EVEN DEX: fast and secure decentralized exchange

Project status: Prototype launch on QIII, 2018

Table of contents

Introduction

The rapid development of the blockchain technology throughout the world has significantly affected the evolution of functionality for a number of industries. First of all, the changes affected the financial sector. The emergence of the possibility of decentralized data storage and the creation of services that operate via smart contracts have ensured the influx of users to the cryptocurrency market and the opportunity for exponential growth of the industry as a whole.

Against the backdrop of the rapid growth of the market, the shortcomings of existing solutions have become more evident: the closure of a number of exchanges (for example, MtGox, BTC-e) trading in cryptocurrencies and having centralized control, the lack of transparency of processes and, as a consequence, the impossibility of an objective assessment of the default risks of the exchange for traders.

In this regard, one of the urgent tasks in the field of crypto-trade and the field of financial technologies is the creation of tools that can ensure the safe storage and management of the funds of its participants when working in an untrusted environment. Its solution is achieved through the use of blockchain technologies. The concept of the EVEN DEX decentralized crypto exchange is based on transparency and security. Unlike the first generation of decentralized exchanges (hereinafter DEX gen.1), which failed to gain a critical mass of users due to lack of necessary services and a number of technological limitations (such as low transaction speed combined with insufficient liquidity provision), EVEN DEX has all the necessary tools for professional trading, where the speed of transactions is comparable to centralized exchanges.

The exchange is implemented on the basis of the EVEN blockchain platform. The EVEN platform is a powerful tool for creating services and products intended for practical application in the field of financial technologies. The platform is developed by the EVEN Foundation team, which focuses on solving the problem of the secure storage of funds and creating a decentralized crypto exchange, which by its characteristics exceeds all previous solutions in this area.

The EVEN DEX exchange is the first service to be launched on the EVEN platform. In the future, the EVEN Foundation team plans to develop additional financial services on the basis of the EVEN platform and provide such an opportunity to all comers; for this, the platform will integrate the ability to write smart contracts, as well as a full API, to retrieve information from the outside world and record it in a chain of blocks, as well as sharing data from blockchain into the outside world.

This document provides information regarding which technologies and algorithms will ensure the speed and safety of the exchange, the rights, roles, principles of monetization and benefits for participants, the main stages of development and fulfillment of the requirements required to avoid repetition of errors of previous decentralized exchanges projects, and project participation conditions for investors.

Keywords: blockchain, cryptocurrency, exchange, decentralized, EVEN, storage, deposit, node, masternode/.

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1. Market analysis

1.1. Review of existing stock exchanges

Today, exchange trade is represented by the classical stock market (stock and securities market), as well as the forex market and the cryptocurrency market. The number of exchanges totals about 400 websites. 170 exchanges specialize in cryptocurrencies. The top-50 exchanges for more than 95% of the total trading volume[1]:

№	Exchange groups	The range of trading volumes in groups (24h/$)		The amount of trading in groups of exchanges*(24h/$)		Turnover share(%)		Exchange market growth(24h/$)
		as of 25.09.2017	as of 11.01.2018	as of 25.09.2017	as of 11.01.2018	as of 25.09.2017	as of 11.01.2018	
1	1 - 10	60 000 000 - 300 000 000	1 000 000 000 - 5 900 000 000	1 474 100 000	25 145 801 269	70,3	75,1	x17
2	11 - 20	20 000 000 - 60 000 000	200 000 000 - 900 000 000	357 968 750	4 791 151 082	17,1	14,3	x13
3	21 - 30	7 000 000 - 20 000 000	120 000 000 - 220 000 000	120 875 000	1 628 252 080	5,8	4,9	x13
4	31 - 40	3 500 000 - 7 000 000	50 000 000 - 120 000 000	58 975 000	786 026 981	2,8	2,3	x13
5	41 - 50	2 500 000 - 3 500 000	35 000 000 - 50 000 000	35 023 000	425 659 326	1,7	1,3	x12
6	51 - 60	1 500 000 - 2 500 000	20 000 000 - 35 000 000	23 325 000	250 684 671	1,1	0,7	x10
7	61 - 70	1 000 000 - 1 500 000	15 000 000 - 20 000 000	13 212 500	163 964 541	0,6	0,5	x12
8	71 - 80	500 000 - 1 000 000	10 000 000 - 15 000 000	7 012 000	114 977 176	0,3	0,3	x16
9	81 - 90	300 000 - 500 000	6 500 000 - 10 000 000	3 962 500	78 991 528	0,2	0,2	x20
10	91 - 100	100 000 - 300 000	4 500 000 - 6 500 000	2 250 000	52 328 355	0,1	0,2	x23
11	101 - 110	50 000 - 100 000	2 000 000 - 4 500 000	706 250	34 215 128	0	0,1	x48
12	111 - 120	20 000 - 50 000	1 000 000 - 2 000 000	312 500	15 598 019	0	0	x50
13	121 - 130	15 000 - 20 000	700 000 - 1 000 000	162 500	9 178 762	0	0	x56
14	131 - 140	2 500 - 15 000	150 000 - 700 000	81 250	3 205 587	0	0	x39
15	141 - 150	1 000 - 2 500	40 000 - 150 000	22 500	797 539	0	0	x35
16	151 - 160	0 - 1 000	6 500 - 40 000	3 750	169 589	0	0	x45
17	161 - 170	0	0 - 3 500	0	6 643	0	0	-

Two types of exchange websites currently trade cryptocurrency assets: centralized (CEX) and decentralized (DEX).

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[1] Source: https://coinmarketcap.com/exchanges/volume/24-hour, data from 09/09/2017 and 11/01/2018

1.2. Centralized exchanges (CEX)

Centralized exchanges (CEX) were formed in the initial stage of the emergence of the cryptocurrency industry: the first exchange MtGox.com was founded in 2010 for trading bitcoins.

Today, many CEX users misrepresent the flow of traded and purchased funds, since the purchase and sale of cryptocurrency between members of one exchange does not mean the transfer of ownership of the asset from one participant to another. For example, a user purchased USD on CEX and afterwards used it to buy BTC. It is important that both currencies were issued by the same exchange, while users are actually operating virtual accounts, but they are not the real owners of the assets that they transferred to the exchange accounts. In this case, only the exchange determines the fee amounts at each stage, which data and which transactions to record in history or the back-office.

There are cases when the stock exchanges did not have the necessary funds to fulfill financial obligations to the owners of virtual accounts. Many centralized exchanges were simply not ready for the recent influx of users, which led to major system failures and attracted the attention of hackers. In connection to this, there were a number of system failures, such as the Bitfinex hacking, which caused thousands of users to lose their savings (until they were reimbursed later on).

Due to the inability of centralized exchanges to provide adequate protection of users' funds, despite their easy accessibility and ease of use, since 2014, projects began to appear that set themselves the goal of solving the inherent problems in centralized exchanges through decentralization. This became possible with the use of smart contracts, which allow you to make it more explicit in the terms of the fulfillment of the obligations of each of the parties without the participation of a centralized intermediary and to exchange tokens.

1.3. Decentralized exchanges (DEX)

Decentralized exchanges presume security and transparency. They do not rely on third-party services to store user funds: funds are stored by the user in their personal ewallet, not from a third party, but by peer-to-peer transactions through an automated process. Decentralized exchanges can also provide better confidentiality while at the same time reducing the risk of server inaccessibility, although only for more technically advanced users.

The decentralized exchanges on the market can be divided into several groups, each of which has a number of significant shortcomings.

№	Group	Feature
1	Fast with centralized gateways	All the operations take place on blockchain, most often running on algorithms that do not require significant network capacities. In this case, the actual provision of currency occurs using centralized gateways. The currency of traders is entered and derived through the centralized gateways, which means that the external impact on such a gateway can lead to devaluation of

		actual assets.
2	Decentralized slow	Solutions based on Ethereum smart contracts or the mechanics of Multisig signatures 2 out of 3 based on Bitcoin provide high security for cryptocurrency transactions. However, such solutions can hardly be called the Exchange, because they can not be used for professional trading because of unacceptably low transaction speed.

To date, there are several DEX exchanges, some of which have already been launched and some of which are under development. All exchanges have decentralization to some extent, but to date no exchange working with several cryptocurrencies has the decentralized storage of funds with software arbitrage, or has the ability to conduct transactions at high speed.

1.4. Market size

The volume of the Forex market for 2017 is about $ 5.3 trillion per day, 5.5% of which is for retail and 94.5% for financial institutions (including 21% for Deutsche Bank).

7 of the 170 traded currency pairs account for about 85% of transactions, with 90% of the trades involving a pair with the dollar.

Geographically, about 60% of transactions are made in the UK (41%) and the United States (19%).

The volume of the Forex market is comparable to 4% of world GDP or X53 trading on the New York Stock Exchange, or X12 of the futures market, or X27 of the stock market and securities.

The high demand for trade in cryptocurrency, as well as the similarity of trading on Forex and crypto exchange markets, has provided the beginning of the integration of markets where a number of Forex brokers are already working with bitcoin and altcoins:

№	Name	Website
1	Plus500	https://www.plus500.com
2	Etoro	https://www.etoro.com
3	IG	https://www.ig.com
4	AdmiralMarkets	https://admiralmarkets.com
5	Avatrade	http://www.avatrade.com
6	Trade	https://www.trade.com
7	Easymarkets	https://www.easymarkets.com
8	XTB	https://www.xtb.com
9	UFX	https://info.ufx.com
10	Global-FX	https://global-fx.com

According to Google Trends, since May 2017, search engines have had more requests for Bitcoin trading than requests for trading gold or oil.[2]

Nevertheless, the volume of trade in cryptocurrencies is currently only 33.5 billion per day (as of January 11, 2013), which looks rather pale against the backdrop of the volume of trades on traditional markets.

The main obstacles to the growth of the cryptocurrency industry today are the shortcomings of existing technologies that restrain the interest of users to cryptocurrencies as an instrument of currency trading.

About 70% of the volume of trade in cryptocurrencies is influenced by the top-10 centralized exchanges[3]:

№	Name	Country	Year	Turnover 24h/million$		Share of total turnover (%)	Growth in trading volumes on exchanges (24h / $)
				as of 25.09.2017	as of 11.01.2018		
1	Binance	China	2017	117,6	5 921,8	17,7	x50
2	Bithumb	South Korea	2013	298,0	4 598,7	13,7	x15
3	BitFinex	Hong Kong	2014	318,8	3 247,5	9,6	x10
4	OKEx	Hong Kong	2013	84,6	2 587,1	7,7	x30
5	Bittrex	USA	2014	230,7	2 490,5	7,4	x10
6	Huobi	Singapore	2013	40,2	1 463,4	4,3	x36
7	GDAX	USA	2015	74,9	1 330,4	3,9	x18
8	Poloniex	USA	2014	101,7	1 292,8	3,8	x13
9	Coinone	South Korea	2016	95,7	1 229,9	3,6	x13
10	Bitstamp	United Kingdom	2013	65,7	983,4	2,9	x15

Unfortunately, decentralized trading platforms are not so common yet, they lack the ease of use and general "user support" to attract a wider audience. Therefore, the liquidity and depth of the market on these exchanges are still quite low.

2. Limitations of existing solutions

2.1. Transaction speed

Until now, the focus of most projects that are developing decentralized exchanges was concentrated on excluding centralized management. In solving this problem, a very important point was omitted - ensuring a high transaction speed for traders. Transfers in currencies based on original algorithms are rather slow. In order to complete a transaction with Bitcoin, for example, it will take anywhere from 10 minutes to 1 hour. In the case of Ethereum, everything is somewhat faster, however, not fast enough for professional trading. Earlier, Ethereum announced its

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[2] Source: https://trends.google.ru/trends/explore?q=Trade%20Bitcoin,Trade%20Gold,Trade%20Oil

[3] Source: https://coinmarketcap.com/exchanges/volume/24-hour, data from 09/09/2017 and 11/01/2018

transition from the Proof of Work algorithm to Proof of Stake in the spring and summer of 2018, which can significantly accelerate its performance, but considering the direct dependence on the miners and investors, as well as the repeated change of terms, the implementation of PoS remains in doubt. It is also known that the transition will not be absolute, i.e. Proof of Work will continue to be used in some form, and this can, to some extent, affect the speed of the entire network.

For now, only the CEX exchanges can provide high speed transactions. The first generation DEX allows you to exchange crypto pairs either for a long period of time, or without guaranteeing the safety of funds, which significantly limits the target audience of users.

2.2. Users risks

According to a study by the University of Cambridge, «Analysis of the world's cryptocurrency market»[4], one of the main problems in large and small exchanges is security, and 73% of the exchanges control their customers' secret keys.

The second problem is the impossibility of fulfilling obligations on the part of the exchange with respect to the return of the cryptocurrency at a particular moment in time back to the user. Historically, many bankruptcies and defaults occurred because of the lack of financial and operational information and transparency for the participants.
The lack of financial and operational data in CEX does not allow users to correctly assess the value of the alleged risks and the exchange itself as a counterparty in general. As a result, they take economically unreasonable risks. In fact, they acquire services of a financial platform with the option of price-setting and order analysis, making money transfers and resolving disputes, buying / selling and storing fiat funds, working with debit cards and e-wallets, contacting customer support, etc.

2.3. Third party effect

The rapid development of the cryptocurrency market became especially noticeable in the spring of 2017. Regulators of many countries are unable to instantly react to a new economic component and are considering various approaches to the legislative norms, requirements and standards that participants will have to meet. Many countries are only at the stage of drafting bills, but regardless of the law, centralized exchanges will remain under the direct influence of third parties.

2.4. Low liquidity

Despite the high capitalization of cryptocurrency, before the traders can make a significant number of transactions on cryptocurrency markets, the liquidity problem must be solved.

Liquidity is defined here as the degree to which the market allows the purchase and sale of assets at stable prices. Lower liquidity leads to higher volatility (especially if large bids are placed), and

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[4] Source:
https://www.jbs.cam.ac.uk/fileadmin/user_upload/research/centres/alternative-finance/downloads/2017-global-cryptocurrency-benchmarking-study.pdf

this causes a more radical price change; At the same time, higher liquidity creates a less volatile market, and quotes do not change so significantly.

Today, money is the most liquid asset. If the transaction amounts to $1 million, then the market can easily absorb it without a significant change in the value of the dollar. Transaction costs, as well as the value of the currency at the time of the transaction, are also known in advance.

But the same transaction in bitcoins or any other cryptocurrency has a significantly greater impact on the value of the cryptocurrency. The absence of market liquidity is the main reason. The stock of cryptocurrency on a particular trading platform may decrease, so the buyer will have to complete the transaction with 1-10% above the original price. To make the same transaction for $1 million, you have to spend $10,000 or even $100,000 more than the original price.

Liquidity is not the only problem in the cryptocurrency industry, but it is a critical component for the development of the market. This provision of liquidity in the blockchain ecosystem of the detachment, and especially among the decentralized exchanges, will become a key factor in the formation of the "image" of the cryptocurrency as being a worthy way of safe currency trading.

Conclusion:

Centralized exchanges are easily accessible and are easy to use, however, they are not able to provide adequate protection for user facilities.

On the other hand, decentralized exchanges provide security for users, but they can not support fast transactions, liquidity and work with fiat, and thus are doomed to failure.

3. Solution

3.1. EVEN DEX decentralized Exchange

Unlike its predecessors, the **EVEN DEX** exchange has the tools for professional trading where the speed of transactions is comparable to centralized exchanges and may have the ability to trade marginally faster.

Transparency and security of **EVEN DEX** is achieved through the use of blockchain technologies: distributed masternodes that operate in a distrustful environment and decentralized collateral storage with protection from third-party exposure. The full consensus algorithm developed by the projects team allows you to make quick transactions with a high level of security.

In the framework of EVEN DEX, there are two types of participants forming a decentralized ecosystem:

1. A trader - a user that utilizes the platform to conduct transactions for the purchase/sale of a currency/cryptocurrency.

2. Masternode - a user that provides computing power for bidding, leaves a security deposit to protect traders' funds from misuse. In this case, the masternode can simultaneously be a trader, the masternode has access to all the functions that are available to the trader.
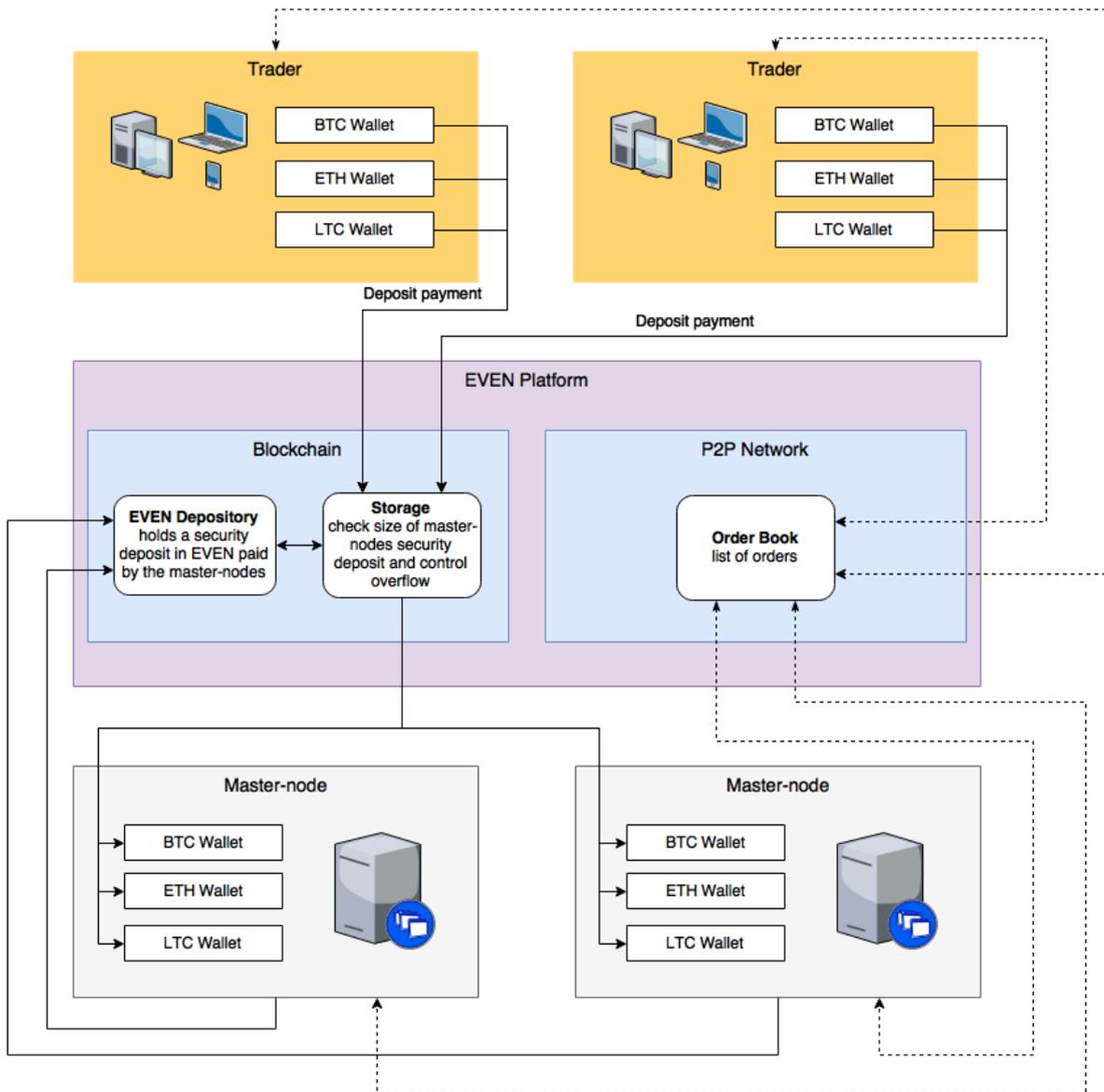
The scaling of the distributed network that is at the core of **EVEN DEX** will be carried out through the involvement of masternodes interested in new sources of income in the system. Miners or owners of computing power obtain a new way of earning, based on the concept of a masternode, which does not require significant graphics processor (GPU) powers, which makes it compatible with simultaneous mining based on the original algorithms.

EVEN DEX key features:
- absence of a single control center
- guarantee of traders' funds safety
- regulation of mutual payments at program level
- 100,000 operations/sec
- 0% transfer fee within the platform
- ~ 0,12% fee for order execution
- ROI up to 100% for the masternode
- 100+ tools for traders
- open-source code and API for external services

11

3.2. Functional features

3.2.1. Absence of a single control center

The EVEN DEX exchange does not have a single center (company, server, organization) that monitors customer data. Thus, targeted measures are not applicable to the funds stored in the system, and the rules embodied in the system guarantee participants' funds safety. This was made possible by the consensus algorithm, which regulates the mutual settlements between the decentralized chain of masternodes and network participants (traders) and protects against fraud from the masternode with the help of a security deposit.

Traders' funds that are added into the system are stored in the real masternode accounts. For example, in order to exchange bitcoins for ethereum, a user must wire funds to a bitcoin account, the private key of which is unknown to him, it is known only to the owner of this account, which is the masternode. To ensure storage of funds' safety, a special depository with collateral is used.

3.2.2. Storage of funds

When adding funds, the user in fact sends the funds not to any particular person, but to the accounts of the group distributed by the masternode. Each masternode can provide a list of cryptocurrencies, which it plans to conduct transactions with. For each specified currency on the side of the masternode, a blockchain of that currency must be provided and at least one account must be opened. The amount of currencies that can be stored on the masternodes accounts is limited and directly depends on the security deposit, which protects the trader's funds from masternode fraudulent activity.

3.2.3. Security deposit

The payment is made in EVEN tokens - a local currency, and operates on the basis of the hybrid EVEN Decentralized Security Deposit (DSD) consensus algorithm.

In order to start operating on the exchange, each masternode must make a security deposit, which is locked in the blockchain and can not be withdrawn back to the owner's account until all obligations to the network participants are met. As stated earlier, the volume of the storage (the maximum amount of money stored on the masternode) directly depends on the size of the security deposit. To exclude any risks associated with currency volatility, the amount of the security deposit is a multiple of the storage size, and when the EVEN rate changes, its size automatically changes. If an «overflow» of funds occurs in some of the master nodes, the funds are automatically transferred to the masternode account, whose repository has capacity to hold the specified amount, taking into account the changed market rate of the total amount of cryptocurrency stored in the masternode. And if the available volume of the network storage is exhausted, surplus funds are transferred back to the traders' accounts. Despite the fact that this situation is extremely unlikely, such protection is provided by the platform to ensure complete security of funds storage.

If one of the masternodes, does not fulfill its obligations to traders, in the time set by the system, a group of orders will automatically be added to the blockchain to exchange part of the withheld commission in the EVEN tokens with the currency that was available to the masternode. In this

case, if the masternode returns to the network and resumes its work, the amount of EVEN tokens retained will be returned, minus the transaction costs.

3.2.4. Masternode credit system

To expand the storage capacity and give masternodes the opportunity to increase profits from their activities, the system provides technical integration with classical financial institutions. This concept allows the masternodes to provide the data required for the verification of identity (KYC), apply for a loan, and, after the consideration of the financial organization of the application, receive an approved amount in the EVEN cryptocurrency. The mechanics will be distributed taking into account the geographic location of partner banks and masternodes, the owners of which are residents of this zone. The legal mechanics of lending, interest rates and regulation of payments are arranged as is customary in the classical scheme of bank lending.

3.2.5. Integration with brokers and liquidity aggregators

To expand the market depth and provide participants the best possible trade offer in the system, integration with liquidity providers is possible. At the same time, the liquidity provider in EVEN DEX acts as a trader. This means that in order to start working on the platform, the supplier must enter assets into the system and make trades for the amount of the available balance. External systems, including centralized exchanges, will be able to import the list of orders through API. In order to eliminate discrepancy between the amount of funds entered and the amount of liquidity provided, automatic sorting and filtering of the imported list will be performed, in accordance with the criteria that the liquidity provider will prefer.

To date, liquidity aggregators act as intermediaries between suppliers and liquidity consumers. Liquidity providers are mostly large centralized exchanges, and consumers are the smaller ones. This arrangement allows each party to benefit from the best rates by expanding the general audience and, as a result, expand the market depth.

At the same time, aggregators are forced to pay a security deposit to liquidity providers, and, in turn, demand liquidity from consumers of the same security to ensure fulfilment of their obligations. A security deposit is required, as a "virtual" exchange of assets takes place among the system participants, and the actual delivery of the requested funds, for the end user, occurs only upon direct request through a chain of intermediaries. In this arrangement, liquidity aggregators and liquidity providers can be 100% sure that the obligations to the system participants of the system will be met in full, as all assets that pass through EVEN DEX are provided with real funds stored in the masternodes and protected by the DSD algorithm.

3.2.6. Transaction speed

As is known, professional traders can use automated software algorithms based on bots for making sale transactions, scalping and other tools that require fast execution of orders. The EVEN team faced the challenge of creating an exchange that, on the one hand, operates on the principles of decentralization and thereby protects the stored funds from third-party intervention, and, on the other hand, provides a speed comparable to classical centralized solutions.

During the development of EVEN DEX, the project team waived all schemes that operate on native smart contracts, multi-sign signatures and other mechanisms that allow for a relatively safe exchange both directly and with the involvement of third parties in disputed situations because of the slow speed of such solutions. Masternodes allow you to exchange safely and quickly between network participants according to the same scheme as when trading on a centralized exchange.

3.3. Comparison with predecessors

Summarizing, you can identify a number of characteristics that second-generation decentralized exchanges (DEX gen.2) should posses in comparison to centralized exchanges (CEX) and decentralized exchanges of the first generation (DEX gen.1).

Name	Transaction speed	Transparency	Protection of funds	Convenience	Liquidity
CEX	High	Low	Low	High	High
DEX gen.1	Moderate	Moderate	Moderate	Moderate	Low
DEX gen.2	High	Full	Full	High	High

EVEN DEX has a high transaction speed, a wide range of professional tools, convenient ways of entering and withdrawing funds, and does not externally differ from the usual centralized exchanges, while ensuring the safety of funds at the protocol level, without human participation.

Thus EVEN DEX fully meets the requirements for decentralized exchanges of the new generation.

3.4. System requirements for working with EVEN DEX

To run the EVEN DEX client software, you will need a PC-compatible computer with an x86-64 microprocessor architecture, with a 64-bit Linux operating system (Ubuntu, Debian), Windows or MacOS, at least 2Gb of RAM and at least 8Gb of free space (without external blockchains) on the hard drive.
To operate the EVEN DEX client in masternode mode, you must have at least 8Gb of RAM and at least 50Gb (without taking into account external blockchains) of free space on the hard drive.
There must also be a stable Internet connection with a speed of at least 100 Mbit/s.
Since EVEN DEX works with third-party blockchains (for example: Bitcoin, Ethereum, Litecoin, etc.) through API, third-party blockchain requirements, including the hard drive capacity, must be met for smooth system operation.

3.5. EVEN blockchain platform

The EVEN platform is developed in the C ++ programming language using the OpenSSL cryptographic library. The solution is a modified implementation of the consensus generation algorithm Delegated Proof of Stake (DPoS) and the implementation of the Decentralized Security Deposit (DSD) algorithm developed by EVEN Foundation. At the same time, DPoS solves the task

of creating and verifying a cryptographic signature through the masternode network, and DSD contains the logic of managing the depository.

3.5.1. The EVEN platform consensus algorithm

Currently, three types of consensus algorithms are widely known: Proof of Work (PoW), Proof of Stake (PoS), and Delegated Proof of Stake (DPoS). As an implementation part of the EVEN blockchain platform, the project team has selected to finalize the latter, namely the DPoS.

Blocks in the EVEN blockchain are assembled by network nodes that have the right (positive balance) in a certain order. That is, each next block must be assembled by a particular node of the network at a specific time - according to the schedule. This schedule, as well as information regarding "who" and "when" should collect the next block, is generated based on the votes that network participants with the right to vote give for the nodes. Thus, the voting procedure takes place in the network - participants select those who will collect the blocks. The next person who collects the block, reports the result of this vote in a distributed database. Further, this data is distributed in the network among all participants, and they receive information regarding who and at what point in time should collect the next block. Since all network members have this information, they can check the signature of each next block and decline blocks that are generated by an unconscientious network member. They can also check the block assembly correctness, and if someone has not assembled the block, or did it incorrectly, then in the next round of voting they can vote against such participant.

As part of the EVEN DEX exchange implementation, the algorithm for achieving consensus DPoS is used among the masternodes. This guarantees only one execution of each order. If an unconscientious trader has sent an order to several masternodes at once (or an unconscientious masternode submitted several other masternodes for execution), then due to the consensus algorithm, the application will still be executed only once.

3.5.2. Description of the DSD algorithm

Thanks to the DSD consensus algorithm developed by the EVEN Foundation team and used in conjunction with the DPoS algorithm within the EVEN blockchain platform, it is possible to make quick transactions with a high level of security and fraud protection from the masternode with the security deposit help, which at the program level is implemented in the consensus algorithm. The following are the mechanics of the DSD algorithm.

When the trader replenishes the balance, for example, bitcoin, his node with the attached private bit-key creates a transaction that credits the masternode bitcoin-account with the specified amount (distributes the sum among the X masternodes), and records information about transactions in the EVEN blockchain bitcoin network (transaction id, amount), which he signs with his private EVEN-key. Next, masternodes check the trader's balance through the available signed transactions made by him with N (six, in the case of the bitcoin network) confirmations in the third-party blockchain and calculate the incoming balance.

If there is enough balance and there is a symmetric order, the master node executes these orders and makes the corresponding record in the blockchain. The record consists of two transactions: the

first is a transfer from the buyer to the seller's account, and the second is the transfer from the seller to the buyer's account. If there is no equal order, the masternode polls other masternodes that can process the request. The processed pair of equal orders is recorded by the masternode into the blockchain. In this case, if the full execution of the order is impossible, then the order is divided into several smaller orders (two or more) and is thus executed partially or completely.

It is also possible to partially execute the order through one masternode, and further transfer the remainder of the order to other masternodes that can complete the process.

At the same time, a trader can check the execution status of his orders in the EVEN blockchain, and if he finds that the order is marked as executed, but he did not receive the funds (or received an incorrect amount), he sends a signal to the nodes to investigate this situation. If the N node confirms an order execution violation by the masternode, then the masternode receives a fine.

4. Solution advantages

The EVEN solution has the following advantages for the blockchain community, professional traders and miners:

Advantages for the blockchain community

EVEN's contribution to the development of blockchain technologies is a consensus algorithm that provides scalability, high transaction speed and security when working in an untrusted environment. The exchange fits perfectly into the ideology of equality, since it is a completely decentralized application, extends the possible boundaries of the use of blockchain technologies, and provides real benefits to all holders of cryptocurrencies, both professional traders and ordinary users of cryptosystems. In addition, EVEN is not only a decentralized exchange, it is a platform that specializes in creating decentralized financial services.

Advantages for professional traders

The main advantage for professional traders is the protection of working capital. Unlike centralized exchanges, a decentralized solution protects the funds of network participants from interference by third parties.

Advantages for miners

Miners receive a new way of earning, based on the masternode concept. And the process of mining does not require significant graphics processor (GPU) powers, which makes it compatible with simultaneous currency mining based on classical algorithms such as Proof Of Work.

5. Description of the system operational model

To finance the development of the project and meet the need for an internal payment unit, the team plans to issue EVEN tokens, which will allow future token owners to support the project, as well as gain access to the company's products.

The use of EVEN tokens within the system is planned as follows:
1. Traders pay a commission in EVEN tokens to masternodes for execution of trading orders.

2. Masternodes receive payment for the allocated server capacities to execute orders and store of funds entered by traders into the system. At the same time, to connect to the system and to guarantee fulfilment of obligations, the masternodes are required to first pay the security deposit in EVEN tokens

The rules implemented in the system guarantee the safety of participants' funds, based on the consensus algorithm that regulates mutual settlements between the decentralized chain of masternodes and network participants (traders).

The model of EVEN DEX exchange operation and turnover of tokens:
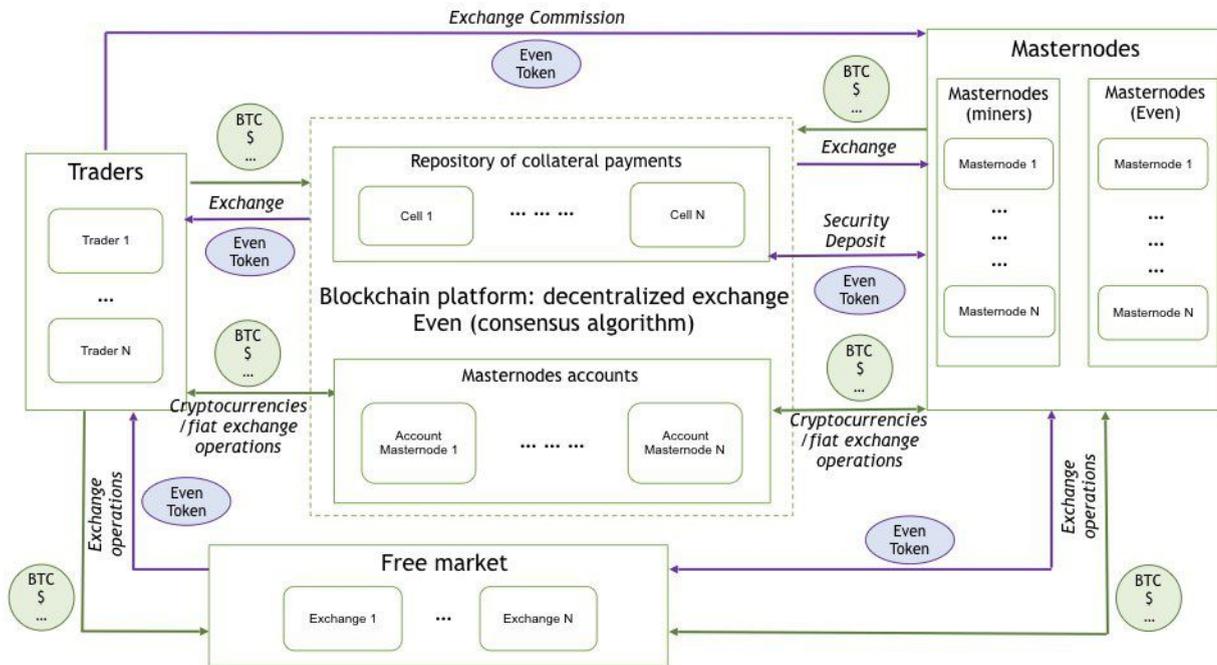
System operation mechanics:

1. Traders make currency exchange directly with the master nodes, through the decentralized exchange EVEN DEX, thanks to the unique DSD consensus algorithm.

2. Traders' funds entered into the system are stored on the real accounts of the masternode. Each masternode can provide a list of cryptocurrencies, which it plans to conduct transactions with.
   For example, in order to exchange bitcoins for ethereum, a user must wire funds to a bitcoin account, the private key of which is unknown to him, it is known only to the owner of this account, which is the masternode.

3. To ensure the funds storage safety, a special depository with collateral is used, that consists of several accounts. Each separate account is used by each separate masternode. The amount of currencies that can be stored on the masternode accounts is limited and directly depends on the security deposit, which protects the trader's funds from masternode fraudulent activity.

Initial purchase of EVEN tokens

In order to start operating on the exchange, you need a small number of EVEN tokens to pay a commission for order execution. The user can buy tokens in any possible way, on other exchanges or exchangers. In order to increase the usability of the product, the system will be able to buy a limited number of tokens from the partner, which will allow EVEN tokens receipt in exchange for other means of payment.

Trade Scenario based on EVEN DEX:

Step 1: The trader wants to place an order. Its node sends a request to place an order for N closest (with the least response time) masternodes.

Step 2: From the list of responded masternodes, the trader selects one and sends it an order.

Step 3: The masternode executes the order and records it in blockchain.
Step 4: If the order execution was partial (that is reflected in the block), then the masternode that processed the order makes a split order and forwards a request to other masternodes that can process the rest of the order. At the same time, the rest of the order is issued as a new order, with reference to the order that generated it.

Step 5: Once the other masternodes has responded - step 2 takes place.

If the order can not be executed or is being executed only partially, then it (or its balance) is transferred further with an increase in the counter of attempts. If the order is not successfully executed with N attempts or by timeout, it withdraws as uncompleted.

The polling of other nodes proceeds from the closest to the current masternode (with the shortest response time) to the remote ones.

Replenishment of balance in the system:

1) A trader replenishes their balance, for example, bitcoin, sending a transaction with the allocation of his BTC to the wallets of the masternodes.

2) This transaction is performed on his behalf by his node, which has access to his private bitcoin key (the interface of the system gives all the necessary instructions to ensure the security of working with private keys). In this case, the node records data about the transactions in the EVEN blockchain bitcoin network (Transaction ID, amount), which he signs with his private EVEN-key.

3) The masternodes check the trader's (nodes) balance through the available signed transactions made by him with N (six) confirmations in the bitcoin network and calculate the remainder.

6. Provision of fiat operations

The EVEN DEX exchange will work with fiat in jurisdictions that regulate the norms of trade in cryptocurrencies. In countries where there is no regulation of the cryptocurrency market, the exchange will operate on general grounds and rules corresponding to the given jurisdiction. The strategy for working with fiat will focus on markets that provide high liquidity and trading volumes. The entry into each market will be accompanied by an individual elaboration of legal norms that meet the requirements of regional legislation.

6.1. Scenario description with fiat

Technically, operations with fiat will be provided by masternodes and will be optional for them. In order to ensure safe storage of funds in bank accounts, masternodes will be required to pay a security deposit in the EVEN cryptocurrency according to the DSD algorithm, just as it does when working with cryptocurrency. In order for software implementation of this approach to be possible, each masternode will have to meet the requirements set by the regulator and have accounts with partner banks with which the software integration will be made to enable the DSD protocol to perform operations with the funds stored in the masternodes' accounts. Masternodes will receive an additional fee for withdrawal operations.

Within the framework of EVEN DEX, there are two schemes of working with fiat:

1. Through partner banks. Partner banks that have a license to work with cryptocurrency accounts and the ability to convert cryptocurrency into fiat will give an option to connect via API to the EVEN platform to provide online data regarding transactions.
2. Through facilitators. The facilitators are companies with a license to conduct financial transactions and operate on behalf of banks (with the presence of cryptocurrency accounts) for the settlement of cash operations opening and maintenance, bank cards issuance and maintenance, and the Internet and trade acquiring.

   To establish fiat on the EVEN DEX exchange, the trader will be offered a list of masternodes that have the required amount of a security deposit in fiat, as well as the conditions for the establishment of fiat on the exchange with the terms and amount of commissions depending on the jurisdiction, the sending bank and the bank recipient/ facilitator. If the sending bank and the receiving bank are the same bank, then the funds will be credited immediately. If they are different banks, then the procedure for crediting the funds can take up to three business days.

   At the same time, the funds can be transferred to the EVEN DEX exchange in the following ways:

1. P2P-transfer (from card to card) for cases when both the trader and the masternode work with bank cards.
2. Bank transfer (from the sender's account to the payee's account), whereas transactions with a check payment under 14 000 EUR are most often accepted by the bank without the participation of the bank's financial control. In this case, the EVEN DEX platform will have all the required data about the transaction and will be able to provide it to the bank upon request.

   After the receipt of the fiat by the EVEN platform, the trader will have a virtual balance

available, which he will be able to manage.

At any time the trader can use the following options for the withdrawal of funds beyond the EVEN platform:

1. To the card or bank account of any EVEN partner bank, with multi accounts, including a cryptocurrency account;
2. On your card (not a partner bank), taking into account the limitations of transaction amounts, which are regulated by the issuing bank.

6.2. Requirements for partner banks

The following requirements will have to be met by partner banks:

1. Availability of a programming API for making intra-bank online transfers with no additional fees.
2. High reliability rating (high liquidity h2, h3).
3. Availability of an accessible network of branches in Asian and/or European countries.
4. The bank must be a member of the IPS (international payment system).

6.3. Requirements for masternodes

The masternode can operate as a fiat provider that will have to meet a number of requirements within the system, namely:

1. Obtain a license for operations with fiat in accordance with the local requirements (KYC, AML) of the regulator.
2. Go through the internal verification of EVEN DEX.
3. Create accounts in partner banks integrated with EVEN DEX. Make a security deposit.
4. Ensure uninterrupted operation of the masternode and full protocol access to managing the fiat funds on the masternode account.

7. KYC / AML on the EVEN DEX exchange

The policy of EVEN Foundation is entirely aimed at the transparent operation of financial flows passing through EVEN DEX. To this end, the system provides a multi-level mechanism for user verification (KYC - Know Your Customer), as well as anti-money laundering mechanisms designed to create transparent money flow conditions (AML - Anti Money laundering)

7.1. KYC

The KYC procedure within EVEN DEX will be mandatory. In those countries where legislation allows operations of insignificant amounts to be carried out without verification of identity, it will remain possible, in accordance with the requirement of local regulatory bodies, to operate on the stock exchange without passing KYC. .
To fulfil the requirements for customer identification, it is planned to involve certified service providers for KYC. Masternodes will conduct client (trader) validation with the help of calls to such providers of KYC services.

The procedure for passing KYC may have some distinctions for different countries and different providers (in different countries distinct documents are used for the identification of citizens), but in general this is confirmation that the participant of the system is the same person who he claims to be. This confirmation can have different degrees of trust - from the initial trust, which can be remotely done, simply by sending scanned copies of documents to the authorized KYC service, to the maximum, when a person will need to personally come to the service provider's office and provide their biometric data. The degree of confidence depends on the amount of funds that can be disposed of in a fraction of time.

For owners of the masternode, who will conduct operations with fiat, KYC procedures will be mandatory.

7.2. AML

Each time fiat is submitted to the masternode, the funds will flow to its bank account, and tokens will be issued from this node. Further, any masternode that is to withdraw the fiat can withdraw only such tokens, i.e. when the history of its origin is known, and when a bank transfer from the real account of the token issuing masternode takes place (to the withdrawing node, or immediately to the beneficiary's account). Thus, a clear history of the progress of fiat in the system can be traced.

8. Business model.

8.1. Even Foundation financing

The operating profit of EVEN Foundation is formed by its own network of masternodes that will be created with 20% of EVEN tokens, which will be automatically issued when the platform is launched (data on the belonging of tokens will be registered in the genesis of the block). These funds will be used to provide a competitive service, which includes the development of system updates, technical customer support, attraction of new system participants, expansion of the masternode network, increase of liquidity, expansion of product geography, and attracting new partners for operations with fiat .

8.2. Monetization for EVEN DEX users who own master nodes

EVEN DEX provides an opportunity for users that own masternodes to make a profit from working in the system, namely, through fees from transactions, which allows the doubling of funds invested by the masternode within 12 months (ROI up to 100% per year).

Masternodes provide the system with their equipment to support platform operation. As a guarantee of their reliability and confirmation of compliance with the rules of the network, they make a security deposit. Traders buy EVEN tokens to pay a commission for successfully completed orders.

The deposit is paid in EVEN tokens, which must be purchased at a free market price. This ensures that the currency will be in demand and provided with the interest of the masternode, that wants to earn commissions from the turnover of the exchange. Also, it is essential for the network at the

protocol level to regulate the fulfilment of its obligations by the masternode to the participants of the system. If the master node violated the protocol, some of its collateral will be withheld to compensate for the damage. Such a scheme takes precedence over the classical arbitration system, which consists of the absence of the very need to engage in controversial situations between third parties.

The collateral gives the masternode the ability to process transactions in a volume that is capable of securing the amount of the collateral taking into account the market value of the EVEN currency. The master node leases part of the overall system storage, in which the traders' funds are stored.

You can draw an analogy with a bank vault in which there are many cells. Each cell can be of different sizes and store money and assets of the bank's customers. The cell itself is leased to the masternode, which is responsible for the safety of to the client's funds. The deposit value of this cell and its lease is determined by internal rules, and its revenue is determined by the size of the cell and the commission that the bank's customers pay, and is distributed evenly among all masternodes, given the size of their cells. The larger the masternode cell, the higher its revenue. This is a very conditional example, in fact, there is no centralized authority, and all of the above logic is controlled by software that is built on the basis of EVEN blockchain.

As mentioned above, each master node has a collateral that allows it to own and manage part of the common storage. But its revenue is kept separately and paid by traders in EVEN tokens to its wallet when it reaches a full network consensus.

The masternode has the right to indicate what part of the income from its collateral it wants to receive. For example, it can indicate that it wants to receive 50% of income for the previous period, leaving 50% to increase its storage, and withdrawing 50% for itself in the form of income.

In the classical sense, the return on the investment is up to 100% from the first day, since the masternode has the ability to pay off its obligations and return the previously paid deposit for free use.

9. Token Sale procedure description

The decentralized exchange EVEN DEX will function on its own blockchain platform, however the process of tokenization is planned in several stages:

Stage 1: ETH-based token emission of the required volume for free token sale, provision of internal project economics, and token distribution for performing tasks within the system of miners (masternodes).

Stage 2: Development and launch of its own blockchain platform, as well as the token migration. To ensure speed, independence from Ethereum, and reducing the transactions cost and the possibility of implementing the processes embodied in the EVEN concept.

For the initial sale, the token will be released on the Ethereum platform and conform to the ERC20 specification.

Symbol: EVEN
Quantity: 64 995 000
Face value: $1
Package size of tokens for sale: 42 246 750
Additional emissions are not expected.

EVEN token is user-defined and is essential for the system operation. EVEN token ownership does not give any economic rights in the company, as well as the distribution of profits or any claims for any assets.

EVEN token will be freely traded on the market, its cost will be provided by the need to lease the depository with masternodes, and also pay the commission by traders for successfully conducted trading operations.

The initial currency issue will be made during the ICO, after which the issue will be completely stopped, and the currency value will be formed by the market demand for the currency.

Free sale of tokens is planned in 2 phases:

1. **PreSale**
   Dates: March 1, 2018 - April 15, 2018
   The size of the package of tokens: 1,600,000 EVEN (equivalent to $800,000)
   Discount: 50%

2. **Token Sale**
   Dates: May 1, 2018 - June 15, 2018
   The size of the package of tokens: 40,566,750 EVEN (Soft cap $5,000,000)

Discount for the purchase of tokens will depend on the stage of Token Sale:

Token Sale Stages	Tokens to sell	Token Price
Stage 1: 01.05.2018 (14:00:00, UTC+8)	3 200 000	$0,60
Stage 2: 02.05 - 08.05.2018 (14:00:00, UTC+8)	6 450 000	$0,70
Stage 3: 09.05 - 15.05.2018 (14:00:00, UTC+8)	8 600 000	$0,80
Stage 4: 16.05 - 22.05.2018 (14:00:00, UTC+8)	10 000 000	$0,95
Stage 5: 23.05.2018 - 15.06.2018 (14:00:00, UTC+8)[5]	10 385 000	$1,00

During the Presale and Token Sale there will be extra 5% bonus for individual purchases greater than $10,000.

Distribution of tokens:

62% Free token sale
3% Bonus to investors at an early stage

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[5] In case hard-cap will be raised before 15.06.2018 the Token Sale will be closed

20% Reserve fund (19% for infrastructure creation and provision of initial storage; 1% for the sale of tokens to participants in the system at launch to ensure the functioning of the system)
11% Team option (6% to the founders immediately after Token Sale, 5% to be frozen for the future project team, which will be distributed in accordance with the company's option policy)
4% Remuneration to the advisers and partners in the referral program

To exclude the possibility of influencing the exchange rate of EVEN when distributing tokens to advisors and partners, the tokens will not be distributed immediately, but according to the following schedule:

Term after the completion of the Token Sale	Share of option
In 1 month	0,1%
In 2 months	0,8%
In 3 months	0,9%
In 4 months	1,3%
In 5 months	0,9%

All tokens that are not be sold during Token Sale will be transferred to the reserve fund.

10. Structure of expenses

Intended use of proceeds:

11. Road map

Product development is divided into several stages, for the sequential creation, testing and implementation of a software solution.

Formation of the concept (QII 2017)

The team had the objective of creating a solution that would meet the requirements of the professional trader market, this solution was to be competitive and guarantee the safety of the stored funds. Understanding the problem from the inside (some team members suffered losses from working on CEX), it was decided to use the blockchain technology, to overcome the problems associated with the safe storage of funds.

Mathematical and economic system modeling was made. As a result of negotiations with representatives of centralized and decentralized stock exchanges, as well as experts in the cryptocurrency market and banking services, the original concept underwent major changes, the team gathered enough material for the formation of the White Paper.

White Paper v 1.0 (QIII 2017)

The White Paper was formed, the team expanded through personal investments. The project moved to the active stage of concept definition and preparation for the development start.

Running the development (QIV 2017)

Starting the development with a small team, a development technology was chosen, a pool of tasks and terms for the implementation of the White Paper concept was formed. The simplest blockchain system running on C ++ was developed. The architecture for own implementation of the algorithm DSD and DPoS was formed.

Token sale (QI 2018)

The evenfound.org website is launched, the public version of the White Paper, the opportunity to take part in the development of the project, and the ability to purchase tokens at the initial price is introduced.

Prototype (QIII 2018)

Development of a prototype product that is not a viable solution from the point of view of an end-user, the solution will reflect a number of key product features, have full implementation of block building and consensus building on the basis of DPoS, as well as protection of stored assets by the DSD algorithm.

The main functions that will be available at the stage of the prototype:

1) The basic implementation of EVEN blockchain in the test network based on the DPoS algorithm:

    a) Generation of cryptographic keys.

    b) Formation of a list of nodes (including delegates).

    c) Creation of transactions in the EVEN peering network.

    d) Generation of blocks from the peer-to-peer network transactions.

    e) Validation of blocks by nodes.

    f) Calculation of the balance of the node.

2) Possibility of creating an account through the graphical interface on the EVEN blockchain test network and making a transfer to another account.

3) Ability to add/remove/receive a list of accounts in the Bitcoin, Ethereum test network

4) Ability to create an account for a test blockchain in the Bitcoin, Ethereum network and transfer to another account within the same network.

5) The ability to add, delete orders for the cryptocurrency purchase/sale.

6) The ability to make a security deposit with the masternode and automatically execute orders from the order book.

Alpha version (QIV 2018)

At this stage, EVEN DEX will receive an additional set of tools to create a minimally viable product (MVP). EVEN DEX will still operate in a test environment.

1) Filling out personal data for obtaining the possibility of input/output of funds.

2) Model of operation with Litecoin cryptocurrency.

3) Ability to add a Limit order.

4) The ability to add a Market Order.

5) The ability to add a Stop order.

6) Test integration with a bank partner for the possibility of performing fiat operations.

Beta version (QII 2019)

The beta version of EVEN DEX, will not have significant additions to the product, this stage is designed to search for and correct possible errors, critical vulnerabilities and in-depth testing of the system involving a wide range of participants. The system still works on test blockchains.

Pre-release version (QIII 2019)

After fixing all the errors found, and getting a stable version of the product, the real issue of tokens on the EVEN blockchain unit will be made, all the blockchains integrated into the system will be transferred from the test to the regular network. At the stage of pre-release, the system can still detect errors, the probability of critical vulnerabilities is extremely small, but to limit risks, restrictions on the input of funds from one account will be introduced.

Release (QIV 2019)

Full product launch. Artificial restrictions withdrawal.

Post release development

After completing operation on a minimally viable product, the development work for the EVEN platform does not end. New features will be added to the product, such as:

1) Possibility to add a Tailing-stop order;

2) Implementation of smart contracts operating in the Solidity language;

3) Open API with basic features:
a) Authorization
b) Provision of personal data
c) Creation/removal/receipt of a list of accounts in all submitted blockchains.
d) Creation /removal/receipt of the list of personal orders.
e) Receipt and filtering of market depth
f) Input/output of funds

4) Mobile app for trading;

5) Other professional tools designed to increase the informative work with the graphic terminal.

Product development strategy includes not only the subsequent expansion of the functionality of EVEN DEX but also the creation of synergistic services in the field of financial technologies such as:

1) EVEN Remittance - money transfers with low commission fees using the partner network formed when creating EVEN DEX.

2) EVEN Escrow - a service to guarantee the execution of a transaction between two parties, with the involvement of a decentralized arbitration.

3) EVEN Trust - a lending service.

4) EVEN Pay - plastic cards, with the automatic conversion of cryptocurrency into the national currency.

All these services are aimed at creating a single system based on a common financial network and operating on the EVEN platform. The composition of the services is not final and can be revised depending on the needs of EVEN DEX users during the commercial operation of the product.

12. Team and advisers

Founders

Anton Ivanov (CPO)
Role: Product and marketing strategy
Experience: Entrepreneurship, creation and management of products for 10 years (Agora, B2B-Center, Yota)
LinkedIn: https://www.linkedin.com/in/fockus

Ruslan Tsechoev (CTO)
Role: Technology management and development
Experience: Entrepreneurship, development and management of IT projects for 9 years (Agora, B2B-Center, Digital Solutions)
LinkedIn: https://www.linkedin.com/in/ruslan-tsechoev

Alexander Kuzin (CBDO)
Role: Development of the project
Experience: Entrepreneurship, development of IT projects and partner networks for 11 years (Agora, AcquiroPay, Alfa Insurance)
LinkedIn: https://www.linkedin.com/in/alexander-kuzin

Gregory Mozharovsky (CSA)
Role: Technical Product Architecture
Experience: Entrepreneurship, blockchain development, low-level programming and architecture for 13 years (Quizart, Digital Solutions, Voshod)
LinkedIn: https://www.linkedin.com/in/gydrus

Shukhrat Dzhuraev (CFO)
Role: Legal and financial management
Experience: Managing Director of Kaspersky LAB in Eastern Europe, Latin America, Africa and Middle East, with 20 years of experience in the IT industry. Held executive positions in leading companies such as Seagate Technology and Microsoft.
LinkedIn: https://www.linkedin.com/in/shukhrat-dzhuraev

Alexander Kulagin (CMO)
Role: Development of the project
Experience: Serial entrepreneur in the field of FinTech, building automation and agro-industry, investor, founder of Cryptania, 12 years of enterprise management
LinkedIn: https://www.linkedin.com/in/alexander-kulagin

R&D Team

Ruslan Tsechoev (CTO)
Role: Blockchain and GUI development
Experience: PHP, JS, HTML, CSS, C++
LinkedIn: https://www.linkedin.com/in/ruslan-tsechoev

Gregory Mozharovsky (CSA)
Role: Project architecture, development of new algorithms, blockchain development
Experience: Pascal/Delphi, C/C++, DB, PHP, JS, HTML, CSS, Windows, Linux
LinkedIn: https://www.linkedin.com/in/gydrus

Vadim Veleshko (Frontend Developer)
Role: GUI development
Experience: JS, NodeJS, HTML, CSS
LinkedIn: https://www.linkedin.com/in/vadim-veleshko-373406ba

Advisers

Maxim Frolov
Experience: Managing Director with 20 years of experience in the IT industry. He held executive positions in the leading companies of the industry, such as Kaspersky LAB, Seagate Technology and Microsoft
LinkedIn: https://www.linkedin.com/in/maxim-frolov-260ab8

Abdelkrim Belhia
Experience: 25 years in the financial sector, top manager in Societe Generale, RBS, BSI, Edmond de Rothschild. More than 20 years of assets management.
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