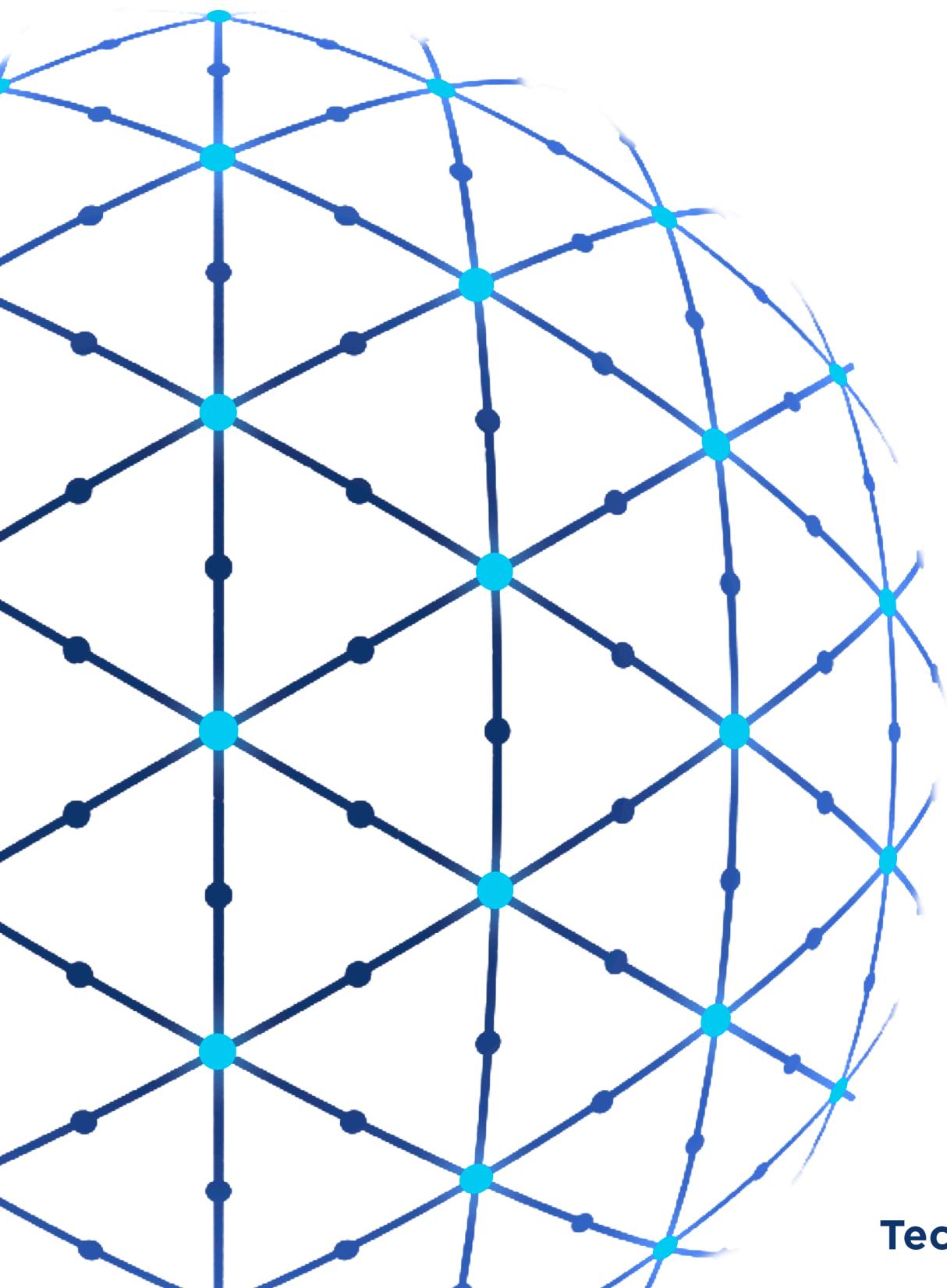




Decentralized Data Exchange for the Travel Industry



Technical WP •



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/ TravelChain

TravelChain is a register of data containing public or private user information with these options: making deals on exchange of information, goods and services from user to user.

TravelChain offers businesses to buy directly from users their private information and create targeted advertising according to their current needs and thereby reducing potential costs of advertising campaign for a client.

Information is recorded in TravelChain according to ontology standards developed in cooperation with a working group of market participants and data analysts from Novosibirsk State University. Data structure is designed considering that this information shall be used by systems of machine learning and artificial intelligence to discover hidden demands of users.

The ontology allows to store information in a sufficiently complete descriptive format:

- History of deals
- Appraisals and feedback
- Section of tourism
- Section of movements
- Section of accommodation
- Section of places
- Section of activities
- Section of events
- Section of services
- Section of goods
- Section of private information
- Valuable personal experience
- History of search requests
- History of movements
- Experience (guidebooks, life-hacks...)
- Profile
- Social contacts
- Contacts
- Other commercially valuable information

In all these categories a user can place information either in a private form (encrypted) or in an open one (public).

Contents

TravelChain ecosystem consists of the following basic components:

- Blockchain;
- API and libraries;
- Ontology;
- TravelChain Web application;
- TravelChain mobile application;
- TravelChain Widgets;

- Ecosystem applications;
- Plug-ins for browsers;
- Advertising platforms;
- Reputation agencies;

Blockchain is based on the Graphene blockchain core and represents a registry of data.

Public data is in open access to the public, private data is encrypted with a private key to the user information with a note about the type of data stored.

Blockchain contains information according to the rules of Tourism Ontology which is a standard generally accepted by participants of TravelChain market. The ontology describes data fields required to make deals, perform operations, portray a cultural object and so on and so forth.

API allows to interact with the blockchain, perform transactions or carry out inspection of blocks. Program libraries of TravelChain allow developers to use documented code modules to manage direct interaction between user and blockchain.

Ontology and standards provide sufficiently complete information about classes in the tourist market. Ontology allows to set general rules for interaction between applications and define development culture at.

TravelChain.io site

This site is an application of the ecosystem and performs following:

- Stores and reflects usage documentation;
- Allows access to TravelChain wallet;
- Enables information search;
- Enables to dispatch an offer for purchase of private information;
- Enables to receive a notification about request for purchase of private information;
- Enables to dispatch a key to decrypt private information;
- Enables to receive award if private information is utilized;
- Enables to aim advertising campaign at user target audiences;
- Enables user to establish cost of an incoming advertising message;
- Enables user to manage private and public information;
- Provides basic cost indicators of information units in various categories;
- Reflects the number of utilized information units and the total amount of deals;

Mobile application of ecosystem performing the following functions:

- Allows access to TravelChain mobile wallet;
- Transfers financial means through NFC (Near Field Communication) technology;
- Reflects the number of utilized information units and the total amount of deals;

- Presents selection of mobile information units by the user;

Plug-ins for browsers

Work for Chrome browser.

- Collects information on history of the user's surfing;

Widgets are built in web sites of partners to allow:

- Collect questionnaires of users to know customer better;

Reputation agencies

Analyze deals and peer reviews of community participants, submit value judgements;

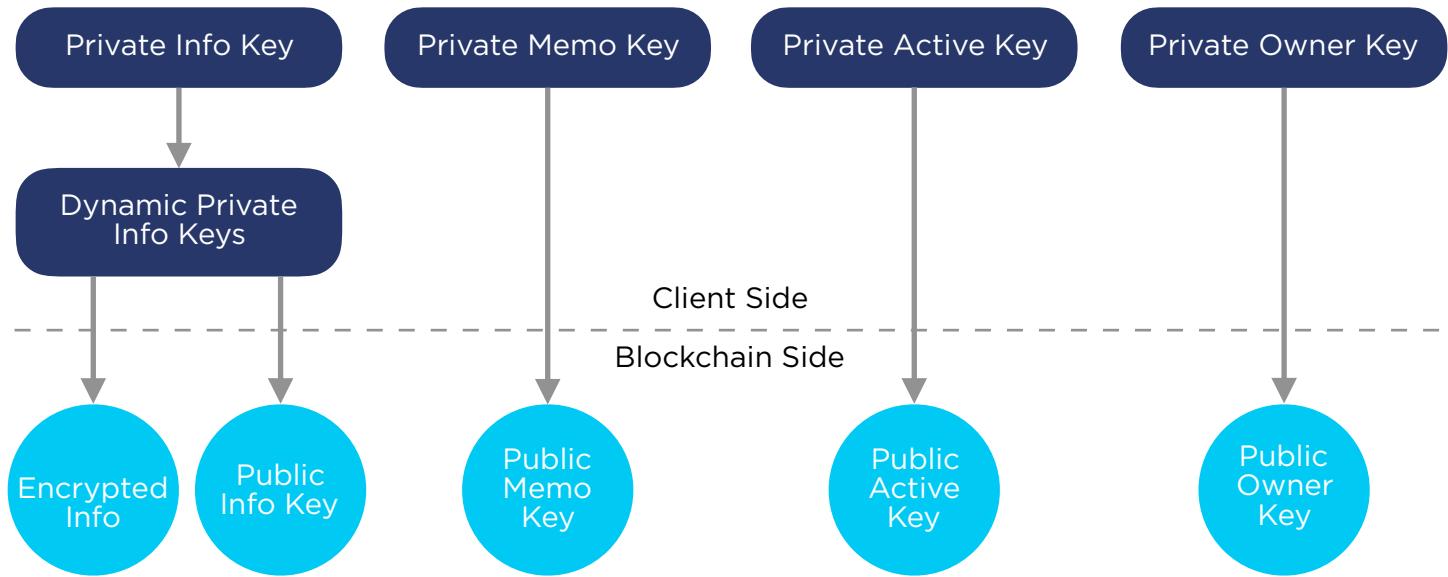
Advertising platforms

Provides businesses with an opportunity to launch marketing campaigns with TravelChain;

/ Architecture of access key storage

The system of TravelChain provides for the following levels of access keys (all in sets public/private):

- Info - the key responsible for dynamic keys to information encryption;
- Dynamic Info - dynamic keys to information encryption;
- Active - allows to manage financial means of the account;
- Owner - the main key of the account, allows to change all account keys;
- Memo - the key to encrypt private information;



All public keys are stored in the blockchain and are used by the program architecture to verify digital signature of user for changes of information that corresponds to the information key.

All private keys are totally under control of the user. None of the keys is stored in the blockchain or in any other centralized storage if it is not foreseen by an outside service.

Management keys Info, Active and Owner can vary a lot in different effects and pattern depths but they allow to build complex, multi-level corporate patterns of account ownership.

/ Registration and logging in

While going through registration at any application of the ecosystem, a user can generate main keys of the account on the basis of random combination of words (brain key) or on the basis of arbitrary password of sufficient length.

To log into applications of the ecosystem module oAuth is used which allows authentication by pressing the button «Log in with TravelChain».

/ Types of accounts and referral system

Account types for TravelChain users:

Basic - the cheapest account. The fee for its creation is paid by the registrar (travelchain.io (travelchain.io or its counterpart)

Annual - a temporary account with additional functional options on the platform (creation of assets) providing as well cashback from all the commissions paid by the user on the platform. Fee for the updates is paid by the user.

Lifetime - a lifetime participant means no limits in length of participation as compared to the temporary account. Fee for the updates is also paid by the user.

All the fees paid on the platform are distributed in the following way:
80% are received by referers, 20% are allocated to the development fund.

Referers - all the higher Annual и LifeTime participants who took part in inviting a basic participant. If the basic participant paid the fee and became Annual/LifeTime, then part of the reward used to be retained by referers now goes to this participant. He/she also starts to receive reward from all the fees of those basic users invited by him/her.

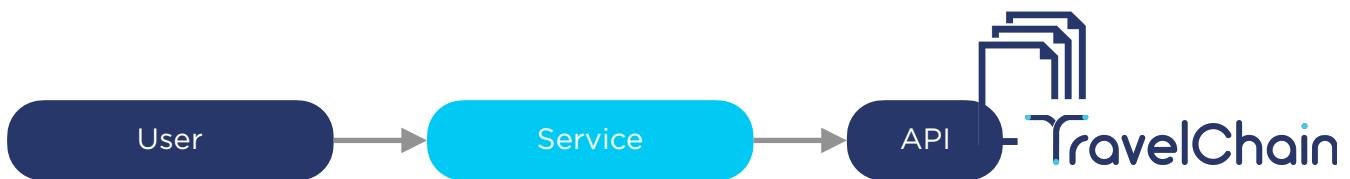
/ Roles on the platform

TravelChain platform singles out the following roles:

- Users / Companies
 - Consumers of services and information
 - Suppliers of services and information
- Technical observers (delegates)
- Economy observers (committee)
- Services

/ Recording of information at TravelChain

A service connects to TravelChain using API and libraries according to Ontology standards assisted by documentation of TravelChain. The service verifies user information at server or browser side and depending on privacy setup sends it to the TravelChain in public or encrypted shape.



Recording

Any information can be symmetrically encrypted by dynamic private info-key of user and published in the blockchain. The dynamic private key `priv_dynamic_info_key` is derived from a general private info key of the user `priv_info_key` with no backwards conversion. Dynamic keys `priv_dynamic_info_key` allow to decrypt specific unit of information published in TravelChain.

```
dynamic_priv_info_key= info_key_generate(priv_info_key + HASH_INFO)
```

The private key `dynamic_priv_info_key` is used to symmetrically encrypt user information:

```
info_encrypted = encrypt(info, dynamic_priv_info_key)
```

Encrypted information `info_encrypted` is signed by an active key of the user `priv_active_key` and sent to API of blockchain for publication.

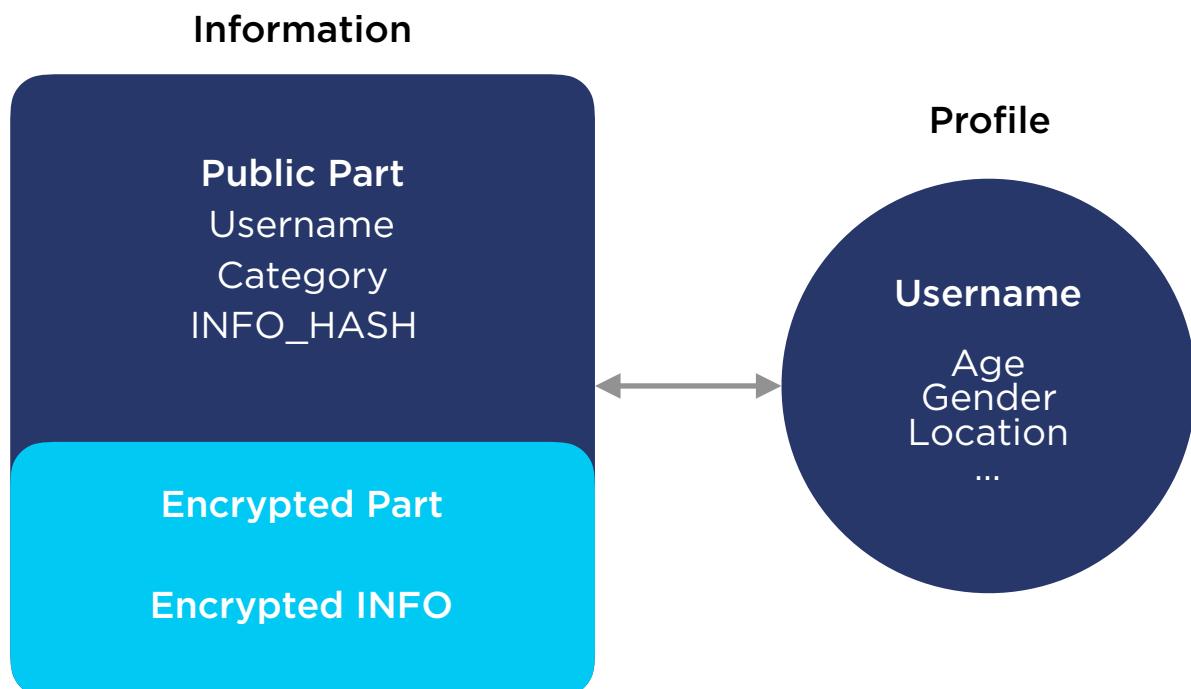
Information is decrypted through function that receives encrypted information and private key to the information dynamic_priv_info_key as arguments:

```
info_decrypted = decrypt(info_encrypted, dynamic_priv_info_key)
```

As a result information can be decrypted only with private info-key of the user who possesses this information All stages of encryption can take place both on the side of the client and at the backend of the service.

Public information is recorded into blockchain in the same way as private one with the only difference that encryption algorithms are not used.

Any information in TravelChain has metadata specifying the category of information. Proceeding from public information of the user, a selective search for information can be made for further acquisition of rights of use.

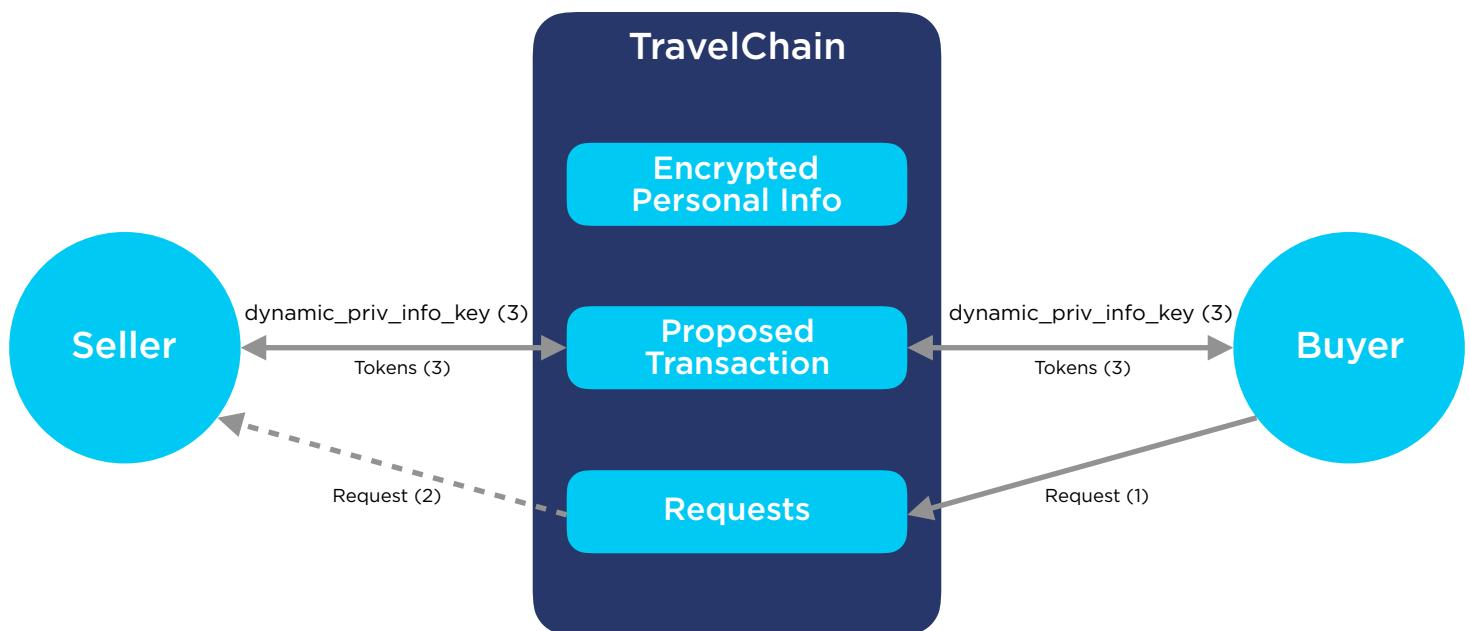


/ Transfer of information

In order to receive information a buyer needs to place a request (1) addressed to specific users. This request is implemented by an operation in the blockchain that keeps required specifications of the request.

```
| answer = request(users, params)
```

This request is received by the information owner (2) and a decision is to be taken whether the decryption key `priv_info_key` should be transferred to the buyer or not. While taking a decision on the transfer, the seller of information creates a request to carry out a transaction (3) attaching a decryption key and offers the buyer to pay for the deal. In order to pay for the deal it is enough for the buyer to sign the offered transaction.



Reward goes to the user once the offered operation has been processed.

The key to information `priv_info_key` is encrypted by Diffie-Hellman key exchange algorithm that has a secret decryption key which is common both to sender and recipient:

```
| Pub(Alice) * Priv(Bob) = Pub(Bob) * Priv(Alice)
```

Encryption of private key to information is done as follows:

```
encrypted_dynamic_priv_info_key = encrypt (
    sender_priv_memo_key,
    dynamic_priv_info_key
    recipient_pub_memo_key,
)
```

In order to decrypt dynamic_priv_info_key, the message recipient must apply this function:

```
decrypted_dynamic_priv_info_key = decrypt (
    encrypted_dynamic_priv_info_key,
    sender_pub_memo_key,
    recipient_priv_memo_key
)
```

Therefore, encrypted message with a dynamic private key to information can be read only by sender and recipient. Transfer of message with the key takes place through API at blockchain level. Using the key one can decrypt private information of user and gain access to it.

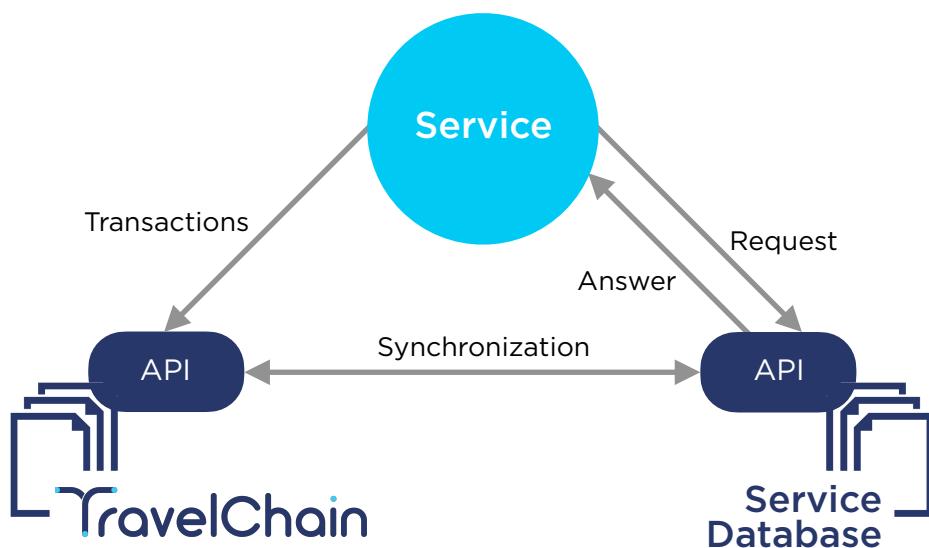
/ Service Database

Service databases continually synchronised with the blockchain allow to use it as an ordinary database. For this reason developers can give up working directly with the blockchain and open up many opportunities in displaying, sorting out and massive decrypting of information and also use systems of machine learning and artificial intelligence.

TravelChain.io site is using service database developed by the team of TravelChain. When used, data from the blockchain is continuously synchronised with database of MongoDB which provides a wide functional of filters for display. Therefore, a user can resort to a wide functional of filters for information search in the register of TravelChain data.

Any developer can use API of service database, create a functional analogue and use it in a similar or alternative way.

When users work with service database their transactions are transferred from the client directly to the blockchain bypassing centralized services. Therefore, service database does not work with the user in CRUD mode but only in READ mode.



/ Systems of evaluation

System of evaluation is used by TravelChain participants after a deal to provide a service or private information has been closed. Evaluation is stored on-chain (in blockchain). Conversion of evaluation into reputational judgements is done by Reputation Agencies off chain (outside blockchain)

Proceeding from evaluations recorded in the blockchain Reputation Agencies resort to either direct calculations or systems of machine learning or artificial intelligence to obtain in result a subjective reputational judgement and present it through API and/or at their web-client. Reputation Agencies initiate evaluation standards which can be used by those clients of TravelChain who accept them.

TravelChain launches reputation agency RA TravelChain with an algorithm described below. Reputational Agencies can be created and developed by any participants of the ecosystem without centralized consulting any party and thus open up the road for free competition.

/ RA TravelChain

RA TravelChain introduces the following standards of evaluation to be used for settling reputation by systems of machine learning and artificial intelligence:

- Credibility of provided information;
- Communicability;
- Goodwill;
- Responsibility;
- Intelligence;

Absolute reputation increase of a participant shall be determined in RA TravelChain by the following equation where the product of the total amount of payments multiplied by reputation of a paying participant shall be summed up in relation to all recent payments and rationed by the sum of reputations of all the contributors concerning all their payments and therefore be equal to an average payment where deciding factor is the reputation of a paying participant.

$$\text{absolute_reputation_increase} = \frac{\sum (\text{sum_payments} * \text{reputation_of_the_paying_member})}{\sum \text{reputation_of_all_participants}}$$

Relative increase of reputation shall be rationed within 0 to 1 range along the system relative to maximum value among all the participants.

$$\text{relative_increase_of_reputation} = \frac{\text{absolute_reputation_increase}}{\text{MAX}(\text{absolute_reputation_increase})}$$

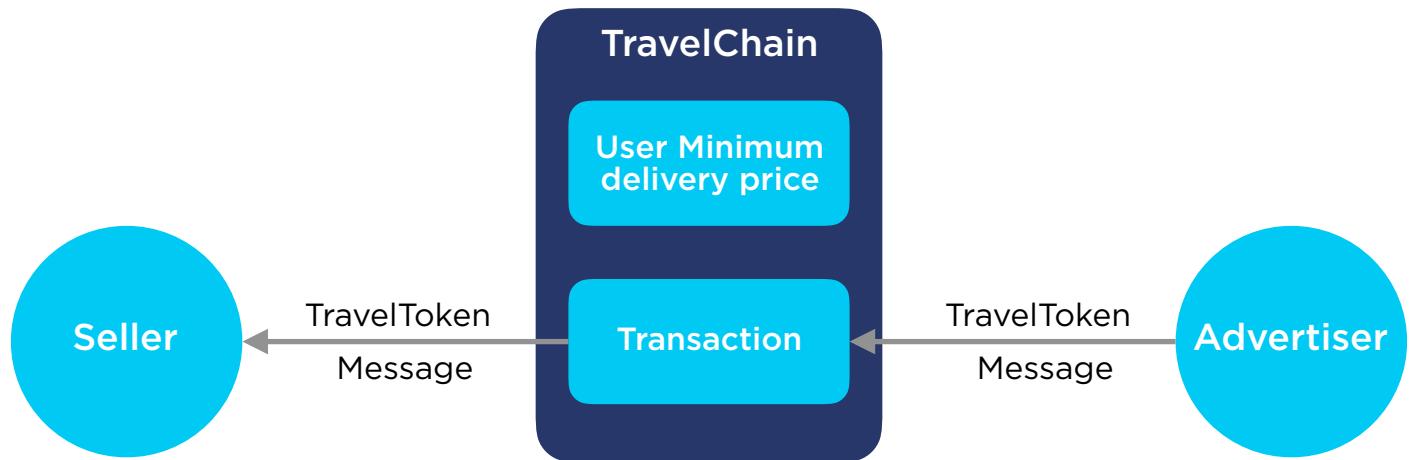
In order to determine a new current reputation by results of the latest estimated period, an average previous reputation is considered relative to previous reputation taking into account the length of all previous periods and the length of the latest estimated period.

$$\text{est_period} = \frac{\text{previous_reputation} * \text{duration_of_previous_periods} + \text{relative_increase_of_reputation} * \text{last_estimated_period}}{\text{duration_of_previous_periods} + \text{last_estimated_period}}$$

When the system is developed further, this algorithm of evaluation and update of reputation might be supplemented by a mechanism to identify fraudulent schemes of artificial increase of reputation that create a vast number of costly fictitious tasks mutually undertaken by colluding parties.

/ Direct advertising messages

TravelChain provides an opportunity to send and receive personified advertising messages. For instance, a user can indicate minimal cost of advertising message having claimed that he/she is ready to browse advertising messages if this minimal reward is received from the advertiser.



This message shall be shown to the user for all clients of the ecosystem accepting conditions for taking part in marketing net. The advertiser, proceeding from the user's reputation and private information on the user, decides whether to accept the proposal or not.

Technology of delivery of direct advertising messages can serve as a basis for aggregators of information and advertising cores which if tied up with each other and applications of the ecosystem can offer businesses to form and deliver personified advertising messages.

/ AdsCore TravelChain

TravelChain team develops advertising core AdsCore TravelChain. It can be one of the many advertising cores at TravelChain platform. More detailed technical information on how AdsCore TravelChain works shall be presented later on.

/ Assets at TravelChain

TravelToken is the basic token at TravelChain. This token is required to perform any operations at TravelChain.

(User Issued Asset) are the assets issued by users. Can be tickets, points, experience, exchange items of any nature. Assets are created and issued by creator if no other option is foreseen. The value of UIA assets is regulated by free market or creator of the asset if asset trade is prohibited.

MPA – assets can be used by aggregators of data as an equivalent value for each type of information. These assets are issued by market and the creator ensures that these assets have sufficient security deposit. The value of assets is regulated by creator witnesses (technical observers) or a committee. MPA-assets are a variety of smart contract (SmartCoin).

Generic features of assets allow their owner to carry out a wide range of business tasks:

- If fee is charged in transactions with assets;
- White list of accounts. Only designated accounts are permitted to keep and transfer an asset;
- Whether ownership rights can be reviewed. This enables the asset owner to bring it back under control at any time;
- Transfers prohibited. This feature allows transfer of assets only from creator to creator thus prohibiting creation of market;
- Whether confidential transfers of an asset are allowed. This feature prohibits covert transfer of assets (without disclosure of recipient/ sender);
- Managers of price feed for MPA asset. Managers are: members of committee (economy observers), witnesses (technical observers) or creator of an asset.

/ Delegated proof of stake

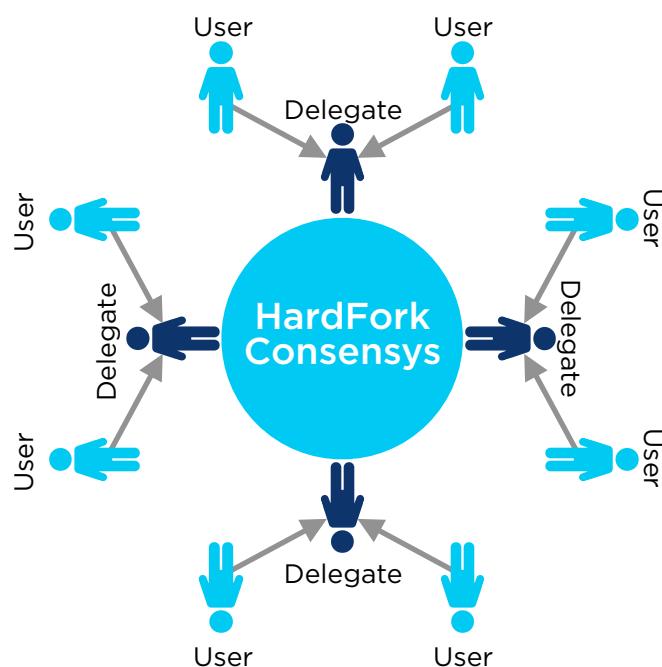
Algorithm of DPOS consensus allows elected delegates to validate transactions with a speed from 1 to 100 000 transactions per second which makes this algorithm the most fast and effective of all existing ones.

DPOS is based on the principle of delegated democracy when each participant of the network has a vote and weight depending on the number of TravelTokens on his/her account. Each participant can use this vote for taking decisions on community life or delegate this right of vote to another participant.

TravelChain has two managerial roles: Technical Observers (Delegates) and Economy Observers (Committee). Together they constitute Decentralized Administration of TravelChain.

/ Technical Observers (Delegates)

Delegates are technical observers of chain of blocks in TravelChain. They support infrastructure of network and receive reward in TravelTokens. Number and composition of active observers is established on principles of delegated democracy by the community. Each delegate must install TravelChain software in order to participate in signature of blocks.



A block is a group of transactions which update blockchain data. In order for a block to be incorporated into the chain it has to be approved and signed by technical observer who has the power to sign the blocks at the moment.

According to DPOS, participants of TravelChain can choose the number of technical observers for block verification under conditions required for their decentralization. Number of delegates to TravelChain can vary from 0 to 1000. Within this framework of elected delegates and according to the period of automated technical servicing of blockchain top delegates are nominated from all those elected by the community. The top list is the result of regular count of votes cast for each delegate in the community of participants.

The process of block generation takes place in rounds. At the start of each round top delegates are randomly shuffled and queues up for a planned turn in block generation. At the planned time the delegate receives the block, validates and signs it, and sends to the network. The next technical observer checks up the preceding block, then checks up and signs a new block and thereby the chain grows up.

After a round of generation is over after top delegates have had their turn, the delegates are automatically shuffled and the process is repeated in another order.

This process occurs in cycles until next technical servicing is due when recount of votes takes place.

For chain of blocks to be trustworthy, 51% of top delegates must agree on its correctness. Therefore, a massive expensive calculation of hash sums (such as POW) do not take place in DPOS system and the system itself is highly manageable and not subject to forks.

Apart from observing chain of blocks, delegates participate in managing some of the network parameters by changing program code of blockchain (hardfork) if this is required by the community. Changes in blockchain code are accepted if approved by 51% of top delegates and had their software replaced.

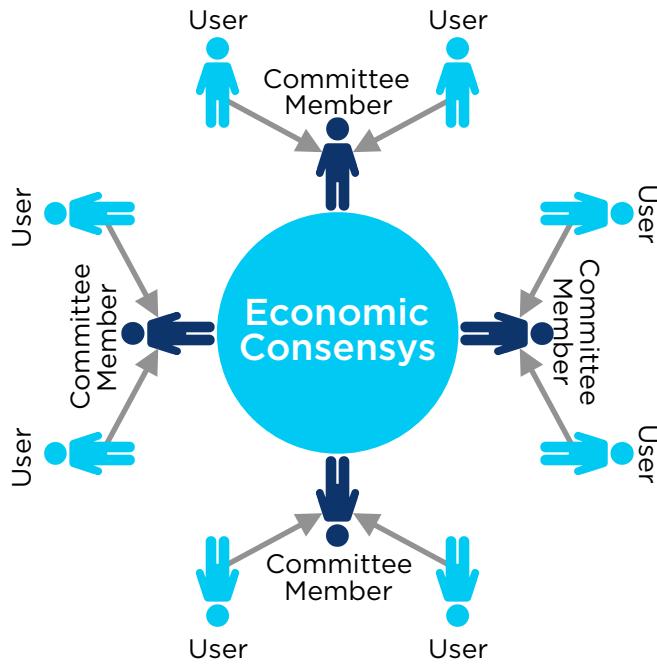
The delegates, in consensus with economy observers and the whole community, can manage:

- block interval: interval between blocks, maximal size of block/transaction;
- expiration parameters: intervals of waiting;
- witness parameters: maximal number of delegates (witnesses);
- witness pay: reward for each signed block;

If acting top delegates do not meet interests of community, they are deprived of their votes and replaced by new ones as nominated by the community.

/ Economy observers (committee)

Committee is a group of economy managers of TravelChain blocks. They manage economy parameters of blockchain trying to balance them and acting in long-term interests of the community



The committee is drawn from active participants of TravelChain upon principle of delegated democracy. It is made up of representatives of inside communities, companies, corporations, teams, and competent activists. The committee receives no pay for its activities..

The committee manages economy parameters of blockchain without restart of chain of blocks:

- fee structure: establishes more than 40 various parameters of fee;
- worker budget: establishes the amount of available fund for digital development;

Committee members can be recalled at any point in time either in part or in full in the same way as the delegates if they do not meet interests of community any more.

/ Voting

Each user can take part in voting to manage:

- Number of delegates in the network;
- Number of committee members in the network;
- Distribution of Digital Development Fund;
- Adoption of any decisions put forward for a general vote of community members;

Each delegate (witness) or committee member can be voted for only once and then - at any time - suspend one's vote. Degree of influence of a voter depends on how many TravelTokens at stake this user has in the net.

Voting for distribution of digital development fund may depend on user's stake in the network where, besides casting vote for a proposal, a user can vote against the proposal. Interests of people who vote for or against a proposal are therefore balanced out to resolve any issues arising in the system.

/ Operation and fees

Each action taken in TravelChain is rewarded by regulated fee in TravelTokens. The fees are regulated by economy observers without stopping or restarting the network. The fees can be used across a wide spectrum: from covering the cost of account creation to publication of a kilobyte of information.

The fees paid in TravelTokens are directed to reserve fund of community. The fees paid in personal assets of users are directed to asset's fee fund and can be withdrawn by those who have technical right for doing so (owner of the asset).

Market - these operations enable creation of decentralized market between two random assets.

`limit_order_create` – operation to create a limit order;

`fill_order` – operation to fill out an order;

`limit_order_cancel` – operation to cancel a limit order;

Assets – enable to create and manage UIA and MPA assets.

`asset_create` – operation to create a new asset;

`asset_update` – operation to update a private asset;

`asset_update_bitasset` – operation to update additional parameters of MPA;

`asset_issue` – operation to issue UIA;

`asset_reserve` – operation to reserve an asset;

asset_fund_fee_pool – operation to refill private fund of asset's fees;
asset_claim_fees – operation to claim fee from asset's fund;
asset_settle – operation to settle a market asset;
asset_global_settle – operation of a forced shutdown of market by the asset's owner;
asset_update_feed_producers – operation to update list of producers of MPA price feed;
asset_publish_feed – operation to publish asset's price feed;

Transactions

transfer – operation to transfer funds;
override_transfer – operation of a forced transfer of funds (if allowed);
transfer_to_blind – operation to transfer funds to a private account;
transfer_from_blind – operation to transfer funds from a private account;

Decentralized administration

witness_create – operation to create a witness;
committee_member_create – operation to create a committee member;
worker_create – operation to create a worker;
committee_member_update_global_parameters – operation of the block-chain global parameters update;
witness_update – operation to update a witness;
committee_member_update – operation to update a committee member;

Managing permissions to withdraw funds from account to account

withdraw_permission_create – operation to withdraw funds;
withdraw_permission_update – operation to update withdrawal of funds;
withdraw_permission_delete – operation to delete the withdraw permissions;

Accounts

account_create – operation to create an account;
membership_annual_fee - fee for an annual membership;
membership_lifetime_fee - fee for lifetime membership;
account_transfer – transfer of account's ownership rights to another owner;
account_update – operation to update an account;

Vesting

vesting_balance_create – operation to create a vesting balance;
vesting_balance_withdraw – operation to withdraw vesting balance;

Proposal operations

proposal_create – operation to create proposed construction of transactions;
proposal_update – operation to update proposed construction of transactions;
proposal_delete – operation to delete proposed construction of transactions;

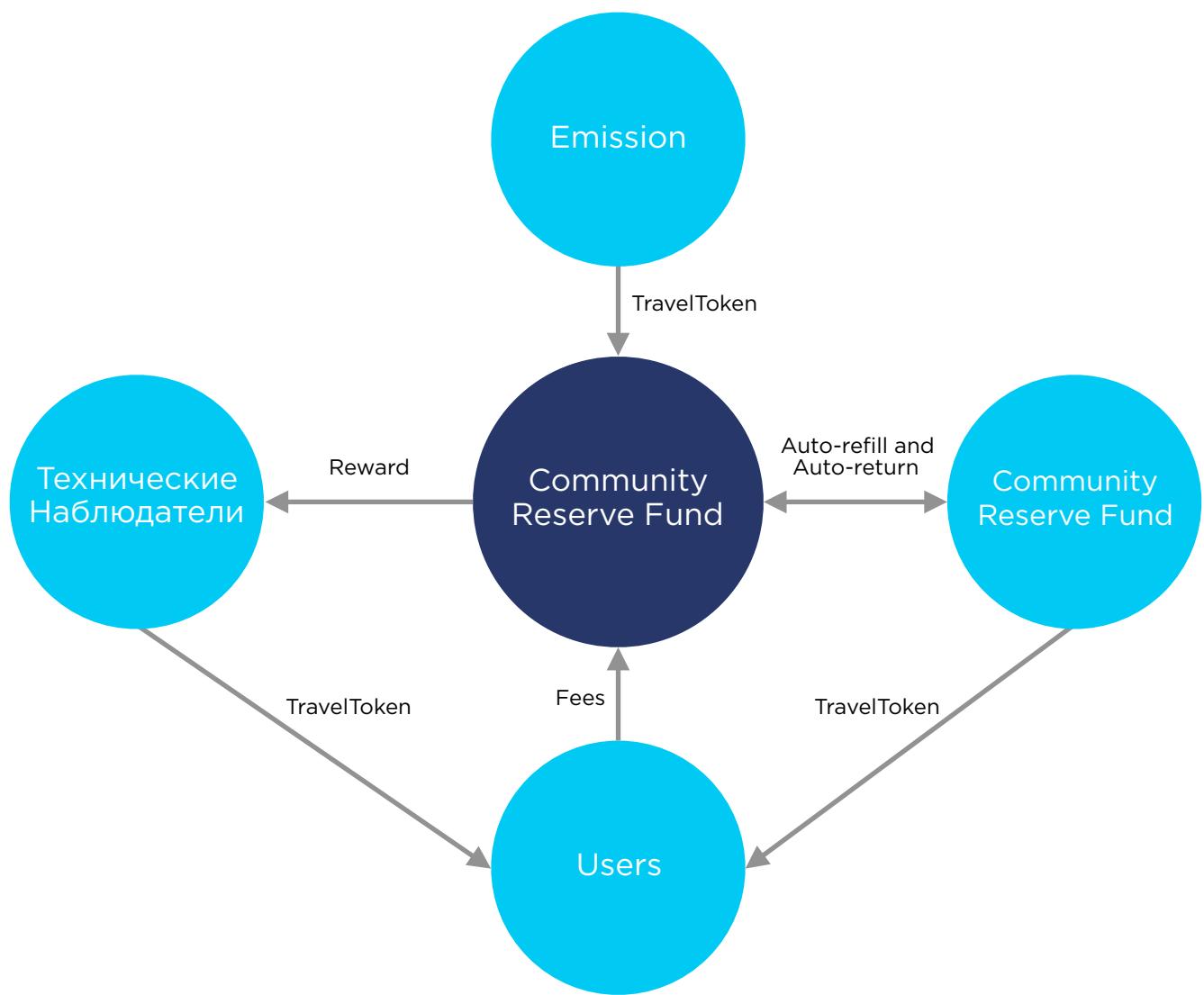
Miscellaneous

custom - random operation which allows to record any information into blockchain;
balance_claim - cost of a request for an initial balance of blockchain; used only once while launching working net;
assert - operation to validate inner state of blockchain.

/ Issuing and Digital Development Fund

Issuing is set up at a fixed value of 10% per year. Total issuance goes to the reserve fund of community and remains under its management. This reserve fund provides payments for the daily fund of digital development and also payments to delegates.

Annual 10% issuance of coins allows to involve additional leverage for development but is not critical for participants who received TravelTokens earlier. Due to the fact that TravelTokens are regularly contributed to the development fund and used effectively, the number of users increases and in result demand for data and TravelTokens grows.



Targets for expenditure of digital development funds are set up by the committee but community is not obliged to abide by them. Rewards are paid from the daily pool which is totally under control of the community and is subject to vote. Unused coins of digital development fund are returned daily to the reserve fund.

The fund for digital development must create flexible conditions for the development of TravelChain ecosystem. Participants can independently offer development tasks with a defined schedule of payments and ask community approval for these tasks. The committee can offer its own venue for development and seek resources from the community.

Prime offer of TravelChain committee for use of digital development fund is to stimulate collection of user data via developers of applications. A detailed summary of this proposal will be presented to the community at the time of issue launch planned for Q1 2018.

Due to the fact that TravelTokens make their way from daily digital development fund to users and the latter perform operations on the platform subject to fees, TravelTokens with time go back to the community reserve fund thus enabling continued performance of economic system.

/ Vesting and Genesis

Vesting represents rules laid down of user balance issuance. Vesting guarantees linear distribution of balances and does not permit changing this rule after launch.

Parameters of vesting:

begin_timestamp – vesting begins at the time of TravelChain working net launch;

vesting_duration_seconds – duration to be indicated before launch of working net and depends on many factors;

begin_balance – participants to PreTokenSale and the team have unchangeable vesting balances in TravelTokens according to distributed stakes;

Participants of Token Sale are not concerned with vesting.

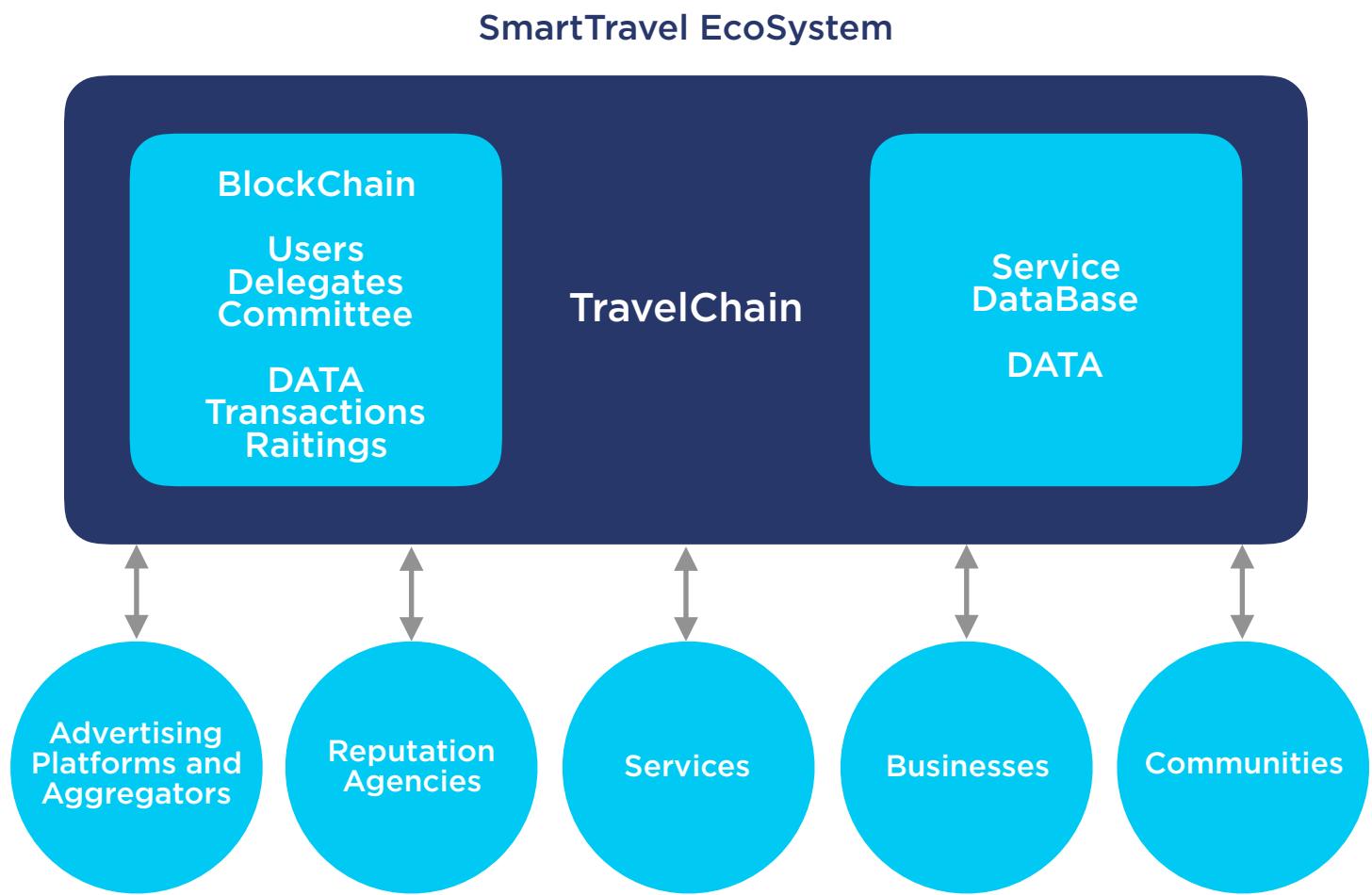
Rules of vesting are set out in blockchain genesis-block which is formed by the team before TravelChain working net is launched. It contains:

- Total number of TravelTokens in the economics;
- Accounts and public keys of TravelChain users;
- Vesting-balances of all TravelChain users;
- Accounts and public keys of initial delegates of TravelChain;
- Accounts and public keys of initial committee members of TravelChain;
- A set of fees in TravelChain;

Genesis-block is formed only once, the procedure of whole-system vesting is not repeated.

/ Architecture

Component parts of TravelChain architecture can be presented as follows:



/ Road map

Stage 1. Token Sale.

Time: December 2017.

Target: Raise up to \$10.000.000 for design and development of TravelChain.

Launch of TravelChain testnet;
Launch of MVP TravelChain;

Setting up of working group with industry representatives for introduction of TravelChain;
Token Sale;

Stage 2. Preparation for TravelChain launch.

Time: January 2018.

Target: Preparation for launch of TravelChain working net.

Design of basic standards for storage of tourism data at TravelChain platform;

Launch of block-explorer;

Launch of basic functional at TravelChain.io platform;

Stage 3. Launch of working net.

Time: February 2018.

Target: Launch working net of TravelChain, and offer an opportunity for initial developers to design their applications.

Formation of genesis block;
Launch of working net;

Access to the stock market;

Публикация документации использования TravelChain;

Stage 4. Preparation of tools for collection of information.

Time: Q1-Q2 2018.

Target: Preparation and launch of collectors of information.

Introduction of additional operations and plug-ins for TravelChain;

Mobile application for TravelChain with wallet function and function of data collection and control;

Plug-in for Chrome;

Widget JS for introduction into partner sites;

Stage 5. Integration of partners.

Time: Q2 2018.

Target: Integration of strategic partners from tourist sector.

Expansion of ontology as regards partner requests;
Introduction of widgets into partner sites;
Profound integration of partners;

Stage 6. Establishment of developer community.

Time: Q2 2018.

Target: To establish a community of developers ready to introduce TravelChain into existing projects or create own ones.

Create expanded documentation;
Establish community of developers;

Stage 7. Distribution of coins and critical mass.

Time: Q2-Q3 2018.

Target: Distribution of tokens through ecosystem projects, team of developers and active users for recruitment of critical mass of participants.

Launch of labour fund;
Emission launch;
Recruiting 100 000 users;

Stage 8. Infrastructure for scaling.

Time: Q1-Q2 2019.

Target: Working out infrastructure solutions for scaling TravelChain.

Creation and introduction of infrastructure solutions for scaling the ecosystem;

/ Use case of TravelChain and TravelToken

For instance, community and economy managers of the market discuss what is to be done for TravelChain development in the near future. They take decisions as to what types data are to be delivered to the blockchain.

Eventually they agree to subsidize **GPS coordinates of users**. An account is set up on the platform with TravelTokes allocated from digital development fund.

After this, the account owner can create MPA (Market Pegged Account) – a smart contract which makes it possible to get a new asset linked to the value of information. For instance, GPSToken. Then **GPSToken becomes the principal currency in circulation** at market exchange of GPS data.

Any GPSToken can freely circulate within this market – be exchanged for services, spent within an application; exchanged for TravelToken. GPSTokens can be used by data owners, applications and services.

How is it going to happen after all?

1) While working with an application a user makes a note in settings permitting to share GPS coordinates. **Applications motivate the user to share data** – providing reward in GPS tokens or in currency of this application – for instance, points or game coins.

2) The number of users grows reaching hundreds of thousands of people. **Their data present interest for commercial companies**.

3) **Advertising networks can buy access to these GPS coordinates, exchanging TravelTokens for GPSTokens at the inside market and use them to achieve goals of businesses**. For instance, **to show advertisement of a restaurant or a shop to a person who is nearby at the moment**.

It is important that a user should be content with this advertisement and does not perceive it as a spam. A price was agreed previously for reception of advertising messages from companies. In result the user receives via smartphone not only a personal offer but also a reward.

There can be plenty of these examples for all types of data to be collected about the user.

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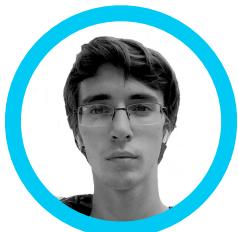
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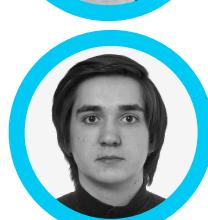
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