ROAD-Distributed Internet of Vehicles Economic System Based on auto-ledger

Abstract：

ROAD attempts to create a full lifecycle interaction and accounting system for cars based on blockchain technology, which is called auto-ledger. The auto-ledger is an Internet of Vehicles and intelligent transportation system built on individual interaction and community intelligence to implement related business applications, data confirmation and privacy protection with blockchain. At the same time, the ROAD Token is created to coordinate the resource exchange between the vehicle nodes and the heterogeneous chains. Road is a business-driven project, which continues to increase the marginal effect of the overall participation population through the practice and expansion of commercial projects.

1. Preface

1.1 Project objectives

ROAD, business-driven, provides users with auto-ledger based on blockchain storage and develops the application ecosystem of auto-ledger. Based on the auto-ledger, we develop business applications

such as data transaction, information exchange, and vehicle finance, and protect user privacy, and explore and practice a viable business model.

1.2 Background introduction

1) The size of the automotive aftermarket is increasing

The number of vehicles in China will reach 330 million in 2019, while the number of vehicles in the world will exceed 1.2 billion. The market segmentation for automobiles, such as car maintenance, used car trading, and auto-finance all exceed 1 trillion. The research reports shows that automotive data market will reach 800 billion US dollars annually in the future. Now, the data collection, confirmation and transaction environment of automotive data is the weakest link in the industrial infrastructure.

2) The rapid development of 5G and blockchain will develop a new business model of Internet of Vehicles

The large-scale 5G commercialization has accelerated the development of the Internet of Vehicles industry, which has extremely high requirements for communication capabilities. Since the second half of 2020, vehicles rolled off the production line will be pre-installed C-V2X. The stock car can also be 5G networked and intelligent through the installation of OBD. The rapid development of the Internet

of Vehicles will create a large number of new usage scenarios and business models.

3) Automotive data has increasingly high circulation and application value.

The generation of each type of data in the full lifecycle of vehicles including manufacture, sales , maintenance, daily use, and re-circulation, has important application value to the scenario at that time. However, the high discrete state of these dynamic data distributions determines that it is difficult to collect, confirm, and maintain, and a large number of black-box transactions in the automotive data market. Car owners, as data contributors, often fail to earn revenue. In view of this situation, the EU has imposed GDPR since May 2018, and auto companies or other service providers have no right to use user data without the user's authorization. The blockchain confirmation of automotive data and the interest coordination of each transaction unit (token mechanism) will change this situation of automotive data transactions.

4) The world's top auto companies are increasing the research and application of Internet of Vehicles and blockchain

In 2016, BMW and other enterprises launched MOBI, the Mobility Open Blockchain Initiative. The aim is to accelerate the use of blockchain, distributed ledgers and related technologies in the

transportation industry by promoting blockchain standards. In addition, the Continental Group, Toyota, and Mercedes-Benz are launching business trials in the blockchain.

1.3 Explanation

This paper is not a complete and detailed specification. We attempt to propose solutions based on the current development of the industry and the team's business experience in the automobile aftermarket. Moreover, we will continue to optimize our project through practices in software and hardware, and improvements in commercial applications. The content of this paper will be revised gradually as the business progresses.

2. Introduction of ROAD: Principle and road

There are extra dividend for the rapid development of blockchain and Internet of Vehicles. As a transparent system, ROAD develop an effective automobile distributed economic system based on the auto-ledger. In order to achieve this goal, the following aspects we need to do:

2.1 Build an auto-ledger that covers the full lifecycle of the vehicle

The auto-ledger records all static data (VIN number, car price, configuration, insurance, mortgage, etc.) and dynamic data (driving

habits, driving trajectory, maintenance, violation records, etc.) generated after vehicles rolled off the production line, which is equivalent to mapping a virtual digital vehicle in the system. The virtual digital vehicle is the subject of the digital assets it represents. The owner has the right to manage and transfer all the data and digital assets of the virtual digital vehicle.

2.2 Business-driven is an important way for ROAD to drive to maturity

We will adopt the business maturity model of automotive aftermarket and utilize the business model design of Internet products to enable ROAD to generate positive returns. Implementing commercial project will be an important part of the ROAD team.

2.3 Hardware device

For the car to be produced, it is easy to achieve the Internet of Vehicles through the pre-installation of T-BOX, and it is a bigger business opportunity for the stock market. For this part, we adopt post-installation OBD 5G terminal equipment to achieve the Internet of Vehicles. At the same time, this is also an important part of our business project.

2.4 Economics-compliant Token Mechanism

Building a credible auto-ledger system is not a one-time thing, and the blockchain Token model, which not based on a business-driven,

will become a Ponzi scheme. In the design of the Token mechanism, we will imitate the design of the qutoutiao app, establish reward incentives, and achieve an overall marginal utility.

2.5 Privacy protection

User privacy is a particularly important issue in the Internet of Vehicles. User privacy protection of the Internet of Vehicles is extremely fragile, and a large amount of user data collected, which makes it very easy to predict user behavior. To solving this problem, user privacy data will be stored and confirmed on the chain. We try to protect user privacy based on an improved zero-knowledge proof algorithm.

2.6 About Future

An interconnected Internet of Vehicles has great commercial value. The Internet of Vehicles economic system, based on a billion-level node, can operate automatically through Smart Contract and semi-dynamic configuration. In addition, economic factors such as network, power, and computing power can plug and play. According to their own wishes, the vehicle nodes can upload the corresponding SKU and adapt to different bidding, sales strategies, and permission policies to make a self-detected metadata.

3. Technology

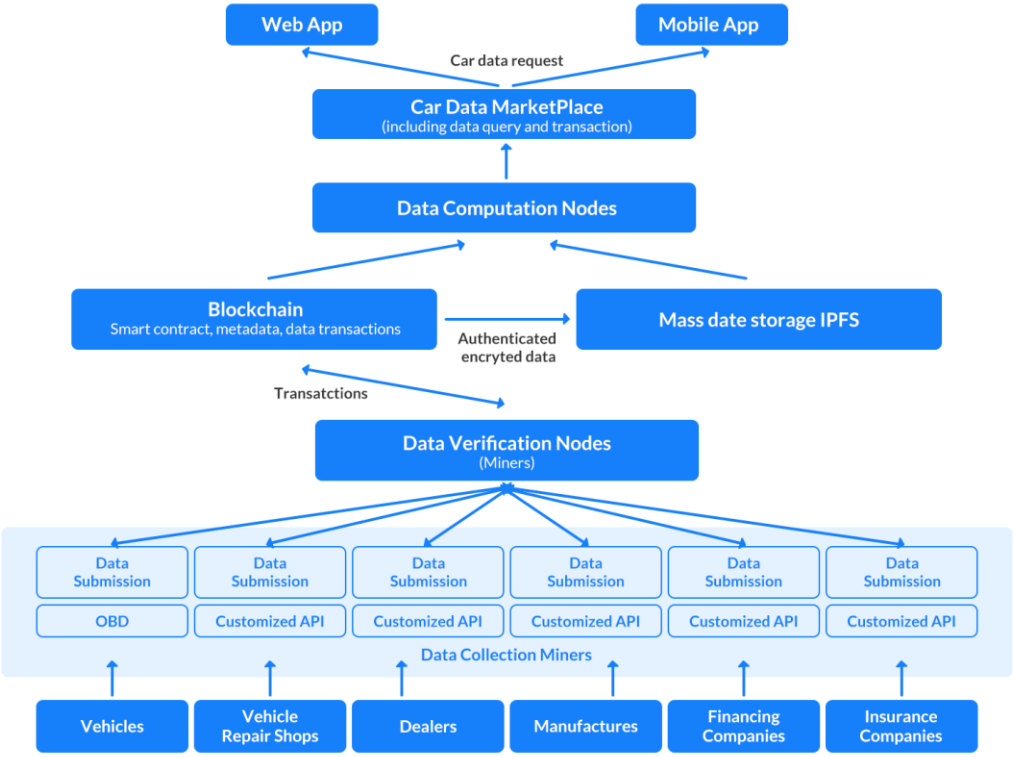
The ROAD Chain is a parallel chain based on INT Chain, aiming at solving the issue of Intelligent Transport and Internet of Vehicles. It

interconnects with INT Chain and other IoT systems through cross-chain protocols and makes the future of Internet of Things. In the aspect of technical architecture, ROAD will adopt the technical advantages of INT Chain and develop its exclusive technology road, according to the features of the IoV system.

3.1 ROAD system architecture

The system architecture of the ROAD is divided into three layers (as shown below):

1) Data production layer (including collection and submission);
2) Data storage layer (including verification of data and transactions, distributed storage and transaction records, and on-chain storage of key data);
3) Application layer (including data publication, search and calculation, user applications);



Data for collection and submission

The production of data is the cornerstone of the system, and the main sources of data are divided into two aspects:

1) Customer data (vehicle) is mainly collected by the intelligent voice assistant, OBD and other post-installation hardware devices, and then upload and confirm after data masking.

2) Automotive service providers, Intelligent Transportation solution providers and financial service companies upload their industry data directly through APIs. At the same time, they can combine their industry advantages and upload the calculated data after certain analysis.

Data verification

After data authenticity verified by data verification node, the data can be submitted successfully. There are two modes for data verification:

1) TEE (Trusted Execution Environment, such as Intel SGX) verification mode based on hardware security boundaries
2) Another verification mode based on the privacy protection algorithm. The purpose of both is to enable the data verification node to verify the authenticity of the submitted data without revealing the submitted data. Regarding efficiency, TEE is faster, but its cost is higher because it requires hardware support. The preparation of smart contracts based on TEE verification is complicated. After verification, the data verification node will store the data submission record in the blockchain, and the encrypted data will be distributed stored on multiple nodes by IPFS technology.

Mass storage

VIN Number is the unique identifier of the vehicle. The data collected by the ROAD hardware devices are all around the VIN Number. and each data provider is equipped with a digital identity for data encryption and transaction flow, because the automotive data involves factory data, real-time driving data, sales history, maintenance history, accident history, insurance history, loan history, etc.

Especially, the real-time driving data generate every day, the amount is very large, and so it is obviously inappropriate to store such large amount of data directly in the blockchain. ROAD stores the Hash of each packet on the chain, and the real packets will be distributed stored on the node with large storage capacity by the IPFS technology, which ensures the integrity and security of the data while avoiding the problem that the block data is rapidly increasing.

At the same time, the data provider decides whether to encrypt the data and transactions, select the encrypted data, and the encrypted key, thus avoiding the leakage of user privacy.

Blockchain system

The ROAD Chain will be deployed in the form of a parallel chain of INT Chain, which is the hub connecting the car, the manufacturer, and the service provider. The ROAD Chain will record all the original data submission process. For daily driving data, the hash values of all data packets are stored in the blockchain for subsequent retrieval of queries. For key data, such as car factory data, accident data and manufacturer statistics will be directly stored in the chain. Due to the distributed and decentralized features of the blockchain, it will greatly increase data security and trustworthiness. The ROAD Chain will run the entire economic model, and all data transactions, confirmations, and verifications will take place in the blockchain system. This not only

allows the entire data ecosystem to run forward, but also guarantees the authenticity and copyright of the data.

Application layer

On the blockchain and data storage systems, ROAD will develop app/Dapp for users to check vehicle condition, complete data transactions and subscribe data products. This the app will access the blockchain system, so ROAD will also develop a data deal-making engine based on smart contract. Users and service providers can design their own solutions on the app according to their own needs, and then complete the data transaction. In addition, service providers can sell some data products on the app in combination with their own industry data, ROAD officials will also provide users with wallets, block browsers and other basic applications.

3.2 Consensus mechanism and fragmentation

ROAD will adopt the IPBFT consensus algorithm of INT Chain. The features of the consensus algorithm are shown below:

1）More nodes participating in block generation: nodes are randomly selected according to the ratio of the votes, and after more than 2/3 verification nodes verified, the block can be generated. Therefore, it can guarantee a higher speed of the block when there are more nodes participating in the block.

2）Governance is more efficient: the consensus algorithm add multiple governance parameters and penalty mechanisms. Each parameter supports online referendum adjustments, so it is more efficient in community governance.

3）Strong consistency: It can generate block after more than 2/3 verification nodes verified, so the consensus algorithm has strong consistency and the blockchain will not forked.

4）Fast and high performance: In the current network environment, the speed of the generated block can reach 3 seconds, and the performance reaches 3000 TPS. In a 5G low-latency network, performance will greatly improve.

ROAD project is the part of the Internet of Vehicles industry and has its own exclusive business characteristics. Therefore, ROAD will do targeted modification to the consensus system according to its own industry needs.

First, in terms of governance, the logic must meet the needs of the Internet of Vehicles industry.

Second, in terms of data collection and submission, considering that the car will have stronger and stronger edge computing capabilities, we will design a set of consensus algorithms for edge nodes to encourage them to submit more data to the chain. More details as follows:

The number of nodes is huge and reaches several billion. The data submission is real-time, it is obviously unrealistic to deal with such a large amount of data through a single blockchain system. In order to solve the problem of data interaction, ROAD will adopt take the method of fragmentation to complete the data collection work.

First, the many edge nodes are divided into different groups. The process of this grouping takes place on the ROAD Chain. Different car users can join different groups according to their own needs. In each group, all edge nodes are peer nodes. During submission, a part of the verified and calculated edge nodes randomly selected by the verifiable random function to collect, verify, and submit real-time data. For the nodes participating in submission and verification will be rewarded in real time. For the nodes providing legitimate data, they can participate in the election. For vandals, they will be disabled by the system, which will form a positive incentive for the data provider.

Verifiable random function

The verifiable random function first proposed by Silvio Micali to solve the triangulation problem of blockchain. The main feature is that in the case of a large number of peer nodes, the verifiable random function randomly selects some nodes to achieve consensus so that the confirmation speed of blocks can be improved. Although this consensus algorithm has not been widely practiced in the blockchain

ecosystem, it can achieve decentralization in the case of many peer nodes, which obviously has great advantages. ROAD will fully utilize the research and development results of the Algorand project and improve the implementation of verifiable random functions in the consensus algorithm according to our own business conditions.

4. ROAD business model and business product

Driven by business models, ROAD continues to enrich the data value and interaction value of auto-ledger through the expansion of business applications. The business ecosystem of ROAD includes car archives, intelligent drive, car maintenance, auto-finance, e-commerce, and car sharing. At the same time, 5G network transformation for stock vehicle is also a very important commercial application for ROAD.

4.1 ROAD software product

Auto-ledger App

It is not competitive in the market that only provides services such as driving assistance, Violation-handling, car maintenance, etc. Based on static and dynamic automotive data, the auto-ledger APP develops a decentralized ecological application and transaction system around the driving scenario, vehicle aftermarket, auto-finance, and city

transportation.

The auto-ledger APP provides data and service to car owners, maintenance technician, accessories supply chain, insurance brokers, used car dealers, shared drivers. And build a service platform to serve purchasing, driving and maintenance.

Luxury car blockchain file system

Luxury cars, especially super sports cars, are high-flow models. Auto-ledger will establish an exclusive, distributed, and non-tamperable database for this kind of cars, including driving status, maintenance, race records, and circulation records. This will provide a credible data for vehicle residual value evaluation and vehicle recirculation pricing.

Distributed auto-finance

With the development of automobile digitization and safety technology, automobile circulation and confirmation will eventually support and automobile driving will also be digitized. For example, ROAD will develop a financial-level secure digital car key (RDCK), on which ROAD will develop distributed automotive financial systems.

Data trading marketplace

On the one hand, the application value of automotive data facilitate the circulation of the automotive data market; On the other hand, it is not easy to collect this data from a centralized platform. Due to the high circulation value and high dispersion status of automotive data,

the following problems have arisen in the automotive data market:

1) Isolated data islands are formed due to the lack of trustworthy transaction media among data individuals;
2) It is difficult to guarantee the authenticity and integrity of the automotive data;
3) It is difficult to confirm data ownership and data privacy leakage;
4) Under the table Trading

ROAD will solve the above problems through blockchain technology and Token mechanism. This not only solves the issue of fairness and trust between the isolated data islands, but also makes the smallest data holding unit (car owner) have the same position as the commercial organization by the digital virtual vehicle technology of the auto-ledger and all of car owner become the nodes on the chain. Moreover, since the data is bottom-up circulation, the owner confirms first, so each circulation is recorded and cannot be tampered with, and the commercial contracts can be safely and automatically executed between the nodes.

Ride-sharing system

Ride-sharing system is complex business system. Based on the characteristics of transparent and tamper-proof in blockchain, ROAD attempts to make changes in business areas such as shared-ride shuttle, shared parking and shared charging, etc., which can enhance

the credibility of ride-sharing platform and serve as a reliable guarantee for national regulations and passenger safety.

Trusted IoV Device Alliance

Blockchain 1.0 creates trusted credentials (BTC, etc.), and Blockchain 2.0 creates trusted contracts (smart contracts). We believe that trusted credentials + trusted contracts + trusted devices + trusted data are the next development trend. The trend is that using the blockchain as the basic trusted platform brings a new model based on trust; in this model, trusted devices and trusted data are the key factors; the ROAD main blockchain provide a decentralized blockchain platform for a variety of IoT smart terminals (vehicle / Wearable / screen display, etc.) to realize data value extraction. ROAD has proactively formulated the "ROAD Trusted IoV Device Data Collection Standard" to provide a third-party IoT device manufacturer with an open Blockchain solution to empower the industry. By following the platform standard traditional IoT devices can access the platform, in addition to its own functions, it has also become a trusted data source for ROAD. In addition to the original functions, users can also store the collected trusted data in a safe storage, and have privilege of referendum and many upgrading services. ROAD will provide standardized access solutions, guide the process and application docking for manufacturers in the industry, and build trusted IoV device alliance for

ROAD.

4.2 ROAD hardware products

ROAD will develop multiple hardware products for different vehicle scenarios, which will be the source of dynamic data for auto-ledger.

OBD device with masking algorithm

Traditional OBD devices built based on a centralized system. On the one hand, user privacy data is easy to leak. On the other hand, it is very vulnerable to attack by network hackers. ROAD OBD driver-assistance device with masking algorithm is an important data source of auto-ledger. The features of the device as follows:

1) Data masking: Masking user privacy data with the improved zero-knowledge proof algorithm;
2) Transmission encryption: All data is transmitted point-to-point encryption to ensure network security.
3) Process controllable: The persons in charge of all links of production, transportation, installation and activation are recorded in the block, the whole process is completed by trusted professionals.

Post-installed 5G Internet of Vehicle terminal

In the state of 5G LTE-V2X networking, large-scale data intersection and processing of vehicles, people, vehicles and vehicles, vehicles and

road conditions can be effectively and quickly realized, which can help car owners achieve true self-driving and emergency protection. The 5G internet of vehicle terminal can help to install the 5G network to the cars without 5G connected.

Typical post-installed terminals for ROAD include smart voice car driving recorders and other devices. According to Voicebot's "2019 Car Voice Assistant Report", there are 114 million adults in the United States using voice assistants in cars, almost two times more than smart speaker users (57.8 million). The ROAD intelligent car voice driving recorder can solve the traditional application requirements of car scenes: including entertainment, navigation, telephone access, etc., based on edge computing power and storage capacity. And these devices is also a distributed node of ROAD.

ADAS driving assistance system

After the extensive use of 5G communication, ROAD will monitor the external environment of the vehicle through camera and infrared equipment. In addition, ROAD will use the sensor system to monitor the internal and external environment of the vehicle and develop the post-installed ADAS driving assistance system. This system can effectively achieve intelligent vehicles functions such as driving assistance, danger avoidance, etc.

5. Road Token

ROAD Token is the token of ROAD, an important part of the ROAD economic system. ROAD Token is generated based on the INT public chain smart contract. The ROAD follows the principle that the more people participate in the marginal benefit increase. The ROAD Token token is initially distributed by the ROAD Foundation.

The economic system and Token mechanism design of the blockchain project is a complex crowd collaboration management system. We will continue to optimize the Token operating system and gradually improve the token economic system to achieve the goal of increasing marginal effects.

Some of the internal applications of ROAD auto-ledger require stable crypto currency, so we add a second-tier token at a suitable time, adopting a Libra-like method to link stable coins such as DCEP, USDT or USDK.

5.1 ROAD Token initial distribution

Road Token Official Name: ROAD			
The number of initial releases: 2 billion			
Forearlyinvestors	Foundation	Team	ROADecosystem
10%	10%	10%	70%

Team: unlocked in 4 years, release for the first time in January 2021, release 25% each year;

ROAD ecosystem: In order to protect the development of the Road ecosystem and the rights of TOKEN holders, teams, early investors, foundations and ecosystem tokens are locked initially.

5.2 ROAD Token Secondary Distribution and Governance Mechanism

ROAD Token's generation mechanism

Generate ROAD Token through ROAD internet of vehicle series devices;

Generate Token by Data node or contribution data;

Generate Token through ROAD Token's Staking or other DEFI method;

Generate Token by community incentive Token for users to promote the ROAD;

Sharing application Tokens such as parking spaces sharing and buttery charging sharing;

ROAD Token application scenarios and consumption

ROAD Token is mainly used for payment between Road Distributed Business, including:

E-commerce application: auto parts supply chain platform of ROAD system, car accessories and peripheral products based on vehicle owners;

Auto-finance: insurance, auto mortgage, distributed auto-finance, etc.;

Data economy: data transactions between auto manufacturers, accessory manufacturers, insurance companies, second hand car dealers, financial institutions, auto repair shops, and car owners;

Sharing economy: pay for sharing economic scenarios such as ridesharing, parking spaces sharing, and buttery charging sharing.

Token buy back and burn of ROAD Token

ROAD is a business-driven project. The ROAD Foundation will directly or indirectly participate in the business of ROAD-related commercial entities. Some of the profits generated by commercial operations will be used for token buy back. The buy-back tokens will be burnt, and recorded on chain.

6. ROAD roadmap

The first step of ROAD, we will complete the auto-ledger application APP, with 100,000 active users, and build a series of centralized and decentralized application modules in the APP ecosystem, and build a preliminary ROAD Token economic system. ROAD application modules include automotive ledger systems, tool applications, and e-commerce applications.

In the second step of ROAD, we will release automotive data mining

hardware products based on 5G Internet of vehicle specifications, and gradually expand the intelligent voice driving assistants from the current OBD automotive equipment, and carry out 5G transformation of vehicles manufactured before 2020 for use in Collection of automotive data. Further improve the ROAD Token system, open up the automotive open hardware platform, reach hundreds of active users of APP, develop the post- automotive data economy, improve the ROAD developer community, and form more automotive applications for the Business and Customer fields.

The specific process of the ROAD project is as follows:

In 2019, Q2, build up ROAD team, form ROAD products and business models, and develop OBD mining equipment;

In 2019, Q3, define the underlying technical architecture of ROAD, complete development of OBD equipment and the development of auto-ledger APP1.0

In Q2019, Q4, launch auto-ledger 1.0 APP, and sales the OBD equipment;

In 2020 Q1-Q3, the number of users of auto-ledger reached 100,000, and reached a cooperation with well-known Chinese new car manufacturer, embed the auto-ledger in new manufactured cars.

In 2020, Q3-Q4, launch the intelligent voice mining driving recorder was launched, and the domestic automobile after-equipment

manufacturers reached a cooperation. The auto account book has more than 500,000 active users, and the ROAD-based car maintenance, used car trading, auto-finance and other businesses have formed a certain share.

In 2021-2022, cooperation with more auto manufacturers to form a developer alliance, more ROAD-based automotive DAPP emerged, promote the China 5G Internet of vehicle blockchain open alliance and ROAD business ecology mature, launch automotive data trading product version1.0.

7. ROAD team

7.1 Core team

The core members of the ROAD team include Internet of Things development experts, founders of automotive industry, founders of shared economic projects, post-automobile hardware development product managers, blockchain development engineers, etc., with successful experience and failure lessons from multiple Internet projects. The product development team has a deep understanding and R&D experience in hardware products, IoT, security system design, blockchain bottom layer, big data and other technologies. The business operations team has deep cognitive and commercial

realization capabilities regarding token economy, community and traffic, business model and current blockchain market

Aaron. Li is strategic partner. He had been worked in Alibaba China for 6 years as manager of the Exhibition Development Department and was responsible for exhibition channel, marketing channel, government relations, and innovative business.

Vitor. Lee is product partner, CPO. He worked in Alibaba for 10 years. As a senior product expert, he led many influential products such as Xiaolongbao Plan in Alibaba China, UI of 11.11 in Tmall, Smart Court in Alibaba.

Huiqiang. Wang is the Chief Architect of ROAD. He received a Ph.D. from the University of Stuttgart and a master's degree from Tongji University. He was the winner of National Public Postgraduate Project (National Scholarship Council) and co-developer of National 863 Program "Building Reasonable Simulation Based on Satellite Simulation Software STK (Satellite Tool Kit)" He had worked for Vector Informatik (Shanghai) Co., Ltd. and Hisense, and led the development of large-scale social e-commerce public chain system.

PP. Wong is IOV project partner. He worked in Alibaba for 6 years and was responsible for the formation and operation of the Community Relations team. He is also a co-founder of a well-known automotive aftermarket enterprise.

Shanghong. Jiang is community operations partner. He has many years' experience of social business. He has led building team and operations for many well-known We-business brands such as Kans, Gewei, Wahaha, etc.

Eric. Chuang, head of ROAD industry applications. Former marketing manager of Alibaba South China and vice president of chemayi, channel general manager. He has extensive experience in automotive industry resources and application promotion.

6.2 **Advisors team**

Tiger.Wong, former director of China Business Development Department of Alibaba, and a partner of Zhonghui Capital and Entertainment Works.

Freddy, INT co-founder and head of INT China, the earliest Internet of Things R&D practitioners in China, and serial entrepreneurs in Internet field.

Frank.Gui, former general manager of Alibaba (China Direct Sales), COO of lingwa, vice president of Ai Cai Group.

Maji.Chan, vice president of Chehaoduo Group, general manager of South China's Guazi Second-hand car platform.

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9. The governance of road

The ROAD project is operated by the ROAD Foundation registered in Singapore as a non-profit organization.

The funds for maintaining the operation of the ROAD project are mainly from the sales of ROAD Token, venture capital and donations. Some ROAD Tokens will also be converted into other forms of equity assets for project operation when necessary.

ROAD Finance will be transparently managed, ROAD Foundation asset management will be integrated into overall budget management, and financial revenue and expenditure budgets and financial statements will be prepared based on actual operations.

The principle of ROAD financial: Coordinated planning, integrated

management; diligent and efficient.

In order to protect the interests of investors, strengthen the management and efficient use of ROAD crypto assets, and promote the healthy development of the project, the ROAD project sets up an information disclosure system. The project sponsoring team promises to manage and use the crowdfunded encrypted digital assets in a principle of honesty, trustworthiness and diligence.

ROAD will prepare and publish an annual report within three months from the beginning of each fiscal year (December 31 of each year). The report includes but does not include the technical development progress and progress of the ROAD project, application development and progress, digital assets. Management situation, team performance, financial situation, etc.

ROAD will occasionally disclose important temporary information of ROAD projects in real time, including major cooperation matters, changes in core team members, and litigation involving ROAD.

ROAD will publish information report on the official website https://roadpro.io/

In order to better promote the development of the project, we will invite senior experts from the domestic and international Internet of vehicle and blockchain industries, well-known personalities with rich experience, legal experts and general economic experts and experts

who familiar government policies. The third-party Expert Advisory Committee provides consultants and assists decision-making and other external brain staff to the team.

10. Risk notification

1) The contents of this white paper are for reference only and do not constitute suggestions, teachings or solicitations for the sale of goods and services in Road and related companies. Such invitations must be made in the form of a confidential memorandum and must comply with the relevant laws.
2) The contents of this document shall not be construed as forcing participation in the TOKEN public offering. Any activity related to this white paper shall not be considered as participation in the TOKEN public offering, including requesting a copy of this white paper or sharing this white paper with others.
3) Any person or organization wishing to participate in the investment of ROAD TOKEN must be a qualified investor. ROAD does not accept investment from citizens of countries and regions that are prohibited by current laws.
4) The ROAD team will continue to make reasonable attempts to ensure that the information in this white paper is true and accurate. During the development process, the platform may be updated,

including but not limited to platform mechanisms, TOKEN, and its mechanisms. Some of the content of the document may be adjusted in the new white paper as the project progresses. The team will post the update to the public by posting an announcement or a new white paper on the website. Participants are required to keep the latest white papers in a timely manner and adjust their decisions in a timely manner based on the updates.

5) The team will spare no effort to achieve the goals mentioned in the document, but based on the existence of force majeure, the team cannot fully complete the commitment.
6) ROAD TOKEN, is an important tool to improve platform performance, not an investment product. Having a ROAD TOKEN does not mean granting ownership, control and decision-making power to the platform. ROAD as the TOKEN used in Road blockchain, does not belong to any of the following categories of currency or financial product: (a) securities; (b) equity of legal entities; (c) stocks, bonds, bank bills, warrants, certificates or other grants of any the instrument of rights.
7) The value-added of ROAD depends on the market and the application of the Road, and may also be affected by market participants. The team does not commit to its added value and is not responsible for the consequences of its value increase or

decrease.

8) Road platform complies with any regulations that are conducive to the healthy development of the industry and industry self-discipline declarations. Participating representatives will fully accept and comply with such inspections. At the same time, all information that can be used to complete such an inspection must be complete and accurate.
9) the ROAD team clearly communicated the possible risks to the participants, participated in the open market to buy and trade ROAD TOKEN, on behalf of which they have confirmed and recognized the specific neutral terms, accepting the potential risks of the platform, take responsibility of risk by their own.

11. Terminology

OBD: On-Board Diagnostic

V2X: The collective name of the Internet of Vehicles, including V2V: Vehicle to Vehicle; V2P: Vehicle to Pedestrian; V2R: Vehicle to Road; V2I: Vehicle and Infrastructure; V2N: Vehicle to Network; V2C: Vehicle to Cloud.

LTE-V2X: LTE-based cellular network as V2X's base proprietary protocol for the Internet of Vehicles, including LTE-V-Cell and LTE-V-Direct modes. The LTE-V2X has low cost and high reusability, can

utilize existing communication base stations. LTE-V2X is leaded by China. China's LTE-V2X related standards are basically completed by the end of 2017, including LTE-V2X architecture, spectrum, air interface, network layer and application layer, and security. China is accelerating the development of LTE-V2X. And built a pilot of LTE-V2X in Wuxi, Jiangsu.

DSRC: One of the two main communication schemes for vehicle V2X, called Dedicated Short Range Communications, a dedicated short-range communication technology. This technology is adopted by China ETC. DSRC is an early standard of V2X, based on IEEE 802.11p underlying communication protocol and IEEE 1609. The technology of the series of standards, DSRC is an efficient wireless communication technology that provides high-speed data transmission and guarantees low latency and low interference of the communication route. It can realize the recognition and two-way communication of moving targets under high-speed motion in a specific small area (usually tens of meters). DSRC is widely used in ETC non-stop charging, access control, fleet management, information services, etc. There are advantages in identification, driver identification, information interaction between road network and vehicle, and vehicle self-organizing network.

PBFT: PBFT is the abbreviation of Practical Byzantine Fault Tolerance,

The algorithm was proposed by Miguel Castro (Castro) and Barbara Liskov (Liskov) in 1999. It solves the problem that the original Byzantine fault-tolerant algorithm is not efficient. The time complexity of the algorithm is O(n^2).), PBFT reduces the operational complexity of the Byzantine protocol, from the exponential level to the polynomial level, so that the Byzantine fault tolerance problem can be solved in practical system applications, and the PBFT algorithm can tolerate less than 1/3 invalid or malicious nodes.

VIN code: Vehicle Identification Number, referred to as VIN, is a group of seventeen English numbers used in a unique set of numbers on a car to identify the manufacturer and engine of the car. , chassis serial number and other performance information. In order to avoid confusion with the numbers 1,0,9, the English letters "I", "O", "Q" are not used, and the 10th production year does not use "I", "O", "Q", "Z" "," "U", "0".