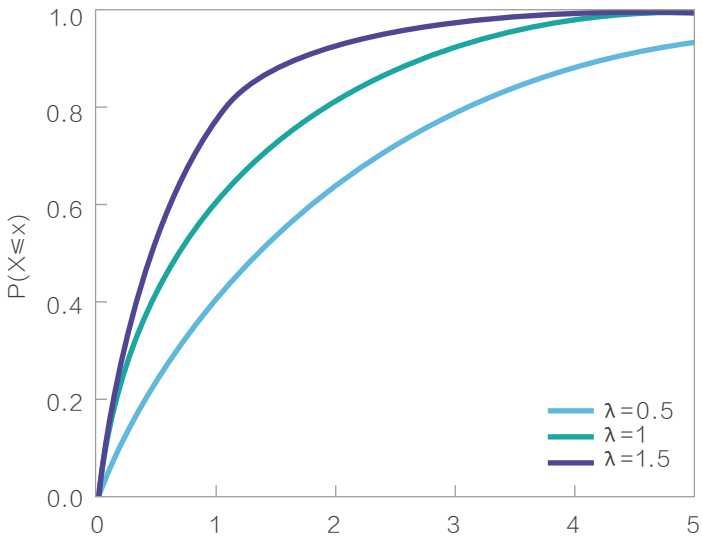

Figure 8. Curves of Cumulative Distribution Function

If the Data dimension (v) and the Time span (t) are considered as weighted parameters, the Data volume (x) can be defined as the base value for the mining benefit, which is verified by the Data Validity process as previously mentioned. For the entire CarBlock ecosystem, assuming the number of daily output for tokens is L and the equation of total gains is f (x) = F (x, v, t), the mathematical limit of the ecosystem can be calculated as:

$$\lim_{x \to \infty} f(x) = L$$

In practical programming, the system allocation ensures that ∑f(x) = L and ∑ will represent all the "miners" involved in "mining" on that day.

5.4 Trade and Smart Contracts

In the data trading scenario, the exact trading logics in the Data Exchange will be driven by the smart contracts. A general process is:

1. Choose a suitable smart contract template (configuration template)
2. Set parameters such as which data dimensions (sensors) to purchase, data scope (such as region and vehicle model), data volume (top / bottom limit), quotation, start / end time, and gateway address (for data receiving).
3. Submit to the Data Exchange. There will be a pre-processing after submission to filter out abnormal trading requests (such as those that are in violation of local privacy laws).
4. Build the smart contract. Then apply and invoke.
5. The smart contract will search for suitable data with the defined parameters.
    a. If the data provider has predefined authorization rules, it automatically decides whether to participate or not according to the rules.
    b. Otherwise, a request will be sent to the data provider, who makes the decision using the request and approval process.

6. When the smart contract gets the final data through the Privacy Mask (see below), it sends the data to the designated receiving gateway, and at the same time, it sends tokens (with a certain amount of processing fee deducted) to the data provider's wallet.

The smart contract template (configuration template) is the heart of the Data Exchange, which will be developed and maintained by the CarBlock team and ecosystem partners. Since the owner's personal information (e.g. name, contact) will not be given to the data user in order to protect the owner's privacy, the data provider (vehicle owner) and data user have no means to contact each other directly and the business logic must occur in the CarBlock ecosystem. More sophisticated business scenarios may include follow-up steps such as Quotations and Digital Contracts. For example, if an insurance company is to provide a precise quotation for a California car owner, the smart contract will wait for the insurance company to calculate the exact price (after it sends the data to the receiving gateway) and then forward it to the car owner. If the owner accepts the offer, tokens of the insured amount will be automatically allocated to the insurance company and the two parties are certified as having completed the digital contract.

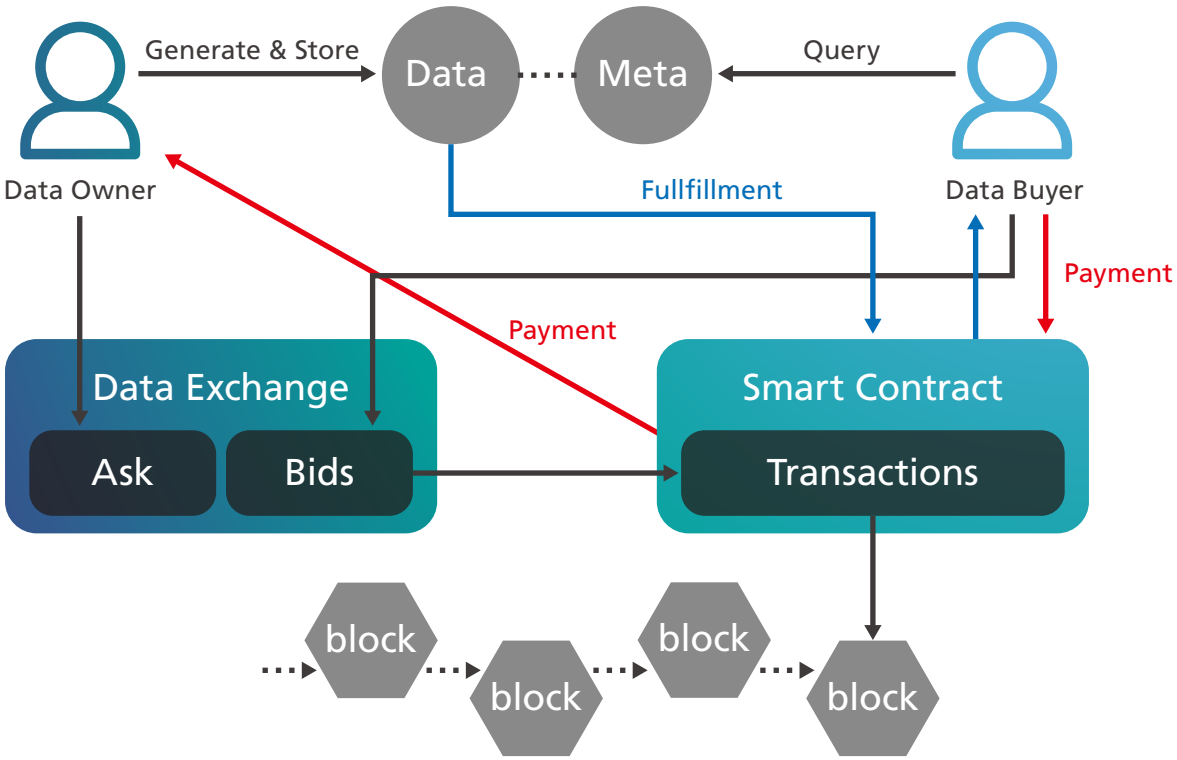

Figure 9. Example of Date Exchange Process

Because smart contracts are created from open source code, they are considered to be fair, private, and safe for all parties, and any party can do "code audit" at any time. Since smart contract poses zero risk to all parties involved, we believe that CarBlock will inevitably and increasingly be trusted by the public, which will allow us to extend from data services to business services. As more and more eco-partners join the ecosystem, the usage scenarios will become increasingly complex and diversified.

5.4.1 Privacy Protection Module

The Privacy Mask, as part of CarBlock's privacy protection module, is designed to manage the sharing of connected car data. It provides data encryption and protection of users' private data. We believe that the data belongs to the data

provider (car owner) and that access to this data must be authorized by the provider. This authorization process can be found in the Request & Approval Model and the Authorization Rules Model.

There are 3 kinds of strategy to the filter layer (we may develop more in the future):

– Confusing strategy: like connect a different stage of the trip with a different order.
– Blur strategy: within the range of position accuracy, do the offset processing for the geographical position and blur the exact position
– Random strategy: within the scope of time accuracy, randomize the order of the logs.

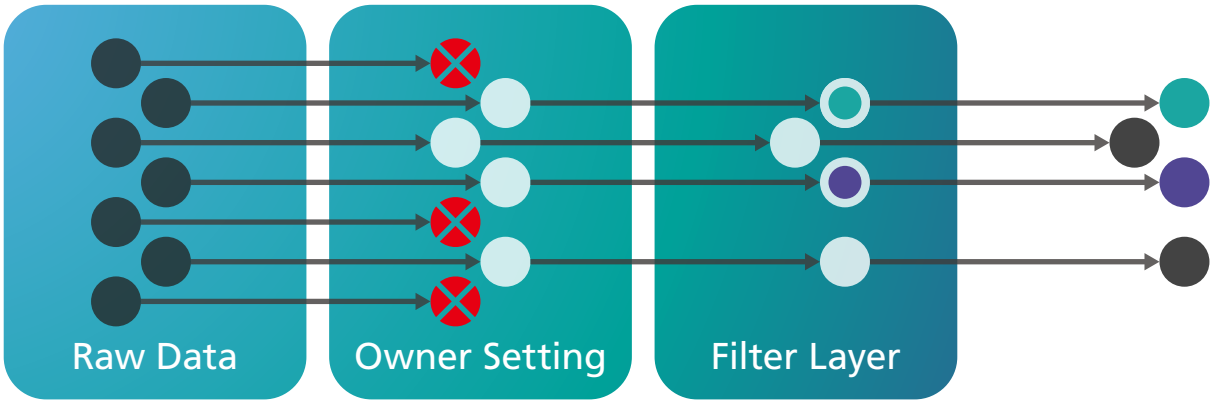

Figure 10. Privacy Mask

allowing users to disclose more data at will to help further future transportation applications.

6. Team Introduction

Founder

Alex Lee

Alex is a serial entrepreneur with multiple successful exits. He is the founder and CEO of nonda, a leading connected car company in the U.S. Alex was previously the co-founder of Baixing.com, a public company in China with over $600 million in funding from top American VCs like Benchmark. Before founding Baixing, Jia served as the head of new business development at eBay and Microsoft. Alex holds a MBA from Columbia Business School.

Product & Engineering

Jan Schmitt

Jan studied product design at the Münster School of Design in Germany and the Politecnico di Milano in Italy. He led design work for Hugo Boss, Schneider Kreuznach, Procter and Gamble. Jan is a participating member of the International Association of Designers, the International A' Design Award Jury and the German Designers Club. He has won 7 prestigious awards, including the RedDot and iF Design Awards.

Jun Zhao

Jun is a serial entrepreneur and a full-stack developer, who is passionate about open source communities and blockchain technology. Prior to CarBlock, Jun was the senior architect at Baixing.com and the founder & CEO at MudLab. Jun also single-handedly developed the first open source blogging system in China and was a two-time honored guest at Qcon International Software Development Conference. Jun holds a master's degree in automotive engineering from Tongji University.

Joe Zhou

Joe has two decades of experience in the tech industry and startups. He served as a lead product architect at Intel R&D center and co-founded Muhe. At Muhe, he led the company to become one of the first organizations to develop mobile apps and HTML5 games in China and to be later acquired for $100 million. Joe holds a master's degree in computer science from Shanghai Jiaotong University.

Ryun He

Ryun is the head of engineering at CarBlock. Prior to CarBlock, Ryun was the head of R&D at Baixing.com, a public company in China and CTO at Huohua TV, a leading mobile video streaming service with over $30 million in funding.

Sales & Partnerships

Ivan Chong

Ivan Chong heads the sales operation at CarBlock. Ivan has over a decade of experience in retail sales, OEM sales, enterprise sales, and business development at various tech companies, including ATP Electronics, Nimbus Data, Ciphergraph Networks, and OCZ Technology (acquired by Toshiba). Ivan has helped to drive explosive revenue growth at these companies, most notably at OCZ Technology, which grew from $10 million per year to over $400 million per year during his time there.

Julie Wang

Julie is head of partnerships at CarBlock. Previously, Julie worked at UBS and was an executive at Teambition, a leading collaboration platform. During her time at Teambition, she actively managed a $10 million business portfolio. Julie holds a bachelor's degree in finance from the University of Hong Kong.

Branding & Community Operations

Christina Lockwood

Christina is a seasoned public relations professional. Prior to joining nonda, she worked in financial marketing with Merk Investments and in customer marketing at NetFortris, a leading UCaaS company. Christina has previously consulted for cutting-edge technology companies such as Lucid, Ride ZUM and MapAnything. She holds a bachelor's degree in mass communications from University of California, Berkeley.

Kevin Jiang

Kevin has a strong track record of building brand awareness for startups. Before joining CarBlock, Kevin was the co-founder of China's biggest online fitness coaching app called Get Fit and the CEO of JoyCar Club, a community for road trip enthusiasts. Kevin also has consulted on innovation projects for Audi, Jaguar, Oxford Publisher, and Schneider Electronics. Kevin holds a master's degree from Brown University.

Advisors & Investors

Dr. HP Jin

Co-founder & CEO at Telenav (NASDAQ:TNAV)

Dr. Jin founded Telenav in 1999 and led the company to its IPO in NASDAQ. Telenav is the world's biggest OEM software provider for car data and owns the most comprehensive sets of car data in the market. Dr. Jin is also a renowned angel investor in Silicon Valley and has invested in multiple unicorn companies like ZOOM. Dr. Jin holds a Ph.D. in Guidance, Navigation and Control (Aeronautics and Astronautics department), and a Ph.D. minor in Electrical Engineering from Stanford University. Dr. Jin will help CarBlock establish partnerships with leading OEMs and car data application providers.

Eran Sandhaus

Former General Manager at Delphi Automotive (NASDAQ: APTV)

Eran Sandhaus is a senior executive with 20+ years of experience in automotive, consumer, and industrial IoT applications. As the former VP & GM of the Autonomous Driving and Connected Services at Delphi Automotive, he led global engineering, business development, and corporate development teams and oversaw the activities of ControlTec and Movimento, Delphi's wholly-owned subsidiaries that were focused on car-to-cloud data analysis and security. In addition, Mr. Sandhaus led Delphi's data strategy and executed several investments and acquisitions in the automotive space. Prior to Delphi, Mr. Sandhaus led global businesses and operations at Qualcomm, Texas Instruments, Cypress, and Marvell. Mr. Sandhaus received his BSc (Cum Laude) in

Electrical Engineering and an MBA from the Technion, Israel's Institute of Technology. Mr. Sandhaus will help CarBlock's business development & partnerships efforts in the mobility and IoT markets.

Professor Andreas Weigend

Former Chief Scientist at Amazon (NASDAQ: AMZN), Professor at Stanford & University of California, Berkeley

Professor Andreas Weigend is an expert on big data, consumer behavior, and social-mobile technologies. He teaches at Stanford and at the University of California, Berkeley. As the former Chief Scientist at Amazon, he helped create the company's data strategy and culture of innovation. Professor Weigend received his Ph.D. in physics from Stanford and will guide CarBlock on the collection, storage, and processing of massive amounts of data.

Dr. David Chen

Former Partner at Lightspeed Venture Partners

Dr. Chen is an expert in Blockchain technology and has invested in many leading Blockchain companies like Blockchain.com, Ripple Labs, LedgerX, BTCC (fka BTC China), and Basecoin. He received his Ph.D. in Science, Technology, and Management from Harvard where his research focused on the intersection of market design and computer science. He will guide CarBlock on blockchain development.

Zongcheng Li

CEO of Timestamp Capital

Partner at 8btc.com

Mr. Li is a veteran in investment management and has strong

understanding of blockchain technology and its applications. Mr.Li will help CarBlock to design a better token economy and provide further assistance in investment related resources.

Dr. David Wang

Former Chief Architect at Ford Sync & GM MyLink

Former Technical Lead at Faraday Future & Panasonic Automotive Systems

Dr. Wang is the President of the NACSAE California Chapter and an internationally renowned automotive expert. He led the electronics architecture and infotainment system design for FF 91. He oversaw the development of the next generation hardware and software platform for IVI, ADAS/Self-driving, and other vehicle ECUs. Furthermore, Dr. Wang was a technical lead in designing various leading connected car systems including Ford Sync, GM MyLink, Chrysler Uconnect and Toyota Entune. Dr. Wang will aid CarBlock in integrating with the mainstream automotive system and provide guidance on the data system integration with next generation electric vehicles and autonomous vehicles.

Dr. Chenyang Xu

Former GM at Siemens Technology to Business Berkeley

IEEE Fellow

Dr. Xu is a veteran technologist and senior executive with a passion for driving transformative innovation. He is a recognized leader and speaker in open innovation, corporate start-up partnership, and computer vision. He is currently the VP and Chief AI Technology Advisor at the US-Asia Innovation Gateway.

During his time at Siemens Technology to Business (TTB) as the general manager, he has developed over 50 successful open innovation partnerships in the areas such as artificial intelligence, big data, AR/VR, advanced robotics and blockchain. In 2016, he was elevated to an IEEE Fellow, awarded for his extraordinary research and commercial contributions to the AI field of computer vision and medical imaging. He also served on the Industrial Advisory Board of UC Berkeley's Department of Electrical Engineering and Computer Sciences.
Dr. Xu earned his Ph.D. degree in Electrical and computer engineering from the Johns Hopkins University.
Dr. Xu will guide CarBlock in its technology and commercial development.

Mark Sagafi

Former Head of Global Business Development at Harman & Toshiba
Mark has 25+ years of executive experience in business development, partnerships, R&D management, product development in automotive electronics, communications, and data storage. Mark has successfully managed many global, multi-site projects in the high-tech industry including in car/truck tolling, telematics, navigation, infotainment and communications. He has also engaged in various capacities with leading OEM and Tier 1 suppliers in the automotive industry, including Audi, BMW, Harman Becker, Delphi Automotive, Lear, Siemens Medical Solutions, Siemens Automotive, Aisin AW, Toll Collect and has maintained close relationships with them. Mark will help CarBlock to expand its partnerships with leading automotive suppliers.

Bo Shen

Cofounder of Fenbushi Capitcal and Bitshares, Mr.Shen is one of the ealiest investors and entrepreneurs in the blockchain industry. Being recoginized as the leader in blockchain investment, Mr.Shen has over a decade of experience in asset management and financial industry in both North America and Asia.

Ming Gong

Founder of ICOAGE (formerly the largest ICO platform in China) and ChainB (the largest Chinese blockchain media). James has been a leading blockchain and cryptocurrency evangelist and key opinion leader in China since 2012. He has helped to translate innumerable blockchain related articles and whitepapers into Chinese, as well as having authored many books on blockchain, including “The Blockchain Society”, “Blockchain – the New Economy’s Blueprint”, and “Cryptocurrency”.

ChinaGrowthCapital 华创资本

FENBUSHI CAPITAL

DHVC 丹华资本

TIMESTAMP CAPITAL

BridgeOne Capital 投道资合

golden block capital 金赛资本

UniValues Associates

Genesis Financials

7. The CAR Token Economic Model

7.1 The Issuing of CAR Tokens

We are issuing a total of 1.8 billion CAR Tokens; no additional tokens will be created. The initial allocation will be as follows:

Parties	Proportion	Detail
CarBlock Community	40%	Soft Cap: 5,000 ETH, Hard Cap: 40,000 ETH 8-month locking period for anchor investors with 12.5% vested each month.; 4-month locking period for private investors with 25% vested each month.; no vesting period for crowdsale.
Miners	20%	Proof of data required. Initial daily mining pool will be 200,000 CAR Tokens and will halve every three years.
Marketing	15%	
Advisory Team	5%	
Core Team	20%	20-month locking period with 5% vested every month.

Note: Initial CAR Tokens are based on Ethereum (ERC20), and will be mapped when the CAR blockchain is released.

7.2 The Cost Analysis of CAR Token Mining

As previously mentioned, car owners, who are part of the CarBlock ecosystem, can earn CAR tokens by providing valuable car data, similar to a “miner” in the bitcoin ecosystem.

According to certain theories, the cost of mining typically is believed to have an anchoring effect on the intrinsic value of a token. Although we don’t necessarily agree that the relationship between ‘mining cost’ and ‘token value’ is related in that way, we’d like to lay bare the cost of mining a CAR token, so that you have the information for your reference.

- From a fuel consumption perspective, the cost of mining 1 CAR token is equivalent to (Number of drivers in the CarBlock ecosystem * average daily gas consumption * gas price)/Daily token pool

- According to a 2017 Motley Fool report[24], an American driver consumes on average 656 gallons of gasoline annually (1.8 gallons per day). For the sake of simplification, let's assume that this number remains constant.
- According to CNBC[25], the average gas price in January 2018 in the United States was $2.54 per gallon.
- nonda will recommend all its users to join CarBlock and adopt CarBlock's SDK in its next mobile app version that will enable token mining. In 2017, nonda's MAU (monthly active users) was over 400,000, so we will use 100,000 users as the base for our calculations.

Putting all these numbers into the calculations, and using the number of drivers in the CarBlock ecosystem as the variable, we get the following results:

Drivers	Cost of 1 CAR token (in USD)	Cost of 1 CAR Token (in ETH)*
100,000	2.29	0.0035
400,000	9.16	0.0062
1,000,000	22.86	0.0352
10,000,000	228.60	0.3523

*1ETH = $650 (Price of ETH in March 2018)

We recognize that this is not the perfect way to calculate the intrinsic value of a CAR token. Time on the road is more valuable than fuel consumption. Secondly, fuel consumption is primarily for getting from point A to point B, while earning CAR tokens is just an additional benefit. Yet, the calculation still holds merit since it shows that if someone wants to abuse the system to earn CAR tokens, there is a substantial cost in the process.

7.3 How CAR Tokens Will Circulate in the Real World

CAR will play an important role in the future of smart transportation as an utility token. To illustrate how CAR tokens can be earned and spent, we've combined several scenarios into the following diagram:

Figure 11. CAR circulation scenario

To illustrate the circulation of CAR tokens in the real world, we discuss a few sample applications below.

Application #1: Insurance

Currently, the price of most insurance packages are set by static information such as the vehicle's model and age, and the driver's traffic violation history. Very few companies (like the aforementioned Metromile) have started to adjust insurance quotes based on people's driving mileage. What will happen if the CarBlock ecosystem comes into play?

– It is common to see two cars with the same model and age in totally two different conditions. With CarBlock, innovative insurance companies can create insurance packages based on a car's real conditions rather than general information about the vehicle's model and age. People who treat their car better deserve a better insurance quote.

– Certain driving styles and behaviors result in a higher likelihood of being in an accident. As a result, with CarBlock, companies can charge more accurate insurance quotes based on a driver's behavioral data rather than just his or her traffic violation history. Insurance companies can even create insurance packages based on an individual's driving habits.

– Moreover, insurance companies can combine information on a driver's typical area of activity with climate/road analysis to further adjust insurance quotes and even notify drivers of potential hazards to lower the rate of accidents.

CarBlock has the potential to forever disrupt the auto insurance industry and enable the growth of new insurance services. The biggest disruption we foresee is the abandonment of an annual payment scheme. Why pay the same annual fees as someone who has a riskier driving behavior? Why can't we pay for auto insurance on a per usage basis like we do with flights? With CarBlock, companies can offer insurance to cover from the start of a trip to the end of a trip and adjust the price based on each trip's conditions in real-time.

Another change we expect to see in the insurance industry is related to the car owner:

– Car owners with good driving behaviors and pristine car conditions can enjoy better insurance quotes and more discounts from the free market enabled by the CarBlock ecosystem.

– For drivers with poor driving behavior or whose cars are not in the best condition, a higher insurance price will be applied. However, third-party analysis companies can provide services to these drivers to coach them on how to drive better and take better care of their cars to prevent their insurance rate from going up. These services allow service providers to earn CAR tokens from car owners and the car owners to also benefit from becoming better drivers in order to avoid potential financial loss and accidents.

Overall, we firmly believe that CarBlock's open ecosystem will foster commercial cooperation that will create more win-win results than the status quo.

Application #2: P2P Car Rental

Although the name of P2P stands for decentralization, yet the current business model of P2P car rental is extremely centralized with an central entity owns everything, leaving individuals on both ends lots of information inequality and concerns.

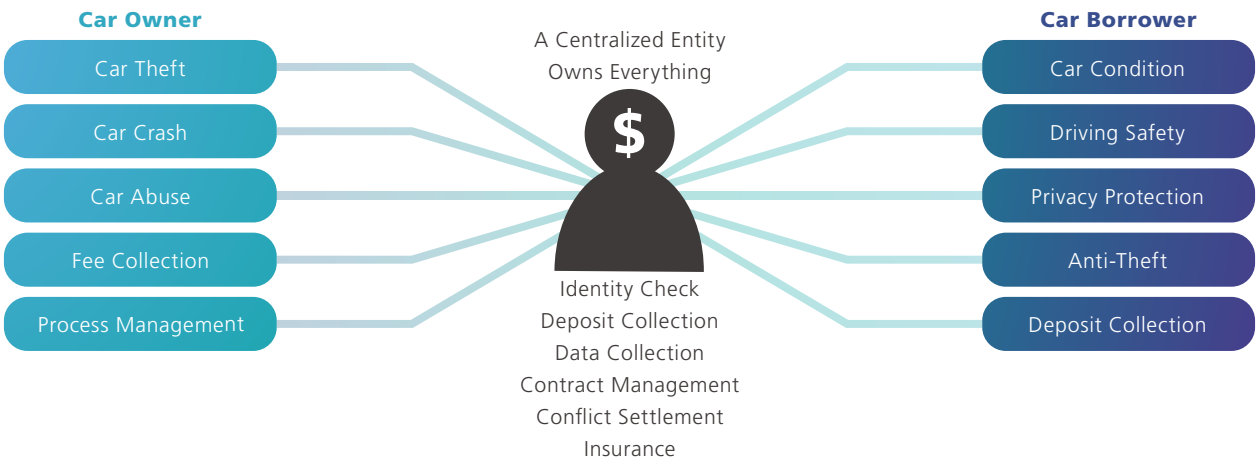

Figure 12. A centralized P2P rental scenario

In the CarBlock ecosystem, P2P car rental will be truly decentralized:

- As a true peer-to-peer business, each party can remain worry-free about privacy breaches. A blockchain based service is a perfect fit for this kind of transaction.
- Information on the car's condition and the vehicle usage by the car borrower will be transparent, accurate and fair.
- Payment will be based on a smart contract and will be automatically calculated from the start of the engine to the safe return of the car.

- Third-party services such as background checks, insurance, anti-theft, and roadside assistance can integrate seamlessly into the system without the involvement of a middleman.
- All car owners in the CarBlock ecosystem will be eligible to become car lenders to take advantage of the market demand.

8 The Formation of the CarBlock Ecosystem

As stated in the beginning, CarBlock is neither a data middleman nor a data platform. It's a business ecosystem, in which automotive and transportation businesses can operate efficiently through an increased access to data. In this ecosystem, users can get more personalized products and services. Businesses can have a more precise cost analysis mechanism and therefore, offer more diverse services and reach their targeted users at a lower cost. Innovators will have a lower barrier to entry, bringing more innovative ideas to fruition via the ecosystem.

The success of this ecosystem relies on:

1. An ample number of car owners joining the ecosystem and providing valuable car data, which attracts more businesses to the ecosystem.
2. An ample number of businesses (including innovators) joining the ecosystem and offering better and more personalized services, which in turn attracts more users.

In terms of initial user acquisition, CarBlock have the following advantages:

For car owners: CarBlock's vision is to give data ownership back to car owners and encourage businesses to create better services that are aligned with the public's interest. In addition, the token rewards provide further incentive for car owners to join the CarBlock ecosystem and contribute data.

For nonda and other similar smart device companies: Mining CAR tokens will be a huge boost to companies that are selling smart hardware devices. With nonda as a successful pilot, more companies will join the ecosystem and bring their existing users to CarBlock.

For Car Manufacturers: CarBlock will provide free data storage and encrypted data access. This free and open source solution will dramatically reduce the workload and cost for car manufacturers, while improving their

capacity to innovate. Car manufacturers simply need to acknowledge that their customers should be the rightful owners of their car data. Then, every car owner can easily manage and control their data using a private key after joining the CarBlock ecosystem.

In terms of attracting businesses to join the ecosystem, CarBlock has several advantages:

- Businesses will be able to offer products and services based on a targeted user profile and in-depth data analysis.
- CarBlock seeks to accelerate data circulation in the ecosystem, which will help businesses adopt a more data-driven model.
- CarBlock will also enable businesses to reach their potential users at a much lower acquisition cost through data-driven targeting, so that businesses can spend more resources on new product development and customer loyalty programs.

The nature of a token economy is such that it protects its users. An offense such as Facebook's Cambridge Analytica scandal[26] would unfold very differently in the CarBlock ecosystem. Simply put, CarBlock will spare no effort to hold the abuser accountable in order to serve the majority's interest in the ecosystem. Developers, innovators, and service providers in the CarBlock ecosystem will also be motivated to offer specific services and tools to help CarBlock strengthen data protection efforts and mitigate the risk of any data misuse.

Finally, CarBlock is an independent blockchain project. As the operating entity, we (CarBlock Foundation) don't need to pursue profits, and therefore can maintain a very open position with no conflict of interest towards our partners. To maximize the value of the entire ecosystem is to maximize our own interests. From a motivational point of view, CarBlock is by far the best entity to run such an

ecosystem compared to traditional corporations. The experience and expertise our team has in the automotive industry, multinational business operations and the mobile internet further help us to create critical partnerships and develop the ecosystem.

Our confidence stems from everything mentioned above. We aim to build a new world with better efficiency, personalization and diversity through reinventing the current dynamics at play in the transportation industry.

9. Development Roadmap

2017

Q1. CarBlock blockchain project kickoff

Q2. CarBlock data market technical solution verified

Q4. CarBlock data market blockchain solution verified

2018

Q1. CarBlock chain development: design of the CAR token economic model, alpha test of v0.1 network

Data storage development: proof of IPFS integration

Q2. CarBlock chain development: blockchain development based on go-ethereum, alpha test of v0.3 network

Data collection: protocol development, integration with current ZUS app, mining test

Q3. CarBlock-chain development: alpha test of v0.6 network

Data storage development: encryption of data, storage and transfer, trade protocol

Data exchange development: transaction layer, smart contract

Data collection: app mining feature release

Q4. App development: wallet release

CarBlock-chain development: beta test of v0.8 network, stress test

Data storage development: IPFS storage and index, metadata storage, data validator

Data exchange development: query

2019

Q1. CarBlock-chain development: v1.0 release and deploy

Data storage development: restful API

Data exchange development: protocol development of a privacy mask and implementation

Q2. Data exchange development: core logic of exchange, order and fulfillment

Application layer development: website

Q3. Launch vehicle insurance service with partners as the first data application

Q4. All users can start using CarBlock

2020

Q1. Application layer development: app and public API

Operations: develop users within the industry

Ecosystem partners development, third-party application access

Q2. Launch vehicle maintenance/repair service with partners

Q3. Launch used car dealership service with partners

Q4. Launch p2p car rental service with partners

10. Disclaimer

This document is only for conveying information and does not constitute an opinion on the transaction of project shares or securities. Any proposal or request for offer to such effect will be made under credible terms in accordance with the permission of applicable security laws and other related laws. The above information or analysis does not constitute any investment decision or concrete advice.

This document does not constitute any investment proposal, investment intent or investment solicitation on securities. This document does not constitute and shall not be construed as a transaction offer or an invitation to transact any form of securities, neither is it a contract or promise in any form.

All the examples of returns and profits in this document are for demonstration purpose only or represent the industrial average, and do not constitute a guarantee for the result of user's participation.

CarBlock clearly states that users with relevant intent shall have clear knowledge of risks on the CarBlock platform. By making an investment, investors confirm their knowledge and acceptance of the project risks, and are willing to personally take responsibility for all corresponding results or consequences.

CarBlock clearly states that it will not take responsibility for any direct or indirect losses arising from the participation in the CarBlock project, including: (i) reliability of all information provided in this document; (ii) any resulting mistake, negligence, or information inaccuracy; (iii) or any subsequent behavior.

CAR is a digital token used, besides other scenarios, in the CarBlock ecosystem. CAR is not a investment target and we cannot guarantee the value of CAR, whose value may decrease under certain circumstances. Due to unpredictable factors, milestones listed in this white paper may be subject to change. While the CarBlock team will make the best efforts to implement all milestones stated in this white paper, all individuals and groups purchasing CAR shall bear the risks on their own. CAR does not represent the rights of ownership or control. Owning CAR does not provide ownership of CarBlock or other CarBlock associated applications. CAR does not confer any rights on any individual to exercise participation in, control over or decision making of CarBlock or other CarBlock based applications.

11. Risk Assessment

As a new model of investment, investment in digital assets involves various risks. Potential investors shall discreetly assess the investment risks and their own risk tolerance.

Risk in Token Sales

The environment of the token sales market is closely tied to the state of the entire digital currency market. In the case of a sluggish market or existence of other uncontrollable factors, the token price may be underestimated over a long period of time despite its positive underlying value.

Risk of Regulations

To date, blockchain is still in its early stage of development. There are currently no laws or regulations in any country, including China, that stipulate requirements for precondition, transaction, information disclosure, and locking for ICOs. Also, it is still unclear as to how the current policies will be implemented. All these factors may bring uncertainty to the project's investment and liquidity. Blockchain technology has become the main target of supervision in major countries. If there is any intervention or exertion of influence by supervising authorities, CarBlock application or CAR may be affected. For example, if there is a legal limitation on the use and sale of the token, CAR or the development of CarBlock based applications may suffer restriction and obstruction and CAR may be directly terminated.

Risk of Competition

With the advancement of information technology and the mobile internet, digital assets such as Bitcoin are increasing in value and various decentralized applications are emerging, heating up the competition. With the steady

appearance and expansion of other application platforms, the community will face constant operational pressure and certain risks from market competition.

Risk of Talent Loss

CarBlock has gathered a technical team and a group of renowned advisors, who possess deep expertise in their respective professional sectors. Some of our advisors have a long history of active involvement in the blockchain industry. Our core team possesses decades of experience in the development and operations of an internet product. The core competitiveness of CarBlock lies in its stable core team and consultant resources, the loss of which may affect platform operations and project progress.

Risk of Development Abandonment or Failure Due to Funding Shortage

If the price of tokens raised by the founding team drops or the development time is prolonged, the team may face a shortage of development funds and by extension, not have sufficient funds for all activities. If this were to happen, there is a risk that the intended targets may not be realized.

Risk of Losing Private Keys

After the buyer extracts the digital wallet address for CAR, the only means to operate content contained in the address is via his or her secret key (private key or wallet passcode). Users are personally liable and responsible for protecting their secret keys, which will be used to sign transactions and to prove ownership of assets. Users understand and accept that if their private key document or passcode is lost or stolen, the CAR tokens associated with their user account (address) or passcode will be unrecoverable and permanently lost. The best

method for securely storing the login document is to store the secret key separately in one or several places and avoid using a shared computer for this purpose.

Risk of Cybercrime

There is a possibility that hackers, other entities, or nations may attempt to interrupt the CarBlock platform or CAR functionality with any methods, including but not limited to DoS attack, Sybil attack, guerrilla-style attack, malware attack, and homogeneity attack.

Risk of No Asset Insurance

Unlike bank accounts or accounts with other financial institutions, CarBlock accounts or related blockchain networks generally don't have any insurance guarantees. For losses under any conditions, no public or individual entity will be able to provide insurance.

Risk of Related Core Protocol

The current CarBlock platform is developed based on Ethereum. In case of any defect, unexpected malfunction, or attack on Ethereum, CAR or the CarBlock platform may suffer a stop or a loss of function.

Risk of an Open Source System

There are risks related to neglected critical defects in open source software or large scale failures of global network infrastructures. While some of the risks may drop over time due to bug fixes and breakthroughs in computation bottlenecks, other risks are still unpredictable, such as political factors or natural disasters that may interrupt part of the internet or the global internet as a whole.

Risk of Rapid Development in Cryptography

The rapid development in cryptography and the advancements in science and technology such as quantum computing may bring about the risk of cracking the CarBlock platform, leading to possible CAR token loss.

Risk of Insufficient Interest

There is a possibility that the CarBlock application may fail to be used by a large number of individuals or entities. This means that the public does not have enough interest in developing and improving the relevant distributed applications. This lack of interest may have a negative impact on CAR and CarBlock based applications.

Risk of Poor Acceptance or Lack of Participation

First of all, CAR shall not be deemed as an investment target. Even if CAR may have value associated with it after a certain period of time, such value would be very minimal if CAR is not accepted by the market and therefore short on participants. There is a possibility that due to reasons including but not limited to failure in business relations or marketing strategy, CarBlock platform and all the future marketing efforts supported with the raised funds may fail to achieve success. In such a scenario, there may be few to no supporters for the platform. Of course, this would be very unfavorable to the project.

Risk of Application Defects

The CarBlock platform may fail to provide normal services due to defects caused by known or unknown reasons (e.g. large-scale Node crashes), and may even suffer losses of CAR tokens in extreme scenarios.

Risk of Application or Product Failing to Reach Specifications or Buyers' Expectations

The CarBlock application is still in its development stage and major changes may be executed prior to the launch of the official version. During the development process, CAR or the CarBlock platform may not meet its original specifications or meet the expectations of buyers. This may result due to faulty analysis or any changes in design.

Other Unpredictable or Unforeseeable Risks

Tokens based on cryptography is a completely new technology that has not be fully tested. In addition to risks already described in this white paper, there are other risks that may occur that are not yet mentioned or anticipated by the founding team.

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