ETHEREUM EXPRESS COIN

Whitepaper

September, 2019

Executive Summary

The first version of this document focuses on the real business cases of using an Ethereum Express coin in two relevant and vital areas of the crypto world – mining and iGaming. In this document, we'll look into the main challenges in these areas, such as technical complexity, liquidity, financial constraints and other barriers that stop these worlds from opening to users who are indirectly familiar with the crypto. We're offering a solution – standardized, convenient and available to everyone who wants to connect to the blockchain world and receive dividends, but doesn't know how.

EEX is a cross-platform solution that is based on an innovative model with its own blockchain and uses the Proof-of-Authority consensus. On the one hand, EEX approach allows the creation of open organizations to solve completely different business needs, with clear rules for the distribution of income as well as fewer and smaller fees for different areas. This allows to use EEX solutions by different players (even if they do not related to the crypto-industry).

On the other hand, the EEX business is structured as a decentralized autonomous organization to improve transparency and community participation in the operation flow of our business.
Unlike most of the projects, we run the model on an existing pilot projects with enough capacities to finalize and test our hypotheses on a significant number of users.

We finalize this paper by describing the evolution of our business model and the ways of expanding our revenue streams. Additionally, we are considering other possible cases of Ethereum Express applications to solve specific problems and challenges of cryptos worldwide. Ethereum Express is going to expand gradually forming a so-called EEX Conglomeration.

Introduction

Challenge

According to Statista, in the second quarter of 2019, the number of unique users who have at least one registered blockchain wallet has surpassed 40 000 000 people [statista]. This is five times more users compared to 2016. This once again proves the fact that the interest in blockchain among common users is steadily growing.

Even though blockchain industry (of so-called distributed ledger technology) is still in one of the first evolution phases, blockchain is already changing the face of business and government today. The effect is seen in all spheres: from physical asset traceability, clinical supply chain, global trade finance, cross-border payments and remittances, post-trade processing to voting and digital identity. Right now, new ecosystems are developing blockchain solutions to create innovative business models and disrupt traditional ones. This is occurring in every industry and in most jurisdictions globally.[Deloitte]

The reasons behind growing interest are understandable. This technology is:

● decentralized;
● secure;
● transparent;
● fast;
● financially effective.

Right now the majority of projects work in the sphere of fintech, the sphere of cryptocurrency to be more precise, which is hard to define. Much like the blockchain, cryptocurrencies have become a "buzzword" used to refer to a wide array of technological developments that utilise a technique better known as cryptography. [HOUBEN]

Foundational ideas proposed by Satoshi Nakamoto on the dawn of technology found the embodiment and evolution in hundreds, if not thousands of projects with different economic models, which were based on different variations of decentralized technology and offered various ideas.

Even though at first the idea of Bitcoin consisted of creating open and secure P2P transfers [Nakamoto], the crypto-industry got populated with similar service worlds that had their own established leaders. For example Binance, which is now the leader in crypto-exchanges.
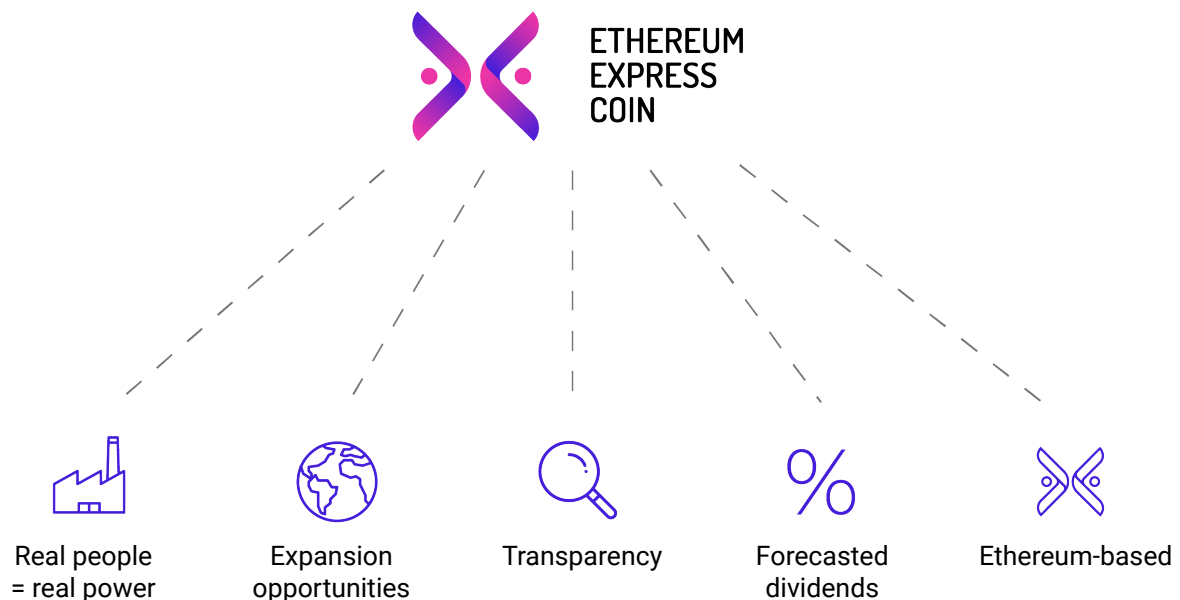
Ethereum Express Coin is transforming the market starting with the launch of an open platform to facilitate connections between the worlds of gaming and mining and aims to create a backup global cryptocurrency for different business operations.

EEX solution in a nutshell

Ethereum Express is a community driven blockchain platform, that allows any user from any part of the world to take part in cryptocurrency ecosystem without any hassle. What's even more important, it allows users to do it effectively as well as to use its technologies to launch different projects on top of EEX – for business users enterprise partners. The project starts from the two promising areas – igaming and mining – which, with all possible profits, remains an unexplored deep ocean. We're letting people make a profit without the need to own additional technical knowledge and expensive equipment for mining, as well as empower gamblers everywhere to use transparent, secure, and innovative way for their entertainment.

Compared to our competitors and other solutions, Ethereum Express has a couple of USP.

Figure 1. **Ethereum Express USPs**

| Real people = real power | Expansion opportunities | Transparency | Forecasted dividends | Ethereum-based |

Real projects = Real power.
Unlike the majority of blockchain projects, Ethereum Express is launching with pilot projects which implement our technology. They are a mining company (it's name can't be disclosed yet due to the legal restrictions) that needed to find a solution to facilitate interaction with end users and our gambling partner who's aiming to make the process of online entertainment more transparent and understandable.

Thanks to our blockchain partners, Ethereum Express launches with a real-life application of its own coin (with a ready-made model of demand generation and added value), as well as the ability to finalize and test the most courageous business hypotheses.

Expansion opportunities

If necessary, the capabilities of Ethereum Express allow users to quickly scale, while partnering with other partners, and change equipment configurations, sell white-label solutions or buy new ones. This is especially important in the context of the rapidly growing popularity of the platform.

Transparency

Due to its proprietary distributed ledger technology and unique coin of the same name, Ethereum Express guarantees complete transparency of all financial transactions – whether it's transferring usable capacities to our customers or the payment of dividends.

Ethereum-based and Ethereum-oriented

Ethereum Express blockchain is based on the blockchain of the second most popular decentralized project in the world – Ethereum. This is due to the fact that, unlike other projects, Ethereum simultaneously represents both cryptocurrency and a decentralized functional environment that is not exclusively fixated on P2P transactions, but allows to make blockchain technology more universal and convenient.

Target Audience

Our main audience can be divided into two main groups. First one consists of the end users of EEX platform or EEX solutions. These are people already familiar with the concept of cryptocurrencies and market newcomers.

The second group consists of the enterprises and business partners who will be our customers . At the start, they are representatives of the two business areas in which we launch our POCs. For them, based on the first business cases, EEX becomes a technology partner that will take care of all the costs and implementation of token-as-a-service paradigm.

Each of the groups has its own individual users for whom Ethereum Express has its own unique proposal. Let's take a closer look at them:

Figure 2. **Target Audience of EEX Solution**

Role	Description	Proposal
Traditional investment seekers	People in search of new sources of passive income. They have sufficient knowledge and finances to experiment with new tools. They heard about cryptocurrencies, but never dared to give them a go, because of the difficult entry threshold and high risks that are traditionally associated with trading.	**1.** Easy entry threshold, friendly infrastructure. **2.** Open terms. **3.** Blockchain is used as a tool of transparency, not as the complication of processes.
Referral marketers	This type of person might not even have heard of the crypto industry. However, they are well versed in marketing and are looking for a new kind of referral programs that can be distributed to and by their audience.	**1.** Personalized marketing program and offerings. **2.** An additional incentive in the form of mining dividends. **3.** An opportunity to influence the development of the product.
Market newbies	They are already familiar with the crypto industry, but are still not well versed in all the subtleties and nuances of the market. This group is afraid to invest substantial resources on attempts to profit from cryptocurrencies, but would try if a convenient chance turned up.	**1.** Low entry threshold. **2.** No need to buy expensive equipment. **3.** Clear terms and conditions.

Role	Description	Proposal
Hodlers	Due to the high volatility of cryptocurrencies, they are waiting for the best opportunity to sell their assets at the highest rate. Until then, they are trying to accumulate a lump sum of coins.	**1.** An additional source of accumulating crypto assets. **2.** High ROI. **3.** Platform security. **4.** Transaction of operations.
Returners	People who successfully and profitably survived the "bull market" in 2016-2017. During the overhyped trend, they became observers, ready to return to the game as soon as a suitable and trustworthy opportunity appeared.	**1.** Working capacities **2.** Blockchain component **3.** Free market access
Businesses	Teams and companies looking for a permanent technology partner capable to solve specific request using blockchain technology.	**1.** Balanced team of professionals in different areas **2.** Existing portfolio with success projects **3.** EEX implementation in different spheres.

With the development of technology and the expansion of EEX implementation, we even consider our business partners to be organizations and companies from the fiat non-technological world. They are the companies that are looking for smart contracts with their business cases (for example, to run loyalty programs backed by an asset with real value or to run their own online casino) and those which are yet to implement the blockchain technology but are interested in it.

Case Study. EEX Implementation

iGaming Market

In this and the following sections, we will consider the first examples of the application of EEX technologies in real-world business cases. The first of them is devoted to the operation of the EEX blockchain in the field of gambling. More precisely, in building a gambling platform on top of the EEX ecosystem, regulated by its own smart contracts.

Why gambling? A recent study by Statista has given interesting results. According to this resource, among all users of mobile devices, 11% use their smartphones for online betting and gambling [statista].

This doesn't take into account the data on traditional PC users. Moreover, according to a new report by Grand View Research, Inc. online gambling is expected to generate USD 102.97 billion by 2025, registering a CAGR of 11.5%, up from just $ 45 billion in 2016 [grand view].

Figure 3. **The Online Gambling Market**

ONLINE GAMBLING MARKET FORECAST

Size of the online gambling market from 2009 to 2020 (in billion U.S. dollars)

Source: Statista

The main reason for this growth is the very phenomenon of the popularity of the gambling industry, as well as new models of user interaction. Among them, experts are considering blockchain technology, whose capabilities have a number of undeniable advantages that are already changing the landscape of this industry.

Bearing in mind the facts above, market leaders have been focusing on mergers for the past few years, primarily to increase their market share and improve margins. For them, blockchain technology becomes a partner or, in other words, a technical provider. And in this race, the winner is the one whose decision will be the most convenient and interesting to the end player.
Next, we will analyze how the use of cryptocurrency can be a trustworthy, secure and convenient experience.

Problem Overview

Traditional online gaming services have a number of issues that affect both players and game operators. Among the main challenges are the following:

Lack of privacy
Traditionally, the gambling industry has an image far from simple entertainment. Due to this fact, a lot of players would like to remain anonymous and have total privacy. At the same time, the traditional online casinos are using outdated systems to carry out money transfers (for replenishment or withdrawal). They allow data access for all the actors of the process.

Vulnerability to manipulation
Gambling is often associated with scandals, fraud, manipulation and not entirely "clean" operators. The problem is centralization and the absence of any regulatory processes that third-party regulators can monitor.

High Costs and House Edge
Employment in the gambling industry involves many costs - ranging from software development to marketing and licensing. The same factor imposes the need to have great advantages at home - reaching up to 5%. In this case, the player can not tell if they had in a bad luck streak, or was cheated casinos.

Transparency and trust issues
From the point of view of all participants in the process, the traditional approach of the entertainment industry is something happening behind closed doors. No one can tell how much money was paid into winnings, how much was delivered, how much is in a common bank, etc. Moreover, due to the lack of process transparency, no one can guarantee the receipt of income from a gain.

Legalization
Last but not least comes the problem of legalization. Centralized platforms are subject to tight regulation by governments of countries. In some of them, all gambling is illegal. This problem is both a barrier to end users and a constraining factor for the industry.

EEX iGaming Solution

Overview

By having the blockchain at the heart of the EEX solution, each of the above described problems can be solved.

The basis of our solution is the immutability of the blockchain and the strict rules of smart contracts. Therefore, EEX has the opportunity to create a truly trustless system, which is

Figure 4. **EEX iGaming Solution**

Under control	Fast	Fair	Secure	Smart Contract Powered

Under control

The Proof-of-Authority consensus, which we will discuss in more detail below, is built on a self-regulatory system of our own community, which, unlike the usual middleman, is interested in transparency and reliability of operations in the entire system, and also allows it to get rid of unscrupulous actors (for example, hackers) At the same time, voting opportunities within the community allow our team to understand the desire of the players and, for example, add additional features, new games, etc.

Moreover, in a traditional online casino, players must blindly trust random numbers which are generated purely by the casino's Remote Gaming Server (RGS). With decentralized management, the most loyal users can be allowed to audit the system to exclude possible fraud.

Fast

The absence of the need to connect traditional payment methods for mutual settlements on the platform makes it truly fast. Furthermore, because of the blockchain, the system only needs to know the address of the player's wallet, which means the absence of traditional time-consuming registration forms for, no fees for additional information, etc. This also fulfils users' desire for anonymity.

There is no need to share any financial or personal information. All that a casino sees is a purse number.

Fair

EEX uses the blockchain and smart contracts to offer unrivaled transparency. On the one hand, the complete openness of the data allows players to independently verify the availability of payments, the number of games played, and be sure of

the inviolability of the rules. It is a key component of blockchain-based gaming technology.

On the other hand, switching games to a blockchain framework allows us to reduce reduce fees related to gambling transactions. Unlike traditional areas where House edge (the average percentage share that casinos take from its players to ensure that casinos keep running) is high enough, crypto-only gambling sites have little to none overhead costs. The use of decentralization, in particular, significantly reduces or eliminates licensing fees, payment to merchants, regulatory compliance costs, transaction costs, taxes, etc.

Secure

The ability to use funds directly from the user's wallet for the game allows players to keep their money under control during the whole process. Each bet in any game is protected by a smart contract that works according to the escrow principle. That is, until all conditions are met in the system, the game will not start. This eliminates the possibility that a casino misappropriates player funds, leaves a shortfall in the event of insolvency or is unable (or unwilling) to promptly pay out a win of any size.

Automation of all processes can also be attributed to this point thanks to the same blockchain that takes care of the routine tasks done by humans. It ensures the highest accuracy levels and excludes the human factor in the processing of all operations.

Smart Contract Powered

With the power of smart contracts it's not only processes that become more transparent and convenient. All the data, such as gaming results, winnings, and payouts that are usually hidden from the public eye become visible to players as well. Moreover, crypto-transactions are virtually irreversible, thus issues of fraud and non-payment are eliminated.

Operating Principle

Speaking of functionality and architecture, the EEX solution for the gambling industry follows the philosophy of a single structural platform, which is discussed in the System Architecture section. Of course there are some differences. First of all, this component of the EEX ecosystem is based on a full-fledged game server working in conjunction with the blockchain and EEX's own smart contracts. For operator and affiliate partners, EEX can be considered as a complete enterprise solution with payments, security and databases – all administered on the blockchain.

As for the user, the infrastructure of this business is as follows.

Figure 5. **EEX iGaming Operating Principle**
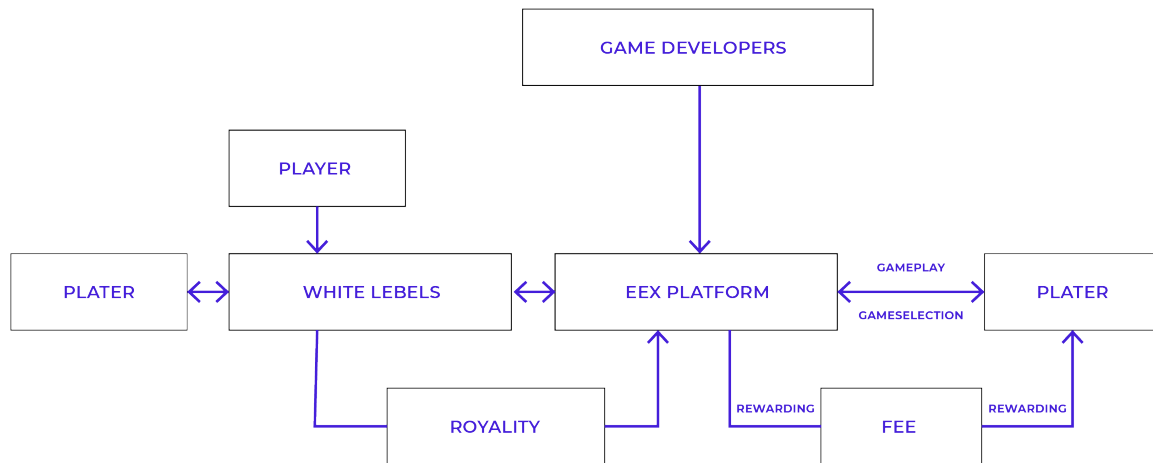
The first component of EEX iGaming is the core or EEX platform itself. This part is responsible for processing, payment of winnings, calculations and other operations. In the future, we plan to open this part of the platform to third-party organizations that can use its functionality as a white label. That is, by building and opening their own casino using our API - without worrying about the complexities of the game logic, user balances, play history, and more.
Partners will be charged royalties for the use of our API. The amount of which depends on the number of players, bets and payouts.
At the initial stage, the EEX platform offers a set of classic casino games and slots.

Mining Business Case

Market

In this section we will look at the second case study of the EEX platform to solve a specific business problem. Namely, tokenization of computing power.

From the moment Bitcoin appeared and right until today, miners are the second most important players on the market. After all, they are responsible for transactions on the blockchain by solving a "cryptographic puzzle" [HOUBEN].

In simple terms, mining is a process during which mathematical problems are solved. As a result of it, new information blocks are released and transactions are recorded in each block. Miners receive a reward for each found block. The amount of the reward depends on a particular coin. Also miners get a reward called a "transaction fee" which is like a tip or gratuity left for the miner [Kroll].

However, there is one sidenote: the process is designed in a way that steadily increases the complexity of the calculations and requires a constant increase in the computing power of the network, and hence more powerful equipment.

If at the start of the Bitcoin network, the coin was profitable and easy to mine with just the power of a regular personal computer, today the Bitcoin network has grown to such an extent that it is impractical to do so [Global]

Let's take a look at the chart [Blockchain]. The complexity of Bitcoin computing (or Hash Rate Networks) over the past four years has increased by more than 260 times.

Figure 6. **The Complexity of Bitcoin Computing**
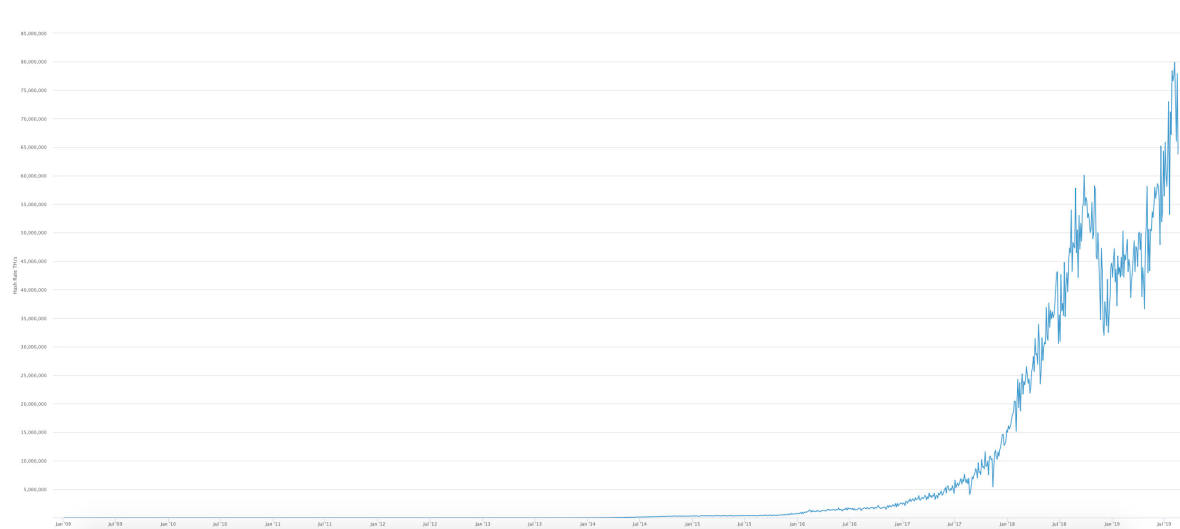
Miners who were using personal computers ,had to evolve by switching to mining bitcoin with GPUs that were released to the general public in 2010 [Greene].

Afterwards, in the same year, the so-called mining pools appeared, allowing parties to mine together and split the rewards pro rata. And finally, the last round of evolution brought specialized equipment. 2011 brought the first open source FPGA Bitcoin miner implementations [Taylor].

The market then saw ASIC – programmable logic devices built on application-specific integrated circuits which offer order-of-magnitude improvements in energy efficiency and cost performance over CPU, GPU, and FPGA by specializing silicon for a particular computation. At the moment there are already six generations of these types of miners [Khazraee].

However, it's important to remember that cryptocurrency mining is competitive. It's not possible to mine with less efficient rigs since cheap electricity has allowed certain users to dominate the mining market [Riga].

According to Tokeninsight, in the first quarter of 2019, the shortest payback period for one Bitcoin mining unit was 108 days (when using Avalon Miner 841). For Ethereum – 132 days (when using Antminer E3 Asic and PandaMiner B3 Mute), 70 days for LTC (with Innosilicon A4 + LTC Master) and 177 days for Dash with Fusion Silicon X7 Miner. As you can see, the numbers are somewhat disappointing. [tokeninsight]

If we discard the option of building your own industrial mining center with access to cheap energy, modern miner has three of the most common options:

Figure 7. **Options for miners**

Solo Mining   Mining Pools   Cloud Mining
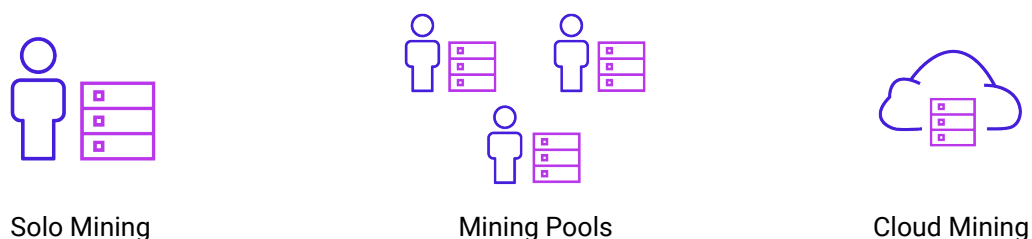
- Solo mining using your equipment. Advantages include the absence of additional commissions, full management and disposal of own capacities. However this option contains a number of serious shortcomings: the income of a solo miner is unpredictable, coins with a high hashrate require serious power, and miners themselves should constantly update the equipment [MinerGate].

- A miner can join one of the mining pools and combine power with other miners to increase the likelihood of finding a block. In this case, the miner can choose a reward distribution model (for example, proportional mechanism, pay-per-share mechanism, or pay-per-last-n-share mechanism) [wiki].

  Also, this method involves fewer expenses associated with updating the equipment, more stable income, and higher chances of receiving rewards for thefound block. And although it is estimated that 90% of the blocks are

mined by known pools or syndicates of miners [Ankalkoti].

However, the disadvantages are proportional to advantages.

They include high commissions, possible problems with the network, lack of trust in the service, as well as the dominance of large pool associations. A small number of mining pools occupy a vast majority of global Hash power, placing blockchain systems at the risk of being overthrown by a gigantic pool or colluding pools, which can significantly reduce the income of the miners due to high commissions [Bai].

- Finally, the third option is to join one of the cloud mining services, which allow users to become miners without even having their own equipment. By renting computing power in remote data centers, user with an average computer and a crypto-wallet can use the technology that's powerful enough for their needs at this specific moment. The advantages are obvious - the absence of noisy and uncomfortably warm farms and rigs, the absence of additional electricity bills, lack of need to participate in the technology race, the ability to stop mining when the situation requires so, and finally, the predicted profit. The main disadvantages of this method are the possible dishonest and shady service of the platform and a slightly lower income compared to solo mining.

Problem Statement

Based on the previous section, we can see that mining plays one of the key roles in the crypto industry. Even though it is investment-attractive and does an important job in maintaining the health of blockchains, there is still a number of barriers in this area that cause inconveniences for most ordinary users. Ethereum Express is designed to solve them.

Figure 8. **Barriers for Users**

| Lack of technical knowledge | Financial limitations | Lack of standardization | Harmful software | High volatility of cryptocurrencies | Consensus problem |

Lack of technical knowledge

In order to run even one mining rig, the user must have sufficient technical knowledge. However having knowledge of the equipment specifications is not enough. The user needs to understand what types of things are needed to build a desktop from the ground up, to be able to find the necessary information in repositories and specialized forums, to understand basic networks and their settings, and also to have knowledge on working with electric networks provided that they are powerful enough.

Financial limitations

As mentioned before, technology does not stand still and updating equipment is one of the cornerstones of successful and efficient mining. The rapid obsolescence of mining equipment and its high price made professional mining not profitable for most users [Evan].
In addition, the associated costs of ensuring security, space, air conditioning for mining systems and electricity for their power supply is added to the list of issues.

Lack of standardization

Nowadays there are hundreds of blockchains following their own rules of remuneration, with different algorithms and laws. Every time the miner chooses a new project, for example, one with a lower hashrate and a high probability of finding a block, they need to delve into its unique specifics.

Harmful software

2018 will be remembered for the invasion of malware that turned ordinary users' computers into hacker mining farms. In 2019, according to reports from cybersecurity researchers, there's a new ransomware virus on the loose that's targeting miners [Redman]. To effectively counter new emerging threats, a simple antivirus is not enough.

High volatility of cryptocurrencies

Although cryptocurrencies have gained such wide popularity because of this, high

volatility also negatively affects mining processes. The more energy is spent on the extraction of blocks, the higher should be the price of the asset. In practice it doesn't always work this way. This situation makes the costs of mining in the long term unprofitable (purchase of equipment).

At the same time, in 2019, the cloud mining costs are all less than the current BTC price of $ 5,200 [tokeninsight].

Consensus problem

Today, almost 90% of public blockchains use the PoW consensus, the original consensus algorithm in a Blockchain network [Bai].

Existing Projects that Inspire Us

When designing Ethereum Express to solve Mining business case we were guided by the best industry practices [Krishnan]not only across mining projects but also by recognized market leaders whose ideas could be useful to us.

Figure 9. **Inspiring Projects – Established Businesses**

Project	Key Takeaways
Zmine	This project is using an interesting model called WRYGC (We Rent Your Graphic Card), which lets everyone give Zmine their own GPU in order for the project to operate and share the cryptocurrency received from the mining operation. GPUs can be purchased right on the inneral market.
Genesis Mining	GM provides a multi-algorithm, multi-coin cloud mining service offering 10+ mineable cryptocurrencies through 6 major mining algorithms. The shortest contract is 18 Months Bitcoin Mining Radiant Contract.
Bitcoin.com	This project offers only BCH and BTC mining. However it has conveniently organized mining activity and detailed statistics about mining process that are displayed on website as well as through mobile app.
Hashnest	Hashnest was launched in 2014 by Bitmain, which is a world-renowned manufacturer of ASIC mining hardware. The website currently offers a Payout Accelerated Cloud Mining Contract (or PACMiC for short). The PACMiC is an electronic contract structured in a way that allows Bitmain to pay the maintenance costs of mining rigs (such as electricity), while all the mining revenue is used to pay back the owner of the PACMiC. When the principal is not fully paid back, it will share profit with buyers.
Eobot	Eobot offers mining contracts either for 24 hours or ten years. The service is neatly designed and also offers a fee estimator for users to calculate daily profits in exchange for the hashpower they purchase.
Nebulas	Although this project is not related to mining, it was included in our list for using non-traditional algorithms and its philosophy of communication with users. It's based on Nebulas Rank (NR) which is an open sourced, core ranking algorithm based on liquidity, propagation of users' assets, and the interactivity between users.

Why do we use Blockchain?

Despite the advantages described in the market analysis section (link to the section), mining process has a number of negative factors, which, nevertheless, can be offset by the introduction of distributed registry technology. At the same time, we see blockchain as a foundation-level technology. It is not a fully formed application as it must also include features such as user interface, business logic, data persistence and interoperability mechanisms [Gartner].

Which challenges and problems can we overcome and solve?

Risk of fraud

After the end of the so-called bull market, a lot of new mining companies went bankrupt or completely disappeared from the radar without fulfilling their promises [Emem].

Each Ethereum Express Coin transferred to the owner is backed by real computing power, which can be easily verified by analyzing partner's public mining addresses.

Opaque mining operations

The EEX operation algorithm is designed in a way that allows profit distribution to be proportional to the amount of assets held. Thanks to open data, every user can easily check and calculate the percentage distribution of the mined funds.

Lack of control and flexibility

EEX coins are controlled and distributed using smart contracts available in our blockchain version. They allow us to conduct secure operations between two separate parties, as well as set up flexible marketing activities within Ethereum Express – subject to strict rules.

Mining Capacities

Although, for security reasons, we cannot provide the actual address of the mining farm, we will describe its characteristics in detail. Our client's farm is located in one of the regions of Eastern Ukraine in the building of former typewriter factory. It consists of 10,000 m2 of industrial-grade construction, high capacity electrical lines, extensive ventilation, and cooling options ready to be used.

Figure 10. **Mining Capacities**

S= 10 000 m²
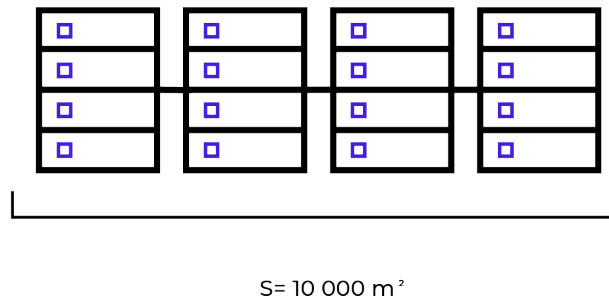
In terms of security, there are 24-hour security guards on site to prevent unauthorized and unwanted guests from entering the facility. Currently, there are more than 44k of GPUs installed inside the building, combined with a single software (designed specifically for this farm), which is under 24/7 control by professionals working at the facility all year round.

The operation flow

In the mining case, EEX platform acts as a link between the end user and the mining facilities for hire. For the convenience of calculations, our partner uses the format of pre-installed interest plans corresponding to different leased capacities. At first, you can choose and purchase one of investment plans for fiat, Bitcoin, or Ethereum using the Ethereum Express internal exchange or buy the required amount of coins on one of the external exchanges directly.

After the receipt of funds, the user is charged the amount of EEX coins, according to the chosen plan. These funds act as the guarantor of profit and the settlement tool within the platform (including the payment of commissions).
After each mining round, the user receives reward in EEX coins. Funds can be accumulated in the user's personal wallet, withdrawn or reinvested to expand the investment plan.

To withdraw funds, we use the same model as we do in the calculation. EEX are freely converted on the platform website to cryptocurrency (at the initial stage – to Ethereum) or can be transferred to the third-party exchange and converted into one of cryptos there (at market rate). Internal exchange rate is calculated from the average market price of assets.

The receipt of coins in circulation is strictly regulated. It can occur in three cases:

- An investor or user rents facilities. In this case, through the internal server, it exchanges its own funds in proportion to EEX. Each payment method has its own exchange rate. For more comfortable calculations, we provide package solutions that cost a certain amount and equal a certain mining power

- The completion of the mining round. After making profit from the mined blocks, our partner exchanges the mined Ethereum for EEX, distributing the profit between users. The mined Ethereum is then sent to a cold wallet - an untouchable reserve, which acts both as a guarantee of the return on investment and the future basis of the mining base (in the event of Ethereum switching to the PoS protocol).
At the same time, a part of earnings from mining is used not just for rewarding users, but also for achieving internal company goals. Part of profit will be used to cover bills and also allocated to the development of the Ethereum Express internal platform.

- In the third scenario, the release of funds from the steeped amount of issued coins is possible with the unanimous vote of the node validators. For example, to enter a new exchange and fill the stock market. This option can only be considered after successfully testing hypotheses and debugging all the processes and algorithms for the functioning of the Ethereum Express platform.

System Architecture

Figure 11. **The EEX Ecosystem**
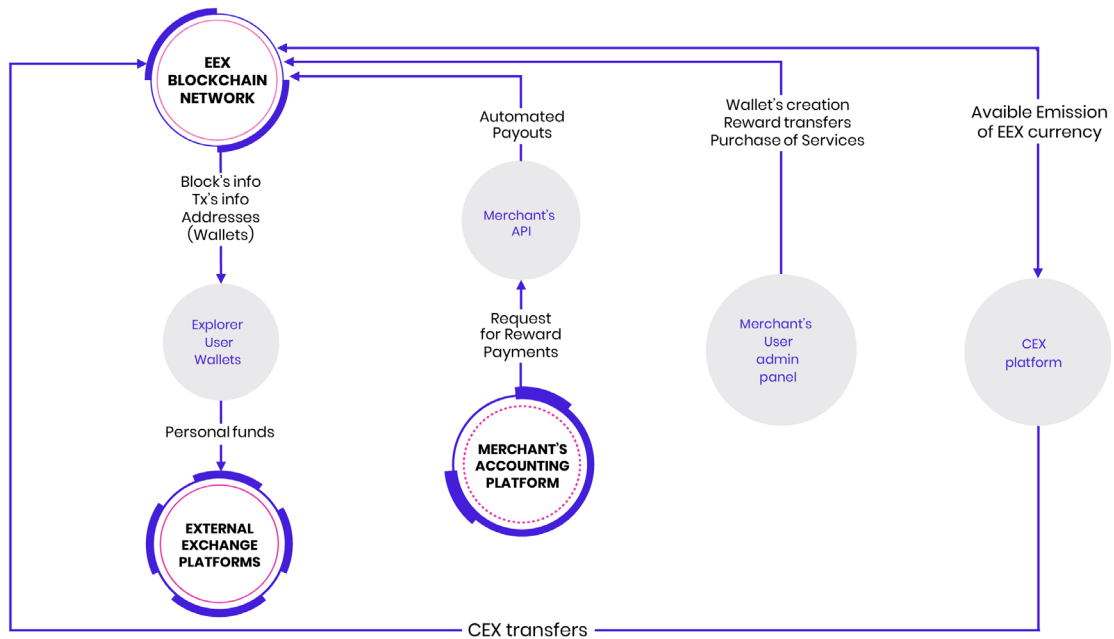
First and foremost, for two particular cases described above, EEX can be described as an online platform which can be modified to solve specific problem but has the core fixed structure in the basis. For example, describing the mining case, EEX allows mining capacity holders (i.e. our mining partner projects who use idea of EEX) to meet everyone who seeks profit from mining without encountering problems described above.

In the case of mining, Ethereum Express Coin acts as a tokenized means of power. In the gambling scenario, EEX acts as means of wager, but in both cases EEX holders act as nodes or computers, that make decisions on the network and are responsible for conducting transactions and network maintenance.

The gamification aspect is achieved through another feature of the proof-of-authority algorithm – the ability to vote for decisions on the network or beyond. The users with the most money and highest "popularity" will be able to compete for the so-called "status" of the validator node. For this to happen, other users should vote for them. This opens up great opportunities for events and additional attraction of money to the project.

The functional infrastructure of the project consists of a number of different modules, microservices, and databases. The four main structural elements of Ethereum Express are the Exchange platform, the Administrative module, its own storage service or blockchain wallet, and the Transaction history access service.

Exchange platform

The functionality of the Exchange platform is subordinate to the following needs of users and the project. It allows:

- To provide user-oriented service for a cryptocurrency exchange for depositing funds into internal user wallets such as:

  - **EEX (user's external wallet) → CC (user's external wallet)**
  - **CC (user's external wallet) → EEX (user's internal wallet)**
  - **p2p transfer between user's wallets**

- To provide a secure web-service for settlements on the platform;

- To support the next list of cryptocurrencies;

- Users to pre-calculate currency exchange rate

Figure 12. **The Exchange Platform**
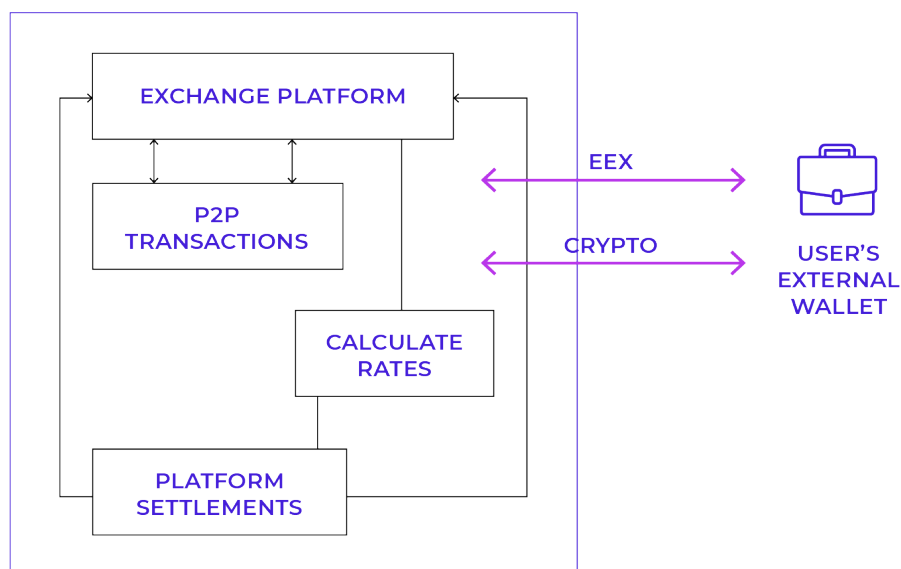
Administration module

This module is responsible for the functioning of

1   Admin part of the platform (sets and calculates rates for CEX, charges fees, sets reward payments, etc.)

2   Wallet's administration (manges commission's fee, top-up fee, in CEX fee, pay-out fee, p2p fee, etc.)

3   Access to functions from user side.

4   Notification center.

Figure 13. **The Administration Module Architecture**
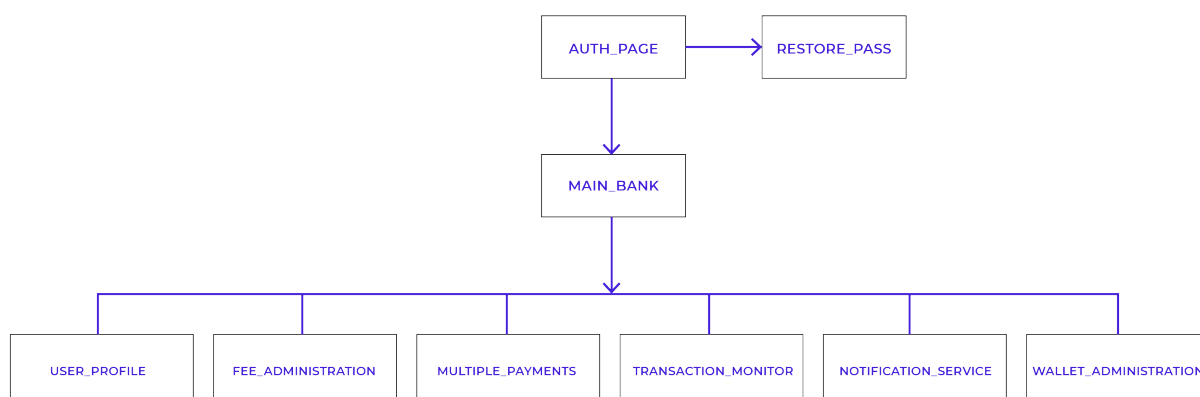
Storage service and Wallet infrastructure

Wallet Infrastructure provides EEX's users with the opportunity to operate their funds in the EEX inside EEX's product infrastructure. At the moment, this product is a single wallet account that supports the core currency of our platform – Ethereum Exchange Coin. Thanks to it, user can send and receive funds, view transactions and manage commissions.

Key points about WI:

- Secure crypto wallet allows **depositing / accumulate** user's funds after CEX operations **(CC → EEX);**
- Allows to provide **reward payments in EEX;**
- Allows user to provide **pay-out (withdrawal)** payments via **EP (EEX → CC);**
- Allows user to provide **p2p payments** inside EEX's infrastructure;

Transaction History Access Service

This is our server-side blockchain explorer. It allows us to visualize and make all the operations inside our blockchain as transparent as possible. At the same time, thanks to the ease of use and friendly shell, this module can be used by any average user. The explorer interacts directly with the EEX blockchain, providing users with the opportunity to:

- Watch the block / transaction feed
- See transaction history of a given address
- See the input and output of transactions
- View the genesis block
- View Network nodes

Application Architecture

From the point of view of user interaction with the project, we're designing EEX as a powerful online tool for monitoring all processes from a single gate. Therefore, the front-end of the project is as important as its back-end. The final product, which the user sees, is based on three basic principles: user-friendly design, easily accessible functionality and a variety of operations.

Features

At the first stage of launch, the EEX platform will be embodied in a separate web applications, e.g. two different but different but similar by user experience products. First will allow users to monitor the operation of the mining network, the development of its own marketing network and its own financial indicators. Second will be designed as a single gaming portal featuring all entertainment products of EEX iGaming case.

However, the user interface will be presented in several main sections (similar to both cases):

Dashboard. Depending on the business case, this section can represent a lobby for gaming where user can choose a game and interact with igaming system or - for mining case - it is a section with basic digital metrics directly related to the mining process and indirectly to the EEX blockchain. The total hashrate of the ETH network, load schedules, the number of working rigs, data on internal transactions, work nodes, the amount of total and personal earnings in accordance with the hashrate, payment schedule, etc.

Wallet. It has all information about personal transactions, the ability to check balance and the number of EEX coins earned or won. The wallet is also a system for exchanging and withdrawing funds to external wallets. At the same time, the EEX front-end is essentially a shell for transactions, providing the ability to get a private key to save funds locally on a computer, without the need to download the entire blockchain.

Support. We support users 24/7. In addition to the expanded FAQ base, which no innovative project can do without, users will have access to a separate support team.

Settings. In this section, users can configure notifications, see the main project documentation, change personal information or interact with other operational activities within the platform.

After launching the web application, the development and design team will focus on the release of mobile application. Its functionality will duplicate the web version and we are also considering the possibility of implementing the functions of a mobile wallet with built-in vault for additional security [Cutler].

Security

To ensure the protection of both tools and user data, our structure is encapsulated within a highly secure private network. The only public interfaces exposed outside are HTTPs ports, which make sure only customers and applications using these ports will be able to get inside. We consider a multi-level security system:

Figure 14. **Multi-level Security System**
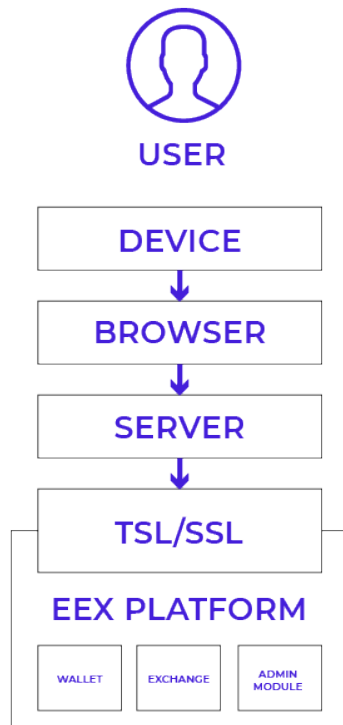
Device Level – although this is the most insecure part of the entire ecosystem that we cannot influence, the platform will operate a system of instant notifications about hacking attempts, entry from unauthorized devices, etc.

Browser Level – being originally designed for hostile environments, major browsers provide an impressive level of security. At this level, in addition to the protective properties of the programs themselves used by users, we implement multi-factor authentication.

Server Level – we use one of the most trusted data center providers for our servers. We rely on the credibility and capabilities of these providers, including physical security and environmental controls to secure our infrastructure from physical threats or impact.

Protocol level – all our external interactions use TLS/SSL protocol. TLS/SSL Tunnels will provide privacy and data integrity for all sensible data passing between various elements of our ecosystem using the industry safety standard.

Wallet level – EEX does not store private user data. It only allows to display the status of a wallet. The private key of any wallet can be stored on an offline device.

EEX Coin

Reason to choose Ethereum

In the winter of 2018, our team began searching for existing solutions that would meet all the necessary criteria. After several months of careful analysis of different blockchains and their specifications, it became clear that the onchain solution (like EOS-based, TRON, or ERC20 tokens) doesn't fully meet our requirements. We decided to use one of the leading technologies as the basis of our own EEX blockchain. In the end, we picked Ethereum.

Rules

According to the official documentation of Ethereum [Ethereum]: it is a blockchain with a built-in Turing-complete programming language, allowing anyone to create smart contracts and decentralized applications. Using the applications, they can create their own arbitrary rules for ownership, transaction formats and state transition functions.

Values

The ability to create rules within your own registry for managing logical processing and data verification played an important role in selecting Ethereum. However, we also relied on the basic principles of this project, which resonate with our values.

Simplicity. The technology should be as simple as possible to use. All the complex information should be tucked away under the hood.

Universality. This value is especially important for a long-term project that operates in such a transient market as the crypto industry.

Modularity. Even if we do not have any modules at the moment, we do not exclude the possibility of adding them.

Agility. We support the Ethereum protocol's belief that every project is an ever-evolving entity. Thus we are able to change depending on the current market conditions.

Coin Characteristics

Being an improved version of Ethereum, the largest decentralized network, EEX is ambitiously not only going to replace internal calculations inside external projects, but also to squeeze out the outdated models of interaction between people.
EEX is based on a completely new and independent blockchain network that uses code base on the Ethereum technologies, since they are open and have been tested in their reliability. Moreover, the power of these technologies will allow us to create different tokens for different needs in the future (with the expansion of EEX Conglomeration).

As for the EEX itself, the emission of the asset will happen once and amount to 10,000,000 units. Initially, all the coins are located at the smart contract address and will be issuing according to specific business cases and their smart contracts logic.

Coin Characteristics

Figure 15. **EEX Coin Characteristics**

Coin Name	Ethereum Exchange Coin
Coin Ticker	EEX
Platform	Ethereum (Clique Protocol)
Total Supply	10 000 000 EEX
Block time	Variation. Average time 15 sec
BLock reward	None. Nodes receive fees
BLocksize Limit	According to GAS limit
Record-keeping Model	Account based
Smart Contracts	Solidity programming language
Encryption algorithm	ECDSA (Elliptic Curve Digital Signature Algorithm)
Required different block masternode for final confirmation:	10
Governance	DAO principle

Proof-of-Authority (PoA) Paradigm

Proof-of-Authority (PoA) is a new family of BFT (Byzantine fault-tolerant) [Lamport] algorithms which has recently drawn attention due to the offered performance and tolerance to faults [Aniello].

The main feature of this consensus is operating in rounds during which an elected party acts as mining leader. However, PoA requires less computing power hence provides better performance. This type of algorithm was first introduced as part of the Ethereum ecosystem for private networks and implemented into the clients Aura and Clique.

EEX blockchain uses Clique protocol for permission setting of Ethereum [Angelis]. It shadows the design of Ethereum mainnet and unlike PoW, it is more suitable for permitted networks where all consensus participants are known and reputable. Without the need to mine, Proof-of-authority is more efficient while still retaining Byzantine fault tolerance.

Proof-of-Authority is a new concept in the blockchain world. It can be described as user having a number of pre-approved authority nodes (called sealers, think of these as mining nodes); any new node that the user wants to add has to be voted on by the currently approved set of authority nodes, which gives users full control over which nodes can seal blocks (mine) on their network. To make sure a malicious signer cannot do too much harm to the network, every user can sign at most one out of a number of consecutive blocks by the following formula

$$(floor(SIGNER\_COUNT / 2) + 1)$$

The same consensus is applied when an authority node is removed from the network. Algorithm of PoA depends on:

- acting and trustworthy individuals: validators who must identify themselves;

- the candidate must be willing to invest money and put his reputation on the line. A hard process reduces the risk of choosing questionable validators and encourages long-term commitment;

- validator Approval Standard: The validator selection method should be the same for all candidates.

The process should be able to weed out bad players. Finally, it exists to ensure that all validators follow the same procedure that ensures the integrity and reliability of the system.

Functionalities:

- validators get fee from p2p transactions (no rewards for block mining);

- validators can vote for new candidates;

- in the genesis block validator should be set in the launch of the blockchain;

- in genesis block list of addresses with an allocated amount of coins should be set;

- block time could be custom;

Limitations:

- we design EEX like an asset whose emission will be done once.
  However, when creating other tokens on the top of EEX blockchain, their functionality can be subordinate to any rules, according to their smart contracts.

Smart contracts features:

EEX blockchain allows to use any of the smart contract features available in the original ETH blockchain. Smart contracts can be created and deployed to the blockchain in order to implement some special functionality for participants, like in the original EEX asset.

EEX DAO

Principles

EEX is focused on achieving a long term goal, so we aim to adopt decentralization principles in areas other than our economy. We believe that the principles of digital democracy are much more effective, because users themselves often create the vector for the development of the project. In our case this approach can be considered as a hybrid Decentralized Autonomous Organization. It is a hybrid, because by combining the DAO idea with the Proof-of-Authority algorithm, we won't be able to give the voting opportunity to all members of the network, but this right will be given to the users who are most loyal to and engaged in the project. Therefore, true democracy becomes a reality.

We believe that with DAO approach any project becomes not only agile or flexible, but also allows to be more open to the end users. Moreover, the lack of a centralized authority can reduce internal costs [blockchainhub].

Unlike standard management models, DAO solutions are almost always data-driven and based on the wishes of all members of the community. At the same time, the choice of this model by such successful projects as Dash or EOS confirms the interest and trust by the blockchain community.

Voting

Along with basic principles of Decentralized Autonomous Organizations [Bannon], with this type of governance, we can add the gamification to the user experience, which allows us to create additional incentives along with marketing and revenue model. For example, the EEX coin holders will be able to participate in the operational activities of the project (e.g., vote to increase mining capacity with specific equipment, changes to the project's design, conducting a promo-event, etc).

Each decision can make a significant impact on EEX success, and create a gradual network effect. The more people come into ecosystem and implement valuable projects, the more established the network becomes. However, because the current White paper focuses on the technical execution of coin's blockchain and our business model, the detailed description of architecture and the principles of EEX governance will be finalized after pilot stage is passed successfully.

Ethereum Express Conglomeration

With the wide adoption of the EEX platform, we plan to gradually transition from partnering with cryptocurrency related projects to establishing partnerships with more traditional businesses.
Why?
Firstly, experts agree that the use of the Proof-of-Authority consensus algorithm is perfect for private blockchains that require the ability to manage operations. Secondly, and most importantly, due to the idea and speed that underlies the project.

With the successful launch of the model, where the blockchain can tokenize computing power or improve the entertainment sphere, it can be argued that any information is suitable for tracking and tokenization: from transferring to distributed registries of loyalty programs to warehouse accounting and distribution of goods to end users. In other words, the solution of specific business cases for a specific client looking for an opportunity to facilitate and accelerate interaction with their clients.

When concluding a contract with a new partner, part of the funds stored in the EEX cold fund will be reserved for it and then opened for use by it's clients in accordance with the proposed use model (for each individual case, the project architecture and business logic will be developed separately).

Such scheme of work will allow to create a whole conglomerate of projects based around a single idea of Ethereum Express Coin. Their users will be able to benefit simply by choosing one of the EEX partners. For example, consider the following situation:
Company A chooses the EEX platform as a partner to rethink and relaunch its loyalty program, whose main fuel and reward asset will be EEX, which can be obtained as a cash back by making purchases on the company's marketplace. User who has received EEX on their loyalty program wallet can spend their earned EEX on a discount on the marketplace, or they can do it in another way. For example, by transferring their rewards to the wallet of an affiliate project B using the EEX infrastructure in order to tokenize video rendering. By doing so, the user will be able to rely on dividends from project B.

Thus, the entire EEX ecosystem is giving birth to a galaxy of diverse projects, on the one hand creating a truly global network with great opportunities for users, and liquidity for EEX itself on the other.

Go-to-market Plan

After achieving success in areas of mining and gaming, we plan to expand the EEX platform to other areas of business. Firstly, these are projects related to referral marketing (due to the needs of automation and standardization and the constant search for new marketing mechanics) and those who are in search of technical partners able to provide a scalable and streamlined solution to expand their own client base. In other words, to attract people who are somehow connected to the crypto industry. Secondly, we're looking into working with areas requiring large computing power, which is exactly what EEX has [Liu].

Taking into account the above information, our efforts can be divided into two main directions. The first one is to consolidate our positions among blockchain community and the second one is to collaborate with EEX final users in the form of development of new offers, development of our marketing strategy and operational activity debugging.
In the second half of 2019, we will focus on testing and confirming our marketing hypotheses with our first partner project, Mining Express. Based on the results of our observations, the service will be improved for the global scaling. In more detail, our roadmap can be presented as follows:

1   Finalizing the formation of the core team at the crossroad of blockchain, marketing and management.

2   Preparing the necessary legal and regulatory documents to enter the world's largest markets – USA, Great Britain, Japan, etc.

3   Solution presentation at key technological events across the globe.

4   Finalization of processes and improvement of our internal products after receiving result analytics of a pilot launch with Mining Express.

5   Contracts with new partners to implement the EEX paradigm in other projects, including betting which, in turn, will make even more turnover for coin.

6   Entry of the EEX coin into the market. Opportunity to buy and sell assets at large cryptocurrency exchanges

7   Adding the ability to use the EEX ecosystem in such industries as Graphic rendering, AI, and Machine Learning calculations.

8   Adding the ability to use the EEX ecosystem in industries based on data using.

9   Formation of EEX Conglomeration.

10 The use of EEX as a means of payment and settlement, backed up by the value of the capacity used.

For each stage we will pick core business processes and challenges. These targets might be revisited and changed according to our current business alignment. However, the principle will remain the same.

Conclusion. What's next?

A successful project is always about making a successful match between the vision of an experienced product team and current market demands. The unprecedented jump in popularity of cryptocurrencies in 2017 and it's subsequent decline somewhat cooled the enthusiasm of the masses and ended the "Wild West" era of the crypto world. However, the crypto industry has withstood and is gradually starting to win back the lost positions. We see the emergence of new projects, ideas and approaches.

In today's world, simply having desire, technical skills, and the thirst for quick dividends is not enough. Market is becoming consolidated, centralized and, as a whole, is turning into a playing field for large competitors, most of whom are nevertheless interested in attracting new investors and the general public.

What makes EEX unique? The main USP consists of a whole set of factors, including purely technological solutions, that follow the example of our blockchain, and business solutions, which are being launched with an existing pilot projects.

In the future, based on the analysis of the first indicators, EEX has every chance to turn into something more than one of the projects. It can become a standard, or simply put, a ready-made infrastructure with an understandable integration process for different companies. Using our model of tokenization and by developing marketing activities for personal projects of different companies, industry players will get an effective tool to attract new customers and investors.

On the other hand, the end consumer will also benefit by receiving the opportunity to receive dividends from one of the most liquid crypto areas in just a few clicks.

We believe that the opportunity which blockchain offers to the world is truly enormous. We also believe that the most visionary, courageous and daring will win in this race!

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List of Figures

List of Abbreviations

EEX	Ethereum Express platform or coin
ETH	Ethereum
BTC	Bitcoin
CC	Cryptocurrency
PoA	Proof-of-Authority consensus
CEX	Currency exchange operation
p2p	peer to peer transfer (user to user)
GPU	graphics processing unit
DAO	Decentralized Autonomous Organization