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Smart Contract Platforms Review

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OVERALL MARKET REVIEW

The market niche of infrastructure blockchain platforms in general bears little to no regulation risks.

Digital technology is dominant worldwide. The old mainframe digital technology managed data in batches, now digital data is managed in real time over the internet. Blockchain brings digital technology into real-time computing systems management. It has the ability to change all aspects of the digital economy, including conducting business, delivering healthcare, shopping, enhancing education and learning, entertainment, and staying connected with a social world.

Infrastructure blockchain projects are still to mature in upcoming years as well.

Current infrastructure blockchain projects mostly offer smart contracts, dApps or mining.

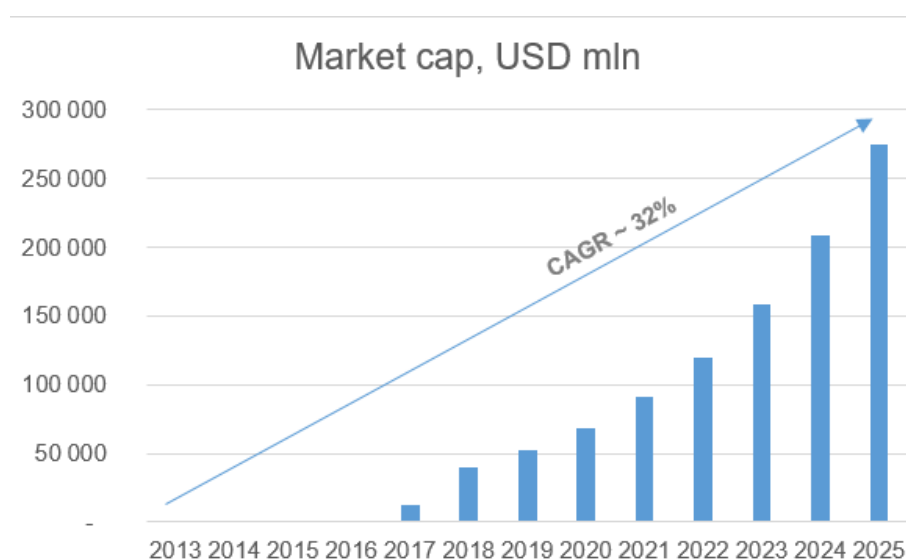
Smart contracts are a truly revolutionary tool. They have the potential to decentralize many of the processes we all rely on today. The exciting thing is that they have the power to dramatically improve on existing solutions without being a direct threat to governments.

Smart contracts are one of the applications of blockchain technology that enables organizations, government, legal bodies and even individuals to exchange monetary values, properties, shares, bonds with a value and a contract in a clear way, avoiding any conflict and without the need for middlemen. The key factor in the growth of smart contracts is their tendency to not only define the rules and regulations of an agreement but also automatically enforce any of its obligations. A smart contract can be used for any situation from financial, insurance premiums, contract breaches, property law and much more. This application has shown decent growth and is expected to grow significantly more in the forecasted period, catering to end-user businesses such as banks, governments, insurance, real estate, the supply chain and others. Government smart contracts could offer an advanced step in the development of voting and other legal formalities and tenders issued by those in power. These may include any agreement made between governments and private or public enterprises.

A second significant use case is, of course, decentralized applications. A dApp, in general, can be thought of as a normal application, but with the big difference that it is completely **autonomous and transparent**. dApps work on self-executing smart contracts, so the middleman is completely cut out.

According to a [Reuters survey](#), the smart contracts market is estimated to grow at a CAGR of 32% until 2023.

Based on historical data on market capitalization from [coinmarketcap.com](#), the forecast can be visualized as follows:

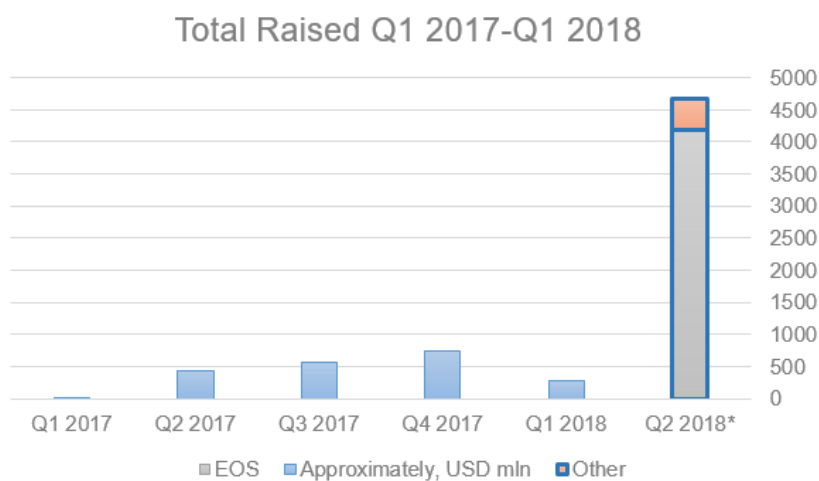


Currently, exchanges, financial services, gaming, and blockchain infrastructure are the most popular industries for projects deciding to stage an ICO. Exchanges, blockchain infrastructure and financial services are also the

leading industries for the number of funds raised. It is interesting to note that the most popular industries have not changed since 2017: Blockchain infrastructure, financial services, gaming & VR, and exchanges & wallets.

In Q1 and Q2 2018 blockchain infrastructure projects raised almost USD 5 bn overall; what is more, the amount raised during Q2 was 18 times higher than in Q1. This is due largely to EOS, which raised more than USD 4 bn in its crowdsale – a breathtaking record amount.

The total amounts of funds raised during 2017 and the first two quarters of 2018 are as follows:



SIGNIFICANT MARKET PLAYERS – A BRIEF SUMMARY

Project	Market cap, USD	Raised, USD	ATH, USD	Country of legislation/ Origin country	Development stage	Consensus mechanism
Ethereum	41.3 bn	18.4 mln	1432.88	Switzerland/USA	Active use on the market, but not the platform's final version	PoW (plans to move to PoS)
EOS	6.3 bn	4.2 bn	22.89	Caymans/USA	Mainnet is live	DPOS
Stellar	4.5 bn	No data	0.93814	No data	Testnet available	SCP/FBA (BFT family)
Cardano	3.4 bn	~ 62 mln	1.33	No data/ Hong Kong	Testnet available	Ourobos (PoS)
Ethereum Classic	1.8 bn	N/a	47.77	Switzerland/USA	Active market use	PoW
NEO	1.7 bn	28.1 mln	196.85	No data/China	Final stage	dBFT
NEM	1.3 bn	No data	2.09	No data	Beta 0.6.96 released	Proof-of-Importance
VeChain	744.7 mln	ETH 200	0.015944	Singapore/China	Mainnet is to be released by the end of Q3.18	PoA
Qtum	568.4 mln	15 mln	106.88	No data/ Singapore	Mainnet is available	PoS
Lisk	426.3 mln	6.5 mln	39.31	No data/Germany	1.0.0 Testnet released (as of June 2018)	DPOS
Zilliqa	429 mln	22 mln	0.20	Singapore/ Singapore	Testnet stage, dApps release is upcoming in Q3 2018. Some projects already on Zilliqa's platform	pBFT
ICON	353.4 mln	45 mln	12.64	Switzerland/Korea	Final stage – already functional	LFT (BFT family)
Waves	183.3 mln	15.8 mln	18.07	UK/Russia	Testnet available	LPoS
WanChain	120.5 mln	35.7 mln	9.92	Singapore/ China	Version 1.0 available	PoC (Proof of Concept)
Nxt	82.7 mln	~16.8 th	2.16	No data	The project is live, Ardor developed on the basis of NXT	PoS



Ubiq	41.8 mln	N/a	7.21	Switzerland/USA	Working platform for dApps, Ledger wallet available	PoW
HyperledgerFabric	No data	No data	No data	No data/USA	SC 1.2.0 released on GitHub	pBFT

Blockchains must be scalable to achieve their full economic potential. This necessarily entails compromises. It is known that blockchain protocols suffer from a so-called "impossible triangle": It is impossible for a single blockchain to have at once the three desiderata of security, decentralization, and scalability. Here is a comparative table of consensus mechanisms popular in infrastructure blockchain projects, which have most recently been trying to solve this trilemma:

	PoW	PoS	DPoS	BFT	PoA
Pros	Has been tested in the wild since 2009 and stands steady today as well.	Energy efficient. More expensive to attack for attackers. Not susceptible to economies of scale.	Cheap transactions High scalability High energy efficiency Miners can collaborate to make blocks instead of competing like in PoW and PoS	High throughput Low costs High scalability dBFT: fast&scalable	Energy efficient Fast
Cons	Slow. Uses up a lot of energy, not good for environment. Is susceptible to economies of scale.	Nothing-at-stake problem	Partial centralization Participants with high stakes can vote themselves in to become a validator.	Requires trust between participants Usually used for private, permissioned networks. dBFT: Everyone is fighting to be root chain. There can be several root chains.	A bit centralized: Can be used in public blockchains but usually used in private, permissioned blockchains
Popular users	Bitcoin Ethereum Litecoin Ubiq, etc.	Ethereum (soon) Peercoin Nxt Qtum Waves, etc.	Steemit EOS BitShares Lisk	Hyperledger (pBFT) Stellar Dispatch Ripple Zilliqa (pBFT) NEO (dBFT)	VeChain POA.Network Ethereum Kovan testnet

In a proof-of-work mining system, participants solve an asymmetric computation that is hard to decipher, but easy to check. One criticism of this algorithm is the overall cost of the processing power used to solve the problem, which is then checked by other nodes and encoded onto the ledger, with a fee awarded to the miner.

In a regulated environment or one with a limited number of known participants, there may be opportunities to dial back on some of the arduous cryptographic protections. The consensus is less costly to achieve when the participants have some degree of trust. This can result in shorter times for committing transactions and agreement on the immutable record.

An alternative system, proof-of-stake, achieve consensus by having miners prove that they control a certain amount of currency or tokens. Existing private blockchains use a round-robin approach to adding blocks onto the chain, which they digitally sign using a public-private key encryption mechanism. Ethereum, a popular advanced blockchain platform, has been working on moving from proof-of-work to proof-of-stake in its Casper protocol, which offers a stronger technological definition of settlement.

As can be seen from the table above, PoS and BFT mechanisms and their derivatives (PoI and pBFT & dBFT respectively) are the most popular among infrastructure blockchain projects.

Regarding Proof-of-Importance (PoI) – this protocol is considered better than PoS for evaluating stakes and is resistant to arbitrary manipulation. NEM's consensus network depends not only on the number of coins but on the possibility that productive system action is remunerated. The chances of staking a block arise from a combination of various factors, including notoriety (controlled by a different purpose-designed framework),

balance, and the number of transactions made to and from that position. This is termed as *importance calculation*. This gives a more all-encompassing image of a 'helpful' system member. Below we will consider the project in detail and highlight possible "cons" for this protocol.

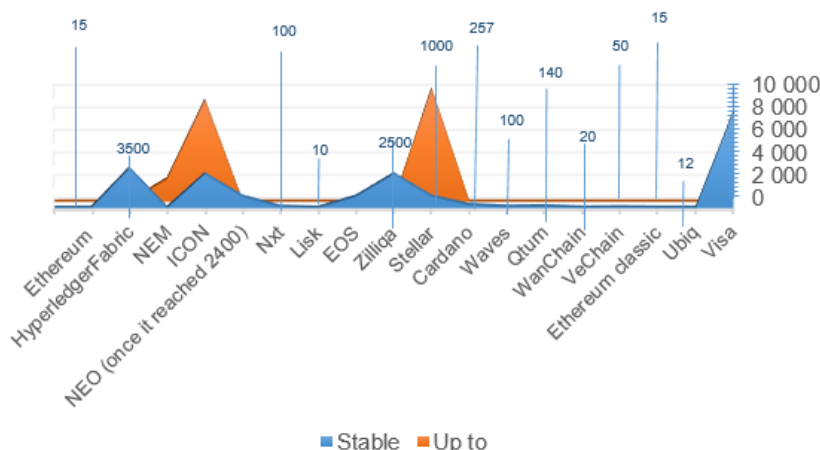
These concepts are also sometimes compared by being Turing-complete or not (e.g: PoW, PoS – Turing complete, BFT family - not).

Turing completeness is a property of a programming language or system whereby all Turing-complete systems can compute the same set of operations, such as conditional branching or loops.

The Bitcoin blockchain was not Turing complete; it could perform some conditional operations, such as 'check timelock' (a contract which enforces a certain passage of time before coins could be spent) but not, for example, execute a payment if a certain exogenous condition is met. Some argue that it is unnecessary for blockchains to be Turing-complete (the creators of the Bitcoin blockchain turned off this property) and furthermore that it is unsafe, due to the dynamic typing of such languages that potentially produce unpredictable results. Extra complexity comes with additional challenges. At the time of writing, the \$150 million fund existing on the Ethereum blockchain known as the DAO (distributed autonomous organization) is in turmoil after an attack saw the equivalent of \$45 million flowed away into an account, like a cash machine that keeps spitting out cash without updating your balance.

This happened because the language in which the protocol for the DAO was written is procedural, rather than functional – meaning that it is impossible to fully determine the behaviour of the smart contract before executing. The language, Solidity, was Turing-complete. However, the functionality can be achieved without this danger. Smart contracts themselves are not a new idea; many 'domain specific languages' for financial services already exist and are currently being used to code smart contracts. There exist ecosystems of languages such as functional languages, or specification/implementation (what a contract does / how it does it) pairs. These come with formal reasoning and verification tools that can be used to prove a contract's behaviour mathematically before running it. These tools are not applicable to Turing-complete languages. Actually, only a portion of dApps truly requires the use of Turing-complete languages. That is why we do not wish to pay any further attention to this topic.

As already mentioned, one of the problems in the "trilemma" is scalability, which is responsible for the speed of transactions. The current market situation is as follows (tps):



The orange fields indicate announced tps levels for the projects above, which they have not yet achieved for various reasons.

We will return to this issue a little later.

DETAILED REVIEW

It is quite a complex task to compare 17 projects, so we decided to divide them into 3 groups from the point of view of their interoperability and logic.

In the first “group” there is only one project – Ethereum, as it still is the major player in the infrastructure blockchain project market.

The second group includes ICON, Waves, Zilliqa, Eos and NEO. These projects have historically had much “hype” around them, and they are still showing a quite strong market performance.

The third group includes the other projects from the table above. We will highlight their strengths as well as possible weaknesses, and show their current market performance.

Ethereum

Ethereum’s merits in the blockchain world are hard to belittle.

Briefly, Ethereum has two main features:

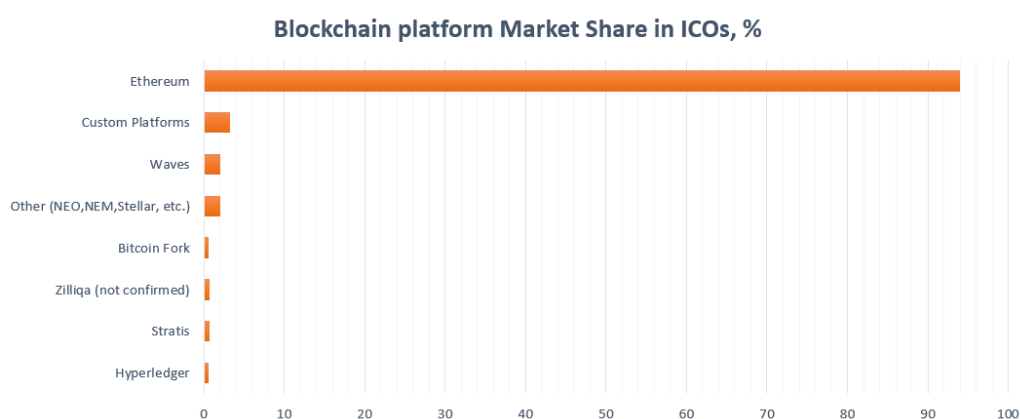
- A cryptocurrency
- Smart contracts:
 - A tool for registering transactions for the exchange of crypto assets and other resources through smart contracts
 - gas for the implementation of smart contracts in a peer-to-peer network
 - A platform for dApp creation

Ethereum is, in fact, a pioneer in the smart contracts world.

A smart contract is a computer algorithm that enables automating contractual relationships between people: It cannot be circumvented, cancelled or violated.

There are many strengths - at the moment, Ethereum occupies more than 90% of the ICO market and is its absolute leader. The initial emission of tokens in 95% of cases occurs on the basis of the Ethereum platform, and at this stage of the ecosystem’s development, Ethereum continues to monopolize the market due to easy listing on DEX (most tokens are built on Ethereum or the 0x protocol.). 2nd-quarter projects have used other platforms such as NEO, NEM, Stellar, and Waves.

The vast majority of current ICOs use the Ethereum infrastructure not exactly as a platform, but more precisely the smart contract capability of this network. When conducting fundraising campaigns, ICO organizers usually accept ETH or BTC as payment, sending investors tokens in return. Most often, these are tokens of the ERC-20 standard, which are themselves smart contracts.



On the other hand, as Ethereum is open-sourced and anyone can build a program on top of Ethereum, it is great for democratizing access to the blockchain, but the downside is that *each new node will operate slower and slower, which clearly affects the speed of the software*. This makes it difficult to scale.

Ethereum is extremely in demand, and despite the relatively short time of its existence it has managed to attract attention from all types of user, e.g.:

- software developers IBM, Microsoft, Acronis
- financial and credit organizations such as VTB Bank and PJSC "Sberbank"
- S7 and Lufthansa airlines
- The charity organization UNICEF (United Nations Children's Fund)
- and many others

It is widely used for its intended purpose as a platform for developers. The technology also finds application in various areas of financial activity and business relations.

To date, Ethereum has firmly taken second place by capitalization, immediately behind Bitcoin. The significance and prospects of the technology cannot be overestimated, and with each passing day, it evokes more and more public interest provoking a largely steady increase in the coin's value.



However, the total number of ETH coins for release is unlimited. In the long term, infinite emissions can lead to a drop in the value of the cryptocurrency as a result of inflation.

Ethereum has great plans to adapt sharding and Plasma on its platform. Sharding is a scaling solution that uses shards, or micro-chains, to process separate types of a transaction on the Ethereum blockchain. Sharding removes the need for the entire network of nodes to process every individual transaction – increasing TPS on the blockchain.

Plasma compartmentalizes network usage through child chains that process transactions separately from the main chain, updating the entire blockchain only when transactions are complete. Together, these two scaling solutions could compound the network's TPS by 100x each while retaining the security of the Ethereum protocol, creating a decentralized ecosystem that can potentially support one million transactions per second. The terms for implementing these updates are not specified.

ICON

The ICON project aims to build one of the largest decentralized blockchain networks by the means of its ICON platform which supports dApps, crosschain compatibility, smart contract versioning, DEXs and AI support.

ICON is often described as the Korean Ethereum and with reason. The overall purpose of ICON is similar to that of Ethereum. We note that ICON offers more features at the date of analysis than most of its competitors; the only drawback is that it seems that ICON is currently focusing on the South Korean market, based on its business development achievements.

The project is aimed at combining all activities in the country through its own blockchain system. It is creating an open-source ecosystem that enables organizations such as government departments, universities, hospitals and financial institutions to interact without third-party networks that charge commissions for transactions or delay the process.

Thus, ICON's goal is to allow users to use ICX to pay for products and services directly to organizations that cooperate with the ICON Network. ICX is essentially a currency that can be used in the real world for various products and services.

Key features include intellectual contracts that can function in multiple chains.

ICON also works on the ERC20 standard.

As for the project's roadmap - overall, the team is on track with business development but has some trouble with technical development.

ICON utilizes a consensus algorithm called Loopchain fault tolerant (LFT). ICON describes LFT as a continuation of the BFT approach by Tendermint, with a simplification of the algorithm for selecting a primary node. The Loopchain platform is designed to enable transactions between independent ICON blockchains to form a community called a Nexus.

The Practical Byzantine Fault Tolerance (PBFT) has been modified to the Loop Fault Tolerance (LFT) version, resembling more the Tendermint approach. The LFT is basically a consensus algorithm aiming at combining PBFT and Delegated Proof of Stake (DPOS). The basic structure however still remains the same, where leader nodes are ones taking turns in proposing transactions on the blockchain while still voting on the validity of each transaction.

Unlike other networks, the Loop Fault Tolerance of the ICON works towards making the voting process efficient by trying to reduce the number of steps involved in this consensus process. LFT instead uses the spinning technique, which simplifies the whole algorithm used to select primary nodes who are leaders responsible for validating, broadcasting blocks to the appropriate validation nodes.

The following can be considered as the advantages of this project:

- The company is launched by Korean FinTech, which is estimated to be worth around USD 4 bn. Currently, it is the market leader in Korea with the largest blockchain network, employing more than 40 organizations in financial services, insurance, education and hospitals.
- The project has been under development for more than 3 years and has applications in the real world. In August 2017, the first production blockchain service was launched - a KYC authentication platform with 25 security firms.
- It is currently functioning. DAYLI Intelligence has more than 100 employees, most of whom contributed to the project.
- Interchain ability makes ICON a blockchain-agnostic platform. This is a benefit no matter which blockchain becomes the dominant platform in the future.
- A distinguishing feature (from EOS and Ethereum, for example) is the presence of DEX on the platform, which executes the trading system between sellers and buyers on the blockchain.

- The ICON community already consists of authoritative institutions - banks, securities, insurance, hospitals, etc. The project's dApps including blockchain and payment & exchange identifiers are already proving beneficial. For example, a blockchain ID can be issued by a community of securities and used to verify identity in all other communities. Similarly, ICX issued by hospitals can be used for payment and exchange in other communities.

Issues potentially include the following:

- ICON may face difficulties in expanding outside of Korea due to language and cultural barriers.
- Regarding the regulatory environment for Korea, there are uncertainties regarding AI. If ICOs are not permitted in Korea, this will somewhat limit the use of ICON.
- The maximum inflation of 20% is quite high and inflated for ICO participants.

For information, ICON has joined the [“Blockchain Interoperability Alliance”](#). The alliance is backed by ICON, Aion and Wanchain and has a shared goal of promoting interconnectivity between isolated blockchain networks.

Project tokens' emission is also limited.

ICON Charts



Actually, ICON demonstrates largely the same dynamics as the overall market despite a previous postponing of mobile wallets and token swap (both now finally released after a delay), which may be evidence of market makers' overall belief in the project.

Waves

Waves advocate itself as a blockchain platform intending to be a decentralized location for crowdfunding and trading by tokenization.

Waves intend to impact fiat currency transfers and crowdfunding markets on the blockchain. It also provides smart contracts, but they are specific and unlike Ethereum ones. Here, smart contracts are written by built-in plug-ins, making the entire process more simple. Waves make certain things simple by using plug-ins; things which if done on Ethereum could be very lengthy and complicated.

Shortly, Waves is a decentralized platform, where:

- Any goods may be traded
- DEX including fiat exchange is possible
- An innovative crowdfunding system is featured

The platform operates on the basis of LPoS consensus, a modification of consensus proof-of-stake. A feature of LPoS is the ability of users to transfer their own balances to full nodes on a lease basis in exchange for a portion

of the profit from mining (called account leasing). Lessors have the right to return the transferred funds at any time. Users involved in generating blocks are selected based on the balance of Waves tokens. Rights of mining within the framework of the platform are only available to full nodes. Ordinary users can only transfer their balance sheets to these, and cannot participate in the process of mining.

At the moment, the tps rate for Waves is up to [100](#), which is about 6 times faster than Ethereum. These figures are however far from the best for this indicator; Zilliqa, ICON and HyperLedger Fabric, for example, are much faster.

As mentioned, one of the platform's features is DEX. WavesDex is a decentralized exchanged built on the Waves blockchain. It enables users to trade their BTC/ETH/etc. in exchange for Waves (or any other asset token issued on the Waves platform), and has fiat gateways like EUR, USD etc. About 50 edits were made before the release of this platform.

In April 2017, the platform launched its DEX exchange in a lite-client form with a GUI interface, and it thus became available to all users. The lite version of the trading platform differed from the main DEX network in the sense that customers did not need to download the blockchain system completely, and any pair of tokens could be traded directly without using an intermediate currency. On July 24, 2018, with the end of the beta stage of the mobile application Waves Client, the DEX exchange received a major update.

In the new version of the platform, the interface has been changed, the API updated, the ability to search for assets has been introduced, as well as the ability to attach and unfasten tokens on the home page, night mode has been added and stability has been improved. All changes were made taking into account the requirements of users. On the same day immediately after the update, a phishing attack was carried out on the DEX and the main company website. The decentralized structure of the exchange did not allow hackers to withdraw tokens, because the platform does not store client assets. Waves took several hours to regain control over its domains. After this cyber attack, users criticized Waves for its requirement for entering seed-phrases to use the DEX wallet.

Waves have featured some marketing innovations, notably its soccer-related tokens. By the start of the World Cup, Waves had released 100,000 MutCoin (MTN) tokens. 50,000 MTN will be received by platform users, the remaining 50 will be provided for the players and coaches of the Russian national football team.

Within 60 days of the end of the World Cup, Waves will have to redeem all the tokens. The price depended on the results of the Russian football team. If the Russian team won the cup, the prize fund would have reached \$ 2.5 million.

Waves also released 200,000 Soccer token (SOCCER). Their redemption price was tied to the team-winner of the World Cup. The maximum reward is 30 bitcoins.

It is still unclear how this ended as 60 days have not passed at the time of writing, but the economic component of this event still raises questions.

It is notable that, for example in the Netherlands, businesses began to accept Waves in bars and restaurants; the first serious Russian ICO project on this platform was the project LavkaLavka (with some with interesting features), as well as Viso (advertising for convenience stores) and MyTrackNet, a geolocation project on blockchain. Among the foreign partners for Waves are eSports (a playground for game developers), PrimalBase (a decentralized workspace for IT professionals), MobileGo (gaming industry) and even the Astana International Financial Center (AIFC). PrimalBase and MobileGo have also released their own tokens on the Waves platform.

Overall, WAVES' dynamics follow the market.

Waves Charts



To date, Waves' cryptocurrency is ranked 48th by capitalization, having dropped significantly from having once been in the top ten.

It's hard to make any predictions in such a changeable market, but the project has existed for two years, is more or less stable in this time, and in general, the development team has followed its roadmap. Recently, however, Waves has not shown the best results, and its activity on social networks is also significantly reducing.

This does not necessarily put them in a bad light, but the project's management and developers should think about the future development of the project.

EOS

EOS is a blockchain-based decentralized operating system designed to create, host, and support decentralized autonomous apps, with such features as scalability, flexibility, usability and governance, which is maintained by establishing jurisdiction and choice of laws along with other mutually accepted rules. This is usually done via a legally-binding constitution. Every single transaction on EOS must include a hash of the constitution in the signature.

That sounds highly impressive itself, but what has really captured the public's imagination are the following two claims:

- The project is planning to abolish transaction fees.
- They are claiming to have the ability to conduct millions of transactions per second.

The stated goal of EOS is to develop a blockchain on a commercial scale by creating "decentralized autonomous communities". In the whitepaper, it was stated that EOS is "a program for creating a globally scalable blockchain society" that allows to "vertically and horizontally scale decentralized applications" through a "construct similar to an operating system."

Simply, it is assumed that EOS' software will support distributed applications that work on the basis of the blockchain, similarly to how network applications currently function.

Recently, the Bitfinex exchange has concluded a partnership agreement with the EOS project, intending to create their first decentralized exchange, [EOSfinex](#). This agreement is a vote of confidence in EOS - a platform that allows users to run decentralized applications. In this capacity, it stands in line with the Ethereum, Lisk and NEO in the market, where competition is extremely high.

One of the unique features of this ICO is that the sale of tokens lasted about a year; as the project's management stated, this is due to a wish to guarantee users obtaining an objective market value for EOS tokens.

Another "highlight" is the following: the projects' team expressly state that EOS tokens do not have a real relationship to the software. The purchase agreement, which investors must sign, states that the tokens *"do not have any rights, use, purpose, purpose, functionality or functions."*

EOS' software will be at first and foremost a platform for coordinating the transfer of authentic messages to accounts.

Regarding the roadmap, EOS more or less adheres to the milestones specified in the initial roadmap. The testnet's audit has already been conducted, the problems identified during this are partially fixed and still being solved. The mainnet is live.

Since EOS does not use the principle of Proof-of-Work, it avoids the trap of centralizing the power of mining and forks.

One of the advantages of this system, as well as for the models of dBFT (Delegated Byzantine Fault Tolerance) found in NEO, is the fact that producers of blocks cooperate rather than compete, thereby reducing the likelihood of forks. Unlike dBFT, forks can happen, but the system offers several checks to warn users that they are on a minority block and they have no incentive to continue working.

By the way, to the fact that Ethereum has almost monopolized the market, and even such a large project as EOS functions within the Ethereum environment, it is possible to invest in it using this cryptocurrency and also BTC.

The project also has problems, and there are some doubts about it. EOS's mainnet launch was slated to happen on June 2, 2018, but was delayed for [more than a week](#). During this delay, the project was often criticized, especially regarding the fact that despite such a high amount of funding raised, the project had no working product and the development team did not react to information about bugs discovered by external testers. Since the date, the mainnet became live, distrust has generally subsided.

EOS steadily holds a place in the top 10 for market cap among blockchain projects, periodically achieving the top 5. In general, the dynamics of the token corresponding to the mood of the market.

EOS Charts



1,000,000,000 EOS tokens are issued in total; the emission is limited, conferring a lower risk of inflation than Ethereum's.

In general, EOS has a strong chance of occupying its niche, despite criticisms: Ethereum aims to become a ["world computer"](#), NEO is a ["global economy"](#), whereas EOS intends to scale decentralized applications to a commercial level. The exchange launched in cooperation with Bitfinex is the first example of this kind.

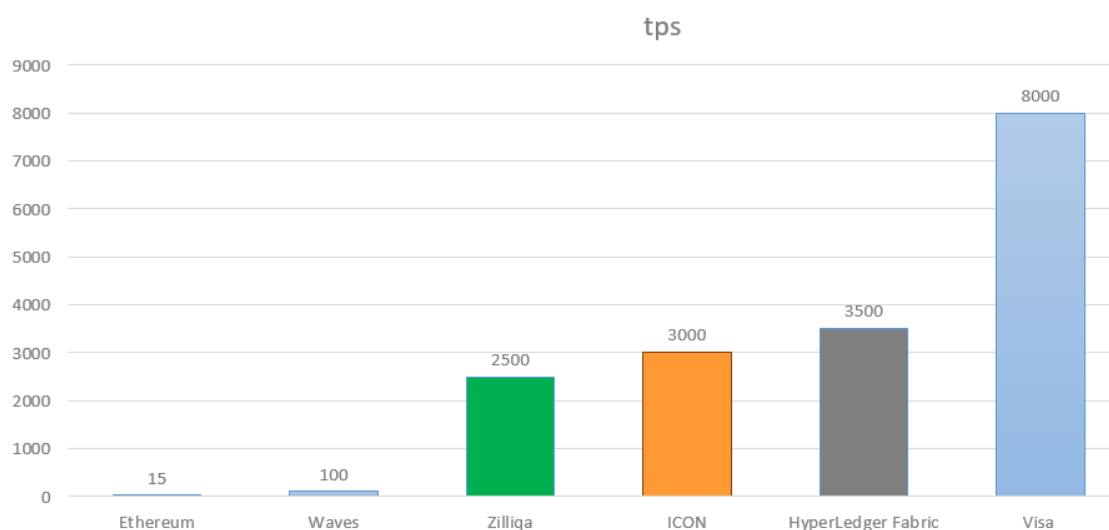
Zilliqa

Zilliqa is a new blockchain platform that can handle thousands of transactions per second, thus potentially approaching Visa and MasterCard's capacity. To do this, the platform uses sharding, including network sharding, sharding in the processing of transactions and sharing of distributed computing.

Besides being a high-performance infrastructure solution (thousands of tps), the Zilliqa team envisages near-to-zero-fees as well as support for dApps and smart contracts.

Zilliqa also operates on ERC-20. Basically, Zilliqa operates using PoW, but doesn't use it to reach consensus; for this purpose, pBFT is used. Zilliqa utilizes the pBFT protocol to ensure the security of the network. pBFT assumes that a portion of the nodes within the network is hostile. Based on that, each node has to independently verify all transactions on the network and share the results with other nodes. The consensus is reached by a majority of nodes.

As can be seen below, Zilliqa is one project which could try to compete with Visa if further development continues to be successful. Zilliqa's tps level is confirmed by the crypto community.



Zilliqa also offers transaction finality, unlike its competitors, which means that there is no need to wait for confirmations. This also eliminates the double spending risk and provides an additional speed improvement.

According to the project's Medium account, the roadmap milestones have been changed slightly and moved 1Q back. Development is already at the final stages and the team say that there are already projects built on its basis, but this information is not yet confirmed.

With regards to the smart contract language, as mentioned a non-Turing complete language has its own pros and cons; however, we note that only a portion of dApps truly requires the use of Turing complete languages.

Zilliqa closes up the top-30 by market cap and demonstrates even better than overall market dynamics, so the fact that the project demonstrates these dynamics in a falling market may be evidence of market makers' belief in the project.



Zilliqa Charts



Overall, Zilliqa has stunning prospects: Its lower capitalization as compared to the competition could be an indicator of possible opportunities for future growth, development is in full swing, at a really serious pace; regarding resolving issues of transaction speed the project has moved ahead of everyone else at the moment.

At the same time, it has been announced that Zilliqa [postpones](#) its Mainnet release from Q3 2018 to January 2019. According to the team, this additional time will be leveraged to conduct security audits, prepare for and execute a token swap, integrate with wallets, develop toolchains, etc.

NEO

NEO is the first decentralized, open-source cryptocurrency and blockchain platform launched in China. They had a complicated path by the standards of the cryptocurrency world, but perhaps a bright future. This currency first appeared in 2014 and was called Antshares, but did not stand out for any reason.

Currently, NEO is working towards developing a product for the future. It not only rebranded from Antshares to NEO in June of 2017 but refocused its marketing as well, with enormous success. Neo's objective, while ultimately utilizing many of the same technologies as Ethereum, is to be the platform for a new smart economy.

NEO can be used already. Many outlets have adopted it, making transactions easier for them and their customers, especially regarding international transactions and smart contracts. NEO is being called the "Chinese Ethereum," and has collected a huge fan base.

NEO uses delegated BFT for consensus. This means that an assigned subset of nodes, called accounting nodes, is responsible for executing the consensus protocol on behalf of the NEO network. The accounting units must deposit money as collateral, and this amount must be a certain size. The problem with the idea of collateral is as follows: If the number of accounting units is large, then their collateral reduces liquidity in the market. If the

number is not large, there is a risk that attackers will be able to take the network under their control. However, all BFT family consensus protocols are characterized by high throughput, high scalability and low costs, which make them suitable for infrastructure blockchain.

The project has the following positive features:

- The platform already has a cooperation agreement with Microsoft and Alibaba. The relaunch of the platform took place at the Beijing branch of Microsoft.
- Support for all major programming languages, which indicates the involvement of a large number of developers in building the platform in comparison, for example, with Ethereum.
- Sharding and parallel computing are implemented.
- A total absence of commissions for transactions (as Zilliqa, EOS, etc.);
- A high scalability level – currently not the highest, but the project team claims that the potential is super-high – up to 100,000 tps.
- [Close cooperation with China's government](#), which in the long term may mean becoming China's national cryptocurrency.

NEO Charts



100,000,000 NEO tokens are issued in total; the emission is limited, which indicates less susceptibility to inflation than Ethereum.

Some believe that the Chinese authorities are considering allowing ICO in the country only on the basis of NEO; in this case, the project would have every chance to grow into a full-fledged competitor for Ethereum and other ambitious infrastructure blockchain projects.

CONCLUSION – PART 1

All three of these projects are really ambitious and have a great chance to occupy their niches. As the key feature of EOS is its scalability, we compare it with Zilliqa (pBFT), NEO (dBFT) and EOS (DPoS) in this respect; the inference could be that the standard/practical pBFT's advantage (Zilliqa) is that it offers completion. We will also compare dBFT & pBFT, as their advantages over DPoS are quite obvious.

dBFT – has a designated subset of nodes called accounting nodes, responsible for the implementation of the consensus protocol on behalf of the NEO network. Nodes should place a deposit which is quite significant in size.

pBFT- for security reasons it is required that this protocol is executed with a sufficiently large number of nodes. No pledges/deposits.

Another difference is the approach to achieving high throughput or scalability. pBFT does not scale if you exceed a hundred nodes. However, BFT protocols have the advantage of completeness. There are two ways to use BFT without affecting the main bottlenecks. One of them is to run BFT among a subset of delegated nodes on the network as NEO does. Another way is to divide the network into several subnets, where BFT can be executed in parallel.

Zilliqa uses the second approach. It has two advantages: 1) security and decentralization are maintained at a high level. Zilliqa also uses other basic elements, such as Schnorr multi-signatures, to get around some problems. This means that: 2) throughput can increase linearly with the number of nodes. The second advantage is clearly absent in the first approach. Usually, a larger network means better decentralization, but in an unprotected network, this, unfortunately, leads to bottlenecks. However, a parallel network such as Zilliqa can maximize the use of a large network, avoiding bottlenecks.

The EOS launch was not really successful and its Delegated Proof-of-Stake (DPoS) consensus mechanism hardly seems like the kind of solution that the decentralized web can be built on.

Waves NG implements a protocol based on Bitcoin NG, using PoS to exclude Sybil attacks. Zilliqa uses PoW for this purpose. Since Zilliqa was inspired by ByzCoin, which in turn was inspired by Bitcoin NG, there are some similarities in the design between Waves NG and Zilliqa. However, the main difference between the two protocols is that Waves NG does not feature sharding.

ICON operates on an even further-developed pBFT – LFT, which is basically a consensus algorithm aiming at combining PBFT and DPOS, which gives it a strong position. The project is already operational and in use.

As can be seen, all the above projects have something special; there are downsides to these coins, but it is still prudent to consider them all (and the ones from the list below), as the smart contracts era is at its very beginning.

Ethereum certainly seems like it is in the best position for the moment. Being the first player, it has already caught the eye of individuals and businesses looking to take advantage of smart contracts. NEO is perhaps the second because, rather than just focus on smart contracts and decentralized applications, it wants to build a smart economy. EOS is something like the second generation of Ethereum. Its nature is the same, but it boasts multiple technical advantages such as higher transaction speeds and, most significantly, horizontal scaling. As smart contracts become increasingly adopted, it will have to find a way of dealing with higher numbers. Of course, EOS has a future, Zilliqa as well. Zilliqa has a specific mission to support high-throughput dApps that need to leverage the properties of the blockchain: Openness, accountability, transparency, etc. ICON's is perhaps the most unique. Among these projects Waves seems the least successful, but still it has a future – it is under further development and surely has its users.

OTHER PROJECTS

Stellar

Stellar Lumens is a real-time electronic payment platform. It was founded in early 2014 by developers Jed McCaleb and Joyce Kim as a “fork” from the Ripple system, which later developed its own open-source protocol. In general, the platform was conceived as Ripple, without the deficiencies and using its own electronic currency, formerly called Stellar and now known as Lumen.

As is well-known, the main disadvantage of Ripple is its centralization; Stellar is completely decentralized, and full consensus among participants is reached.

Technically, Stellar uses SCP – the Stellar Consensus Protocol, which selects a group of nodes to vote for transactions and a process of making a collective decision for the group for each of them. This consensus is built on the basis of BFT.

Stellar / Lumens is not just a cryptocurrency, it is a whole global financial ecosystem with a built-in decentralized exchange, its own token and a wallet. The platform is created for the most convenient and cheap transfer of funds between participants. The idea is that companies and individuals have the opportunity to quickly transfer any financial assets using the XLM token. Ripple is well-known for its transaction speed, Stellar in this regard is even faster, having several thousand tps. There are already ICOs being launched on the basis of Stellar.

Stellar has the following features:

- **Multicurrency transfers.** Participants in the system can make transfers and easily exchange currency within the system, both regular currencies and cryptocurrencies. They can also combine two processes in one - a money transfer which is transformed into another currency upon receipt.
- **Micro-transfers.** It is possible make money transfers of any amount, without a minimum threshold.
- **Compatibility.** The Stellar platform supports a huge number of electronic wallets (Centaurus, Saza, Ecliptic, etc.), which makes participation in the system much more convenient.

It is worth noting that the platform is currently operating and stable, has a deserved popularity, and transfers are genuinely very fast.

Despite the fact that according to the Alexarank website, social activity for the project has slightly decreased, the project has a good outlook. Initially, it quickly gained recognition in the crypto community, gained incredible popularity and entered the top ten for capitalization level, and still holds its place (6th at the time of writing).

Stellar is already integrated into the business models of such companies as Deloitte, Tempo, Parkway, and the IBM Corporation (IBM uses Stellar to make payments between remote offices worldwide, significantly reducing costs for bank transfers).

All rights to Stellar belong to a non-profit and non-equity fund. The fund regularly reports on its activities, which contain detailed and comprehensive information on the status of the assets at its disposal.

Cardano

The ambitious and high-tech project Cardano and its internal token ADA are steadily holding their place in the top 10 most promising cryptocurrencies. Cardano is a decentralized platform for scalable transfer of value, with open source code. The platform ensures great reliability for all operations. Cardano is a project that aims to create a next-generation smart contract platform and ecosystem by learning from and improving on lessons learned in the Bitcoin and Ethereum communities. The project claims to be “the first blockchain platform to evolve out of a scientific philosophy and a research-first driven approach.” The project’s goals include improved scalability, security, governance, and interoperability with traditional financial systems and regulations.

Cardano like Ethereum is an entire ecosystem, which provides participants with the opportunity to develop their own smart contracts, and hence tokens. However, Cardano is not an Ethereum fork, as it has the following differences:

- a two-level blockchain structure is implemented. One of the levels serves for circulation of the internal cryptocurrency ADA, the second one is just for the use of smart contracts. This separation allows the network to redistribute the load, offering a much higher performance, and eventually create a stable, productive and secure platform.
- Cardano offers a more economical and fair distribution algorithm based on the ideas of PoS - Ouroboros (while Ethereum continues to burn gigawatts of electricity on PoW).
- Using Haskell as a language.

Ouroboros uses a PoS algorithm for energy-saving and transaction processing acceleration. Cardano also adopted the RINA (Recursive Internetworked Architecture) for scalability of the network, in order to achieve the TCP / IP standard, the main protocol used on the internet for data exchange.

At the moment the project has a testnet available and regularly informs its followers about its [development stage](#).

To summarize, the project has the following pros and cons:

Pros	Cons
<ul style="list-style-type: none">• The Oroburos (PoS) protocol is the only PoS protocol to be peer-reviewed and mathematically proven to be secure• A wallet is currently available• There are plans for smart phone wallets in the near-future• A debit card that can be directly linked to ADA accounts is currently being developed	<ul style="list-style-type: none">• There is a base fee for every transaction• Some of the applications are still being developed• It's still a bit centralized

Further growth of capitalization and the token's exchange rate will depend on the rate of completion of claimed Cardano platform functionality. The most anticipated and most valuable, in terms of investment attractiveness, is the emergence of smart contracts and distributed applications based on the blockchain. The implementation of smart contracts will open a possibility for Cardano to use its technology in the real economy – via financial organizations and government institutions, the main goal of the developers.

If the idea succeeds, Cardano will still have to wait on a long process of certification and licensing, but the start of this process will signal investors to expand their interest, which will automatically lead to the growth of token's price.

Ethereum Classic

Ethereum Classic is one of Ethereum's major forks. The reason for the appearance of Ethereum Classic was the hacker attack on the DAO fund at the end of 2016.

Ethereum Classic, like Ethereum itself, is decentralized. Like ETH, ETC is used on crypto exchanges and has the same functions involving decentralized applications and smart contracts as Ethereum. It is written in the same language, Solidity.

It is a secure, decentralized platform aimed at creating and supporting the execution of decentralized applications (dApps). This was the fundamental principle of the original Ethereum before they decided to perform a hard fork and make changes to the protocol.

The only significant difference between Ethereum Classic (ETC) and Ethereum (ETH) is the basic idea. There were of course participants for and against the hard fork at the time of its occurrence. Despite the fact that ETH and ETC are based on different blockchains, they are the same in their functions and in their use of smart contracts.

After this hard fork most developers and large traders, including Vitalik Buterin its original creator, switched to Ethereum which has gone through many updates since then.

To date, the transition of ETC to Proof of Stake is not planned (unlike Ethereum), although programmers from the IOHK Institute are engaged in the development of a PoS protocol for Ethereum Classic.

Earlier this year it was announced that Ethereum Classic would receive investor support through the [Ethereum Classic \(ECT\)](#) investment trust.

This trust was created by the VC [Grayscale Investments](#), a subsidiary of the Digital Currency Group, which holds 3.6% of all Ethereum Classic.

Grayscale already has a good track record; it successfully helped investors to profit from the crypto loans made through the Bitcoin Investment Trust, so it is not surprising that by August its net assets of ECT reached more than USD 53 mln.

At the moment, Ethereum Classic is stable among the top 20 cryptocurrencies by capitalization (until recently in the top 10), while Ethereum is in second place. The dynamics of these currencies are similar.

Ethereum Charts



Ethereum Classic Charts



Technologically, if ETC wants to remain as one of ETH's competitors, it should innovate like Ethereum and establish partnerships like the Ethereum Alliance Enterprise, otherwise, it could quickly become obsolete.

NEM

NEM is a blockchain platform for managing digital assets. NEM does not support smart contracts, but some software transaction capabilities are to be added in the next release of the platform, known as Catapult.

Initially, NEM was launched as a fork of NXT in 2014, but its creators eventually encoded an entirely new platform from scratch (in 2016).

The platform is unique, featuring a 1-minute block time, a POI algorithm and multivalued accounts, among other unique innovations.

With the use of NEM, anyone can create their own asset in a public blockchain – known as mosaics. The idea of mosaics is similar in many respects to the concept of tokens on the Ethereum platform, but the closest analogue is the assets of the NXT project. Mosaics can serve as a digital representation of absolutely any asset – a national currency, a share in a company or a real estate object. One of the best-known mosaics on the NEM platform is the CMS token, used for the ICO of the Comsa project.

In order to pay fees for the confirmation of transactions and the creation of mosaics, NEM's cryptocurrency (XEM) is used. The coin has a ~ 9 billion issuance; this number is limited. XEM can be used not only as "gas" for the operation of the system but also as a cryptocurrency for calculations. At present, commissions on the system remain floating and are selected automatically depending on network load.

In addition to creating mosaics, NEM offers users the following features:

- Exchange of open and encrypted messages
- Creating transactions with multi-signatures - transfer would not be made until several people from a predetermined circle agree to send the transaction.

The main difference between NEM and competing platforms such as Ethereum and NXT is the use of the PoI consensus. The algorithm is based on the classic Proof-of-Stake, in which the probability of checking the next transaction by a particular user depends on their balance.

Proof-of-Importance offers a modified transaction verification mechanism based on the "significance" of each wallet. This parameter is created using three factors:

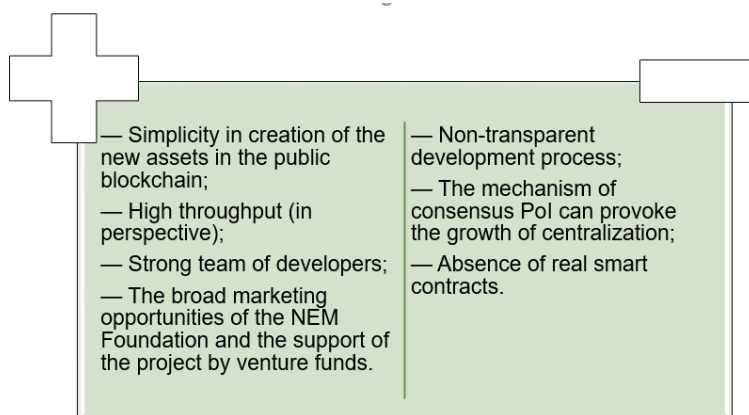
- the amount of XEM in a wallet
- the number of transfers made by the user
- the importance of addresses with which the user interacts: sending funds to an "authoritative" address is more important than moving XEM into a newly created wallet.

Since the maximum number of coins was created at the initial stages of the network's existence, the mining of NEM's cryptocurrency is impossible. Instead, the system uses harvesting - payment of commissions for the verification of transactions. To participate in harvesting, a user must keep at least 10,000 XEM in his wallet.

Catapult is an updated version of the platform, a technical description of which was presented in 2016. The code base of the project was completely rewritten, with an emphasis on speed of operation. With the release of Catapult, the NEM platform will receive a number of important innovations:

- An increase in network speed to up to 4000 transactions per second (to date, the throughput is very low: 2 - 3 tps).
- A built-in escrow service.
- Elements of smart contracts: software execution of transactions depending on various conditions.
- API for accessing platform capabilities using classic applications.

In general, we can highlight the following features of the project:



As for future prospects, a strong technical base combined with the serious marketing resources of the NEM foundation could create serious interest in the project's opportunities in the business environment, but there are weaknesses - a closed development process and almost no public information about specific project plans.

In such conditions, the assessment of the investment attractiveness of the project becomes a difficult task. Nevertheless, the project team has repeatedly proved its competence in practice, which helps us be optimistic about its future success.

VeChain

VeChain is an enterprise-focused IoT and dApp platform for products and information. It aims to connect blockchain technology to the real world by providing a robust infrastructure through the use of RFID and other similar IoT technologies.

Regarding smart contract use, the project focuses on real industrial operations. VeChain provides cooperation and the transfer of value between different uses.

The VeChain cryptocurrency doesn't involve mining.

VeChain is creating an entirely new business model providing "trust services" to all parties in joint activities on all platforms, enterprises and industries.

VeChain's main concerns are logistics, quality assurance and the fight against counterfeit goods. The emphasis is on food and luxury goods. Each stage of creation and moving of goods is entered in the blockchain, which protects against changes in the initial data.

Services offered by VeChain:

- **Gateway API Services**

These are AWS services that enable developers to create, publish, track, maintain and protect APIs at any scale. The API gateway is usually considered a backplane when it comes to connecting AWS services and other private and public websites.

- **Third-party services**

The company has implemented specific systems and structures that allow them to offer third-party services. Therefore, if you are looking for a reliable company to process your company's financial transactions, VeChain will offer quality services at a very reasonable price.

- **Distributed data warehouse**

VeChain offers a distributed data store, where information is stored on several nodes.

On February 26, 2018, VeChain rebranded as VeChain Thor, and the company expanded its technology to enable enterprise dApp solutions to be built on top of it. The rebranding included a planned transition of the primary token VEN to VET, as well as the introduction of a new token called Thor Power (THOR). THOR will be used to run

smart contracts via dApps on the VeChain blockchain and will be generated for users who are holding VET. At the time of writing, [CoinMarketCap](#) still lists the coin as VeChain (VEN), as do the majority of exchanges. The project also plans to transfer from the Ethereum platform to its own blockchain.

The main characteristics of the PoA protocol implemented in the VeChain Thor blockchain are:

- A low requirement for computational power
- No requirement for communication between AMs (Authority Masternodes) to reach consensus
- System continuity independent of the number of available genuine AMs.

The primary feature here is the block validator's randomization to prevent a 51% attack and maintain system continuity. The thing to note is that the next block validator's sequence can be randomized both algorithmically and deliberately by the Foundation to increase unpredictability, hence making it more difficult for attacker(s) to find out who might be responsible for producing a number of consecutive blocks at a time relatively far from the current point in time.

At the time of writing, the project has achieved its following planned milestones: The [VeChain wallet](#) is released, [VeChain Ledger](#) support is also live, the VeChainThor mainnet launch was announced on June 30, 2018; within three months the tokens will be transferred to the mainnet.

The partnerships involving the real-life implementation of VeChain deserve special attention:

- The project is partnering with the largest telecommunication agency in Japan - [NTT Docomo](#)
- Cooperation with the Chinese government to implement a system for tracking the [movement of medicines](#) throughout the country
- A partnership with [BrightFood](#), which represents the Chinese government department specializing in food and beverage production
- [PricewaterhouseCoopers \(PwC\)](#) recently announced that it has invested in the VeChain project. The consultants acquired a small share in the authorized capital of the project. The amount invested is not specified.
- etc.

The project also developed partnerships with many large companies around the world, including but not limited to such big names as Coca-Cola, IBM, HSBC, Alibaba, Oracle, Tencent and Cisco as well as cooperation with Oxford University.

In addition to a large number of successful collaborations the project has the following advantages:

- A development plan for which milestones are being successfully implemented
- Scalability of the network, which ensures stable operation in any area of the real economy.

There are also disadvantages:

It may be considered that the project has too quickly "inflated" its own scale. This could negatively affect both the quality of services and its strategic success. The segment of logistics in blockchain is still very narrow and there are few competitors, but for basic platforms for smart contract creation and the dApps sphere, there are very strong competitors who are regularly improving their functionality. In addition, the consequences of migration from the Ethereum blockchain, new opportunities for consensus, additional internal resources are still not known exactly. There may be technical problems regarding the stability of the system.

However, the VeChain platform could truly implement blockchain technology in real life, thus assisting both the businesses involved and their users. Considering that the internet of things (IoT) is forecasted to experience exponential growth and according to McKinsey's report, it is predicted that the global number of internet-connected devices could surpass 50 billion by the year 2020; as can be seen from the information above, despite its young age (ICO ended in August 2017), the project has already been successfully implemented in the real world. This is an indicator of good investment prospects.

The VeChainThor platform has now gone live. The resource code can be downloaded from [GitHub](#).

It is worth noting that the total token amount is limited (VET 1 bn), which makes it less susceptible to inflation.

Qtum

Qtum is a decentralized project with open source code, which is a hybrid form based on the blockchain. Qtum was the first to implement a protocol combining the Ethereum and Bitcoin transaction models. The core of the technology combines a fork of the Bitcoin source code (but using an improved chain of the Bitcoin algorithm, which includes Segwit and Decentralized Governance Protocol (DGP). DGP is a technology developed by the Qtum team based on Bitcoin technology with a high degree of reliability, but which has a more flexible and more customizable structure) and an Account Abstraction Layer (AAL), which allows you to work with different virtual machines including, importantly, with the Ethereum virtual machine (EVM).

Since the Qtum protocol combines the Bitcoin and Ethereum transaction models, developers of both systems (or their derivatives) can easily connect and adapt their applications. In theory, simultaneous use of the EVM and Bitcoin protocols should ensure stable operation of the technology, but the system has also inherited the problems of ETH and BTC.

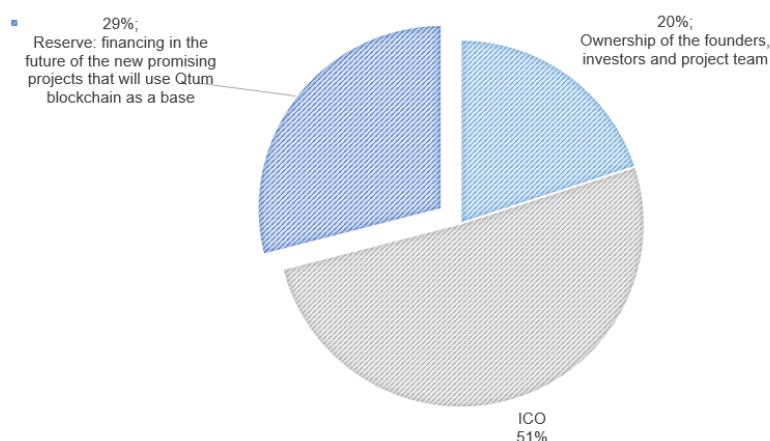
Qtum is based on the PoS algorithm. The developers of Qtum have combined the model of smart contracts (ETH) with UTXO (a model based on the withdrawal of unspent transactions, which uses BTC). In general, Qtum more closely resembles Ethereum - the same EVM, smart-contracts, and an infrastructure equivalent to the Ethereum blockchain's infrastructure, the same "gas" conception. The mining process is also conducted under the PoS method.

dApps are also available on the platform.

The platform already has a practical application, for example, [satellites](#) operated by Qtum were successfully launched at the Jiuquan Satellite Launch Center, which could be considered a new stage for the blockchain industry.

Also, since August 2017 Qtum has been a member of the [Chamber of Digital Commerce](#) as a New Executive Committee Member. The Chamber of Digital Commerce is a body that seeks to promote the adoption and use of digital assets and technologies on the basis of blockchain through education, advocacy and close cooperation with politicians. Other members of the executive committee of the Chamber include TD Bank, Microsoft, BNP Paribas, BNY Mellon, Cisco, Wells Fargo, KPMG and IBM.

There are 100,000,000 Qtum tokens released, which may indicate less susceptibility to inflation. Tokens are distributed in the following proportions:



Qtum was created as a hybrid of two main blockchain systems. It is not clear whether this will become a useful and popular combination of technologies; for example, Ethereum is not standing still, as it is developing a blockchain eliminating its own deficiencies. However, Qtum complied with its own roadmap, holding back promises about the stages of its development, is compatible with both Ethereum smart contracts and Bitcoin gateways and claims that it will maintain compatibility data even if these systems are updated.

The token is traded on various markets; the average trading volume is around USD 150 mln, which exceeds NEO (which it is usually compared to) by almost 3 times (the trading volume of NEO is around USD 58 mln). Qtum is trading on 42 markets, NEO on 39 markets.

Qtum Charts



The project has prospects; it has more ambitious plans than a standard altcoin, as it aims to become a powerful platform that allows entities to create applications that benefit from blockchain technology. Overall, Qtum token is needed as “gas” for dApps on the platform, there is no guarantee that this token will become a digital currency. The token’s BTC price dynamics differ from its USD price dynamics, the price in USD increased 10 times since the date of ICO, whilst the price in BTC was even more volatile, which could be the subject of much speculative activity.

Lisk

Lisk is a platform for dApps, the main idea of which is to enable dApp developers to create their own applications on their own side of the blockchain, to be synchronized with the main Lisk blockchain. All this is completely free. This is done with the aim of Lisk remaining fast, free and scalable.

On this free platform, it is possible not only to practice skills in creating blockchain applications but also to launch a really interesting project.

One of the main unique features is that dApps can be written only in JavaScript. Developers can easily create, publish, distribute and monetize their applications using this platform, which operates using the LSK cryptocurrency. Lisk operates on a modular principle which allows each decentralized developer to operate on a sidechain.

Thus, Lisk is convenient and easy in use, although most platforms for dApps are quite difficult to learn, and developers also need to learn new programming languages.

However, Lisk is primarily a cryptocurrency used to facilitate P2P transactions.

Lisk operates on DPoS, and there are only 101 nodes in the LSK blockchain. Each participant in the network can become a node, but only on the condition that other users vote for him.

The LSK cryptocurrency cannot be mined by everyone; it is intended primarily for developers. It is possible only for those selected - 101 nodes.

The main features of the platform are:

- **Scalability.** As the distribution of applications is conducted on sidechains, Lisk has no problems with scalability, consequently, the speed of its operation is much higher, and the probability of any failures or lags is minimal.
- **Easy in use.** The platform allows you to write blockchain applications in Javascript, which makes life much easier for developers. These applications can be deployed on the platform through the GitHub portal.
- **DPOS (Delegated Proof-of-Stake).** Lisk uses DPOS, which has its own pros and cons.

The project has already released its 1.0.0 Testnet in June 2018, and the migration from Lisk Core 1.0.0-rc.1 to 1.0.0-rc.2 on Testnet network occurred on August 9, 2018. This went smoothly and successfully, and the team is very proud of this achievement as it brings them very close to the long-awaited Lisk Core 1.0.0 release to the mainnet. An announcement regarding the mainnet migration is expected in the second week of August. The project's team admits that they have had several delays regarding milestones, but they have kept the community informed about all such changes.

Lisk has a limited emission – 117,000,000 coins, which also may indicate less susceptibility to inflation.

At the time of writing, total trading amount of Lisk is around USD 6 mln which is not much; almost 40% is accounted for by the YoBit exchange via its LSK/BTC pair.

Taking into account several unique innovations of this platform, as well as its cooperation with [Microsoft](#), we can say that Lisk overall is a worthwhile project. It is impossible to predict the project's prospects, but if they can continue to negotiate cooperation with companies such as Microsoft, LSK's rate will rise.

WanChain

WanChain is a global digital economy ecosystem, the first serious attempt to embody the idea of a decentralized bank covering the whole spectrum of banking services. The essence of the project is to build a sustainable financial ecosystem where participants can provide loans to each other through smart contracts as well as exchange and transfer assets. Inside the system, this will be done utilising WAN tokens.

The project has the following applicability: as DEX, Asset Management tool and ICO platform. Also, cross-platform transactions are supported.

WAN has the following utilities:

- transaction processing fees and cross chain transactions
- deposits to be made on each node to support cross chains transactions. Regarding applications, as more and more cross-chain transactions are managed by WanChain, the more Wancoin grows.

Wanchain is racing through its roadmap. [Wanwallet 2.0](#) has already been released (2.1.2 can be downloaded from the official website) and Wanchain 2.0 is also available. Wanchain 2.0 is considered by the team to be a significant milestone for the entire blockchain space, marking a major step toward the vision of a fully interconnected internet of value. Wanchain 2.0 is the world's first and only interoperable blockchain with secure multi-party computing, which will eventually allow for seamless integration with almost any blockchain in existence. The platform is now fully connected to the Ethereum blockchain, with the capabilities and development plans necessary to scale.

Wanchain's vision is to rebuild finance as we know it by bringing the world's digital assets onto one blockchain. Wanchain's blockchain brings together the unique capabilities of privacy, cross-chain and smart contracts.

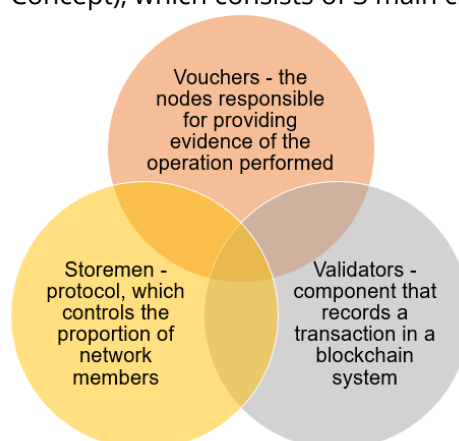
Available application scenarios after Wanchain 2.0 is implemented:

- Deployment of distributed contracts for WAN and ETH on Wanchain
- Deployment of ICO contracts that support both WAN and ETH participation



- Deployment of debt and credit contracts for WAN and ETH on Wanchain

WanChain operates on PoC (Proof-of-Concept), which consists of 3 main components:

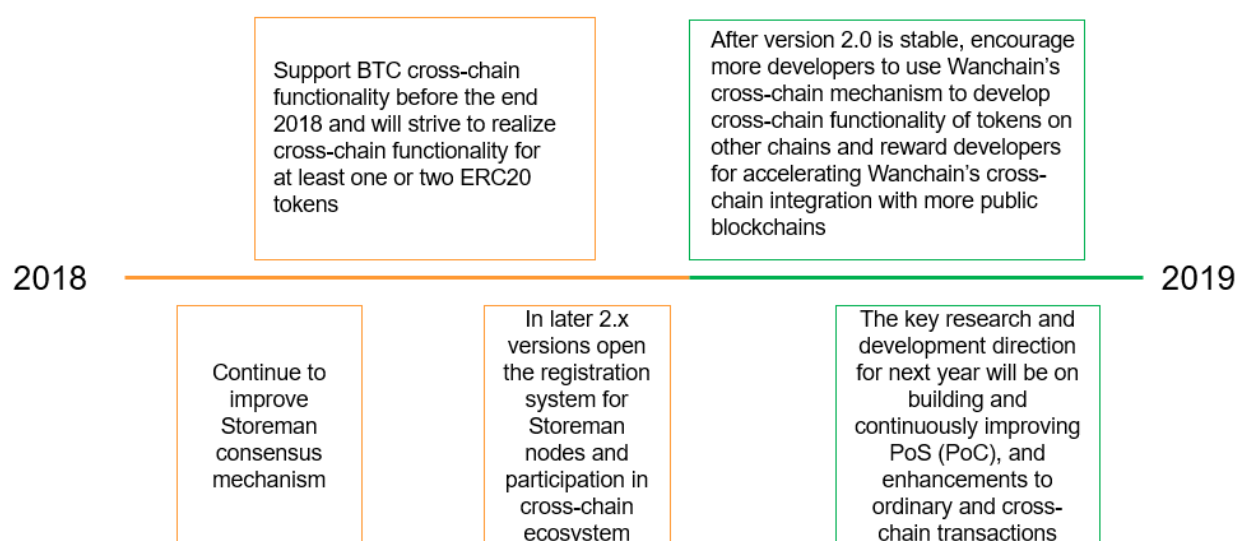


Privacy is built into the Wanchain protocol through the integration of ring signatures and one-time stealth addresses. To support cross-chain capabilities, Wanchain leverages the latest research in cryptographic theory to create a non-proprietary protocol that makes it easy for any public, private or consortium chains to connect to Wanchain and thus exchange digital assets between themselves.

The team provides the following use examples:

Finance	Supply Chain and Logistics	Medical	Identification
<ul style="list-style-type: none"> • Technology will allow for limitless use cases in finance including decentralized exchange, decentralized lending in crypto or fiat, multi-coin ICO, multi-asset management, and cryptocurrency payment 	<ul style="list-style-type: none"> • A well-known fast-food chain use Wanchain to register its sales and ingredients to the blockchain has an outbreak at several restaurants. Wanchain allows the company to trace the source of the outbreak down its own blockchain all the way back to the private blockchain of a specific supplier of anything. 	<ul style="list-style-type: none"> • In case if there is a necessity to transfer the patient from one local hospital to a more specialized one. With Wanchain, the local hospital would be able to seamlessly, securely and near-instantly transfer the patient's medical records to the blockchain of his specialty center, without having to compromise her privacy. 	<ul style="list-style-type: none"> • Different countries use different platforms to register the identities of its citizens. If the citizen from one country wants to entry another, Wanchain would enable a cross-chain transfer of data among each country's governments.

The team has announced the following development steps for the end of 2018 and for 2019:



WAN's cryptocurrency and the platform itself both look quite promising and interesting. However, even if the project has a permanent audience, there is still a legal risk. Legislative bodies in most countries have not yet

issued corresponding regulations if they are in fact ever introduced. Digital assets have the property of "self-financing". In theory, the issuance and trading of these assets can bypass the traditional financial system, and supervision is difficult. However, with a combination of all the right circumstances, the project can be actively used if, for example, there are enough large VC ready to abandon standard banking in favour of banking on the blockchain.

Wanchain Charts



WanChain is not listed on many markets as yet: 5 exchanges, with the largest trading amount circulating on Binance (more than 85%). WanChain is party to the interoperability alliance with ICON and Aion, which strengthens its position.

So far, according to the graph above, the dynamics of Wanchain are declining after a significant rise in late April - early May 2018, due to the upcoming consensus.

NXT

The NXT cryptocurrency is one of the oldest projects from this list; its ICO was conducted in September 2013 and at that moment it was quite unique in its PoS use, DEX and basically being a platform other than Bitcoin.

Its uniqueness lies in the fact that the platform was created from scratch. NXT's developers planned it to be as different as possible to Bitcoin.

The project is based on the principle of the resale of a certain amount of coins for a commission fee. Coins were created by the founders of the system and represent primary blocks, on which are based the generation of new blocks of the chain.

Thus in this system, there is no mining involved as with Bitcoin, but forking is possible, as is conducting transactions for a percentage. The total number of coins in the system cannot be higher than originally (1 bn).

The platform is intentionally designed to facilitate the creation of applications and the provision of financial services. With this purpose, the following features are integrated into the system:

- NXT Asset Exchange (decentralized trading with 0% commission fee)
- High level of security - private messaging services, secure chat or decentralized DNS
- PoS consensus algorithm
- NXT does not store user wallets physically, instead, it uses Brain wallet technology
- The platform does not require large computational or energy resources. Forking works on low-power platforms
- Cryptocurrency, etc.

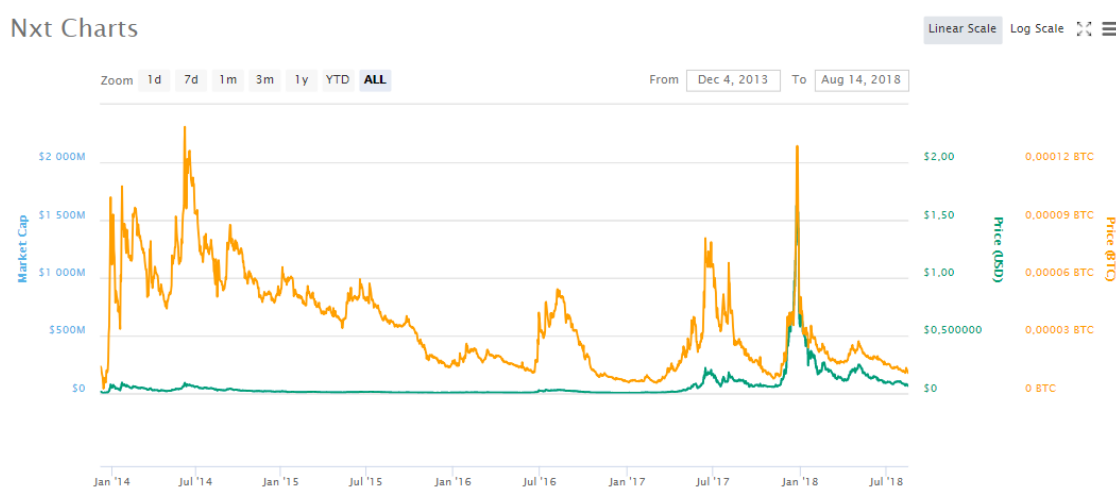
However, due to the minimal initial funds raised, according to [ICOSTATS](#) at the moment, NXT is top ICO project in its ROI.

Token	ROI
NXT	598054%
IOTA	226013%
Ethereum	147877%
Neo	103133%
Spectrecoin	51328%

An interesting fact about NXT is that it can be irretrievably destroyed if sent to the address of the first genesis account. The fact is that each NXT released has its own anti-NXT, by analogy with the quantum and anti-quantum, which will annihilate each other if they meet. Thus, if you send the entire billion NXT to this address, [the NXT 'universe' will disappear](#).

NXT is perhaps the only cryptocurrency that is hardly compared with Bitcoin due to its technical features. At the same time, these features cause confusion and doubts among some of the crypto market's participants. However, this does not reduce the value of the project as a platform for creating decentralized solutions.

Since its launch, the project has lost much of its popularity because there are quite a few alternative projects with similar functionality. It also worth noting that NXT is almost a contemporary of Ethereum (ETH is even younger) and there is no need to highlight which of these projects is more successful and often copied.



NXT is around the 80th place by capitalization among cryptocurrencies and is traded on 13 different exchanges with a total trading amount of around USD 2.7 mln. In July 2018 OKEx, one of the biggest cryptoexchanges commenced a listing of NXT, which indicates the market's enduring interest in the project.

The prospects of the project largely depend on whether the NXT Asset Exchange will gain more popularity than its main competitors, with a possible transition of users from centralized exchanges to decentralized exchanges, as the project itself has no significant standout advantages.

In January 2018 the NXT team launched a platform for decentralized services, Ardor, after a successful year on testnet. Ardor is a blockchain-as-a-service-platform that evolved from the time-tested NXT blockchain. The unique parent-child chain architecture of Ardor, with a single security chain and multiple transactional chains, offers three advantages: Reducing blockchain bloat, providing multiple transactional tokens, and hosting ready-to-use interconnected blockchains called child chains. This is the new NXT generation and is a project from the same team, which is currently developing both projects.

Ubiq

Cryptocurrency Ubiq is the internal coin of the decentralized Ubiq platform, which is a result of Ethereum's hard fork (version 1.5.8), which is completely separate from the original ecosystem. The project is a slightly modified version of the Ethereum blockchain platform and uses a virtual machine (EVM) to process smart contracts and decentralized applications.

The project was initiated in January 2017 without an ICO campaign, and its token (UBQ) is the "new" Jumbucks token. Since there was no token sale, UBQ immediately appeared on exchanges, replacing the obsolete JBS token.

A major part of the Ubiq code is identical to the Ethereum code. Although there are several cardinal changes, such as removing references to the DAO, for the most part, Ubiq is a clone of Ethereum. All Ubiq's users also pay commissions for transactions, and they can also use it as a value exchange platform. The EVM works almost the same way on Ubiq. Smart contracts are written in the programming language Solidity and are executed as on Ethereum.

Ubiq operates on PoW, mining is available via GPU processors, or simply via video cards.

As for other features of the Ubiq platform, its complexity algorithm can be highlighted – known as Flux, and which comes into operation in the third stage, i.e. starting with 8000 units. The reward for each block extracted is 8 UBQ. This figure will decrease every year by 1 UBQ, until the time the reward reaches 1 UBQ per block.

At the time of writing, remuneration for the block is [already 7 UBQ](#). This was done to control inflation - so over the next 8 years, according to calculations by the developers, this should be at least 3% per year.

Ubiq also uses its own version of the Ethereum wallet and other tools. Ubiq has not yet reached the same size and popularity as Ethereum, therefore its commission fees are much lower than Ethereum's. A strange fact - UBQ can be bought for BTC, but it is impossible to buy it using ETH, although it is essentially an Ethereum.

At the moment, the currency is around 190th place by capitalization among cryptocurrencies. On the current market it is impossible to correctly evaluate the prospects of the project, but given the promising and innovative projects based on the platform, Ubiq has growth potential considering the fact that it is still quite young.

HyperLedger

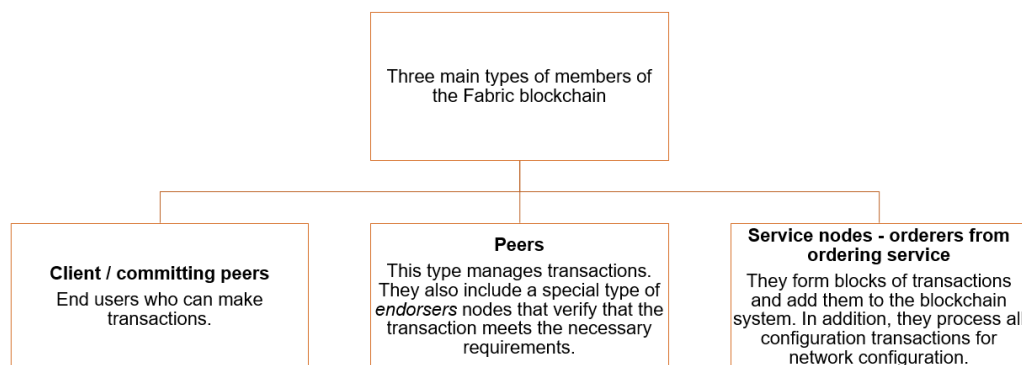
HyperLedger is not a blockchain but was created by the Linux Foundation (IBM, JP Morgan, SWIFT, Fujitsu, etc. joined later) in December 2015 to promote blockchain technology. The project is a joint effort to create an open, distributed accounting system (ledger), which can be used to openly develop and implement blockchain applications and systems. The main focus is on creating and launching platforms that support global business transactions. The project also focuses on improving the reliability and productivity of blockchain.

Currently, there are several HyperLedger projects, one of which is HyperLedger Fabric (originally this project was called OBC - Open Blockchain).

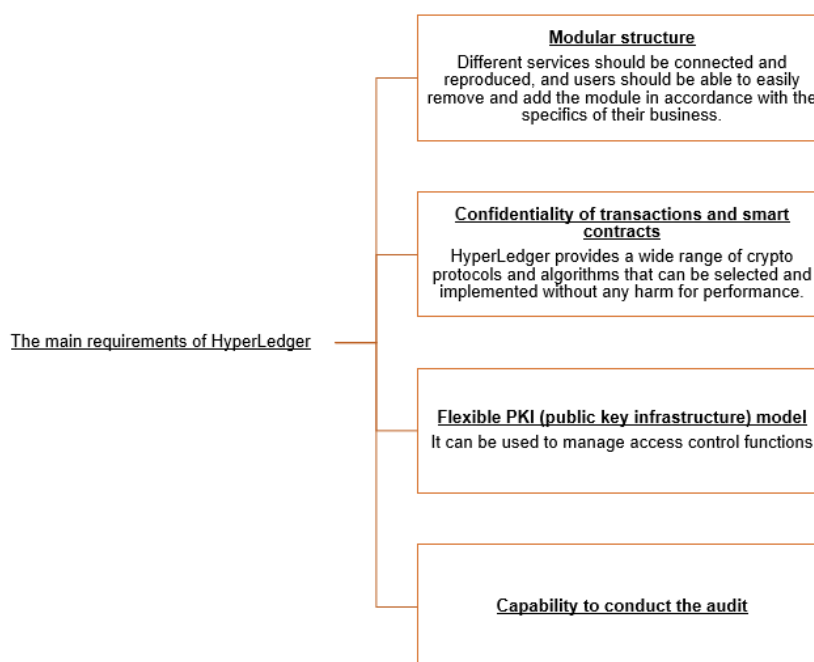
HyperLedger Fabric is a blockchain framework that was originally proposed by IBM and DASH (Digital Asset Holdings). HyperLedger Fabric was created by the corporation for other corporations. It is designed to create a basis for developing solutions for the blockchain and is based on a modular architecture, where if necessary, various components can be connected for example by a consensus algorithm. Smart contracts in Fabric are called chaincodes. The HyperLedger Fabric network includes "peer-to-peer nodes" that perform block code, access register data, support transactions, and an application interface. There are no tokens in HLF, which is also

extremely important for corporate use. The absence of tokens does not mean an inability to organize the exchange of assets - HLF allows you to store information about physical property and liabilities.

Fabric is designed for projects that require distributed ledger technology (DLT). It supports chaincode in Go (Golang), Java and JavaScript (via HyperLedger Composer, or from version 1.1) and therefore potentially more flexible than the language of smart contracts.



HyperLedger aims to create a new platform mainly for business transactions. HyperLedger has published a "golden standard" architecture, thus making an attempt to standardize the industry. There must be a common set of standards that all blockchains can follow to ensure a connection between different projects. The standard architecture can serve as a guide for creating blockchain platforms. It consists of two main components: HyperLedger services and HyperLedger API, SDK and CLI.



HyperLedger Fabric operates on the pBFT consensus protocol (same as Zilliqa), whose advantages over PoS, DpoS and PoW were described above.

Based on this blockchain framework, the [CLS group consortium](#) (Barclays, Bank of America, Bank of China, Hong Kong, Bank of Tokyo-Mitsubishi UFJ, Citibank, Goldman Sachs, JPMorgan Chase and Morgan Stanley, etc.) is developing an alternative to SWIFT transfers. SWIFT itself is experimenting with the implementation of HyperLedger Fabric as well. Sony has developed a data storage system for education. At the moment, there are no economic metrics for this project, but it is believed that IBM will be able to create the largest blockchain system in the world.

CONCLUSIONS & PERSPECTIVES

The projects discussed above have the following future development plans:

Project	Development plans
Ethereum	<ul style="list-style-type: none"> the transition from PoW to PoS (initially this transition was planned in 2017, currently the terms are by the end of Q3 2018) Plasma and Sharding introduction, aimed to solve scalability issues; together the two scaling solutions can compound the network's TPS by 100x (from current ~15 tps) each whilst retaining security levels <p>So if you obtain 100x from Sharding and 100x from Plasma, those two basically give you a 10,000x scalability gain, which basically means blockchains will be powerful enough to handle most tasks most people are trying to perform with them. Again, terms for implementing these updates are not specified.</p>
ICON	<p>The following announcements are publicly available:</p> <ul style="list-style-type: none"> The loop rebrands to ICONLOOP; such change demonstrates the long-term commitment to contributing to the project \$5 Million ICX Repurchase Program Open Source Release Schedule: there will be several releases. The most important updates will provide dApp projects with the ability to run a full-scale token sale with ICX and develop basic smart contracts Wallet update SDK: Java-based SDK that functions using the ICON network, a Python-based CLI tool that works with ICON network Chain ID utilization on a trading sector Other updates regarding services & ICON core.
Waves	<p>New versions of Waves nodes are being tested by the developer community in TestNet. Here new application features can be tested before the upcoming release:</p> <ul style="list-style-type: none"> Mainnet: Explorer; Web-wallet Testnet: Explorer <p>Dates for upcoming releases are not specified.</p>
EOS	<p>By the end of Q3 2018, the project plans to issue advanced wallet features such as deeper governance interactions and smart contract integrations, basic block explorer + APIs. By Q4 2018, publicly available API and P2P servers globally and integration of general GUI for cli (cleos) commands should be completed.</p>
Zilliqa	<p>The mainnet which should have been launched in Q3 2018, is postponed to January 2019, but the team promised to launch the mainnet with "bonuses" such as more dApps onboard, a security audit conducted, toolchains development, etc.</p>
NEO	<p>The following updates are to be introduced by the end of Q3 2018:</p> <ul style="list-style-type: none"> NeoFS (a distributed storage protocol) Joint development efforts with Neo Global Development and their open-source community "City of Zion" Their NEP-8 patch and its relation to the Neo Virtual Machine NEP-9 and how this will facilitate the transfer of NEO assets.

Stellar	<p>Continue improvement to the Horizon API and the surrounding SDKs. As the project is Sharia-compliant, it is planned to be integrated in the following countries: Bahrain, Indonesia, Kuwait, Malaysia, Oman, Qatar, Saudi Arabia, etc.</p> <p>The Medium account for the project hasn't been updated since October 16, 2017. The website doesn't have any news regarding the future project's development either.</p>
Cardano	<p>At the moment, the Cardano blockchain is somewhat centralized and the main goal of the Shelley era is to put the system in decentralized standalone mode. Initially the Shelley release was planned in Q3-Q4 2018, currently this is postponed to Q1 2019.</p>
Ethereum Classic	<p>The project has the following upcoming development plan:</p> <ul style="list-style-type: none"> • SputnikVM optimizations and JIT Compilation • Improved caching for faster performance (StateDB) • Scalability improvement and sharding (towards to 1,000+ tx/sec)
NEM	<p>To fix the beta version's 0.6.96 bugs Increase network speed up to 3,000 transactions per second</p> <p>Continue to establish new partnerships and conduct community events & meetups.</p>
VeChain	<p>VeChain v4.0 to go live, achievement of commercial integration of the ecological environment system. Integration with IoT and a more industry-specific blockchain cloud.</p> <p>Continue cooperation with the Chinese government and other major partners.</p>
Qtum	<p>About 6 mln additional tokens unlocked in March 2019 and 2020. This will put all 100 mln tokens into circulation.</p>
Lisk	<p>The project has these upcoming plans:</p> <ul style="list-style-type: none"> • Lisk was planning to release one of the main Lisk SDK components at the end of 2017. This is delayed and is now TBA. • In October 2018, it should be possible to withdraw and deposit sidechain tokens/currencies on the platform. This is delayed and is now TBA. • Some time in October, Lisk intends to launch its decentralized exchange on which tokens can be traded. This is delayed and is now TBA.
WanChain	<p>The project has the following upcoming plans:</p> <ul style="list-style-type: none"> • The cross-swap feature using SWH and Wanchain will be launched in Q4 2018; • Integration with Bitcoin, Multi-Coin Wallet in December 2018 • WanChain 4.0 integration with Private Chains, Multi-Coin Wallet in December 2019 • etc. (please refer to WanChain section).
Nxt	<p>According to available information, the project plans to attend the Hackaton meetup at the end of August 2018.</p> <p>The NXT team plans to continue developing the Ardor project.</p>
Ubiq	<p>Ubiq has two stated goals for October 2018 in their roadmap: the third Escher Distribution and the ending of a second round of voting for the Official Proposal Execution.</p>
HyperLedger Fabric	<p>The project's SC is being developed and the project's team regularly reports on the status of work</p>

The information regarding project development available above was supplied by projects without taking into account significant market fluctuations.

At the time of writing this report (August 13-14, 2018), one of the most significant falls for the crypto market has occurred (overall, market capitalization has dropped by almost USD 50 bn): the market has been falling steadily since the beginning of August, and by 13-14 August was already close to the beginning of panic. Also,

the cost of mining began to grow, because compensation for a unit of power was reduced. This exerted additional pressure on the market, enhancing the speculative decline. Altcoins suffered most of all, because if Bitcoin is well known and really finds applications, then the utility of many altcoins is now under big question. Hundreds (if not thousands) of projects stopped updating and functioning. Others continued to be afloat, but limited primarily to marketing on social networks. In such situations, the ability to perform a rational market evaluation is reduced.

Thus, there may be delays in the plans for all projects mentioned above; however, most of them have strong chances of a wide application on the market for many reasons. For example, Ethereum is currently overcrowded because of all the ICOs launched on its chain. The clear utilisation of Ethereum smart contracts allowed it to dominate the market. On the other hand, as can be seen, there are already projects which are also completely suitable for launching ICOs. Otherwise, some project tokens are more than perfect for security token issuance because of their unique native features, for example, NEM. Moreover, in 2018 - 2019 security tokens may overcome utility tokens and ICOs because of regulatory pressure (also being realistic - more than 80% of previously-launched ICOs are securities in any case), so potentially security tokens could take the lead as blockchains for regulated tokens.

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