January 2018

VLB Tokens

White Paper

www.vlb.io

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DEFINITIONS

CarFix
CarFix is a comprehensive online-to-offline auto repair platform covering client experience improvement and algorithmic price setting, repair shop capacity management, and spare part market optimization while also providing end-to-end online transaction capability. CarFix's business network is comprised of 280 fully-integrated independent repair shops (with 500+ onboarded repair shops in total), spare parts distributors, and car dealers in the CIS region.

Data Consumer
Any person or entity, including a VLB network participant, that uses Vehicle Lifecycle Blockchain to gain access to information stored on the VLB network. If such information is publicly available, then a Data Consumer is able to obtain it at no cost. If it is publicly verified by the network nodes but stored with a Data Owner then a Data Consumer needs to pay a fee to such Data Owner in order to obtain such information.

Data Contributor
Vehicle Lifecycle Blockchain participant; an entity, such as auto repair shop or car dealer, that is providing information to be recorded in a Vehicle Lifecycle Blockchain transaction and stored by Data Owners. Data Contributors may provide information on behalf of other actual transaction participants (typically Data Contributor's service/goods recipients) such as Car Owners.

Data Owner
Vehicle Lifecycle Blockchain participant; an entity that verifies and validates the entries to VLB as well as maintains the storage of data that such Data Owner accumulates through their business. Insurance companies, car manufacturers, banks, and car dealerships could be Data Owners in this respect.

Industry Participant
Participants in the Vehicle Lifecycle Industry associated with any stage of car lifecycle:

- Car Owners
- Car Manufacturers
- Insurance Companies
- Car Lenders
- Ridesharing Service Providers
- Vehicle Fleet Management
- Spare Part Producers
- Auto Repair Shops

and Others.

DEFINITIONS

Miner
A node on the private VLB network (Network #2) responsible for processing requests by other network participants and “packing” them into a blockchain transaction for remuneration in VLB Tokens. Miner presents an entry point for each transaction to other network participants. The term is used in a VLB network-specific sense and no actual proof of-work-based or proof-of-stake-based mining is taking place.

MSRP
Manufacturer’s Suggested Retail Price.

Network Development Tokens
VLB Tokens (see the definition below) held by auto Industry Participants for the purpose of rolling out the Vehicle Lifecycle Blockchain ecosystem.

Network #1
Network perimeter within the VLB architecture that is based on Ethereum public blockchain.

Network #2
Private blockchain network within VLB architecture used for storing and obtaining access to data.

Spare Parts Producer
Auto equipment manufacturers (spare part and component producers).

Industry Participant Ecosystem
All participants and the process of their interaction within the Vehicle Lifecycle Blockchain system.

Initial Industry Participant
Industry Participant that enters Vehicle Lifecycle Blockchain during Alpha and Beta testing phases of VLB development, thus applying it to their business model in order to better customize and test the use cases of the blockchain to their particular area of business. Initial Industry Participants are welcome to take part in the blockchain development by Initiator at no cost or entrance fee with the full access to the technology, codebase, and various APIs created for VLB.

Initiator
The company initiating the ICO: VLBToken OÜ (registration number 14123367), a company registered in Estonia.

DEFINITIONS

Validator
A node on the private VLB network (Network #2) responsible for validating transactions with smart-contract-based algorithm. Only Validator nodes have access to smart contracts within the private VLB network, thus forming a sort of “governance committee” of Industry Participants within the private VLB network.

VLB Token
Vehicle Lifecycle Blockchain Tokens are “utility tokens” that will be required for industry constituents to record transactions on the Vehicle Lifecycle Blockchain, get permissioned access to data from Data Owners and to “finance” commissions as compensation paid to Miners.

SKUs
Stock Keeping Unit (SKU) is a distinct type of item for sale.

Vehicle Lifecycle Industry
A term that unites all sectors of the auto industry and auto industry participants playing their respective roles from the time a vehicle comes off the production floor until it is recycled in the junkyard.

Vehicle Lifecycle Blockchain or VLB
Vehicle Lifecycle Blockchain is a comprehensive decentralized registry where information about vehicle ownership, insurance history, repairs, maintenance and other records, accumulated throughout a vehicle’s lifecycle, will be recorded through the use of VLB Tokens.

EXECUTIVE SUMMARY

The VLB Token team is launching an ICO in order to build a blockchain for the Vehicle Lifecycle Industry, influence VLB participants' existing business models to achieve critical adoption rate among Industry Participants, and ultimately make the Vehicle Lifecycle Blockchain open, independent of Initial VLB participants, and propagated globally.

The industry players that form the Vehicle Lifecycle Industry are faced with operating and customer services sciences that lead to overestimated prices for services and unnecessary costs, estimated at about $100 billion a year according to research.

Integrity and up-to-date records are the main aspects of interactions among the participants of the Vehicle Lifecycle Industry. Linking transactions and relationships between the automotive production industry, the auto insurance industry, the spare parts industry, the auto repair industry, and beyond provides for a single cohesive ecosystem that reveals tremendous opportunities to reduce cost to consumers and increase profits for businesses by rewarding efficiency, transparency and quality and by discouraging price manipulations and market abuse.

Vehicle Lifecycle Blockchain (VLB) is a comprehensive decentralized registry where information about vehicle ownership, insurance history, repairs, and maintenance records will be recorded through the use of VLB Tokens. VLB Tokens are utility tokens that will be issued in accordance with the ERC-20 standard. VLB Tokens will be used by Data Owners to record transaction entries on the blockchain as proposed by Industry Participants (Data Contributors), and to distribute commissions paid to Miners by parties to a transaction, for processing such transactions.

Vehicle Lifecycle Blockchain will be deployed in two stages:

- Deployment within the controlled environments of the Initial Industry Participants ecosystems with the VLB founding team acting as a moderator to achieve the critical mass of Industry Participants and the critical technology penetration level.

- Deployment of blockchain beyond the Initial VLB ecosystem Industry Participants with the VLB founding team ceasing its moderator role and opening up the blockchain to further decentralization and public consensus.

Vehicle Lifecycle Blockchain will create a seamless decentralized platform of all records related to Vehicle Lifecycle from the production floor to the junk yard. We estimate that global and regional market participants will have more than $35 billion woth of potential benefits per annum from the use of VLB Tokens.

EXECUTIVE SUMMARY

CarFix and other Initial Industry Participants' current businesses will act as a testing ground

The existing CarFix and other Initial Industry Participants* ecosystem present a perfect staging ground to develop and deploy the Vehicle Lifecycle Blockchain.

CarFix Ecosystem Indicators

10 spare parts distributors	500 + Repair shops	50,000 + Customers	250,000 + Repair jobs done

Elaborate validation process

Before entries become eligible for inclusion in blocks they will go through several layers of real world validation processes:
— Arm's length counterpart verification
— Node identity confirmation
— Cross-identity acceptability
— Proof of payment

Leadership Team

VLB's founders have a proven track record of building successful businesses and a deep understanding of automotive industry, having launched successful companies CarFix and CarPrice.

VLB's core team consists of high-level professionals with technology, blockchain development, business development and general management expertise.

Advisors

The Advisory Board is comprised of influential leaders in the areas of blockchain and crypto-technologies, insurance, financial technologies and business development.
Nitin Gaur (Director at IBM Blockchain Labs), Roberto Medrano (CEO of Beach View Capital), Sergey Solonin (CEO and Founder of QIWI Group), Hannes Shariputra Chopra (ex-CEO of Sberbank Insurance), Alexey Arkhipov (Director for cryptotechnologies at QIWI Group), etc.

Partners

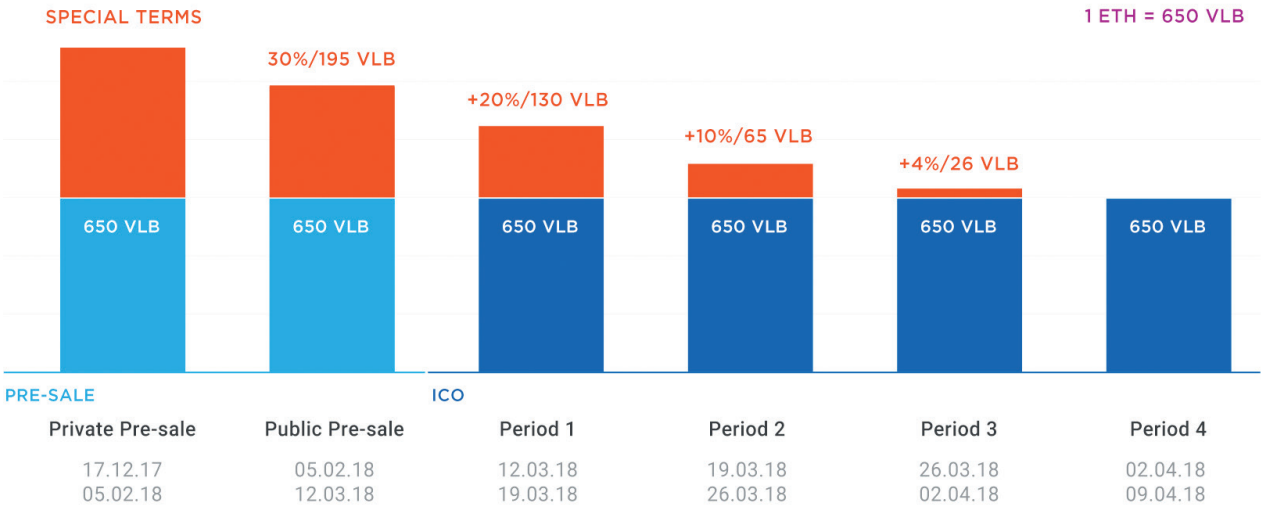
The VLB project is supported by strong partners from automotive, blockchain, legal and venture capital industries.

Genser Возможность быть лучшим
UBER
@mail.ru group
fcg Financial Consulting Group
FLEETCOR
QIWI Blockchain Technologies
SIMILE VENTURE PARTNERS
kima ventures
MAGNUSSON

* The VLB team is working on forming new partnerships with auto industry participants from various regions to ensure wider adoption of VLB

ICO REVIEW

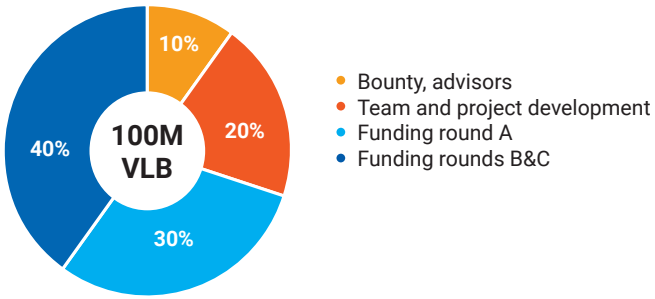
ICO PRICING



soft cap $4 m **hard cap $12 m**

TOKEN ALLOCATION

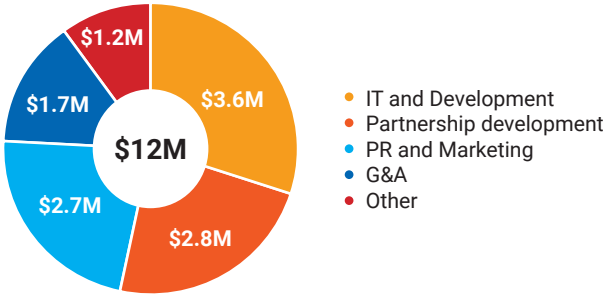
- Bounty, advisors — 10M VLB
- Team and project development — 20M VLB
- Funding round A (ICO) — 30M VLB
- Funding Rounds B&C (Private, base price > 650VLB = 1ETH) — 40M VLB



USE OF PROCEEDS

Proceeds from the ICO will be used for:

- Design, development, and programming of blockchain algorithms
- Integration of Industry Participants
- PR and marketing
- General and administrative (G&A)
- Other costs, including preparing and organizing further rounds of funding



PROBLEMS: FROM CAR OWNER TO CAR MANUFACTURER

- The automotive industry is one of the most sophisticated and technologically advanced industries in the world with innovation ranging from electric motors to self-driving cars to IoT integration.
- At the same time, the industry players that form the Vehicle Lifecycle Industry are faced with operational and customer service inefficiencies that lead to unnecessary costs and inflated prices for goods and services. Such costs are passed on to individual and corporate car owners, car ridesharing service users, logistic businesses' clients, etc.
- According to reports from LMC Automotive and Technavio, the global new and used car markets are almost equal in terms of number of units sold. Total sales of used cars were estimated at 90 million units per annum in 2016. Lack of trust on the secondary car market is another issue: buyers of used cars feel uncertainty when they buy a used car and spend hundreds of dollars for vehicle inspections even though they do not provide 100% certainty in regard to the car's history.

Problems for blockchain participants

KEY POTENTIAL USERS OF VLB ECOSYSTEM

Car Owner / Fleet Owner / Car Lender / Ridesharing Service Provider

— Lack of transparency regarding the car's history for the would-be purchaser of a used car — inflated prices, plus unpredictable car maintenance and repair costs
— Lack of trust in the outcome of maintenance and repair jobs
— High costs in ridesharing economy

Car Manufacturer

— Huge warranty claims costs
— Enforcement of recommended maintenance and repair prices on the dealers
— Customer attrition due to car dealers' violation of recommended maintenance prices set by car manufacturers

Insurer

— Arcane and costly claim management methods
— Inaccurate customer policy pricing
— Lack of oversight over the quality of collision repair

Spare Parts Producer

— Existence of a large market for counterfeit spare parts
— Lack of transparency in warranty monitoring and enforcement

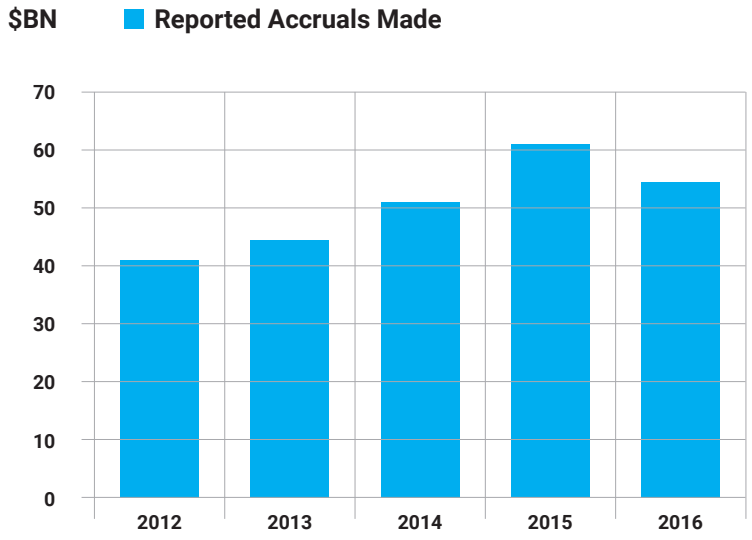
Independent Repair Shop

— Underutilized capacity
— Customer retention

ESTIMATION OF LOSSES FOR KEY INDUSTRY PLAYERS

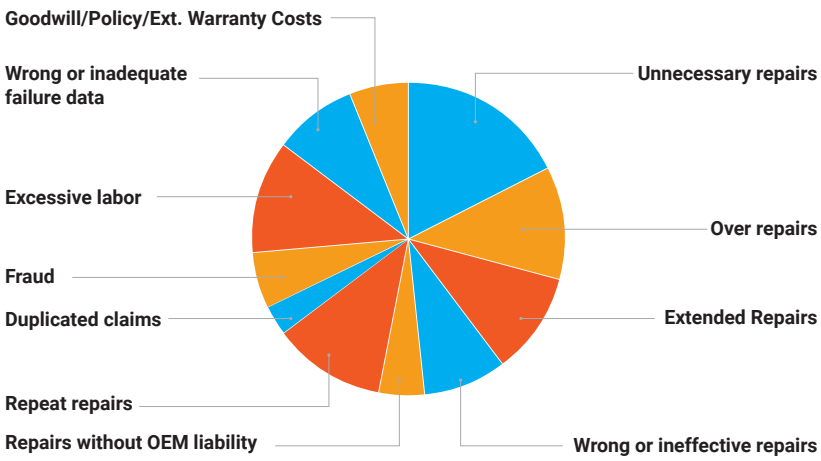
Car manufacturer

- According to the analysis from Warrantyweek.com* 2016, global car warranty costs amounted to $56 billion annually in 2016 and were more than $61 billion the year before.
- 30% of the total warranty cost (almost $17 billion in 2016) derives from poor practices and processes on the part of dealers.
- The highest warranty costs are in Europe and North America; the lowest are in Asia.



Source: www.warrantyweek.com*, Worldwide Automotive Warranty repairs, July 2017

POOR PRACTICES AND PROCESSES BREAKDOWN



Source: MSXI WARRANTY SOLUTIONS

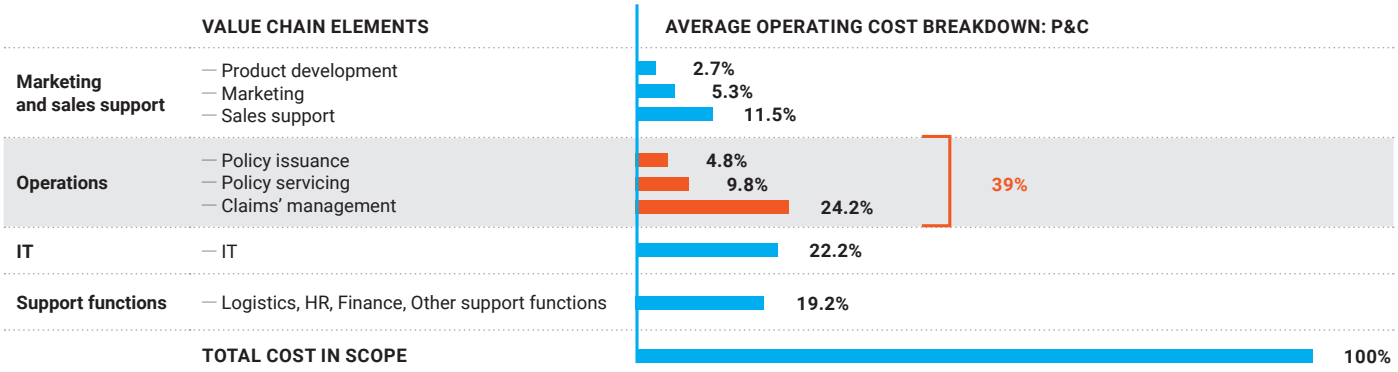
ESTIMATION OF LOSSES FOR KEY INDUSTRY PLAYERS

Insurer

- According to McKinsey & Company*, 5-10% of all claims worldwide are fraudulent. Dishonest insurance customers cause fraudulent damage incidents and conspire with equally dishonest repair shops to get compensation. According to the FBI**, this costs US non-health insurers more than $40 billion per year.

- Policy issuance and servicing and claim management account for 39% of total insurance costs. Most insurance companies use arcane methods for policy issuance and claim management which results in operational cost inefficiencies.

Operations and IT account for around 60% of a typical insurer's cost base



* Source: McKinsey&Company Johannes-Tobias Lorenz, Björn Münstermann, Matt Higginson et. al, "Blockchain in insurance – opportunity or threat?". July 2016, McKinsey.com
** Source: www.fbi.gov/stats-services/publications/insurance-fraud

Spare parts producer

- The Federal Trade Commission of the United States estimates the market for fake car parts at approximately $12 billion a year.

- In addition to warranty claims from cars manufacturers, which are the largest in developed countries, counterfeit spare parts dominate in developing countries.

More than $100 billion of losses are due to warranty costs, fraudulent insurance claims, and counterfeit spare parts

BLOCKCHAIN AS A SOLUTION FOR PROBLEMS IN THE AUTOMOTIVE INDUSTRY

Why Use Blockchain in the Vehicle Lifecycle Industry?

Integrity and up-to-date records are the main aspects when dealing with interactions between the participants of the Vehicle Lifecycle Industry.

Accuracy and immutability of records is essential for enforcing real-life contractual relations, maximizing the resale value of vehicles, ascertaining the authenticity of spare parts, achieving more accurate and cost-effective insurance claim management, monitoring the adherence to various recommendations of business partners, and optimizing insurance. Furthermore, recency of records and the ability to access them in real time opens up optimization opportunities for operations such as more robust inventory management for spare parts' distributors and better capacity utilization forecasting for repair shops.

Poor practices, which amount for 30% of the total warranty costs, could be eliminated by implementing a blockchain for warranty management where all claims, stock keeping units (SKU) for spare parts, and labor hours are recorded. For example, auto manufacturer warranties are contingent on vehicle owners maintaining their cars at certified repair shops that use original spare parts from trusted suppliers. This means that the car owner has an indisputable service record for their vehicle from certified repair shops and is able to demonstrate the origin and the SKU numbers of replacement parts installed. This is critical to being covered by the warranty.

Blockchain technology also offers potential use cases for insurers that include innovating insurance products and services for growth, increasing effectiveness in fraud detection and pricing, all while reducing administrative costs. A distributed ledger can enable the insurer and various third parties to easily and instantly access and update relevant information (e.g. claim forms, evidence, police reports, and third-party review reports). According to McKinsey & Company,* by putting its insurance processes on a blockchain, an insurance company can reduce claims regulation costs by 20-30%.

All of this leads to significant cost and inefficiency reduction for both the consumers and businesses not only in the auto industry, but in any individual human activity or business dependent on auto transportation. VLB will save billions of dollars a year globally and, more importantly, hundreds of thousands of jobs in the auto industry, all while making cars safer and more reliable without the long-term anticipation of automation, electrification, and mobility platform development.

*Source: McKinsey&Company Johannes-Tobias Lorenz, Björn Münstermann, Matt Higginson et. al, "Blockchain in insurance – opportunity or threat?". July 2016, McKinsey.com

BLOCKCHAIN AS A SOLUTION FOR PROBLEMS IN THE AUTOMOTIVE INDUSTRY

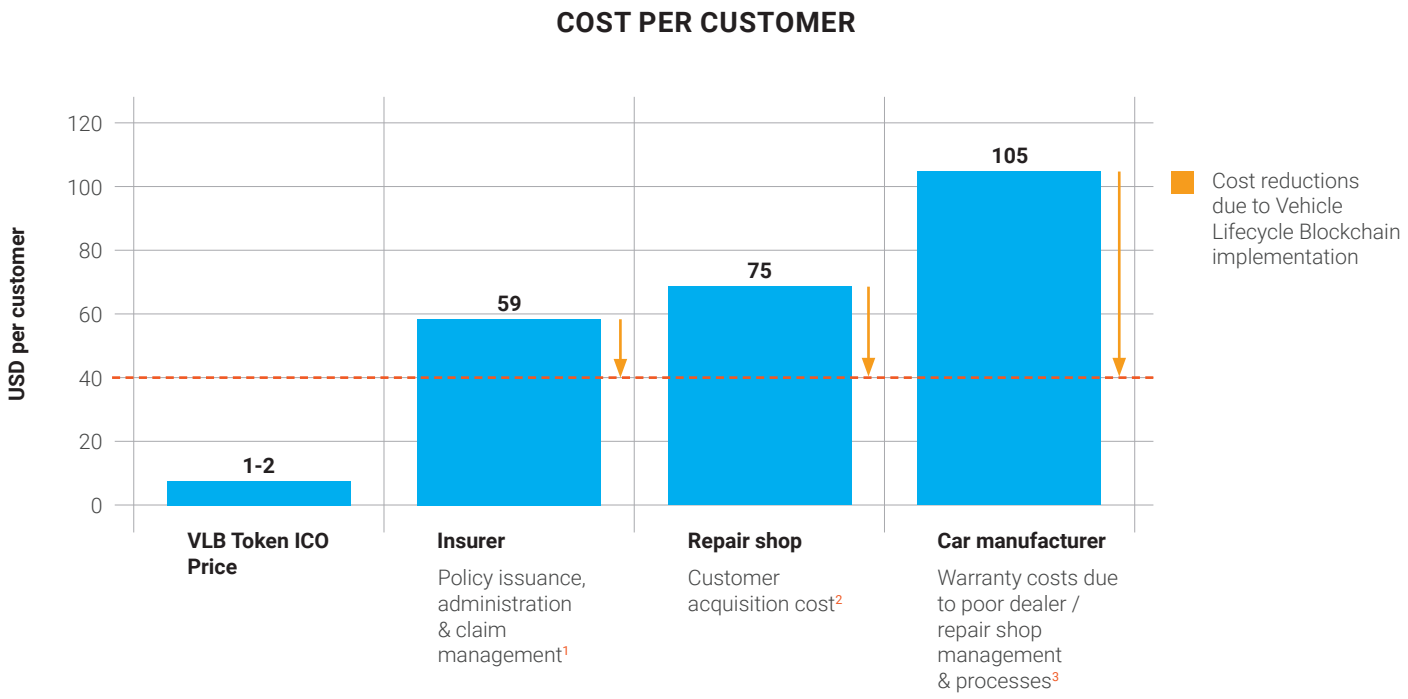
The Vehicle Lifecycle Blockchain will create a seamless decentralized platform of all records related to the Vehicle Lifecycle from the production door to the junk yard and will encompass the following benefits for industry participants:

PARTICIPANTS	BENEFITS RECEIVED	BENEFITS ESTIMATION
Auto Manufacturer	— Essential decrease of warranty claims costs and car recalls costs — Increase of customers loyalty and brand confidence — Verification of maintenance records in the event of warranty claims and identification of counterfeit spare parts — Control and instant pricing for car maintenance performed by authorized dealers	**$17 bn**
Insurer	— Optimization of vehicle insurance policy pricing — Decrease and optimization of claim management costs — Decrease of clients attrition	**$12 bn**
Spare Parts Producer	— Decrease of warranty claims against faulty non-original spare parts — Stock management optimization	**$6 bn**
Independent repair shop	— Secure repair and maintenance records — New client flow	**n/a**
Car Owner / Fleet Owner/ Car Lender/ Ridesharing Service Provider	— Trust and confidence in the used car market — Maximization of the vehicle's resale value — Creation of transparent car history — Decrease in costs for individuals and businesses in the ridesharing	**n/a**

Minimum $35 billion of potential benefits for key market participants from the use of VLB Tokens

EFFECT OF COST REDUCTIONS

The chart below identifies and quantifies costs that can be significantly reduced by respective industry participants:



Footnotes:
[1] McKinsey, European Insurance & Asset Management
[2] www.cars.com, AAA (based on 15% commission paid on average repair cost in US of $500);
[3] www.warrantyweek.com/archive/ww20160107.html

VLB OVERVIEW

With VLB, all car industry participants are Data Owners with respect to goods and services produced: vehicle production and ownership, warranties and recalls, repair and maintenance records, accidents and damages, insurance history, and so on. They will use the blockchain ecosystem to record and secure relevant data.

Data consumers are individuals or other businesses (including fellow VLB participants) that will use VLB for the purpose of viewing all necessary information in regards to a particular car/driver/spare part/repair shop/etc. with 100% confidence that this information is and always will be accurate and complete.

Data Owners will pay small fractions of VLB Tokens to record and broadcast information on the blockchain (VLB "Fuel" — similar to Ethereum's gas) and receive payments in larger amounts of VLB Tokens for access to this data from data consumers via smart contract or get compensated otherwise in case of freely broadcasted data, depending on their business rationale. Taking into account the benefit of blockchain for participants, the low cost of recording transactions will facilitate the active usage of VLB by Data Owners, while data consumers will be willing to pay a higher price for the accurate data. The price of the transaction will be determined by the market.

Data Owners will have incentive to produce complete data that can be cross-referenced by groups of Data Owners participating in a single transaction (for example, a car manufacturer, a spare parts producer, or a warranty repair service provider in a transaction covering repair job under warranty). The accuracy and completeness of data will be enforced by VLB protocol, not only financially rewarding the faithful actors, but punishing the inaccurate ones with the loss of their VLB Token stake as well as revocation of the actor's VLB participant status along with legal and other corresponding "offline" consequences in the real world.

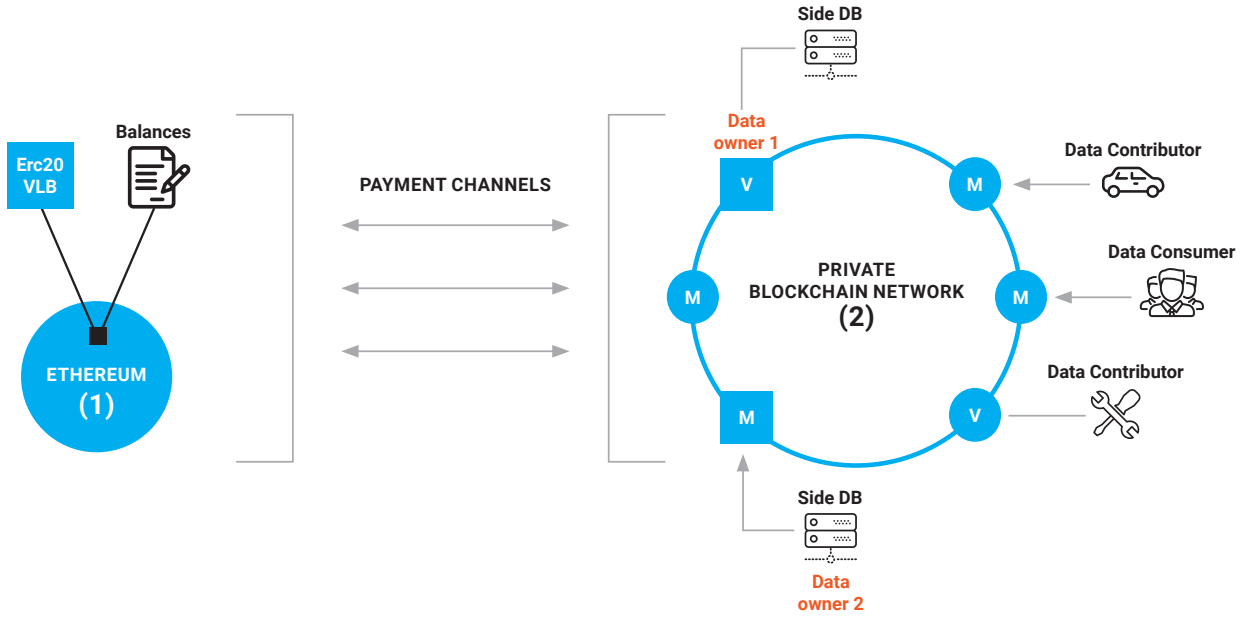
The Vehicle Lifecycle Blockchain will initially be fully implemented within the VLB early auto industry participants' ecosystem, which includes the CarFix network of repair shops, test mode for car manufacturers, insurance companies, spare parts distributors, and fleet management companies. However, the true mass-market potential of this blockchain lies in its decentralized deployment beyond the initial ecosystem.

Blockchain fueled by VLB Tokens has an innate disposition to become global through the facilitation of expansion by certain nodes. Car manufacturers and spare parts producers are global Validators and insurance companies are national Validators. We expect that these participants will integrate and distribute VLB globally as soon as they get positive results during the test period.

VLB OVERVIEW

VLB founders will dedicate a sales and business development team to work with Validators to promote the independent and decentralized use of the Vehicle Lifecycle Blockchain through the utilization of VLB Tokens. VLB Token turnover through the system will increase in parallel with the blockchain's system development.

Network Architecture



Prerequisites

All VLB Token balances will remain on the main public Ethereum network (Network #1). It will not be duplicated with the private blockchain network (Network #2).

VLB Token balances corresponding to transactions between the networks will be settled on Network #1 with the use of virtual payment channels responsible for clearing token balances directly between beneficiaries. This will resolve possible scalability issues of the public Ethereum network.

Network #2 will be private and used by Validators for secure verification of data and by Data Owners for data storage as well as for providing it upon Data Consumer's request. This is why only authorized parties will have access to it.

Each node on the network can fulfil various roles separately at the same time, dependent solely on the ways the node is incentivized to use VLB and be compensated for it. Two main roles upon which the actions of Data Contributors, Data Owners and Data Consumers are largely relying on are the roles of Validators and Miners (which could be taken by them - Miner and Data Owner/ Data Contributor functionality as well as Data Consumer role can be split within the same node - e.g. acting as a Miner for "others' transactions").

Validator Role Description

1. Validator nodes are the only nodes on private Network #2 that have access to smart contracts. They can be Industry Participants on the network that act as Data Owners, but it is not a given
2. Validation process is based on smart contracts, thus programmable and innate to the realm of the protocol itself. It is separate from verification process, which is based on verification of data, stored on the blockchain and, possibly, sourced from the outside-of-the-protocol realm
3. The network has three types of entries: public data, verified (private) and non-verified data (non-verified in part that is private, yet accepted, e.g. validated with the smart contract terms, by the network in part of such data that is public)
4. Public and non-verified entries are publicly available on the ledger
5. Verified (private) entries have their data only partially stored on the ledger in the form of hashes or cryptographically protected merkles – depending on their size. This allows network nodes to validate content without it being revealed by Data Owners, who keep these verified entries (private data) on their side databases (Side DB)
6. To get full access to a verified entry, Data Consumer needs to request it via a Miner node (M) from a Data Owner, who then sends it directly to a Data Consumer via API, bypassing a Miner (for data security reasons)
7. In any case Data Owners along with Data Contributors interact with the network and Data Consumers through Miner nodes

Miner Role Description

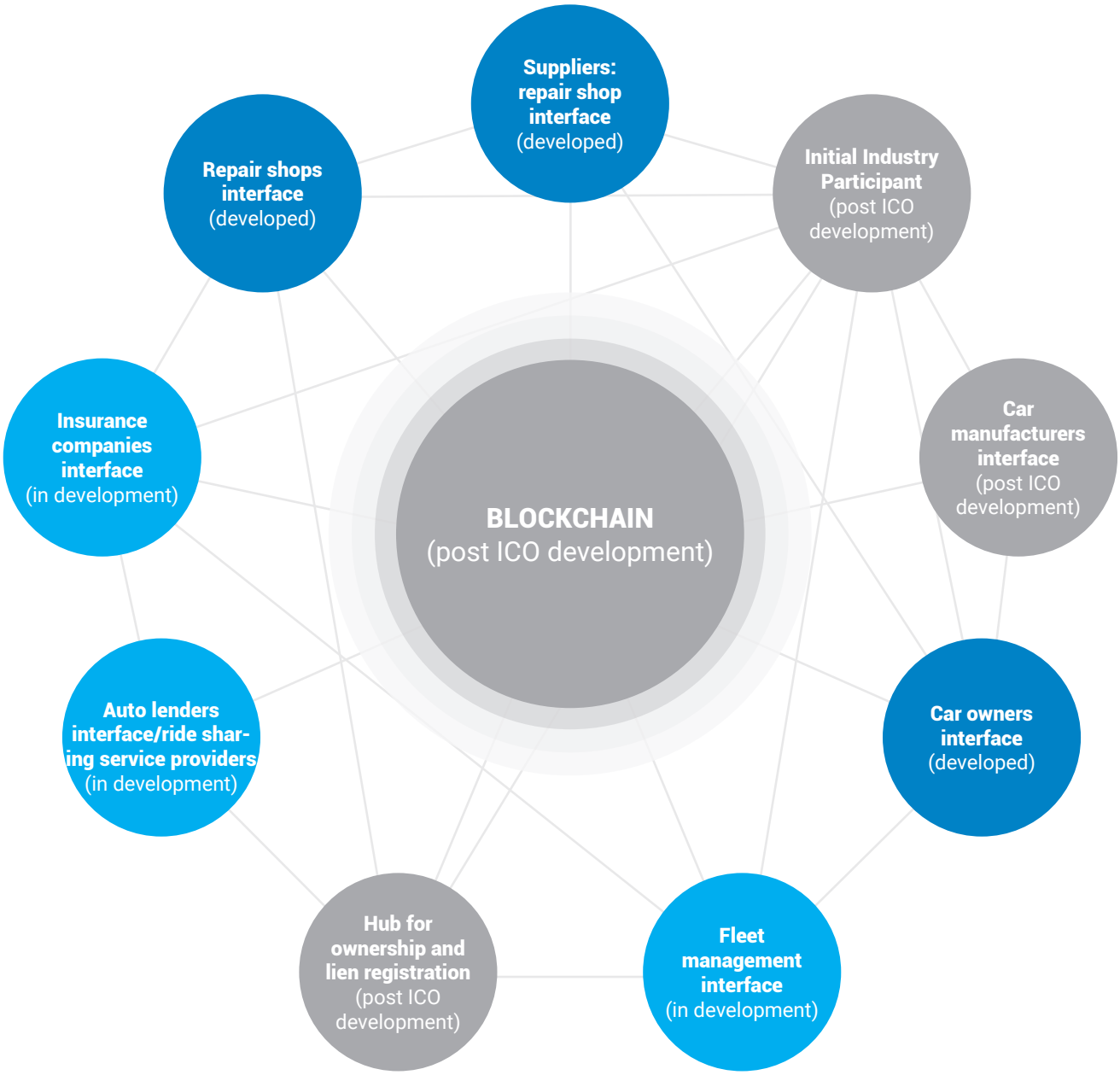
1. All nodes on the network can take a miner role. Miner role in the context of VLB means “request processor” and no actual mining neither proof-of-work-based nor proof-of-stake-based takes place
2. Miner Node that “takes care” of a particular Data Consumer or Data Contributor request/ submission is responsible for:

   - creating the transaction proposal
   - collecting all the responses
   - communicating with an external client (Data Consumer or Data Contributor) in case of failure
   - finishing the transaction
   - creating complementary changes in the settlement network

3. The Miner Node software stack includes not only Network #2 component but also component that integrates it with the payment channels

INTERFACE DEVELOPMENT FOR THE VEHICLE LIFECYCLE BLOCKCHAIN

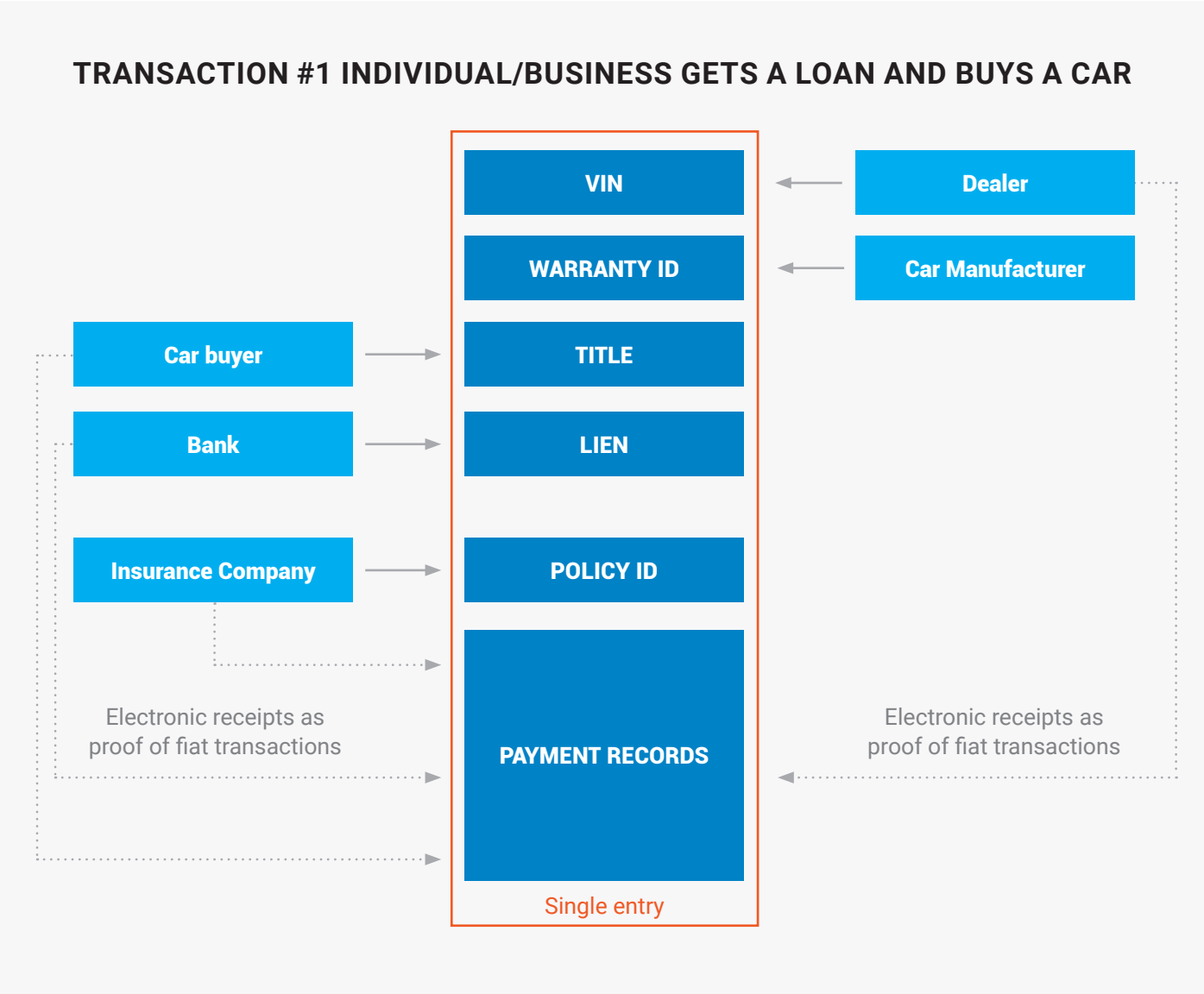
Parts of the interface software to be used with the VLB ecosystem have already been created with a vision for integrating multiple real life processes into a single platform. So some of the blockchain gateways are already developed and have been implemented within the CarFix platform. The VLB team is also exploring and intends to explore further other Initial Industry Participant software interfaces in order to implement the best solutions in the blockchain or connect such Industry Participants' interfaces to the blockchain, so that they remain the same on the surface (with possibly expanded functionality), but have VLB operating "under the hood" – thus smoothening the transition to the blockchain-based operations for such Industry Participants.



VEHICLE LIFECYCLE BLOCKCHAIN FUNCTIONALITY DESCRIPTION

Use Cases

As the use of VLB Tokens to extend the number of records in the Vehicle Lifecycle Blockchain grows, their turnover through the system will increase. Consider the following two transactions that depict their respective entries into the Vehicle Lifecycle Blockchain.



Transaction #1 Highlight

In Transaction #1 the following constituents will provide input of relevant record information into the blockchain entry via the VLB software interface: car manufacturer, dealer, car buyer, bank, and insurance company. In this respect all of these parties, with the exception of the car buyer, who is represented by the dealer, act as Data Contributors to the transaction.

VEHICLE LIFECYCLE BLOCKCHAIN FUNCTIONALITY DESCRIPTION

Typically, lenders are very sensitive about the credit quality of insurance companies that insure the assets that they are lending against. Therefore, once the insurance company reference associated with the policy ID and the bank reference associated with the lien are input into the blockchain entry, they will need to be “acceptable” to one another before the blockchain entry becomes “approved for payment”. In this way, the bank and insurance company are Data Consumers.

Additionally, the dealer, the bank, and the insurance company will provide separate input into the transaction in the form of electronic fiscal receipts to demonstrate that fiat money has indeed exchanged hands, thus validating the blockchain entry and making it eligible to be included into the blockchain, in this respect acting as smart-contract terms-based Validators.

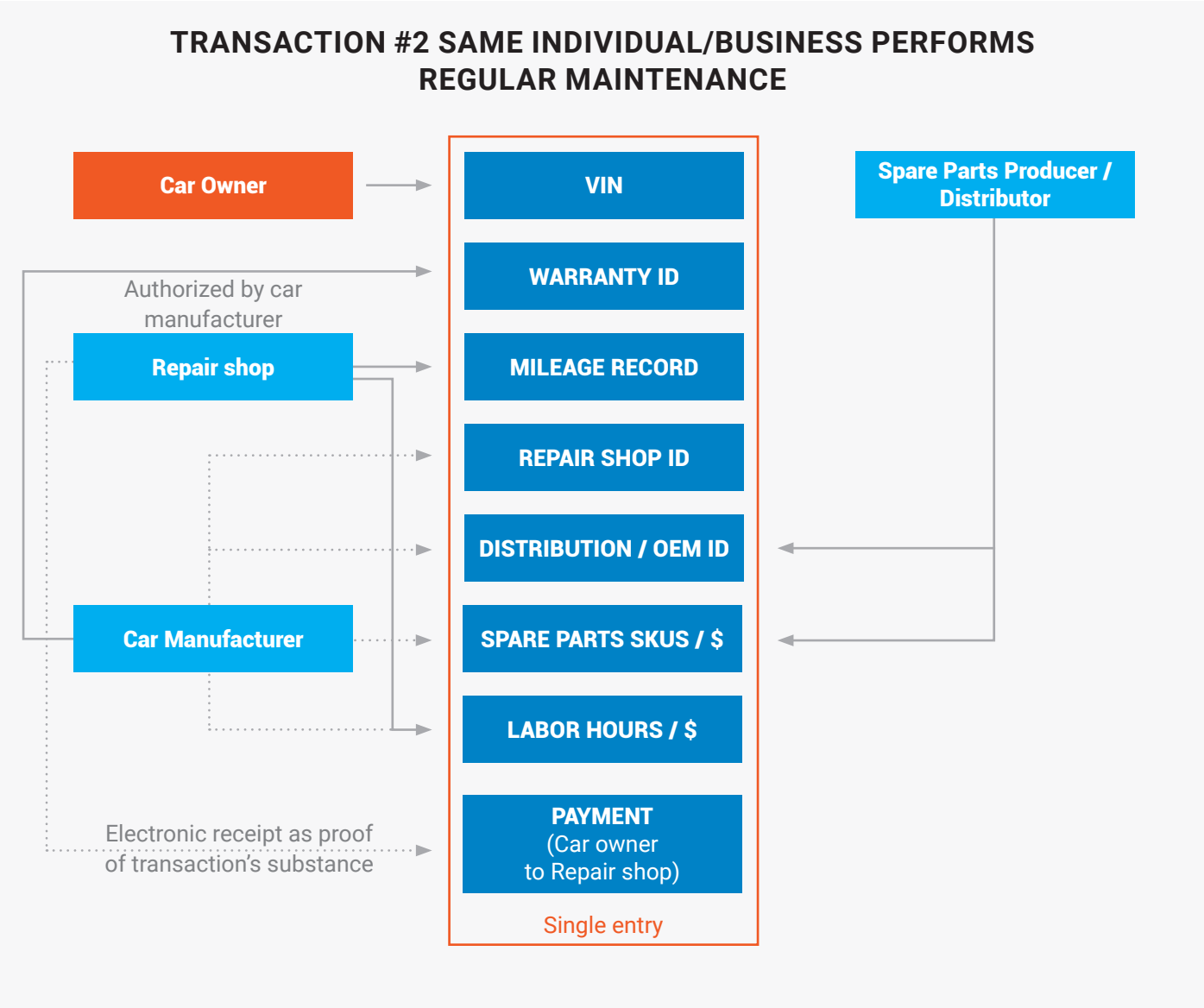
Car manufacturer is the only Data Owner entering the transaction. After the transaction is complete and recorded, some parts of the information contained in it will form part of libraries related to a particular vehicle to be kept privately in the car manufacturer’s and insurance company’s respected databases – the main Data Owners with respect to that car.

The prices in fiat currencies to be settled among the parties in this transaction will be discounted by the market price of the necessary amount of VLB Tokens to be used to provide and record data between the parties. This will serve as better incentive to parties to use the token and expand the token network to their business counterparts while keeping the economic value derived from the use of the blockchain within the blockchain.

Electronic fiscal receipts are the same electronic documents that are used for digital tax accounting by tax authorities of some states imposing strict electronic receipt reporting obligations on sales businesses. Information verification with the tax authorities in regard to the accuracy of these receipts and data feeding to the blockchain could be performed with the help of special fiscal oracle – e.g. a programmable agent that submits information on real-world occurrences to the blockchain. In other states where easily verifiable and accurate electronic copies of actual receipts are not legally imposed on businesses and hence the verification of information to be kept in such receipts with a state registry is impossible, fiscal oracles could be mandatorily installed on the nodes of Data Contributors participating in fiat sales. Such functionality will need to be elaborated with the active help of Initial Industry Participants during the blockchain development phases Alpha and Beta. Over time, as the ubiquity of cryptocurrencies expands, electronic fiscal receipts will be substituted with cryptocurrency payments.This will make feeding the information on payments into VLB much easier.

VEHICLE LIFECYCLE BLOCKCHAIN FUNCTIONALITY DESCRIPTION

In the example in Figure #2 below, the same person/business takes the same car to a repair shop for routine manufacturer mandated maintenance.



Transaction #2 Highlights

When the car owner brings the vehicle to the repair shop, they provide the VIN, which is pulled from the blockchain with the reference to the warranty ID that was attached to the VIN in Transaction #1. In this case, when the repair shop processes the repair request it acts as a Data Consumer of this data, which is publicly available on the network, hence free.

VEHICLE LIFECYCLE BLOCKCHAIN FUNCTIONALITY DESCRIPTION

Furthermore, the repair shop, now interacting with the network as Data Contributor, will provide the following inputs:, repair shop ID, mileage on the car, labor hours, cost, and cost of spare parts. The spare parts distributor will provide the distributor ID and spare parts SKUs and will also act as Data Contributor.

While the car manufacturer does not provide any direct input into this transaction entry, its role is critical for the integrity of the blockchain ledger. In this transaction, the car manufacturer's warranty ID will contain data about the acceptability of the following inputs for the purposes of the manufacturer continuing to stand behind the warranty:

mileage record, repair shop ID, distributor/spare parts producer ID, spare parts SKUs. Car manufacturer is a Data Owner with respect to this information and could be compensated for making it accessible to other parties in the transaction. However, for the sake of the manufacturer's commitment to the car owner with respect to the car's lifetime ownership costs, the manufacturer would need to enforce its MSRPs on labor and spare parts. That is why in Transaction #2 the car manufacturer verifies inputs on its Side DB level. On the other hand, the economic cost for not paying for this verification would be the loss of warranty rights on behalf of the car owner, so we believe the market within VLB could decide the best equilibrium and the actual cost-bearer in this particular case.

Similar to Transaction #1, the electronic fiscal receipt from the repair shop will serve as proof of the fiat payment that took place between the parties and will verify the validity of fiat money-related input into the transaction entry. Finally, for the encryption of Transaction #2 into the blockchain, repair shop and spare parts distributor act as Data Contributors, thus paying smaller VLB Token fees ("fuel") to the network Miner nodes for processing and storing the entry, while, as mentioned above, the car manufacturer is predisposed to receiving a Data Owner reward for verifying the authenticity of the input related to the car.

Also, similar, to Transaction #1, costs incurred by transaction participants with the use of VLB Tokens are discounted from the amount of fiat-denominated obligations to be fulfilled between the parties.

VEHICLE LIFECYCLE BLOCKCHAIN FUNCTIONALITY DESCRIPTION

When Real World and Vehicle Lifecycle Blockchain Converge

Before entries become eligible for inclusion in blocks they will go through several layers of real world validation processes:

— Arm's length counterparty verification
— Node identity confirmation
— Cross-identity acceptability
— Proof of payment

In real life each transaction assembles parties with either opposing or unrelated interests. For example, parties with opposing interests include: buyer and sellers, insurers and the insured, borrowers and lenders, repair shops looking to have freedom in establishing retail prices for their services, and spare parts and vehicle manufacturers looking to enforce their recommended retail prices. Parties with unrelated interests inside the same transaction include, but are not limited to, lenders recording a lien on ownership rights and vehicle manufacturers recording the date on which the warranty starts and a spare parts supplier recording installation of a certain SKU number in order to subsequently rely on the blockchain to forecast demand for specific SKUs in a specific geography and a repair shop recording the related repair job for the purposes of compensation by an insurance company. Subjectively-driven purpose and self-interest of Industry Participants create an environment of input into a single transaction, which, as input, may be untrustworthy on a stand-alone basis but, when combined, underscore the authenticity of the transaction's commercial rationale.

Node identity confirmation and cross-identity acceptability are encoded smart contract functions that may either make a transaction ineligible for the purposes of block inclusion or may serve as decentralized and readily accessible proof for the purposes of real life contractual obligations. For example, a repair shop trying to issue an insurance policy will make the transaction ineligible. However, an unauthorized repair shop performing a maintenance job on a vehicle under warranty will still create an eligible transaction but will demonstrate to the vehicle manufacturer proof that the warranty attached to the vehicle in question may now be rendered void.

Integrating proof of payment into the transaction entry validation is the final step in authenticating the validity and accuracy of the information being recorded on the blockchain. This is the crossover step from the real world into the world of Vehicle Lifecycle Blockchain and VLB Tokens utilization. We will continue our research on the ways we can use fiscal oracles to make sure that proof of payment information from the real world fed to the blockchain by virtual agents is accurate and verifiable.

VEHICLE LIFECYCLE BLOCKCHAIN FUNCTIONALITY DESCRIPTION

VLB — When Real World and Vehicle Lifecycle Blockchain Converge (continued)

Integrating proof of payment into the transaction entry validation is the final step in authenticating the validity and accuracy of the information being recorded in the blockchain. This is the crossover step from the real world into the world of Vehicle Lifecycle Blockchain and VLB Tokens utilization. As described previously, proof of payment occurs when a reference to the relevant electronic receipt is sent to the smart contract behind each transaction. In this crossover step, fiscal regulators in respective geographic markets act as moderators to confirm that the money behind transactions with authentic commercial rationale indeed exchanged hands. Every electronic receipt containing the substance (with relevant IDs used on the Vehicle Lifecycle Blockchain) and price is the basis for levying taxes and can be verified.

A NOTE ON PRIVACY

A natural question with respect to the development of the Vehicle Lifecycle Blockchain is that of privacy. How do you ensure that while the blockchain ascertains the authenticity of transactions, parties that provide input into the blockchain can manage privacy and accessibility to their data, especially when some of them are competitors?

For example, an auto lender may not want to disclose its commercially sensitive list of acceptable insurance companies that meet the credit quality requirements for insuring its encumbered assets. Or a specific repair shop may not want to make public information about the number of customers it serves per day. Likewise, commercial terms of insurance contracts need to remain private between a car owner and an insurance company. These are just some of the examples that the VLB team is tackling when developing the blockchain protocol.

Maintaining privacy of information while ensuring its authenticity through decentralization will be key to making the blockchain a success as it is crucial for actual real businesses in a substantial number of use cases.

Some excellent solutions, such as indistinguishability obfuscation, are too computation-heavy to be practical in the current technological environment. Others may involve storing significant bits of information outside of the blockchain and may necessitate a trusted oracle that could possibly hamper the concept of decentralization.

This is one of the reasons, in addition to scalability issues of public blockchains, why we introduced the private network of Industry Participants (Network #2) to our VLB architecture, combining the benefits of both public (Ethereum) and private blockchain networks here. Out of many possible solutions for privacy, we believe that using the side database construct introduced in the Network Architecture subsection of the VLB Overview section earlier, is one of the most resource-efficient. There are a few methods to apply it within Vehicle Lifecycle Blockchain that depend on actual use cases and computational and storage resources needed in order for such methods to be truly applicable to a global auto industry blockchain and compliant with various regulatory and business practice requirements. That's why we would love to extensively test this solution during the Alpha and Beta testing phases with the actual business use cases of VLB Initial Industry Participants, who will have the benefit of tailoring it to best suit their needs.

PROJECT TIMELINE

DATE	MILESTONES	FUNDRAISING PLAN
April 2018	VLB FUNDING ROUND A (ICO)	$4-$12m
2H 2018	**PROJECT DEVELOPMENT** — Alfa and Beta versions of the Vehicle Lifecycle Blockchain	
1H 2019	VLB FUNDING ROUND B (PRIVATE, INSTITUTIONAL INVESTORS) **STAGE 1: PROJECT TESTING** — Achievement of a certain critical mass Data Owners and Data Contributors and recorded transactions — Entry into new markets	$15-$30m
2H 2019	VLB FUNDING ROUND C (PRIVATE, INDUSTRY PARTICIPANTS) **STAGE 2: PROJECT DECENTRALIZATION AND EXPANSION** — Connection of key project participants to the system: car manufacturers and insurance companies — Permissionless access to the Vehicle Lifecycle Blockchain for Industry Participants — Decentralized development of applications for a broad range of business needs	$20-$40m
2021	**DISRUPTION OF VEHICLE LIFECYCLE INDUSTRY**	

LEADERSHIP TEAM

Founders

OSKAR HARTMANN
Co-founder

Notable startup experience: KupiVIP - Largest off-price fashion retailer in Russia and CIS, CarPrice (co-founder), Aktivo (co-founder), Simile Venture Partners — Investment Fund for early stage start-ups within the Consumer Internet and Digital Media sectors in the emerging markets (co-founder), Lesara — Largest cross border e-commerce company in Europe (co-founder), Zaodno — Single price retail chain (co-founder)
Corporate Experience: BMW (Kuala Lumpur, Malaysia), Boston Consulting Group (Moscow, Russia), Houlihan Lokey (middle market investment bank)

Education: WHU (Berlin, Germany), MBA, University of Hawaii

PAUL NAZAROV
Co-founder

Notable startup experience: AloeCure.com (co-founder, responsible for business development), FCG (co-founder, transaction service and valuation advisory)

Corporate Experience: Macquarie Group (infrastructure fund management), Mubadala Development Company (sovereign wealth), NRG Capital (middle market private equity), Houlihan Lokey (middle market investment bank)

Education: Stern School of Business at New York University

VLADIMIR LUPENKO
Co-founder

Notable startup experience: FCG (co-founder, managing partner), CarPrice (co-founder), Aktivo (co-founder, ex-CEO, real estate crowdfunding platform), Raketa (co-founder, innovative mass market gym chain)

Corporate Experience: KPMG (transaction advisory)

Education: Plekhanov Finance Academy, Vienna University of Economics and Business Administration, ACCA certified

LEADERSHIP TEAM

Core team

MAXIM MANTUROV
CTO

Past Experience: Over 17 years of experience as a programmer, software development manager, and CTO. He has worked for such notable companies like Lukoil, Rostelecom, and Redmadrobot – the leading third-party software developer in Russia.

In his role as a CTO he was responsible for developing and launching Bringit, an online food delivery platform in London.

PETER KALAMBET
Development Team Leader

Past Experience: 6 years of programming and systems engineering. Most prominent experience includes 4 years at IBM Science and Technology Center, where Mr. Kalambet developed various blockchain pilots and distributed payments systems. Peter is a member of the QIWI Blockchain Technologies team. He holds a graduate degree in Computational Mathematics and Cybernetics from Moscow State University and a post-graduate degree from the Institute for System Programming at the Russian Academy of Science.

ILYAS TAITSENOV
Head of business development

Past Experience: BCG and Uber (Russia), where he was responsible for providing management consulting services in the automotive supply chain and for developing the supply side of the Uber business model in key Russian cities.

DENIS TANAEV
Head of product development

Past Experience: Denis has broad experience in product and project management in large companies. During his work at Yandex he built Yandex.Music into the #1 online music service in Russia. He also held Head of Product positions at Ostrovok.ru and Mail.ru where he was responsible for online hotel booking services. In his most recent role as the Head of IT Project Management he has managed the development of all back and front office systems

LEADERSHIP TEAM

ALEXANDER KUCHEROV
Head of Sales

Past Experience: AutoMotoClub (subsidiary of ADAC, COO)

Education: Novosibirsk State University of Economics and Management, High Business School at the Ministry of Economics (MBA)

SERGEY LUSHIN
Deputy CEO

Past Experience: NRG Capital (middle market private equity), Hi Capital (Russian fund of mezzanine financing), X5 Retail Group (M&A Department)

Education: National Research Nuclear University MEPhI, RANEPA

LIUBOV GOROKHOVA
Head of CarFix university

Past Experience: Liubov has 7 years of experience in training and development. She has managed complex T&D projects at the European Pension Fund and Investbank. Liubov has also participated in the implementation of the Mentoring System at Sberbank.

Education: Russian Foreign Trade Academy (MBA)

ADVISORS

HANNES SHARIPUTRA CHOPRA
Ex-CEO of Sberbank Insurance

Past Experience: Mr. Hannes Shariputra Chopra boasts over 25 years of experience in the insurance industry. He is former CEO at Sberbank Insurance, the fastest growing insurance company on the Russian market.

Mr. Chopra served as the Executive Vice President of Allianz SE and President of Allianz CIS and Allianz Eurasia.
Mr. Chopra worked with Allianz AG from January 1996 to 2011 and was responsible for international development (CIS countries, Central & Eastern Europe, Africa, Middle East, South Asia).

Previously, Mr. Chopra held senior management posts at Allianz AG, ROSNO, Allianz Eurasia, and CKW-Consult.

NITIN GAUR
Director at IBM Blockchain Labs

Past Experience: Nitin Gaur currently serves as Director of IBM's Blockchain Labs, which is focusing on devising industry standards and use cases to make "blockchain for enterprise" a reality.

Prior to this role he was working in the capacity of CTO, IBM's Mobile Payments solutions, and IBM Bluemix, and also led Enterprise Mobile Solutions. Nitin led the Application Infrastructure Portfolio of IBM Middleware before taking on MobileFirst Solution portfolio.

Nitin is the foremost world expert in distributed systems and blockchain technology. He has worked with many Fortune 500 companies to develop various enterprise technology solutions in over 20 countries.

Nitin holds a MS in Management Information systems and an MBA in Finance from the University of Maryland.

ADVISORS

ROBERTO MEDRANO
CEO of Beach View Capital

Past Experience: Mr. Medrano has been a cybersecurity pioneer by working in the early phases of the firewall, content security, and security policy. He was General Manager of HP Software, serving a vital role as head of HP's key strategic emerging businesses that included cybersecurity, middleware, management, web services, CRM, and E-commerce. He also held positions of CEO at PoliVec, President of Finjan (FNJN) and Executive VP for Akana - leader API Management/API security. He was VP of Milkyway Networks (IPO 1996) - a firewall pioneer, VP at Avnet Inc (AVT), and an executive at Sun Microsystems. Mr. Medrano has also been on the board of directors or board of advisors for many security companies.

He was recently ranked (2014) as #12 CMO Worldwide and has been selected as one of "The 100 most influential Hispanics in US", "the 100 most influential Latinos in Silicon Valley" “Top 100 most influential Hispanics in Information Technology”.

Mr. Medrano was a Founder/Board member for Information Technology Information Sharing and Analysis Center (IT-ISAC) and participated in the National Cyber Security Summits and The White House National Strategy to Secure Cyberspace in the US.

Mr. Medrano holds a master's degree in business administration from the University of California at Los Angeles (UCLA), a Master of Science degree in electrical engineering from the Massachusetts Institute of Technology (MIT), and a Bachelor of Science degree in electrical engineering from the University of Southern California (USC).

大成 DENTONS
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DENTONS US LLP
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Dentons US LLP is acting as our counsel with respect to matters relating to the U.S. Securities Act of 1933 in connection with the offering of VLB Tokens.

ADVISORS

ALEXEY ARKHIPOV
Director for crypto-technologies at QIWI

Past Experience: Alexey Arkhipov is one of the understood leaders and tech visionaries of Russian IT and the payment market. He is a pioneering technologist with 8+ years of executive-level experience leading innovation in various distributed systems in the financial industry.

Since 2014, Mr. Arkhipov has been fully focusing on Blockchain R&D as a CTO of Qiwi Blockchain Technologies.

In 2017 Alexey was appointed as a head of the Distributed Ledger

Technology unit at FinTech Association, which unites leading Russian banks and financial companies. He currently leads technical development of the first Russian DLT platform Masterchain.

Mr. Arkhipov holds a Degree in Engineering (2006) from Moscow Technological University

SERGEY SOLONIN
CEO and founder of QIWI Group

Past Experience: Mr. Sergey Solonin is the CEO and founder of QIWI, a NASDAQ listed company and the leading online payment service in Russia. He is also the founder of the Russian Blockchain Academy and a managing partner of Target Global Fintech Opportunities Fund, which focuses on fintech and blockchain based technologies.

Within Qiwi, Mr. Solonin launched a research and development division called Qiwi Blockchain Technologies.

This division created the first blockchain specifically tailored for streamlining relationships within the banking sector called MasterChain. It is currently being deployed within the banking sector in Russia.

Mr. Solonin received a Degree in Economics from the Russian Financial Academy in 1996.

ADVISORS

ARTEM SITNIKOV
Partner at Financial Consulting Group

Past Experience: Artem leads FCG's VC practice. He has lead over 1,000 projects during the last 12 years.

He is the mastermind behind FCG's most prominent business line Startup Advisory Services.

Under his leadership and guidance 20+ startups we launched. He sharpened them through the most challenging development stage.

Recently he expanded these services into advising hi-tech companies in creating blockchain platforms.

He led FCG to become the go-to advisor for ICO-related services. He provided analytical support to LAToken during their respective ICOs. In addition to VLB Tokens, his current ICO clients include crypto-mining companies, logistics providers, and companies in the shared economies space.

Artem graduated from the Moscow Engineering Physics Institute (MEPhI) majoring in cybernetics, information systems, and cryptography.

ELVIRA TULVIK
Partner at Magnussonl

Past Experience: Elvira is an Attorney-at-Law and member of the Estonian Bar Association.

Elvira is experienced in fintech, business and administrative law, consultancy, and litigation. Select ICO experience includes: Polybius and Mothership Foundation. Elvira is at the forefront of working with the Estonian banking sector and regulators to develop sound legislation to govern the crypto to fiat conversion mechanisms. Most of Elvira's clients are companies at every stage of their operation and individuals interested in wealth structuring.

She advises clients on improving their business structure in terms of efficiency, minimizing risks, complying with regulations, and communicating with partners and the state.

Elvira has also dealt with the law of armed conflict and human rights.

Education:
United States Naval Academy
University of Tartu

ADVISORS

YAHOO62278
Legendary Bitcointalk forum user

Past Experience: Yahoo62278 got into crypto around 2012 and has worked with many successful ICO projects such as Iconomi, Xaurum, Dcorp, and indaHash to name a few. He managed the bounty campaign for us and is currently working with various projects in his client roster, however, we've developed a more personal relationship with Yahoo62278 during past couple of months, which evolved into him finally becoming our advisor.

In a true cypherpunk fashion, Yahoo62278 wouldn't let us disclose his actual identity or any information about him outside of his virtual personality.

OUR PARTNERS

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Uber Technologies Inc. is an American private hire company headquartered in San Francisco, California, United States, operating in 633 cities worldwide

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Mail.Ru Group is a Russian Internet company. The company is in the top 5 of largest Internet companies, based on the number of total pages viewed controlling the 3 largest Russian social networking sites

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Simile Venture Partners provides hatch, early, and seed stage funding for internet startups worldwide with a focus on consumer market

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Sberbank Insurance specializes in life insurance programs (which includes corporate insurance), endowment and investment insurance

FLEETCOR

A leading global provider of fleet cards and specialty in payment system

QIWI Blockchain
Technologies

Subsidiary of QIWI (listed on NASDAQ, ticker QIWI). Leading innovator, developing blockchain solutions

kima
ventures

The most active Business angel in the world

MAGNUSSON

Magnusson Law, one of the leading legal firms in the ICO space. Select ICO experience includes: Polybius and Mothership Foundation.

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GET IN TOUCH WITH THE TEAM

Telegram

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Twitter

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APPENDIX A: USE OF FUNDS

12M Scenario

VLB cost budget, USD (thousands)	Q2 18	Q3 18	Q4 18	Q1 19	TOTAL
IT					
Interface development	279	273	273	315	1,134
Blockchain development	150	150	300	600	1,200
Intergation with partners' interfaces	175	175	291	291	931
IT support	94	94	94	94	376
TOTAL	692	692	958	1,300	3,641
Partnership development					
Region 1	10	10	10	10	40
Region 2	53	53	53	53	212
Region 3	41	41	41	41	162
TOTAL	104	104	104	104	414
PR and Marketing					
Region 1	100	100	150	150	500
Region 2	250	250	300	300	1,100
Region 3	250	250	300	300	1,100
TOTAL	600	600	750	750	2,700
G&A	338	379	449	555	1,721
Integration of partners	100	500	750	1,000	2,350
Advisors and partners	250	50	0	100	400
ICO Round B			300	500	800
TOTAL EXPENSES	**1,734**	**1,774**	**2,260**	**2,709**	**12,027**

4M Scenario

VLB cost budget, USD (thousands)	Q2 18	Q3 18	Q4 18	Q1 19	TOTAL
IT					
Interface development	105	105	105	105	420
Blockchain development	90	150	150	150	540
Intergation with partners' interfaces	58	97	97	97	349
IT support	24	24	59	59	165
TOTAL	277	376	411	411	1,474
Partnership development					
Region 1	6	6	6	6	24
Region 2	35	35	35	35	141
Region 3	27	27	27	27	108
TOTAL	68	68	68	68	274
PR and Marketing					
Region 1	50	50	50	50	200
Region 2	50	50	50	50	200
Region 3	50	50	50	50	200
TOTAL	150	150	150	150	600
G&A	55	89	97	110	351
Integration of partners	50	100	250	400	800
Advisors and partners	100	20	0	40	160
ICO Round B			100	250	350
TOTAL EXPENSES	**550**	**683**	**726**	**739**	**4,008**