



D3ledger.com

A Decentralized Financial Infrastructure for Crypto Assets

Erasing the differences between crypto
and traditional financial assets

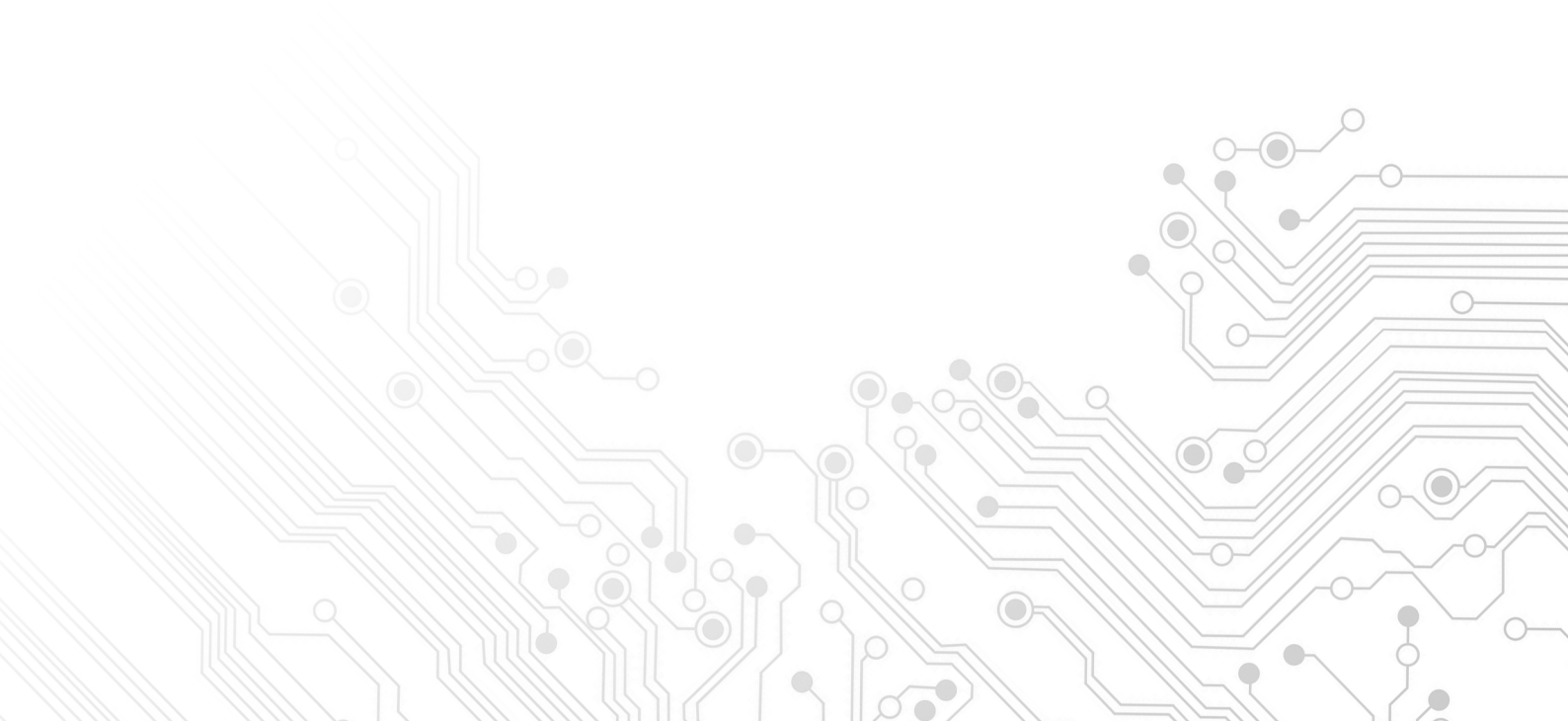


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Introduction

This document is intended for financial market players and infrastructure organizations as an introduction to cost saving and risk management possibilities in both crypto and classical assets markets. D3ledger offers comprehensive solutions in those areas and enables financial institutions to safely and reliably work with crypto assets of any kind within a single user account.

Institutional players, such as banks or stock exchanges, usually avoid working with crypto assets¹ due to the legal ambiguity and compliance risks mostly associated with them, as well as other problems that had been solved for traditional markets long ago.

The evident interest of established financial players to the new world of crypto assets has justified the search for a solution establishing a link between the traditional and crypto economies. D3ledger believes it is technically possible and feasible to create a shared decentralized infrastructure that would provide high-end safekeeping, settlement, compliance, and asset servicing functionality for cryptocurrencies, tokenized fiat, security tokens, and other crypto assets, no matter what they might be. If crypto is the new stocks market, D3ledger is the bridge that ties those two worlds together.



¹ Pieters, J. (2018, February 2). Dutch Banks Refuse Accounts for Cryptocurrency Businesses. Retrieved October 8, 2018, from <https://nltimes.nl/2018/02/02/dutch-banks-refuse-accounts-cryptocurrency-businesses>

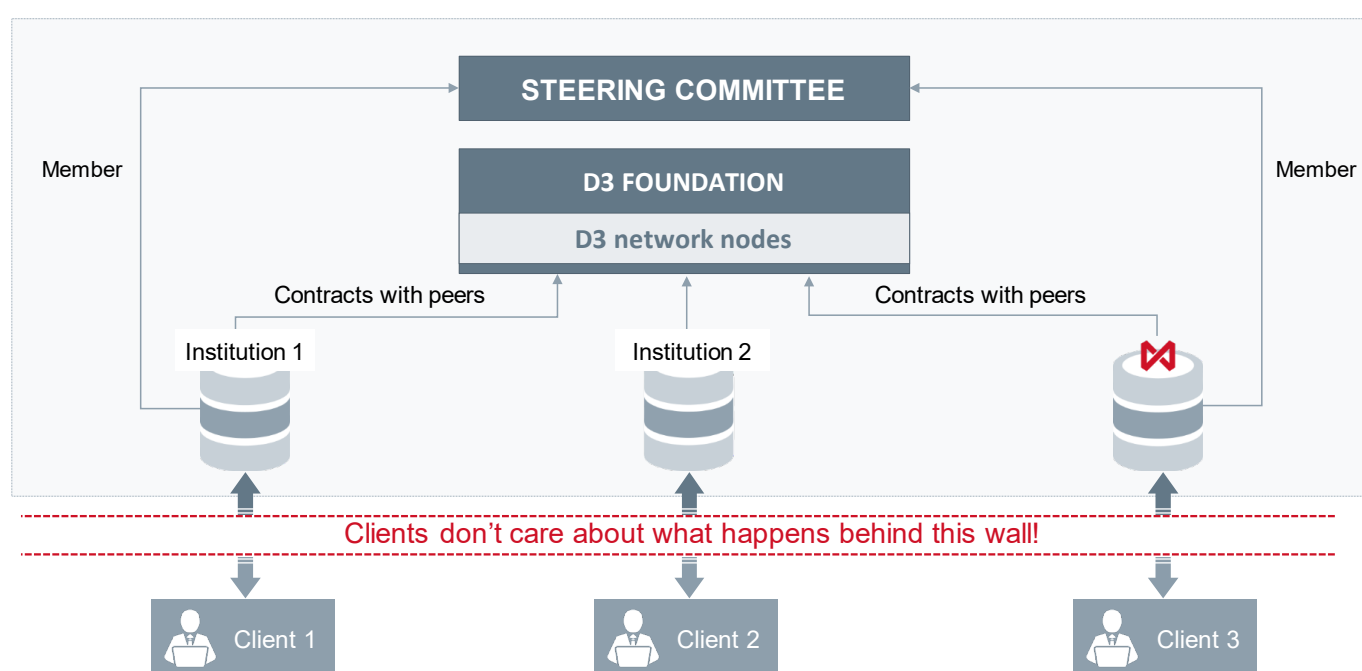
Summary

D3ledger (Decentralized Digital Depository) is a decentralized financial infrastructure that enables market participants to safely work with all kinds of crypto and traditional financial assets while benefiting from well-founded legal basis, explicit regulatory compliance, and clear governance arrangements.

D3ledger uses distributed ledger technology to provide safekeeping, settlement, and asset servicing functions accessible without any intermediaries. Such architecture guarantees the high level of robustness and reliability.

D3Ledger enables access to all kind of crypto assets, including crypto currencies, utility tokens, security tokens, tokenized fiat, and tokenized securities. Bank connections and tokenization are provided by a network of partners, including depositories, in established financial centers.

The D3ledger infrastructure can be used for work with crypto and traditional financial assets by professional market players, banks, exchanges, wealth management funds and other financial institutions, as well as institutional investors, family offices, and high net worth individuals.

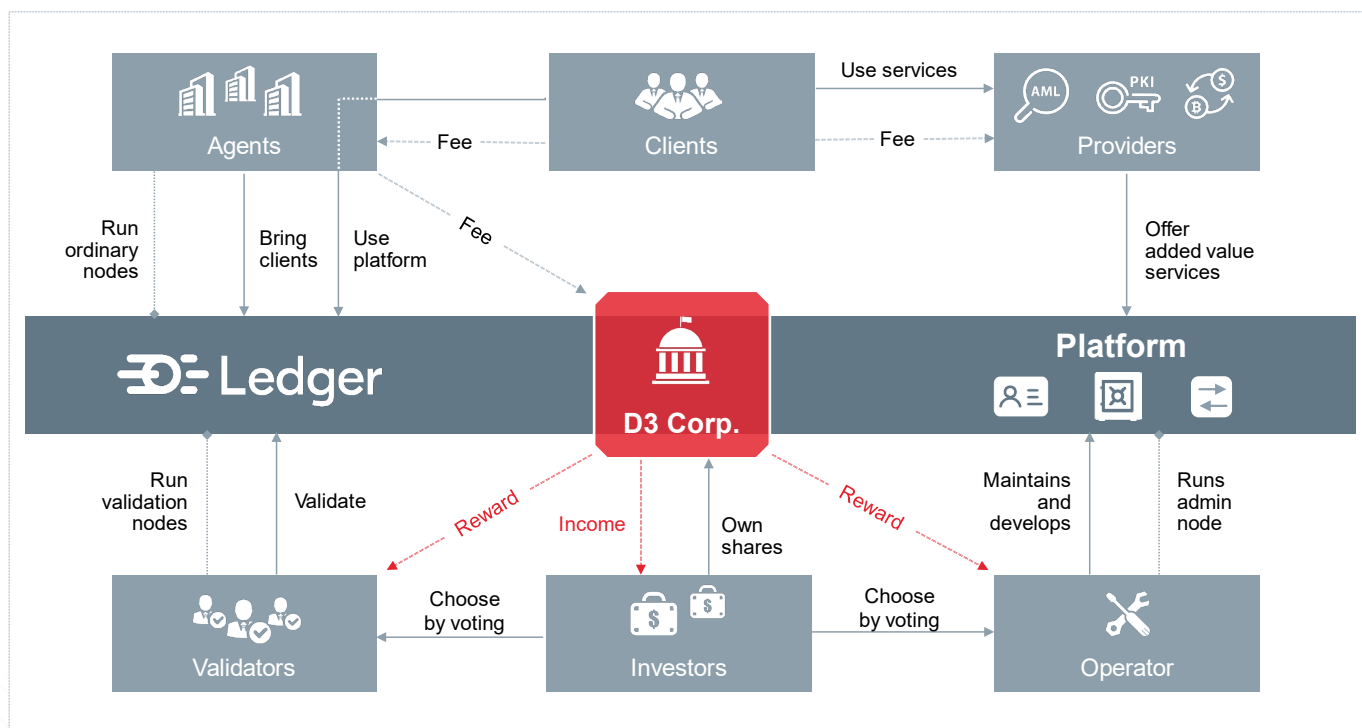


Clientele

D3ledger acts as a secure gateway between the traditional and blockchain-powered ecosystems for the established part of the financial world. Our mission is to ensure a safe and reliable way for banks, stock exchanges, wealth management funds, family offices, and other kinds of financial institutions to work with crypto assets.

D3ledger offers them a new infrastructure for asset servicing and safekeeping that also acts as a settlement and compliance provider.

Those services are enabled thanks to the partnership with central depository systems in major financial jurisdictions, so they have the full power of today's financial markets behind their back. Those partnerships are to take the form of a consortium that would help the clients to stay relevant in the emerging blockchain economy.



Features and Functionality

The D3ledger ecosystem offers several functional advantages to its customers that cover the full scope of activities undertaken with crypto assets.

Universal account. All trading operations with crypto and traditional financial assets can be conducted within a single account connected to numerous depositories and other kinds of financial institutions. It is an environment where the client can access numerous crypto assets, tokenize their own assets, trade, exchange, and operate them.

Full control. All assets of the client are stored in one place, and the client is the only one controlling them. D3ledger acts as a decentralized depository for organized markets, and the client can operate their assets without withdrawing them from the system.

Multi-leg settlements. The system ensures risk-free settlements and delivery versus payment (DVP) settlements. However, unlike traditional DVP, D3ledger offers a decentralized environment which completely eliminates minimal risks associated with the DVP model. Additionally, parties can exchange several assets in one go, and the number of possible participants is not limited to two. This feature also works as an execution mechanism for settlements with third-party exchanges.

Asset servicing. D3ledger offers an environment for holders of various assets where they can realize their rights via conducting corporate actions, such as voting, repurchasing or splitting stocks, dividend payouts, different kinds of reorganization and cancellation of shares, and distributions, among others. Clients can work with different assets and rights in tokenized form from their universal account.

Safekeeping. The employment of blockchain tech ensures the availability of numerous additional layers of security for asset safekeeping, such as Threshold Signature, a multisignature system that requires several lower-level multisignatures for the transaction to become effective. This access mechanism ensures that any movement of funds is duly authorized, and excludes possible errors or theft. The system operates security tokens that implement corporate actions.

The Ecosystem and User Roles

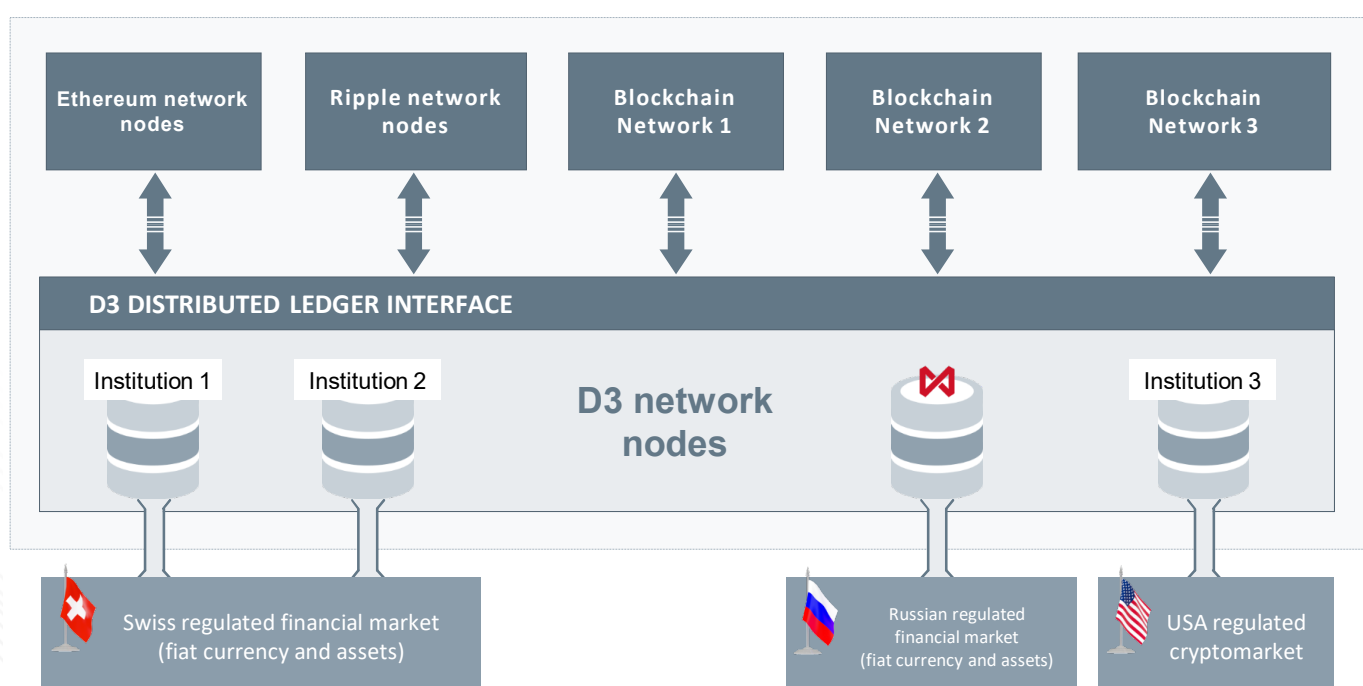
The D3ledger ecosystem is all its participants listed below, as well as D3 Foundation.

D3 Foundation is the governing entity for the entire ecosystem where all network nodes have equal voting rights.

Customers can be both individuals or companies, such as investors, banks, payment processors, or stock exchanges. They generate and keep their private keys that have certificates issued by a certification center, which is a special entity recognized by other D3ledger customers involved in the transaction requiring said keys. In most cases, customers have to run operations on D3ledger by accessing the nodes run by D3ledger partners.

Depository partners are third party companies and financial institutions running a full D3ledger node, as well as the nodes of associated blockchains. They also can initiate an internal transaction, as well as a deposit / withdrawal transaction via a decentralized link. Notably, a customer may be a full partner as well, and in that case they run all their operations through their own node.

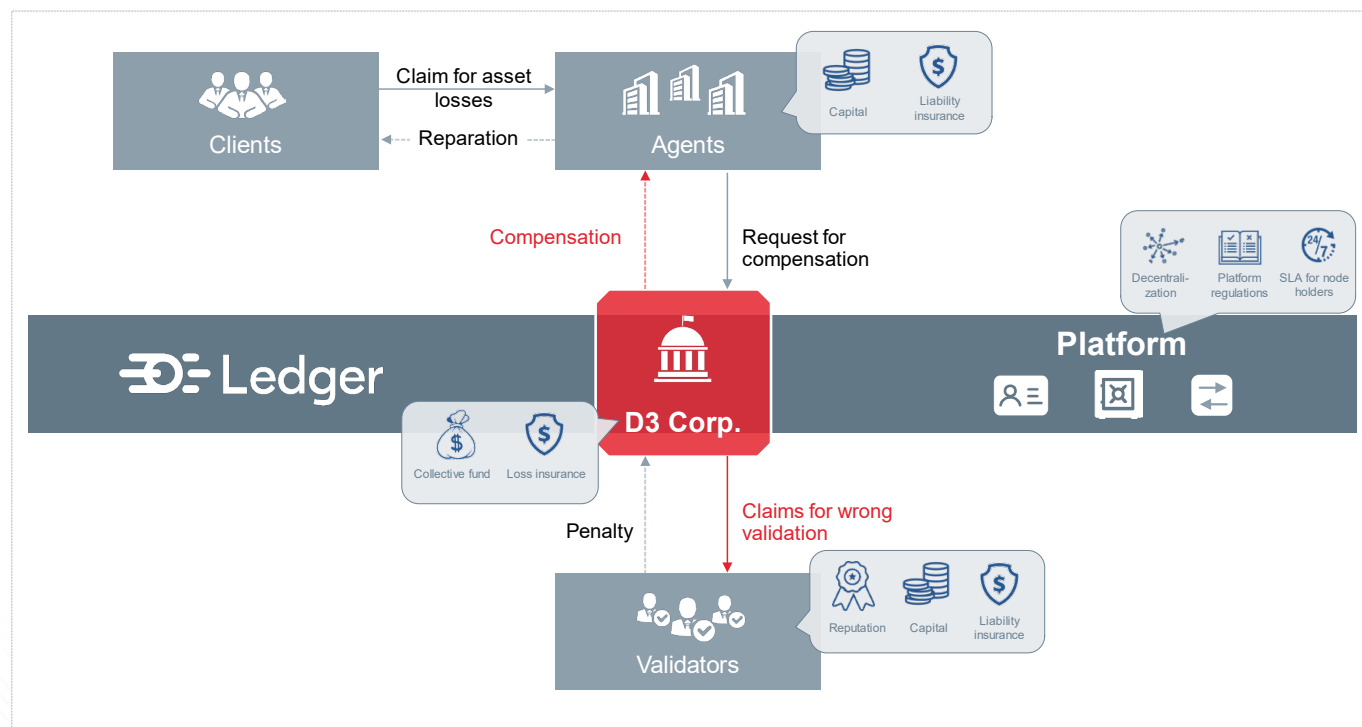
A D3ledger customer can change a D3ledger partner that handles their transactions at any time, or use the services from several partners at once.



Corporate Governance

D3 Foundation has the governing function in the D3ledger ecosystem, including setting out network rules, acting as a mediator or an arbitrator in case of dispute resolution, imposing penalties for dishonest behavior, ensuring the finality of transactions, updating the system's legal framework and software, and making sure nodes are legally bound to carry out transactions.

Parties wishing to join the D3ledger ecosystem have to comply with the rules set forth by the D3 Foundation. All nodes in the system have equal voting rights and a grant their owners a share in governing the foundation. They vote to elect a Steering Committee, a managing board that makes the decisions, and the Foundation is bound to enforce them.



Technology

The technology employed in the D3ledger Platform ensures the seamless operation of crypto assets on and between different distributed ledgers. Specifically, it features the following components.

D3ledger Mainchain is a blockchain ledger based on Hyperledger Iroha¹ system incorporating YAC², a variation of the chain-based Byzantine Fault Tolerant (BFT) consensus protocol. The system uses the network of nodes that interact with each other in order to validate transactions within the ecosystem and perform other functions.

A D3ledger node can operate in three modes: it can validate transactions according to the network rules; it can charge fees for transactions; or it can ensure other nodes operate honestly, and impose penalties on them should they fail to act so.

In any case, a node requires a certain amount of assets in order to operate. This amount doubles every time four new nodes join the network.

Distributed Identity is an example of self-sovereign identity^{3,4} with multi-layer support for structured legal entities and their employees. According to the Decentralized Identity Trilemma⁵ none of the existing solutions can be privacy-preserving, Sybil-resistant and self-sovereign at the same time. While the trilemma is true, it concerns only individuals, not legal entities, and therefore is not applicable to D3ledger. For that reason, the distributed identity mechanism can preserve privacy, ensure self-sovereignty, and be Sybil-resistant at once.

Two-way peg mechanism incorporated in D3ledger acts as the means of interacting with other blockchains⁶ and distributed ledger systems. This mechanism allows one to “move” assets to other blockchains and back by locking the assets on the original blockchain in an escrow and releasing the equivalent assets on the target blockchain.

Pseudonym management service is a special system for managing the pseudonyms of D3ledger participants required to fit within the existing account structure. The service can also implement whitelisting options to filter out assets banned in a particular jurisdiction, and thus transparently block unwanted transactions.

1 Hyperledger Iroha. Retrieved October 8, 2018, from <https://www.hyperledger.org/projects/iroha>

2 Zhang, J., Wang, Y., & Liu, D. (2017). Yac: Yet another distributed consensus algorithm. *Journal of Computer Applications*, 37 (9) (2524-2530), 2524-2530, from <https://arxiv.org/abs/1809.00554>

3 Der, U., Jähnichen, S., & Sürmeli, J. (2017, December 5). Self-sovereign Identity – Opportunities and Challenges for the Digital Revolution. Retrieved October 8, 2018, from <https://arxiv.org/ftp/arxiv/papers/1712/1712.01767.pdf>

4 Lewis, A. (2017, May 17). A gentle introduction to self-sovereign identity. Retrieved October 8, 2018, from <https://bitsonblocks.net/2017/05/17/gentle-introduction-self-sovereign-identity/>

5 Laskus, M. (2018, August 13). Decentralized Identity Trilemma. Retrieved October 8, 2018, from <http://maciek.blog/decentralized-identity-trilemma/>

6 Back, A., Corallo, M., Dashjr, L., Friedenbach, M., Maxwell, G., Miller, A., Wuille, P. (2015, October 22). Enabling Blockchain Innovations with Pegged Sidechains. Retrieved October 8, 2018, from <https://blockstream.com/sidechains.pdf>

Roadmap

Alpha 1.0 Release: Q3 2018

Full support of Ethereum and ERC20 tokens, depositing of Bitcoin, multisignature D3 accounts, atomic exchange of assets inside the system, whitelisting for withdrawal addresses.

Beta 1.0 Release: Q1 2019

Full support of Bitcoin, push and email event notifications. Additional security measures — limiting size and time delays for transactions etc, journal of events. Portfolio estimation in fiat money. Statement of holdings.

Beta 2.0 Release: Q3 2019

Significantly extended list of supported cryptocurrencies. D3 nodes for access only (without having to validate transactions). Extended reporting functionality. Integration with personal security devices. Certification of the platform.



Leadership Team



Makoto Takemiya
Investment Relations
Co-Founder at Soramitsu
and Sora



Alexander Yakovlev
CEO
15 years in IT, 8 years in fintech



Artem Duvanov
Chief Architect
20 years in IT,
Head of Innovation at NSD



Ryu Okada
COO
CPA, Former Deloitte,
Co-founder at Soramitsu



Ales Zivkovic
CTO
Former Innovation Officer at
NKBM, CTO at Soramitsu Labs

Advisers



Urs Sauer
40+ years in finance. Senior
Product Development Manager
at SIX Securities Service



Rok Šketa
Chief Technology Officer
at KDD



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