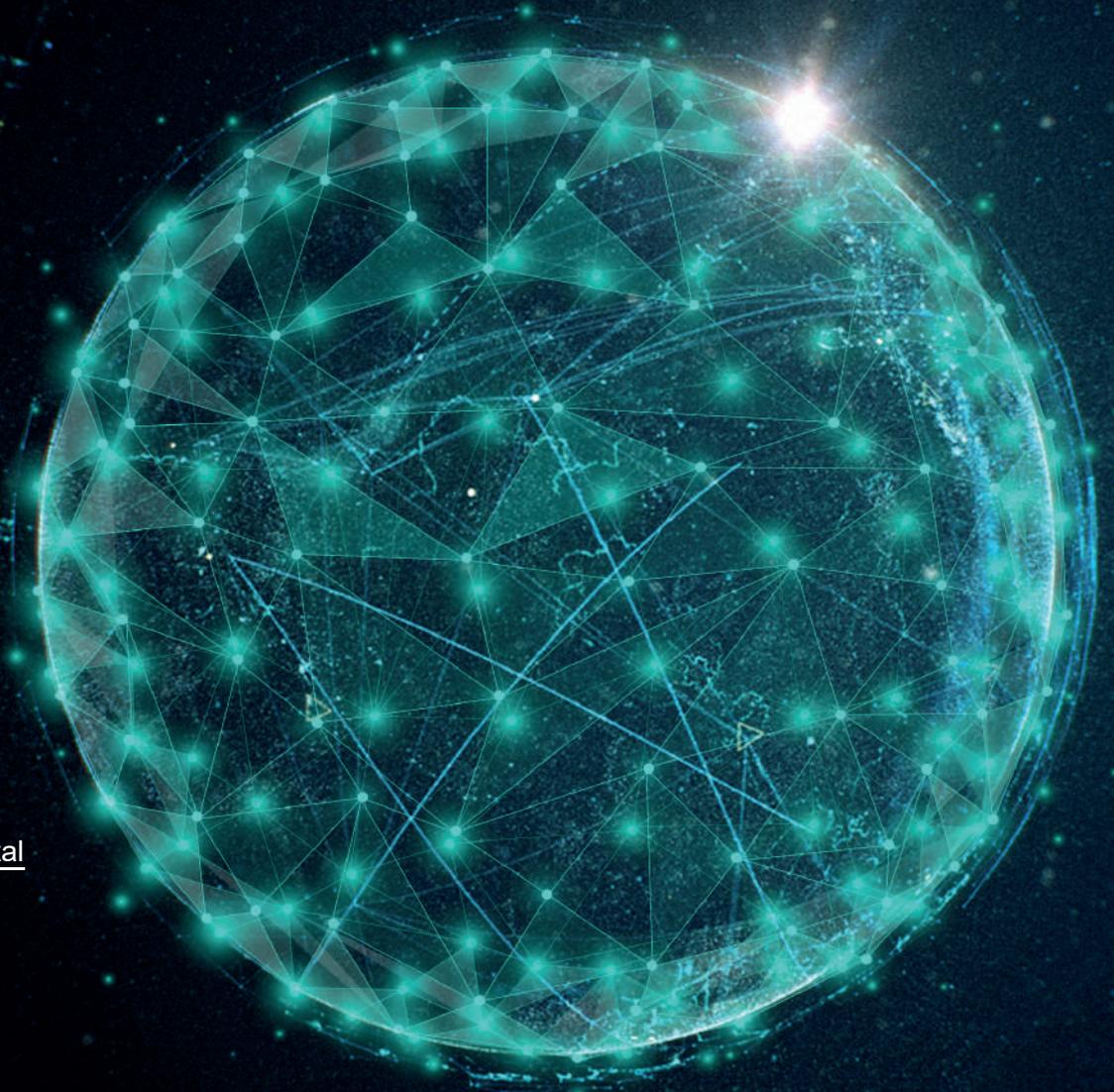




elastos

Smartweb Powered by Blockchain

21 July 2018



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Executive Summary

Like many technological advancements and breakthroughs, the internet was once a quiet revolution in its time. We are now in the midst of another quiet revolution after the internet: blockchain technology. Revolutionary in their own ways they may be, but not quite the complete package. The internet has brought civilizations to unprecedented levels of interconnectivity, productivity and convenience along with making information available like never before. It has changed the way we live, interact and obtain information drastically. Yet, it is riddled with problems of privacy concerns, security breaches due to viruses, malwares and hackers, centralization of power and wealth by the giants of the internet industry, and exploitation of personal user data, among others. Does that entail that we should stop using the internet? Obviously not; we try to make it better. We attempt to make it safer, more secure and redistribute the concentration of power from few to many. Enter the blockchain technology sphere.

Many see blockchain technology as a knight in shining armor – a solution to most, if not all their problems. An increased number of projects and businesses try to incorporate blockchain into their systems hoping it will transcend them into the next level. But experts know that blockchain is not perfect by itself despite solving many issues faced by the internet. When thinking about blockchain, most will instantly link it to security and decentralization. But how many would link it to scalability? The blockchain trilemma is haunting the sphere; the predicament that only two of three properties – security, scalability and decentralization – can be realized by any blockchain system at any one time. There is no way the internet can be made better by a technology that cannot be scaled. Or can it?

Elastos is a project that aims to achieve just that – using blockchain technology to invent an entirely new operating system to run the internet. Elastos is far from merely a blockchain project, it is one that is focused on revolutionizing the online world and solving the problems. By building a complete new platform - the Elastos Smart Web, it aims to retain the good of the internet while eradicating the problems. In the Smart Web, people would enjoy safe and secure browsing, own digital media and data similar to owning real estate, and bring interconnectivity and interoperability to a whole new level.

In this report, we analyze the Elastos project using our proprietary research and analysis framework comprising of 7 key factors, which we believe are instrumental to a blockchain project's success based on fundamentals.

Elastos has many features on the technological and functionality aspects that makes it both appealing and viable. The scope of this project is grand and if successful, the implications are just as transcending. While there are other private and public blockchain projects, features that make Elastos unique and maintain a competitive edge will be discussed. At the same time, while Elastos may be considered a competitor, it can also complement other projects, broadening the scope of its intended reach.

The Elastos token, ELA, has many utilities and its true value is dependent on the traffic in the Elastos network. As the network size increases with increased adoption by users, businesses and other projects, traffic on the network increases as well. And Elastos encourages just that, with the agnostic, flexible and accommodating design of its whole infrastructure. With that in mind, refer to the respective sections of the report to know more about what problems Elastos is trying to solve, how it intends to do so and what makes this project so revolutionary, along with its downsides.

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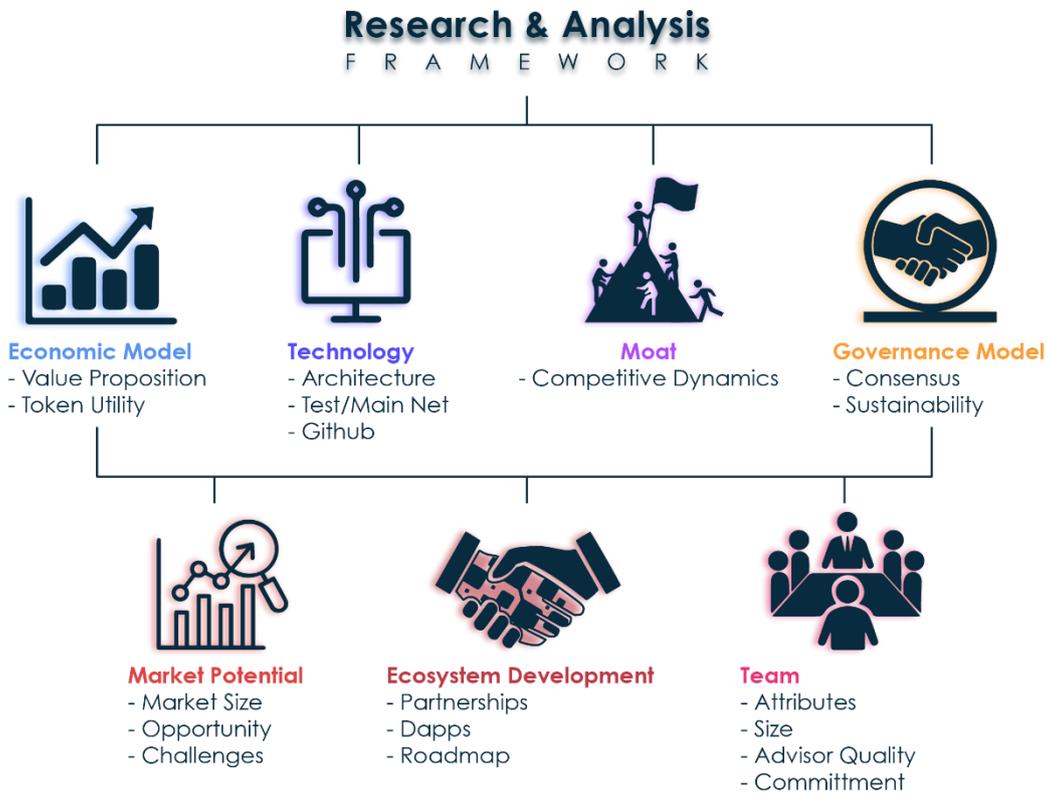
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Visionz Research & Analysis Framework

This framework was developed to evaluate projects based on fundamentals rather than simply hype or speculation; for we believe that it is the fundamentals that will determine the success and longevity of a project.



1. Market Potential	Which market sector is this project attempting to penetrate? What is the current and future scale of the market in terms of economic value and adoption? What opportunities lie in this sector? What critical challenges are faced by players in this market?
2. Economic Model	What is the purpose of the project? How does it add value to our world? What problems are the team attempting to solve? How disruptive is this project to existing industries and economies? What are the use cases for this project? What are its implication?
3. Technology	What is the technological idea and key features of this project? How innovative is the technology? Is the technology relevant to the problem they are trying to solve? Or is it just for the hype? How feasible is the implementation of the idea? What are the potential challenges?

4. Governance Model	What consensus model is used on the blockchain network? How is network efficiency, security and cooperation achieved? What is the incentives mechanics, if any? How sustainable is it?
5. Ecosystem Development	How will the ecosystem be developed? What valuable partnerships, if any, does the project have? Are any DAPPs planned or ready for deployment? What is the forecasted roadmap? Do they have a business or marketing plan?
6. Team	Who are the team members and what are their credentials? Do they have knowledge & experience in relevant fields? Who is on the advisor board and what is their background? Does the project have enough team members to advance development and stick to their roadmap? What is the team's vesting period?
7. Moat	What competitive advantages does this project carry? How unique are the key features of the project? Is it an original idea or a copy-cat project? Even if it is a copy-cat project, does it have a protected significant difference that would enable it to edge over its competition? What they can do that other cannot?

Factsheet

Profile

Ticker	ELA
Circulating Supply	5,266,329
Maximum Supply	33,758,869
Type	Coin

Market

Market Capitalization (Full, US\$/mn)	\$565
Market Capitalization (Circulating, US\$/mn)	\$88
Price (US\$, as of 21-July 2018)	\$16.66
Price (US\$, 52 Week Low)	\$15.60
Price (US\$, 52 Week High)	\$93.96

Social/Community

Website	https://www.elastos.org/
Cyber Republic	https://www.cyberrepublic.org/
Twitter	https://twitter.com/Elastos_org
Telegram	https://t.me/elastosgroup
Reddit	https://reddit.com/r/Elastos
GitHub	https://github.com/elastos



Market Overview

The Underlying Problems of the Internet

Many of the technology we take for granted today were quiet revolutions in their time. Who would have thought scrolling through social media was going to replace our time spent in front of the television; the ease of sending files and messages instantly on shared drives; the revolutionary changes smart phones make to the way we live and interact. These functions have only been around or widely used in the last two decades, or less.

While the online world has changed the way we live, there are also many problems that come with it.

I. Lack of security

Instances of servers being hacked into, websites routed to malicious destinations, and private data leaks are increasing. As more devices are linked to the internet, especially IoT devices like smart home devices, it opens more doors to be taken over and used for nefarious purposes. Millions of smart cameras can be hijacked leading to exposure of private data.

In a recent example, an inexperienced hacker acquired highly-sensitive US military documents and attempted to sell it for \$150 on the dark web.



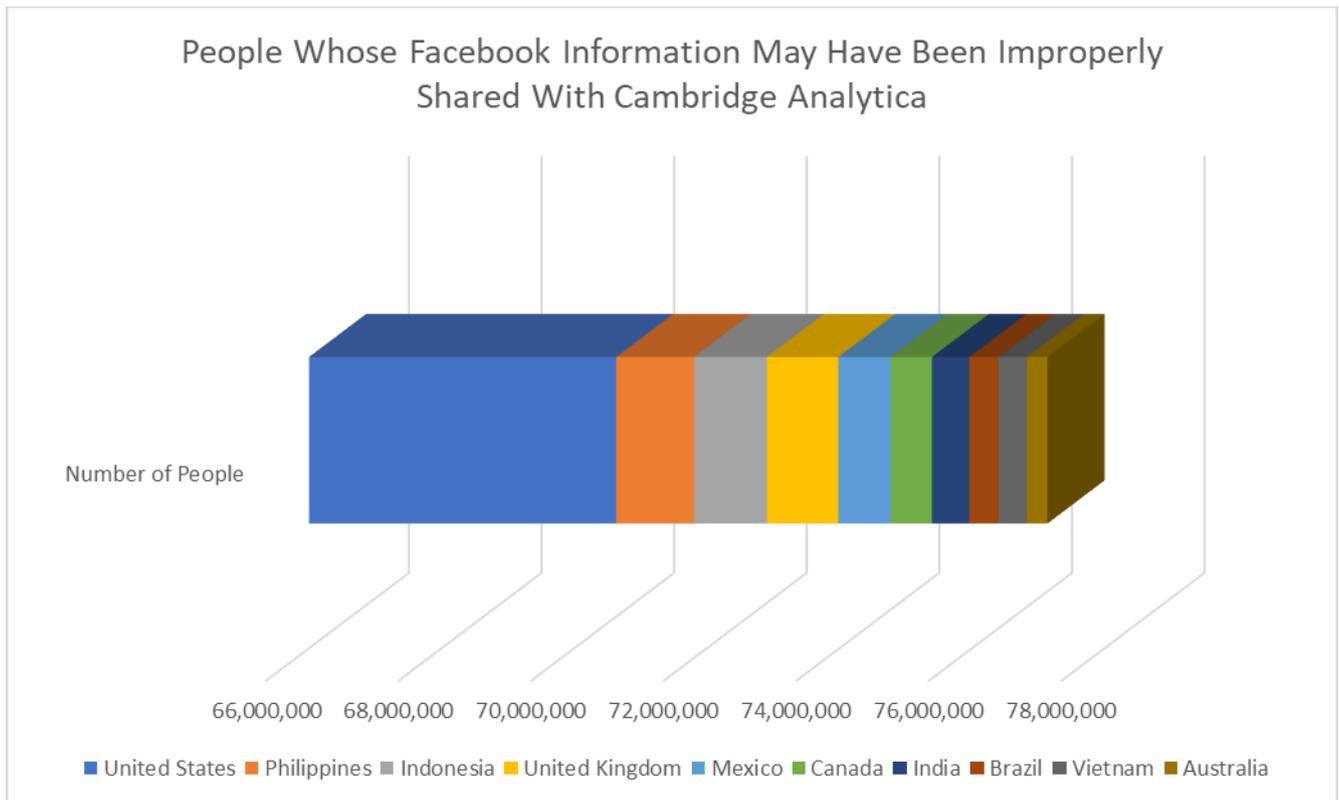
Also, current systems run on centralized architectures. Every internet company has its own data center, where user data are stored and applications run. Malicious network packets can be sent from one user to the central server, and then used to take down other, if not all, users in its network. The single point makes them susceptible to attacks.

II. Centralization of power & data mismanagement

Theoretically, the internet is still decentralized. No one individual or organization owns all or a substantial portion of the world wide web infrastructure. As the online world develops, companies such as Facebook and Google have come to dominate the services and the balance of power has been altered. These companies have a large share of users' attention and data, and other companies pay them to improve their presence and have their content disseminated through their networks.

Large internet companies dominate online services, cultivate user reliance and gather user data for revenue.

These companies offer free services in exchange for user data, and that data can be mismanaged and misused. For instance, unknown to many, social networking giant Facebook allows researchers to gain access to user data for academic purposes — and users consent to this access when they create a Facebook account.



Source: Facebook, Visionz Capital

One of the sources of revenue for Facebook is to collect and analyze user data and sell them to advertisers, generating profits to satisfy shareholders. The Cambridge Analytica data breach scandal saw personal data, which includes details on users' identities, friend networks and "likes" of approximately 87 million users being improperly harvested and shared with the data analytics firm. Despite the breach coming to the attention of Facebook in 2015, Facebook did not do its due diligence to protect the personal data of its users and prevent them from being used in illegitimate ways.

Personal data and information entrusted to these companies are often misused and exploited, even to the extent of engaging in unlawful activities.

III. Lack of intellectual protection for digital assets

Digital resources like electronic books, movies, music and games today are in infinite supply and can be duplicated without cost and with relative ease. Even as digital assets are widely produced, circulated and consumed, they are not necessarily generating wealth for their owners. Creators too are not guaranteed intellectual property rights to their creations. When digital resources are not authenticated, this leads to piracy and a lack of motivation for original innovation, among others. There is a lack of system to make digital assets scarce, identifiable and tradable. Owners hence are not able to monetize the idle resources.

The U.S. economy loses \$12.5 billion in total output annually as a consequence of music theft.

IV. Lack of ownership of digital data

Digital content such as books, music, movies and other data exist in vast amounts on the internet. It is complicated or, in many cases unclear, as to determining the ownership of these data. If you buy a car or a house, it is relatively easy to prove your ownership and to sell it to someone else. If you bought a DVD or a book, it becomes slightly harder to prove your ownership but you would still be able to sell these articles in the second-hand market. However, for digital data and media that you purchase online, it becomes even more difficult to establish ownership. You are also unable to sell it since it is just another copy of the original version and no monetary value can be ascribed to it. Media can be copied, ripped or stolen, resulting in the rampant growth of piracy. The extensive presence of copies reduces the value of original versions of the content. Creators – authors, musicians, filmmakers – lose motivation to create anything original due to declining profits, hurting various industries in the process.

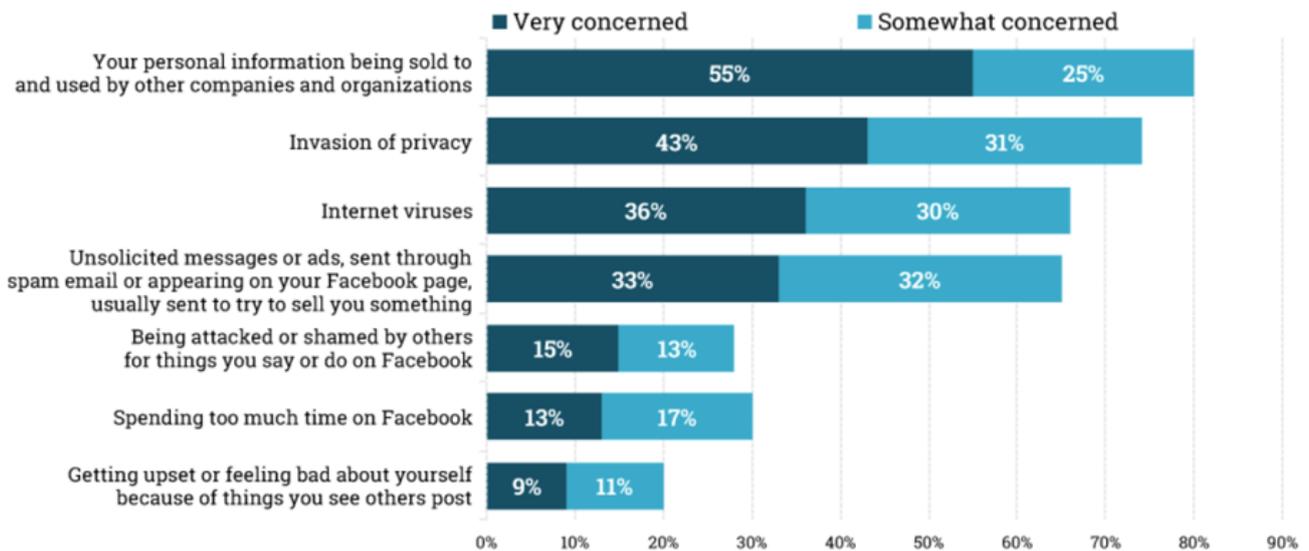
Rights to digital data are often unclear and value cannot be generated, discouraging innovation.

V. Lack of privacy

The data on the internet, by default, are not encrypted. There are no standards as to the sharing of data and recognizing the identity of website users. Large and centralized organizations make their own rules and users either comply, which might result in them selling the personal data, or not be allowed to access these websites.

Private data on the internet are not encrypted and breaches are rampant in the internet.

Facebook Users' Privacy Concerns



Source: Gallup

VI. Lack of trust & interoperability

Proprietary systems are not interoperable and require third party systems and businesses to enforce, protect and handle transactions and contracts. Data are siloed and there is little that businesses can do to collaborate and share data.

VII. Costly web development

Applications can be built on existing programming languages but separate applications need to be built for each operating system. The maintenance needs to be done separately too. In many cases, approvals and gatekeeper costs are paid in order to publish the applications.

There are many problems in the world wide web infrastructure including data breaches like that of Facebook and Cambridge Analytica, and global attacks like the WannaCry attack. While different countries have data protection regulations and laws in place, and companies employ measures to protect the

personal data of its users, there remains ambiguity and inadequacy, where service providers find their way through loopholes. New technologies, like blockchain, are studied to try to solve these issues.

Blockchain is Good, But Not That Great

We are now in the midst of another quiet revolution after the internet: blockchain. It is about to take the world by storm. When anyone can edit a Wikipedia entry, blockchain is there to answer how we can collectively trust activities online. We do our banking online. We shop online. We log into applications and services that make our digital selves and send information back and forth. We live our lives online. Blockchain gives us a constant—a bedrock that stitches data into encrypted blocks that cannot be altered at all in the name of security and privacy.

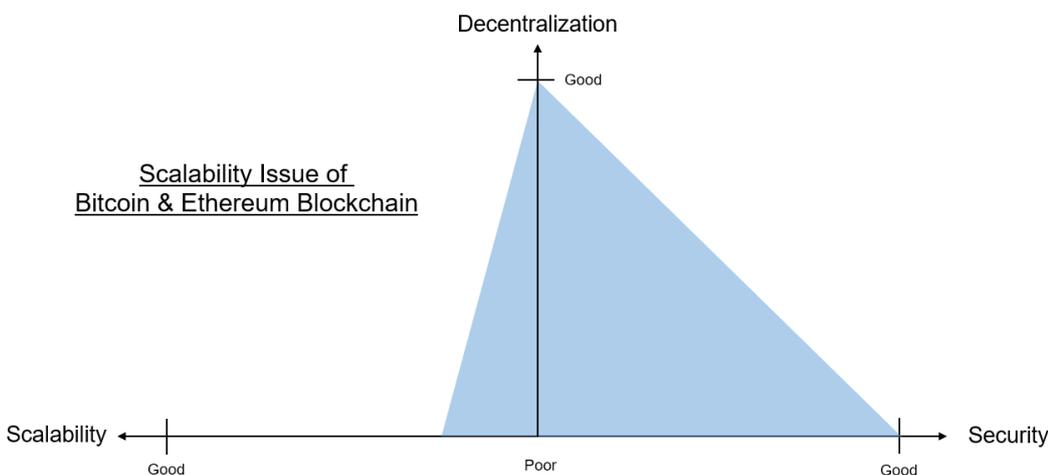
Blockchain stitches data onto encrypted blocks rendering it unalterable.

So, if the cutting edge blockchain technology can change the way we live and work drastically, is it flawed in any way? Despite creating a new economy online and an environment where all digital content becomes assets and are limited, scarce and tradable, there are downsides to the current blockchain system. Known as the blockchain trilemma, there exists scalability, security and decentralization issues within the blockchain space that requires solutions to.

Blockchain Trilemma

Currently, only two of the three traits, namely scalability, security and decentralization, can be fulfilled at any one time; the third is compromised, albeit as important. A secured and scalable system relies on some form of central authority; a secured and decentralized system grows to a ceiling; and a decentralized and scalable system may not be trustworthy. It is nearly impossible to meet all three simultaneously with the current technology.

The blockchain trilemma: scalability, security and decentralization.



Source: Visionz Capital

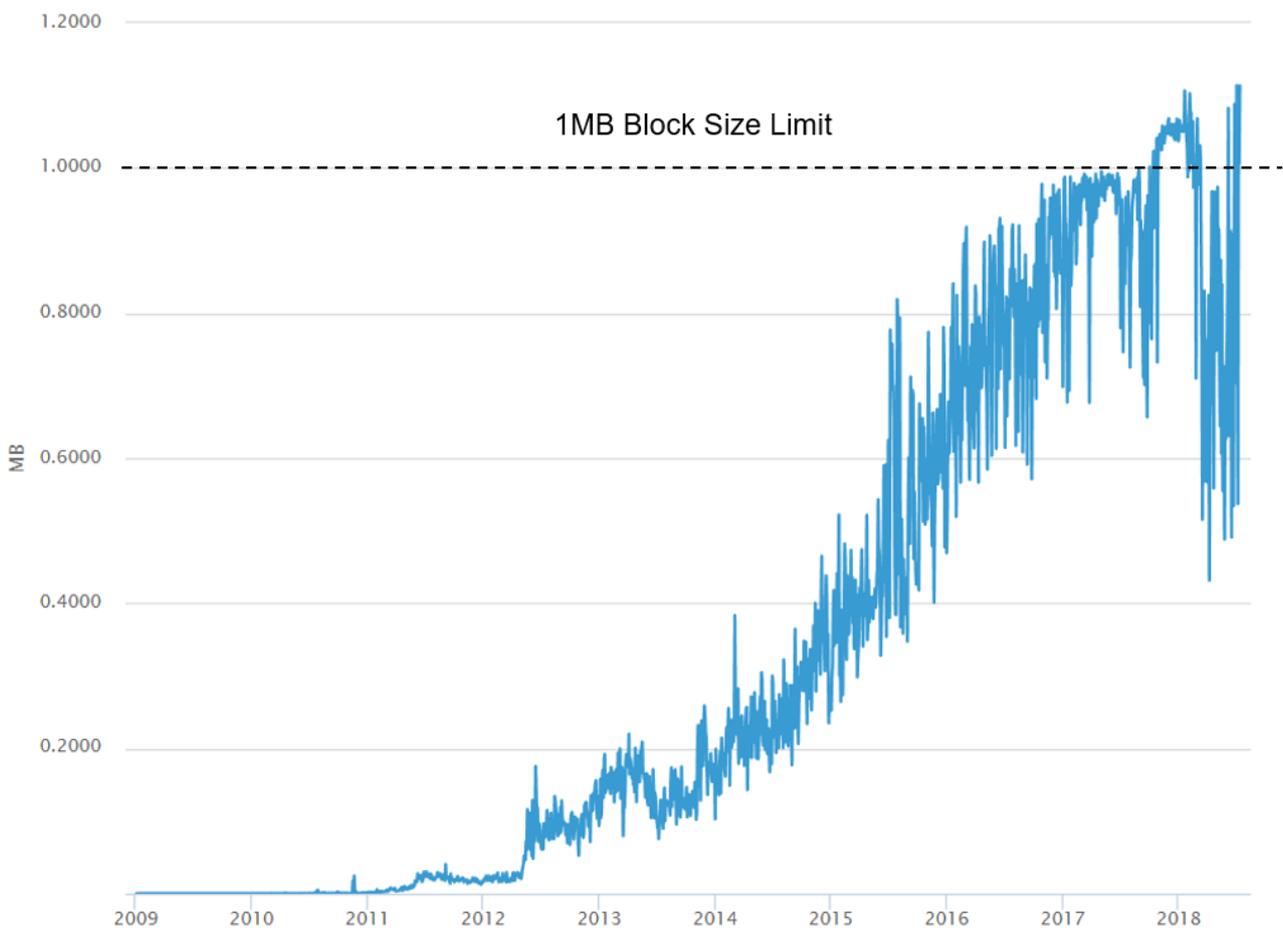
I. Scalability

Cryptocurrencies, one of the intangible assets that operates under the blockchain technology, is becoming more and more mainstream and transaction figures have increased folds over the years.

However, the initial design of cryptocurrencies was not meant for widespread use and adaptations. While it was manageable when the number of transactions were lesser, a host of issues have cropped up with the increased exchanging of hands. The Bitcoin network manages a maximum of seven transactions every second; and 20 for Ethereum. Ethereum’s scalability issues were magnified when the viral success of CryptoKitties slowed down the entire Ethereum network. Comparatively, traditional cashless payment VISA can facilitate 24,000 transactions per second. There is a need to step up the game if cryptocurrencies want to keep up and replace traditional payment methods.

Initial designs of cryptocurrencies were not meant for widespread use and adaptations.

Average Bitcoin Block Size



Source: Blockchain.info

A blockchain scaling solution is necessary to determine the optimal block size limit in a way that does not compromise security nor decentralization. Notably, if block size is too large, nodes running on consumer hardware will drop out due to insufficient computational power, resulting in the network having to rely exclusively on a very small number of supercomputers – centralization risk.



Source: Howmuch.net

II. Security

It is only on a decentralized network that immutability and peak security is achievable. Large amounts of sensitive data that are stored in a centralized institution will inevitably become a central point of failure and extremely vulnerable to deliberate external attacks such as middleman, virus, malware and distributed denial of service (DDoS) attacks.

Data stored in centralized institutions provides a single point of failure making it vulnerable to attacks.

The extensive network of nodes in the ecosystem entails a distribution of validating transactions and data input, making it impermeable to amend data recorded in the ledger and further verifying its contents. As the ecosystem gains more value, it incentivizes more nodes to join the network and further decentralizes the network, constructing a stronger wall that is less susceptible to assaults.

However, the increase in autonomous nodes leads to lower scalability as more time is needed to validate the transactions and reach a consensus to be recorded into the ledger. While achieving optimal security and decentralization, scalability is compromised here.

III. Decentralization

Decentralization is the core component of the blockchain network. Blockchain operates on a consensus algorithm where verification of all data input are spread across all nodes in the network. Permission from all participating nodes are required to make changes. Being reliant on separate components makes it incredibly difficult to alter any data, with no single point of failure, and guarantees the truth of the content.

Increasing the block size limit will put pressure on the miners and the nodes of the network, leading to centralization of the network, as smaller miners who do not have the computational resources are unable to process transactions. On the reverse case, limitation of block size poses significant challenge to transactions per second or scalability. Therefore, a trade-off between centralization and scalability seems inevitable.

Active bitcoin nodes are fairly decentralized

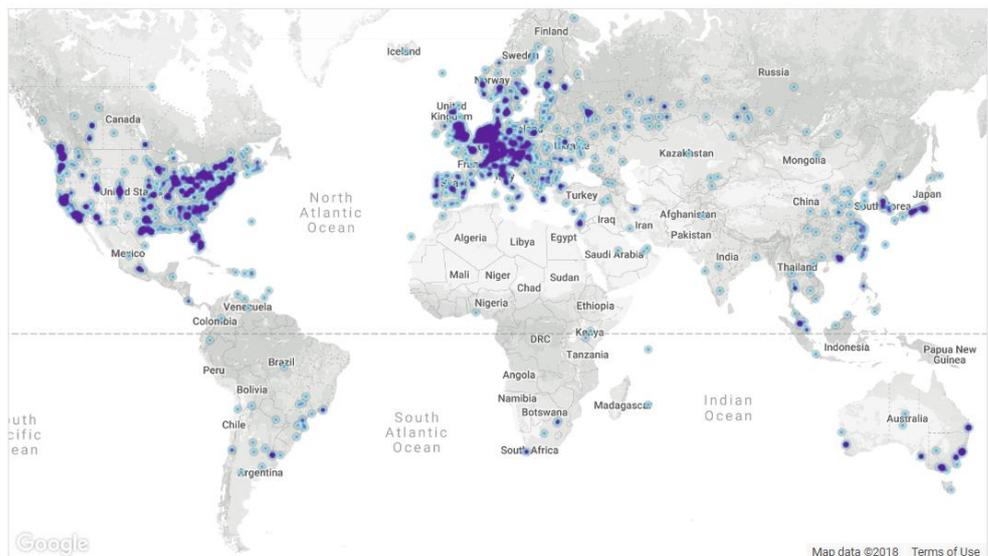
GLOBAL BITCOIN NODES DISTRIBUTION
 Reachable nodes as of Sun Jul 15 2018 19:13:28 GMT+0800 (Australian Western Standard Time).

9565 NODES
 24-hour charts >

Top 10 countries with their respective number of reachable nodes are as follow.

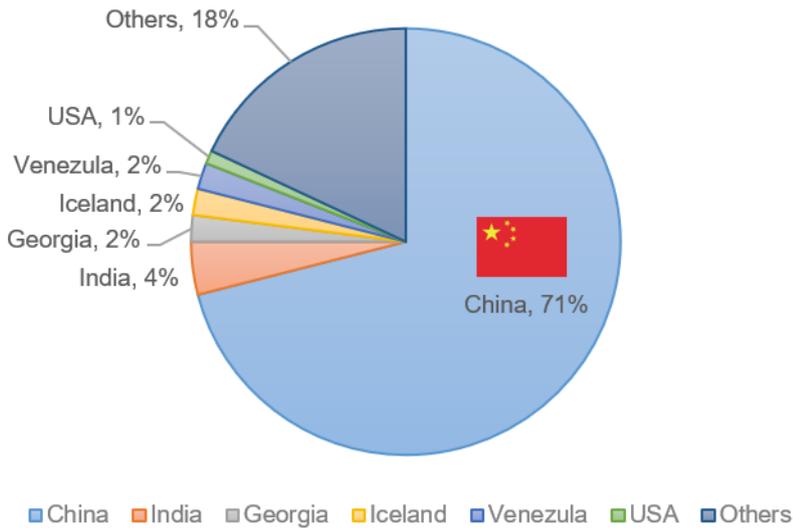
RANK	COUNTRY	NODES
1	United States	2374 (24.82%)
2	Germany	1752 (18.32%)
3	China	918 (9.60%)
4	France	607 (6.35%)
5	Netherlands	458 (4.79%)
6	Canada	352 (3.68%)
7	Russian Federation	284 (2.97%)
8	United Kingdom	266 (2.78%)
9	Japan	239 (2.50%)
10	Singapore	203 (2.12%)

More (103) >



Source: bitnodes.earn.com

Chinese mining pool process over 70% of the bitcoin network



While large concentration of Chinese mining pool does suggest mining centralization, many miners are lured by the prospect of small and steady earnings as part of a major pool, as opposed to the high-reward but lower probability solo or small-pool mining. Also note that China has one of the cheapest electricity in the world.

There have been a few cryptocurrencies and systems like Ethereum, EOS, Cardano and IOTA created to be used as alternatives for faster transactions. They provide solutions to parts of the trilemma, specifically addressing the scaling issue. However, most of them have not proven their worth in actual application.

Anyone who owns 51% of the network will have made a massive investment in hardware and systems to organize and construct a machine capable of executing such an attack. Such attack will never make economic sense from the profit standpoint.

Problems with Designs of Current Blockchain Platforms

I. Storage and speed

Data is stored on the blockchain, which in itself has limited capacity and that too at a very low speed. The example of the blockchain game CryptoKitties crippling the network is a cliché in highlighting the weakness of the Ethereum network, but it serves its point well. Running smart contracts on the main public chain can cause congestion and limit transaction speeds.

The security isn't the computing power but the economic investment behind the computing power.

II. Cost

Smart contracts that run on the main blockchain require data recording and contract executions to be done on the main chain. This results in many nodes repeatedly engaging in the same tasks. And since the Ethereum network charges gas fees for transactions, running smart contracts on Ethereum could become costly with the repetition.

III. Data redundancy

Historical data and the accumulation of future data from smart contracts being loaded on the main chain would negatively impact the blockchain efficiency, leading to congestion in the long run if not managed and cleared.

IV. Weak Decentralized Applications performance

Existing Decentralized Applications (DApps) cannot compete with mainstream applications as they are lacking in computing power and input/output operations per second (IOPS). Current blockchain structures can easily be overwhelmed if the computing stress of mainstream applications are laid on it. Hence, commercial use of DApps is not practical nor economical in the blockchain ecosystem.

Commercial use of DApps are not practical nor economical in the blockchain sphere.

Elastos – The Potential Solution

Both the internet and blockchain are challenged with issues that require extensive and intensive solutions to. Elastos is a project that is born to take on the challenge and solve the array of issues that the current internet and blockchain systems are facing.

Elastos Research & Analysis Summary

<p>1. Market Potential</p>	<p>Problems with the internet</p> <ul style="list-style-type: none"> ▪ Lack of security – systems and servers are susceptible to hacks and breach of security. ▪ Centralization of power & data mismanagement – many of the big companies store user data in exchange for their services, but users have little or no control and knowledge on how their data is being used. ▪ Lack of intellectual protection for digital assets – vast amounts of pirated digital assets exist on the internet due to ease of duplication. ▪ Lack of ownership of digital data – piracy and endless copies of digital data minimizes any potential for generating economic value from those assets. ▪ Lack of privacy – user data is collected through centralized servers each time users access a website, media or connect to the internet. ▪ Lack of trust & interoperability – systems and applications built on one platform are not operable on other platforms. Even if they are, the same level of functionality cannot be achieved as businesses will attempt to retain customers in their own ecosystem. ▪ Costly web development – building applications and protocols for different systems and platforms is a duplication of work and increases the resources required. <p>Additionally, the blockchain trilemma and its present platform designs are key hurdles to adoption.</p> <ul style="list-style-type: none"> ▪ The blockchain trilemma is an issue that all blockchain projects deal with it, namely, the inability to achieve scalability, security and decentralization concurrently. Ensuring any two of these would have to be at the cost of sacrificing the third. For example, DApps built on Ethereum are secure and decentralized but score very low on scalability. ▪ Current blockchain platforms are faced with problems of storage and speed, transaction costs, data redundancy, and weak DApps performance.
<p>2. Economic Model</p>	<p>Benefits of the Elastos</p> <ul style="list-style-type: none"> ▪ Reliable and secure transfer of data; ▪ ID-issued digital assets that cannot be duplicated and that can generate economic value; ▪ Fast and powerful DApps made possible;

	<ul style="list-style-type: none"> ▪ One-time app development as apps run on platforms like iOS, Android or Windows; ▪ Scalable infrastructure and low transaction costs; ▪ Immutable; same quality of trust as Bitcoin ▪ User privacy as users are given control to their data; ▪ Safe and secure network without any possibility of hacks or viruses; ▪ Interoperable applications that can work in tandem <p>This will be enabled by the design of the operating system. The Elastos Blockchain, which can issue ID for users, digital assets, websites, etc. and keep track of ownership of digital assets will allow the generation of revenue and for them to be traded like stocks or real estate. DApps will not be able to directly access the internet. Communications are all done node-to-node (peer-to-peer) without any central servers. And the agnostic nature of the Elastos platform allows applications run on any non-Elastos platform to make use of the Elastos Smart Web services.</p>
<p>3. Technology</p>	<p>Elastos' architecture consists of 4 components:</p> <ul style="list-style-type: none"> ▪ Elastos Blockchain, Elastos Runtime, Elastos Carrier and Elastos SDK. ▪ Blockchain layer is where individual ID is issued for each user, asset, website, etc. and where payment transactions occur. Runtime is a sandbox environment where DApps are run but restricts any direct internet access. All network traffic between the virtual machines occur over the Carrier, which is a decentralized peer-to-peer network without a central server. The SDK allows applications to access IDs and Carrier services on the Smart Web. The main feature about the Elastos Blockchain is the main chain - side chain design structure. Only simple transactions are done on the main chain while smart contracts and DApps are run on the side chains, which can be customized according to the application. <p>Put together, this architecture:</p> <ul style="list-style-type: none"> ▪ Brings trust to the Smart Web ▪ Leaves no room for security breaches or hacks ▪ Removes middlemen central servers for communications between network nodes, thereby bringing decentralization ▪ Provides universal applicability such that even non-Elastos applications can access and utilize the Smart Web ▪ Provide scalability and flexibility for deploying DApps on blockchain.
<p>4. Governance Model</p>	<p>A hybrid consensus mechanism of Proof-of-Work and Delegated Proof-of-Stake will eventually take place on the Elastos Blockchain network. The Elastos main chain</p>

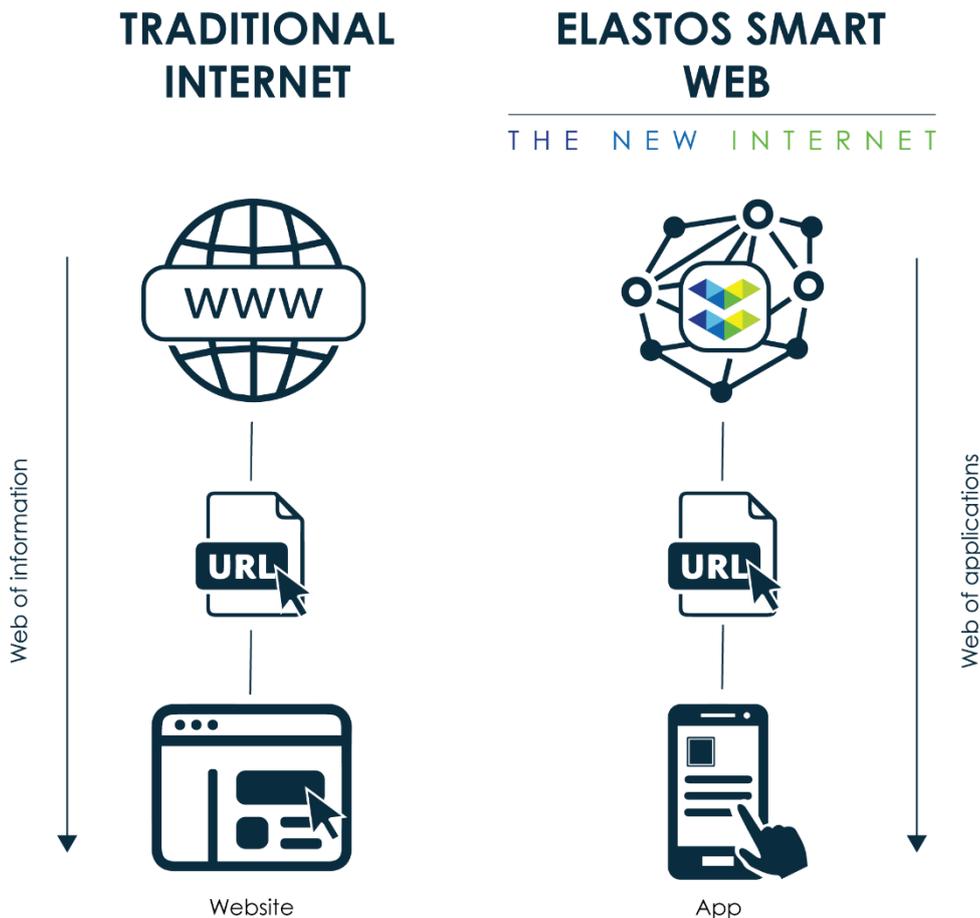
	<p>will be merged-mined with Bitcoin, offering the same level of decentralized network security as the Bitcoin network, while at the same time not consuming additional energy. Staking is incentivized by distributing 80% of DApp lockup tokens being distributed to stakeholder community, while the remaining 20% will go to the Elastos Foundation. Miners are rewarded with 70% of the mining profits, with the remaining 30% going to the Elastos Foundation for development of the ecosystem.</p>
<p>5. Ecosystem Development</p>	<p>Partnerships/DApps: Bitmain, NEO (G3), Foxconn Group, SAIC Motor, Aviation Industry Coporation of China, Far Eastern Air Transport, FRESO, Zapyra/ViewChain, Urban Catalyst and UK China Catalyst, BIT.GAME (META Union Alliance), ioeX, Weatherblock, HashWorld, Reactor Independent Game Guild, Panda Green Energy, Trust Credit Power, and Origin Agritech.</p> <p>Vast number of partnerships and DApps help to expand the development of Elastos Operating System (OS) and increase adoption respectively. The biggest single contribution is from Bitmain, providing its hashing power through merged-mining.</p>
<p>6. Team</p>	<p>The team consists of renowned thought leaders, development experts in OS development and academics from Tsinghua University, who are talents cultivated through a program initiated by Elastos and facilitated by DACA. The founder and planner of Elastos, Rong Cheng has 8 years of experience at Microsoft working on OS development. Since 2000, he set up his own firm to work on his own vision of an OS. Co-founder Feng Han is among the reputed and respected leaders in the blockchain space. Jihan Wu, co-founder of Bitmain, and Hongfei Da, founder of NEO and Onchain, serve on the advisor board of Elastos along with others, who are mainly in academia. They are prominent influencers in the blockchain industry with the wealth, connections and resources to help Elastos succeed in its mission.</p>
<p>7. Moat</p>	<ul style="list-style-type: none"> ▪ Data Security – enabled by Elastos Smart Web. The separation of DApps from the network prevents security breaches and promotes safe internet browsing. ▪ Safety and reliability – merged-mining with Bitcoin provides Elastos Blockchain the same level of security as the Bitcoin network. ▪ Scalability – side chains improve the computational ability of blockchain technology. They are also flexible and customizable, hence increasing the range of applications. Additionally, merged-mining allows side chains with similar consensus mechanisms to be merged-mined together with the main chain as well. No other project currently has this advantage. ▪ Technical Expertise – the Elastos team has experience in research and developing operating systems for almost 18 years, handling contracts for government and successfully releasing a mobile OS for phones in 2007.

Economic Model

What is Elastos?

Elastos is a project that aims to create a new internet operating system – The Elastos Smart Web. With a new world wide web in sight, Elastos aims to create a safer and smarter ecosystem, one that can revolutionize and build an internet of wealth. As compared to the current internet system, widely known as the web of information, Elastos wants to create a web of applications – a safe and secured internet system where users will be able to own digital assets and generate wealth from these assets. Elastos anticipated the importance that could not be overstated as we move further into an age of digital assets and provides a level of security that is unrivalled in this space.

Elastos Smart Web is an operating system, a safety sandbox, a guardian of intellectual property rights and a wealth generator.



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Elastos Smart Web: A Blockchain-Powered World Wide Web

The Elastos Smart Web aims to create a complete operating system that solves all of the problems faced by the internet as well as the blockchain trilemma. The virtual machine has a functionality and efficiency that leads to possible infinite extensions. The Elastos Smart Web will provide a secured running environment for large blockchain applications. And the universal decentralized peer-to-peer network on the Elastos Smart Web will also allow sharing of data without the need of a centralized server. It will provide a secure running environment for large blockchain applications to realize safe and reliable network communication with no centralized control.

Value Proposition

I. Reliable and secured transfer

Data is transferred and stored via a peer-to-peer network with no databases or servers. This prevents any single organization to collect, censor or control the data and there is no single point of failure.

II. Enabling digital wealth

Creators can sell a limited number or an infinite amount of license to their digital work, like music, graphics, books, games and etc. for a price. Users can freely trade these digital assets based on underlying supply and demand conditions. It provides a platform for authenticity, provenance and transparency.

III. Fast and powerful

Most of the computation is handled by hardware on the user's device, allowing usage on personal mobile devices. There is also an ability to scale and accommodate billions of users and devices in the system. The system also allows for resource heavy computing like graphics and games.

IV. One-time app development

As all decentralized applications run on Elastos instead of the other operating systems, only one application needs to be developed and updated, instead of multiple versions. This lowers the costs and time required for development. The Software Development Kit (SDK), a platform that integrates into native apps of other mainstream operating systems, is also available for existing applications on other operating systems to use Elastos.

V. Scalable and low cost

The side chains will handle different tasks, preventing congestions and bottlenecks on the main chain, reducing transaction costs and increasing efficiency. Smart contracts are also hosted off the main chain for greater transaction speed.

VI. Immutable

The quality of trust is passed down through merged-mining with Bitcoin, from the Bitcoin blockchain to the Elastos main chain, and then to numerous Elastos side chains.

VII. Privacy Protection

All the data and user information are encrypted and only transaction information are stored on the blockchain. Users have complete control to provide, remove and transfer their own data as they wish for big data or machine learning. The IDs are private, portable, personal and persistent.

VIII. Safe and secure

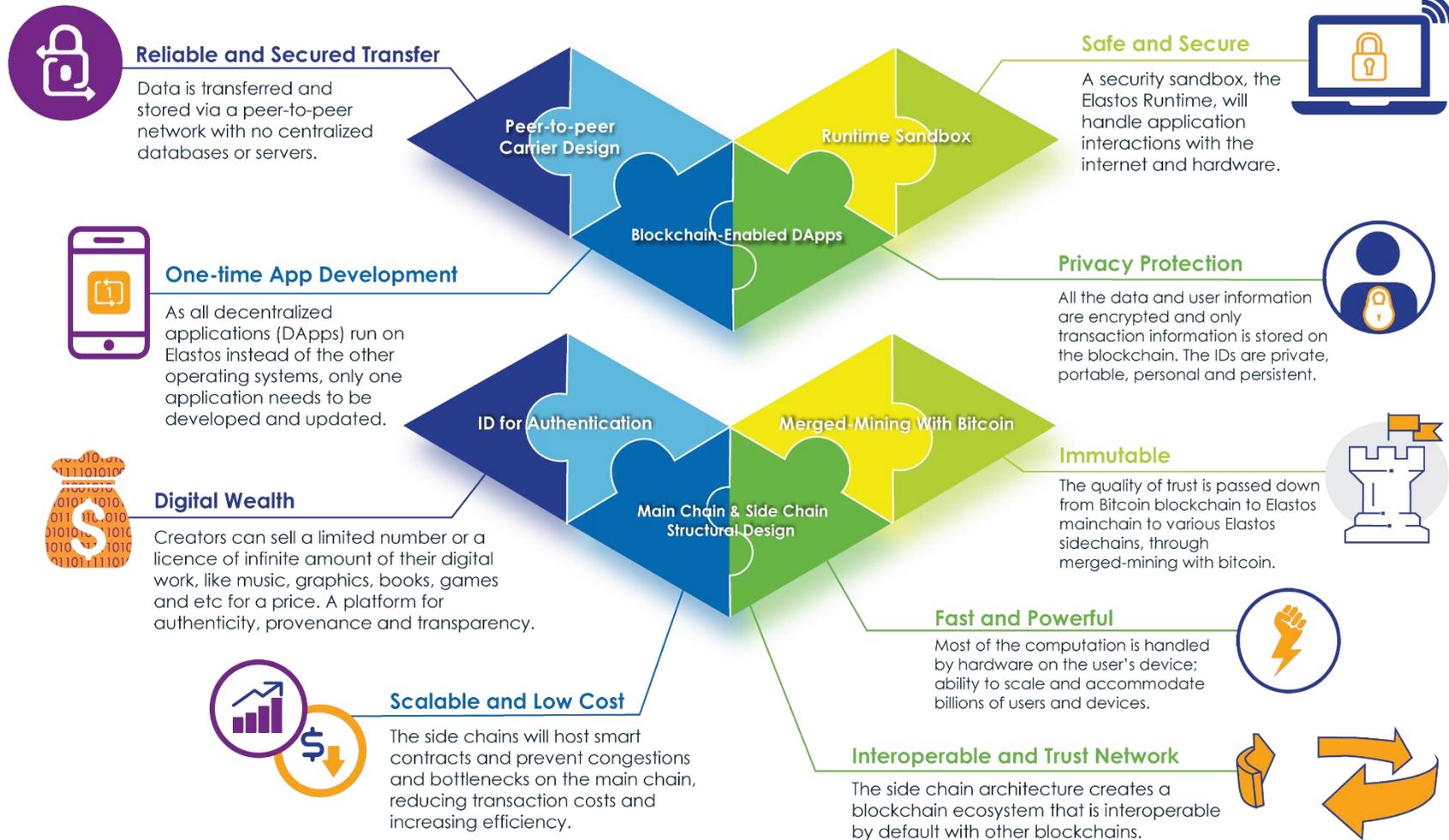
A security sandbox, the Elastos Runtime, will handle application interactions with the internet and hardware. This removes the possibility of viruses and malware attacks, Middleman attacks (MiMA) and DDoS attacks, especially with the advent of autonomous cars and IoT devices, which entails more data being generated.

IX. Interoperable and trust network

The side chain architecture creates a blockchain ecosystem that is interoperable by default with other blockchains. Smart contracts create a platform on a side chain and functions independently, without the need for a third party to facilitate transactions. It will be possible to port existing smart contract Virtual Machines (VM) like Ethereum VM or NEO VM to work on Elastos. In theory, two different applications, whose codes are executed using two different types of smart contracts and blockchains, namely Ethereum VM and NEO VM, will be able to operate with each other.

ELASTOS

VALUE PROPOSITION



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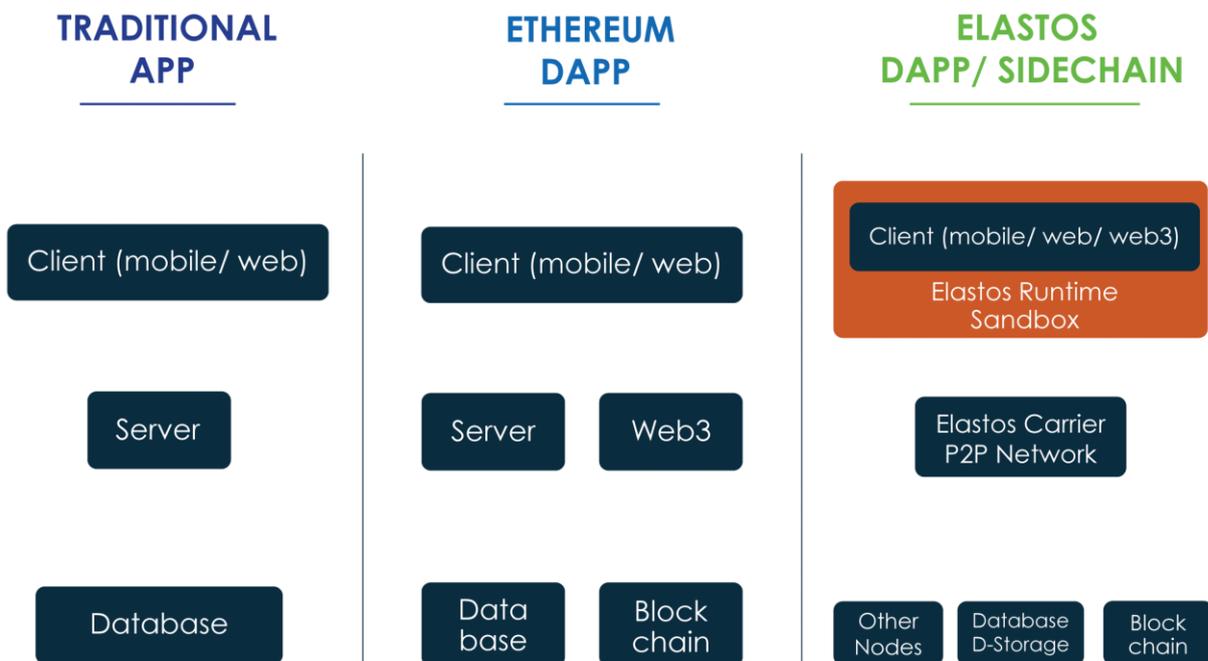
The Elastos Blockchain Structure

The Elastos Smart Web has four foundational layers: Elastos Blockchain, Elastos Runtime, Elastos Carrier and Elastos Software Development. These will be explained in greater detail in the Technology section of this report.

Overall, the Elastos operating system consist of the following features:

I. Blockchain-enabled DApps

DApps running in the Elastos environment will be equipped with blockchain technology but they would not run on the main blockchain itself. Users could run DApps either in the Elastos operating system and on any Android, iOS, Windows or other mainstream operating systems. Applications that are not based on Elastos, like Android or iOS-based applications, can access the Elastos Smart Web through the Elastos SDK. Users can also login to these non-Elastos applications using their Elastos Smart Web ID and store their data in the Elastos cloud storage. Web applications written by Elastos are not found in the current application ecology of Bitcoin or Ethereum.



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Source: Elastos, Visionz Capital

II. Main chain & side chain structural design

Elastos will incorporate a flexible main chain and side chain design structure to enhance computational speed and adaptability to cater to a multitude of DApps. It will provide infinite scalability for a more sustainable structure as more larger scale DApps being built on the blockchain structure will burden the main blockchain with DApps data. The main chain is only for basic transactions and transfer of payments, while the side chain is where smart contracts are executed to support various applications and services.

It is impossible to satisfy demand by storing all data into one single chain.

Previously, data transaction speed is limited by the individual node in the chain, though there are thousands of computation nodes. It is practically impossible to satisfy needs and store all signature data in one chain. With the new design structure, the main chain is not overloaded with information or redundant junk data that would lead to congestion and affect overall performance of the blockchain in the long run. This structure enhances the possibility for Elastos to become a basis for future internet applications.

Along with side chains, 'friend chains' can also exist in the Elastos Blockchain environment. While side chains are mainly for DApps or smart contracts built on Elastos platform, the only purpose of friend chains is for atomic swaps and DEX capability. No elastos DApps can be built using friend chains.

Side chains are for Elastos applications, while the only purpose of friend chains is for atomic swaps and DEX capability.

III. Merged-mining with Bitcoin

The Elastos Blockchain engages in merged-mining with Bitcoin – a process in which consensus is reached on both chains concurrently. The Bitcoin blockchain works as a parent blockchain and Elastos, an auxiliary chain. The safety and reliability of merged-mining are ensured by the strong Bitcoin computing power. Elastos Blockchain will feature the proof of work (POW) consensus system, similar to that of the Bitcoin blockchain. Mining pools deploy merged-mining codes and miners can submit POW to both blockchains simultaneously. This mechanism does not require additional energy consumption and also provides Elastos with a guaranteed computing power to provide blockchain innovations at a global scale. This mining strategy saves resources and avoids repeated consumption while creating more value.

The design is a trust zone and provides a secured internet database.

Although the public and main chain are the most transparent and credible, there remains a risk of attack from the computing power. If DApps on the Elastos side chains employ POW consensus mechanism, they can derive the same benefits as the Elastos main chain, which are hash power support and the security of the

Bitcoin network. This is compounded by Bitcoin's mining hash power. The double passing through of computing power further secures the side chain network. The different layers can also be merged-mined reclusively, establishing a hierarchy of trust among chains.

In extreme cases, a side chain dependent on merged-mining does not require a consensus of multiple nodes. Only one node will be needed to run the chain and that will not diminish the reliability of the ledger information on both the main and side chains. This is a consensus algorithm advantage that Elastos holds.

IV. Peer-to-peer carrier design

The Elastos Smart Web adopts a decentralized point-to-point network for realizing safe and reliable network communication. The design is a trust zone and provides a reliable internet database. The network is built within the enclosed Elastos ecosystem and that makes it one of the most secure blockchain networks in the entire ecology.

The Elastos virtual machine is also employed for identity ownership, processing of digital assets, and to prevent data exposure. The design also allows for efficient data transfer between distributed nodes, such as video and audio streaming or text messaging.

The current computing ecosystem power and value are concentrated within a few large multinational technology corporations and the balkanization of the internet. Other technologies were also created in an attempt to solve these problems, but to little avail. However, in the Elastos Smart Web, creators can monetize their resources and be rewarded handsomely for their creativity and innovation through the intellectual property rights obtained. All these can happen without a third party or middleman. This allows for a creation of value and wealth, and more equal wealth distribution.

The P2P design creates value and wealth and encourages more equal wealth distribution.

V. ID for authentication

In the Elastos Blockchain, all digital assets, including digital media, websites, social media accounts and other forms of identity, can be registered with an ID. This ID can then be used to track and account for ownership of data. Books, music, games, movies, websites, identity, etc. will have IDs that allow authentication of data and identity, enabling trusted trading of digital assets and preventing identity theft, among other benefits.

Digital assets published on the Elastos Blockchain are also equipped with an ID that permits trading, circulation and consumption. This ensures scarcity and preserves the value of the assets. When an authenticated digital asset is transacted, its ownership is also transferred to the buyer, giving them the absolute right to the asset and facilitates its resale in the market, thus creating value.

Elastos Tokens (ELA)

The Elastos Web is intended to be a special economic zone where Elastos tokens, the ELA, is the base currency. The ELA is the basic unit and Satoshi ELA (Sela) is the minimum currency unit for ELA. Uses for the ELA includes trading, investing in digital assets and payments for blockchain processing fees, such as cloud services, DNS and acquisition of UUID (Universal Unique Identifier) for digital assets, handle names, identity and many more. ELA can also be used for participation in token sales of other blockchain projects or DApps to be built on the Elastos environment. DApps would have around 2% - 5% of their respective project tokens locked into ELA. 20% of the project tokens (converted to ELA) will be used for the Elastos foundation development, while 80% of these DApps tokens would be airdropped to ELA node-holders.

Another utility use for the ELA is the transactions fees that miners will receive for the ID side chain that is merged-mined with the Elastos main chain, which in turn is merged-mined with Bitcoin. While the issuing of IDs may be free of charge, the transactions in each ID block mined with the POW algorithm is not.

In the current market where many cryptocurrencies struggle to create new use cases for their native token, Elastos has managed to invent new uses for the ELA while keeping the costs low. The usage of the token as a payment method did not create value for ELA. Instead, value is created from using the Elastos infrastructure and building applications in the system, thereby gaining user traffic and adoption.

Another feature adopted is to issue an additional 4% of ELA each year on top of the total supply. For the case of Bitcoin, the more Bitcoin that is mined, the lesser there remains. Currently, 12.5 Bitcoins are mined every 10 minutes. In four years' time, the figure would be reduced to 6.25. To compensate for the natural loss of tokens, be it through users losing their wallets, and to keep up with inflation, the circulating amount of ELA will increase annually at a fixed rate of 4%. The ELA is inflationary, while the Bitcoin is deflationary.

The circulating supply of ELA will increase at a fixed rate of 4% to curb inflation and loss of wallets.

Utilities of ELA

The Elastos token, ELA, has many utilities and its true value is dependent on the traffic in the Elastos network. As the network size increases with increased adoption by users, businesses and other projects, traffic on the network increases as well. And Elastos encourages just that, with the agnostic, flexible and accommodating design of its whole infrastructure.

1. The usage of storage service on the Elastos platform will require payment with the ELA.
2. Every transaction made in the Elastos ecosystem will be paid with ELA.
3. Applications built on the Elastos platform can implement ELA or Sela as a mode of payment.
4. ELA will be the main currency to reward developers for creating DApps on the Elastos platform.
5. Holders of ELA will be airdropped with DApps tokens built on the Elastos ecosystem in future.
6. Users can participate in token sale projects and products with ELA within Elastos.
7. Trading and investing in digital assets.
8. Elastos ecosystem collaboration projects would have at least 2% - 5% of their respective project tokens published for converting into ELAs. 20% of these project tokens will be converted into ELA token for the Elastos' Foundation development.
9. Users can use ELA to register an ID in Elastos and use this ID to purchase resources in the Elastos ecosystem.

Use Cases (Potential DApps)

Case Study 1: Digital Book

Problem:

Existing mainstream practice involves authors having to use middlemen publishers to publish their books. In many cases, authors experience great difficulties and hiccups finding publishers willing to take on their works. J.K. Rowling, the author of the Harry Potter series, was rejected multiple times by various publishers before she finally found any luck. One wonders how many authors never found success due to this problem. On the flip side of the coin, consumers who buy e-books have claim to ownership of a copy of the book. Yet despite having ownership, they are not able to own it like they own assets, as their copy is just one of the millions of copies floating on the internet. They are unable to re-sell these books or find any economic value for their collections. Much of the economic value is actually siphoned off by publishers and distributors, and creates one of the major issues plaguing the world today - centralization of power and wealth.

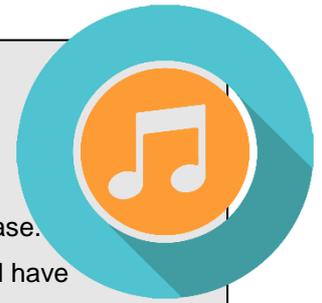
Value Proposition:

With a bookstore DApp built on the Elastos platform, authors can publish their books directly to consumers using the Elastos wallet. Books are issued and tracked with a unique decentralized ID using the Elastos Blockchain. When a book is sold, the author gets paid with ELA and the ownership of the book is transferred to the buyer. Ownership is tracked by tagging the book's ID to the buyer's unique ID. The author gets compensated for his book without any cuts being taken by a publisher. Since books are published in finite numbers and their availability is scarce, these books would have an economic value. Consumers can buy, own and trade these books like an asset within the Elastos ecosystem. When books are resold, using smart contract built into the network, authors can get a small fee each time their books are sold again. Power and wealth are redistributed to the people in the unique Elastos environment.

Scenario:

Lee wants to publish his latest book through the DApp on Elastos to reach out to consumers directly. He uses the Elastos wallet to publish 10,000 copies of his book and sets an asking price of 1 ELA, and indicates in the smart contract that he would like to receive 0.5% of the transaction price each time his book is resold. John, an avid reader and investor in e-books is interested by the plot of Lee's new book and purchases one of the books on sale. The sale is enabled by smart contracts and Lee gets paid as the ownership of the book is transferred to John. Over time, the popularity of the books increases, thereby increasing its price in the market to 2 ELA. John has finished reading the book and would now like to sell it. Using the DApp enabled P2P market place, John finds Mary who is interested in buying the book. Using another smart contract, John sells the book to Mary, who pays 2.1 ELA for the transaction. John receives 2 ELA, while Lee receives 0.1 ELA from the sale of the book. And the book now belongs to Mary, who has the single ownership of the asset.





Case Study 2: Music

Problem:

The music industry has been afflicted with piracy ever since music was available for purchase. Be it records, cassettes, CDs or MP3 files, there was always a way to duplicate a song and have a copy that one did not pay for. And the situation has been increasing in severity over the years. Music piracy costs the US economy alone more than US\$ 12.5 billion in losses each year. As a result, many artists have lost their motivation to create original music, with some even retiring from the scene itself.

Value Proposition:

Music companies or artists themselves can distribute their albums and songs exclusively in the Elastos environment. Each of these songs or albums will be assigned its own ID. Consumers would then need to purchase the song or pay for streaming services using ELA to enjoy the music and would not be able to duplicate the song onto any other platforms. Additionally, users would have to access these songs not through a media player or another intermediary platform but only through the Elastos ecosystem. Hence, tampering with or editing the digital song, or attempting to duplicate it would not be possible. Instances of piracy can be limited with widespread adoption of the Elastos OS for media consumption. This is applicable to other media like books and movies as well.

Scenario:

John is a veteran in the music industry, who had retired due to piracy taking away his earnings and as a result, his inspiration. He comes out of retirement upon hearing of the new music DApp on the Elastos platform. He produces his own music and decides to distribute his new single through the music DApp, hoping to reach out to audiences he never did before. Sally, a user of the platform and an avid music fan is thrilled to see John's new creation and buys his single. She loves the song and wants to share it with her friends, whom she thought will appreciate it too but was unable to copy and share the song to anyone, even through any other platforms. Her friends can only listen to it through the DApp on Sally's phone and soon Sally becomes an owner of the latest hit. She gets offers from her friends and strangers to buy her copy of the song for double or even triple the price at which she bought. John is happy to see his song become a hit and manages to sell all his copies, and also receives a small fee each time his song is sold again, which is enabled by smart contracts on the Elastos Smart Web.

Case Study 3: Movies

Problem:

The cinema industry is set up such that every movie that is produced will require a distribution medium. This is usually either a movie distributor like Paramount Pictures, or a third-party streaming platform like Netflix. Distributors usually take a minimum of 10% to 20% of the movie revenues as their commission. Distributors usually charge commissions from filmmakers, usually between 10% to 50% of net profits. On the other hand, many new filmmakers have brilliant ideas and scripts but lack the funding to produce their movie since producers are unwilling to invest in newcomers.

Value Proposition:

Similar to that of music, producers of movies have the choice of distributing them only in the Elastos environment. Without the need of a middleman movie distributor, the creators can reach out directly to audiences, reducing costs in the process. The commission that should have been paid to distributors can now be redirected in such a fashion as to derive economic benefit for both the movie producers and consumers. Consumers of the film will be required to purchase rights to the film in order to enjoy it, sell it or trade it all within the Elastos platform. Due to limited supply, the value of these movies will be dependent on the popularity and market demand. Newcomer filmmakers can use the Elastos portal to pitch their ideas and raise funds to produce their movie in return for a stake in the ownership.

Scenario:

Sandy is a new filmmaker with an interesting concept for a movie. She uses the Elastos portal to pitch her idea and raise capital to produce her movie. Ali is an opportunist and is constantly looking out for ways to grow his money. He sees Sandy's fundraising and decides to invest in her project using smart contracts, in return for getting a copy of the movie, of which only 10,000 will be distributed on the Elastos movie DApp. The film turns out to be a success and everyone tries to get their hands on it. The price at the peak reached five-fold of its original licensing price. Ali sold his rights to the film and obtained with a new-found earning, while Sandy made a name for herself with the help of the Elastos portal, inspiring further projects and more funding.





Case Study 4: Gaming

Problem:

The gaming industry is one which involves a relatively huge second-hand market. Especially when it comes to console and PC games, the second-hand games market is worth more than US\$ 2 billion. Presently, once a game has been played even once, it immediately loses a huge chunk of its value in the second-hand market. This has much to do with the physical condition of the game discs as it changes hands. First-hand game owners will never be able to recoup the exact price they paid for the game regardless of the popularity of the game. Additionally, independent game developers do not have the means to sell their developed games directly to consumers. They always have to go through a middleman publisher in order to make any profit, a portion of which will be absorbed by the publisher.

Value Proposition:

Mainstream and independent game developers can publish their games directly on a DApp in Elastos and reach their consumer community without any middlemen in between. These games can be scarce and identifiable, just as other digital media. Additionally, these can be played either on mobile devices or on game consoles, as long console developers are able to use Elastos SDK. Since the condition of the game itself does not change irrespective of the number of times it has been played, or number of owners it has had, there is no reason for its market value to drop. In fact, if the game turns out to be popular, the value of each copy of the game would increase.

	Traditional Gaming Platform	Elastos DAPP
Game Content	Risk of censorship	Publish freely
Game Ownership	Platform, Creator	Creator, Users
Payment Method	Through platform with commissions	Directly to creator
Revenue	Profit-sharing w/ multiple parties	Only goes to creator
Personal Data Storage	Platform	User's personal device

Scenario:

A new game developer company, Kite, releases 10,000 copies its first game, which has an innovative concept, on the Elastos-based DApp for gaming directly to consumers. Since they are new to the market, they decide to price it lower than other major games but dictate in the smart contracts that they would like to receive 0.5% of the transaction price each time the game is sold again. Even though the game is by a new developer, Kumar, a gaming enthusiast, decides to try out the game since it is cheaper anyway. Kumar buys a copy with his ELA and is thrilled by the game. He spreads word of the game, both within and outside of the Elastos community, causing mass popularity. Once Kumar completes the game, he sells the game for almost twice the initial price to another gamer, Kim. Kumar manages to recoup more than the price he paid initially while the Kite company earns 0.5% of the game's current price.

Case Study 5: IoT-Enabled Smart Cars



Problems:

Traffic accidents globally account for the death of 1.3 million people, with another 20-50 million people injured or disabled every year. Road crashes also cause USD\$518 billion in losses through insurance payouts or damage of infrastructure worldwide. Majority of these incidents can be attributed to human error due to recklessness, misplaced attention as well as fatigue from long hours behind the wheel. Rush hour driving is taxing on drivers and are causing increased stress levels. Additionally, while car affordability has increased over the years, independent car travel remains off-limits for children, the elderly and the disabled due to restriction in issuance of driving licenses. These are some of the prevalent problems in the automotive industry.

Value Proposition:

Using IoT (Internet of Things) technology to interconnect sensors on cars and smart computing to create smart, autonomous, self-driving cars will provide solutions to the above-mentioned problems. The Elastos Carrier and Runtime ensure that the security and the interoperability of the IoT DApp of autonomous cars is guaranteed, therefore solving some of the key pain points of the industry. Autonomous cars can drive with better judgment and precaution than majority of human drivers. With the help of the Elastos Blockchian platform, drivers can relax in their cars during rides and focus on other things rather than being drained from the stress of driving, especially during rush hours. In fact, with IoT technology enabled in cars and traffic systems, rush hours might not even occur at all. Children, the elderly and the disabled would experience increased convenience and mobility with self-driving cars. The usage of self-driving technology through DApps would also help long-distance cargo drivers who experience fatigue accumulated over the long hours of driving.

Scenario:

Alex drives an hour to work every morning and drops her kids at school on the way too. The smart system on her car plans the best route according to daily traffic conditions. Since Alex does not have to drive or navigate, she can focus her attention elsewhere. She just gets into the car with her kids and spends quality time with them. Once she drops off her kids at school, she continues on her way, now choosing to prepare for her meeting later that day at work. On some days, she has to arrive at her office early. So, her car drops her off at her office first, and then the kids off at school, after which the car drives back to Alex's office and parks itself in a designated carpark lot. Elastos has brought IoT into Alex's life and shared her responsibilities as career woman and as a mother.

Case Study 6: Supply Chain Finance

Problem:

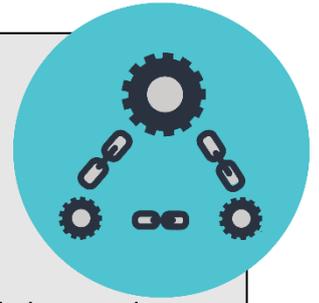
The dynamics of automobile production process is complex - it stretches worldwide with multinational buyers, a multitude of suppliers and lots of resources, including huge sums of capital. Companies are often struggling with locked-up working capital in their supply chains, causing issues with meeting production requirements and product delivery.

Value Proposition:

Automotive companies can move their production processes to Elastos, with the blockchain component running through the entire process from the moment a car is ordered to the moment it is delivered to its new owner. At any stage of the process, funds can be arranged through collateral loans based on pending orders on the Elastos Blockchain system. The entire supply chain will be transparently presented on the Elastos blockchain, fostering trust and credibility across banks, car manufacturers and their suppliers. Additionally, credit rating becomes much more easy and cost-efficient to monitor.

Scenario:

Jayme wants to buy a car and applies for a loan from his regular bank. His loan is approved and is reflected in the Elastos blockchain for car companies to see, using which he orders a car from BMW, on their DApp, which is again reflected in the system. BMW then places an order to their supplier for the required automobile parts but due to a working capital crunch, they are unable to pay the supplier now. BMW reaches out to the bank and requests for an advance payout of Jayme's loan amount in order to pay the supplier. Since Jayme's order and all other information is on the blockchain, the bank uses Jayme's unfinished car as collateral against an advance payout and gives the money to BMW. BMW then sends the money to their supplier, who immediately purchases the required raw materials according to the purchase order from BMW and ships it over. BMW manufactures the car and delivers it to Jayme. The bank disburses the remaining loan amount to BMW.



Case Study 7: Elections

Problem:

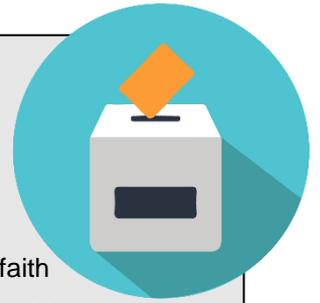
Elections in democratic countries have many issues affecting the fairness of the election results. Firstly, some people do not care to vote for a variety of reasons, including lack of faith in the system and the mentality that the trouble is not worth it. Secondly, there exists the problem of troublesome voter-ID laws, which require the ID voters bring to polling booths to be of certain requirements, failing which voters are not allowed to vote. Thirdly, voter fraud is an issue that infects many elections, where certain voters manage to vote multiple times for the same candidate. Also, voting machines could be outdated and its accuracy cannot be guaranteed. Furthermore, long voting lines at polling booths can discourage people from voting. Lastly, there is fear and doubt if voter anonymity is actually preserved. Voters are afraid that based on their votes, they can be the target of harassment and abuse by their own government. They are also doubtful if the entire election process is conducted with integrity.

Value Proposition:

By conducting elections on the Elastos platform, perhaps by using a DApp that is specifically for voting, elections can be conducted in a much more transparent and credible way. Each voter can be issued a unique decentralized ID (DID) for voting with proper KYC. This would prevent voter fraud as one voter can only have one ID and all polling systems are on the blockchain, which can identify duplicates attempts to vote. This would also bypass any cumbersome voter-ID laws as only one standard ID is required, which is issued by Elastos. Having a DApp for election literally brings the polling booths to one's fingertips through mobile devices or PCs. The reliability of voting mechanism is also guaranteed in the enclosed Elastos system, long queues at the polling stations would no longer be a problem and voters who did not care about voting at all before would feel more encouraged to vote since effort is minimized with everything at their fingertips. Also, since everything is conducted on the Elastos Blockchain, voters can feel secure about protecting their anonymity as well as have more faith in the election system and the government that will be eventually elected in.

Scenario:

Elections are being held in a fictional country, Erebor. Bilbo is a patriotic citizen and is keen to cast his vote for his favorite candidate, Thorin. He opens the DApp for elections on his mobile phone using his secure Elastos DID. Once in, he casts his vote at his convenience, at the comfort of his home. Another patriotic citizen, Borg, wants to cast his vote for the other prime candidate, Azog. However, Borg is a little too enthusiastic and wants to ensure Azog's victory. Borg tries to set up multiple accounts on the DApp and get multiple Elastos DID for voting, but he keeps failing the KYC. Eventually, he has no choice but to cast his rightful only single vote. Due to the transparency and credibility brought by the Elastos Blockchain, citizens are confident that the election process will be fair and just.



Case Study 8: Digital Market Place

Problem:

Many digital marketplaces in existence do not offer a completely satisfying experience for buyers and sellers. Usually, these marketplaces do not have any algorithm to match buyer with seller. Hence, sellers have a hard time finding buyers for listed products. And due to the difficulty in finding buyers, certain exchanges charge their customers a fee each time their advertisement listing is promoted. These marketplaces are also vast in number. Therefore, it is exhausting for a buyer to search all the portals to look for a product. To make matters worse, most marketplaces serve only locally or within their own country, denying their services to an international market. Lastly, even if a transaction is made, there is doubt on both the buyer's and seller's side as to the quality of the product as well as to the fulfilment of payment.

Value Proposition:

A DApp can be built on the Elastos platform that acts as a single, central digital marketplace. Users can buy, sell and trade any items that follows the protocols of the DApp. The marketplace will have an international audience and transactions can occur across demographic regions all using the Elastos ecosystem. Users do not have to pay any fees to list their advertisements; instead they would just have to pay for the transaction fees. Since transactions are done on the blockchain, it can be enabled by smart contracts with conditions put in by both the buyer and seller. Both parties can participate in the trade with trust enabled by Elastos through peer-to-peer carrier network and unique IDs.

Scenario:

Mei is based in Taiwan and has some tokens that represents a certain stake in the real estate near her house. These tokens entitle her to the rental income of these properties every month. She is in the midst of relocating to another country and wants to sell the tokens among other things. She lists her tokens in the marketplace DApp. Jake, an avid real estate investor based in the US, has set a notification alert on the marketplace DApp in case anyone posts any items related to Taiwanese real estate. Mei uses the keywords in her listing that triggers a notification for Jake. He checks Mei's review rating and then contacts her to express his interest in buying the tokens. Mei is glad and agrees. They enter into a smart contract to facilitate the process. The transfer of titles of the real estate is automatically done with the help of Elastos ID, which clearly identifies the ownership of these assets. In addition, due to Elastos' interoperability, all related agencies such as the government, credit bureau and others are automatically notified of the transfer of the asset, therefore, there is no need for Mei and Jake to engage any external parties for paperwork.



Case Study 9: Art

Problem:

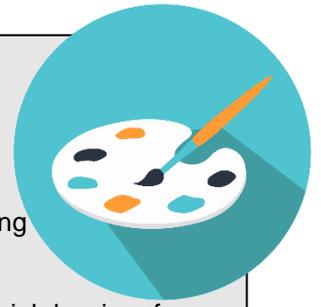
The economy of artworks has an extremely small number of market players despite it being worth more than US\$60 billion. While there are many people who own art for personal entertainment, there are many who buy artworks for investment purposes. This is due to high barrier of entry into the world of art investments. Only the wealthy can purchase expensive artworks and sell it when it appreciates. Other problems in the current art industry include: i) storage and transportation of art pieces during each transaction is a meticulous and cumbersome process; ii) costs involved in authentication and valuation of the art pieces for each transaction; iii) trading liquidity is low due to lack of common space to regularly meet buyers and sellers; iv) middleman art dealers who take a cut of the transaction value as their commission for facilitating the sale.

Value Proposition:

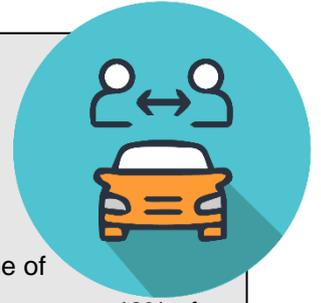
Elastos can solve all the above problems with a dedicated DApp for the art economy. Each art piece can be verified and authenticated just once, and then issued an Elastos ID. The physical art piece can be stored in a secure location, like a bank vault, while the digital ownership of the art piece can be registered on the Elastos network. The original owner can choose to issue 'shares' of this artwork to interested members of the community, so that investors each own a small portion of the artwork. With this, the barrier to entry is lowered and people who are not necessarily wealthy can invest in artworks on the Elatos platform too. These shares can then be traded within the community, depending on the appraisal and demand for the artwork. People can also own entire pieces of art, but when they sell it to someone, the artwork does not have to be physically moved. Smart contracts can facilitate the sale, and the ownership of the art piece will be transferred to the buyer. No expenses are incurred in authenticating, valuing or transporting the art piece in the Elastos space. Also, this creates more liquidity for trading since all art pieces as well as all interested buyers are on one common platform. Lastly, without the need for middleman art brokers to facilitate the trade in the Elastos marketplace, no commission costs are involved.

Scenario:

Vincent van Gogh's "Sunflowers" painting has been authenticated and digitalized into a token on the Elastos-based art DApp by Spock, a mainstream art enthusiast and the artwork's current owner. The art piece has been loaned to The Louvre museum and is stored there. Spock uses the DApp on Elastos to split the artwork into 10,000 equal tokens and makes 5,000 tokens available for sale. Singh, who has enjoyed van Gogh's works since young, buys 1000 tokens of the painting with the ELA he owns. Since this is all on the Elastos blockchain, the ownership of 1000 tokens of the Sunflowers now belong to Singh, as the Elastos ID of the 1000 tokens has now been tied to Singh's ID. The museum pays monthly fees to the owners of the painting for loaning it. The fees are distributed on the Elastos platform according to number of tokens they own.



Case Study 10: Ride-Sharing



Problem:

Companies that used the shared-economy model for ridesharing, like Uber and Grab, typically takes a significant portion of the fare as commission. For Uber, this is in the range of 15% to 25%, while for Grab the commission rate is more than 20%, and in some cases even up to 40% of the ride fare. Their policies with driver compensation have become more stringent and increased competition makes earning prospects worse. While these companies have no physical assets that generate income, their revenues are in the order of billions of dollars. A major portion of this revenue is from the commissions, which are obtained from the general public, like you and me. It results in centralization of wealth and power.

Value Proposition:

A ridesharing DApp can be built on the Elastos network, where the DApp and smart contracts replace companies like Uber and Grab. The middlemen, who siphon out commissions from each transaction between driver and rider are no longer involved in this economic model. Using the Elastos blockchain-enabled computing for driver and rider allocation, the system can run the entire operation by itself without the need for centralized companies. Drivers and riders will have unique Elastos IDs, which help to build trust among the community and also act as a review system for users to rate each other based on their ride experiences. Payments can also be done using ELA tokens or native DApp tokens. Using Elastos' scalable architecture, the system can be designed for worldwide usage. Removing the middlemen will allow for discovery of new price. Riders will not have to pay fares as per previous economic model and drivers will not have to pay commissions to any third-party. Under the new economic model, wealth is redistributed among the people directly involved in the transactions.

Scenario:

Kal is a rideshare taxi driver, who is waiting for a new assignment on his Elastos-based DApp. A notification pops up – Diana is near Kal's location and looking for a ride from Daily Planet building to Central Station, which is two streets away. Kal checks Diana's review rating and accepts the job offer. Kal picks up Diana and drops her off at the drop-off point. Under the previous model, that ride would have cost Diana \$20, and Kal would receive \$15, while the centralized company would take \$5. Under the new economic model provided by Elastos, Diana only has to pay an equivalent of \$17.01 in ELA, of which \$17.00 goes to Kal, and \$0.01 is spent as the network transaction fee. Diana spends less, Kal earns more and wealth is kept between the parties involved in the transaction on the Elastos DApp.

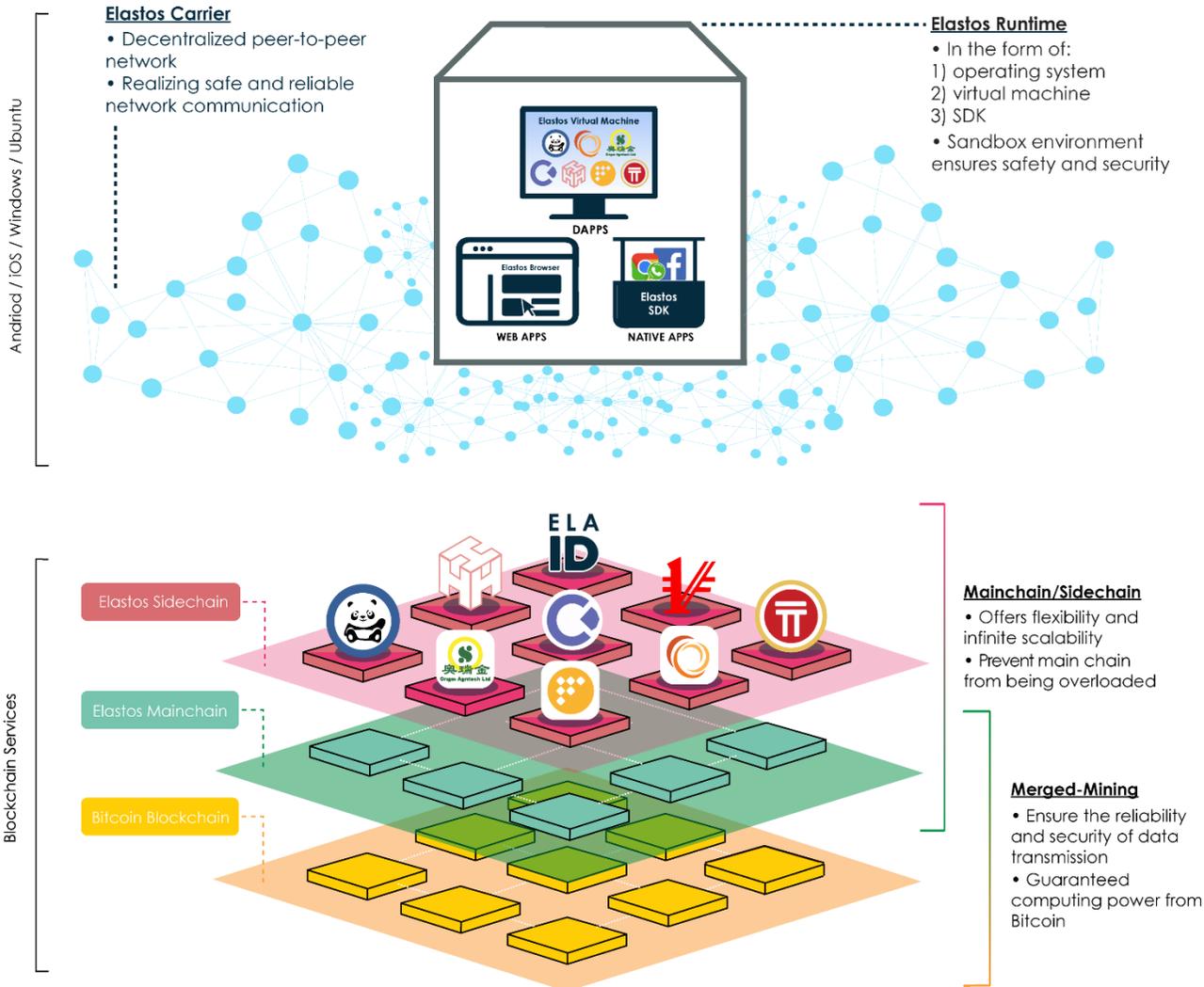
Technology

System Architecture

The architecture of the Elastos operating system, the dynamics of the interaction within the ecosystem and the underlying technology are explained below.

The Elastos Smart Web has four essential components: Elastos Blockchain, Elastos Runtime, Elastos Carrier and Elastos Software Development Kit.

ELASTOS ARCHITECTURE



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Elastos Blockchain

The Elastos Blockchain serves an important function in bringing trust to the network as well as establishing an economic zone for digital assets. This is achieved by maintaining a database of unique IDs for users and digital assets, and the associated property rights, records of transactions and traceability on the blockchain layer. The underlying blockchain will carry the user ID, digital content property rights, transactions, deposit certificate, traceability records, etc. Ownership is determined by tagging IDs of digital assets to those of users. When a user wants to run a game or play any media, the network ensures that the user possess the appropriate rights to do. Hence, a stolen, copied or unauthorized media cannot be played in the Elastos environment.

- Main chain, side chain and friend chain

The Elastos Blockchain is configured in a main chain-side chain fashion to resolve the scalability issue of blockchain applications, while at the same time preserving the decentralization and security benefits that traditional blockchains offer. The main chain is used only to store hashes of each block from sidechains. Hence, bloating with redundant data and network congestion in the main chain can be prevented, ensuring stability and fast network transaction speeds for the long term. The main chain will only be used for major infrastructure upgrades. Other non-essential data is stored in a distributed cloud storage network system and embedded with blockchain-issued DIDs.

Different smart contracts and DApps may have different requirements from the blockchain, in order to optimize their implementation in each scenario. These would depend on their uses. For example, a gaming DApp might work better on a consensus system that provides higher transaction speeds like Proof-of-Stake (PoS), while a DApp for trading of art pieces might run better on a system like Proof-of-Work (PoW). One option is to accommodate as many different requirements as possible into one single chain, but development of such a network might be difficult or even close to impossible. The other option, as Elastos has opted adopt, is to create a main chain-side chain infrastructure. This offers much greater scalability as well as flexibility in terms of developer options and network usage compared to a single chain for the entire network.

The side chains are where all smart contracts and DApps are executed. Each application can have its own side chain with its own token without burdening the main chain. This improves the computation ability of blockchain technology and solves the problem of low Input/Output Per Second (IOPS) of DApps in large scale

The Elastos Blockchain brings trust to the network and establishes an economic zone for digital assets.

Digital assets are assigned unique DIDs to prevent piracy and administer copyright.

The main chain and side chain structure fulfils scalability and flexibility.

implementations. The Elastos Blockchain will provide complete, built-in, easy-to-use side chain support for clients to customize each side chain according to their needs. They may even adopt a different consensus method catering to their preference and needs. The team will also implement basic services – ID generation, token distribution, digital asset trading and fast payment systems – as side chains for global and public use.

Friend chains largely function the same way side chains do, but with applications that are based on other blockchain projects, such as Ethereum or Neo, that issue their own tokens. The key difference lies in that Side chains lives in the Elastos ecosystem while friend chains live outside of the ecosystem. Funds transfer between Elastos chains and friend chains are possible and atomic swap can be enabled between main chain and friend chains.

- Cross-chain token transfer mechanism

Transactions are an important part of the blockchain network. In the Elastos network cross-chain transactions are done using elected arbitrators and a Simplified Payment Verification (SPV) mechanism to ensure the security of the transfers. Main chain ELA token holders jointly elect a specific number of arbitrators, who are responsible for signing the token withdrawals from the side chain to main chain. Each side chain node synchronizes all the block headers of the main chain. Additionally, all side chains have their own respective ELA address on the main chain.

Elastos Runtime

Elastos Runtime is a lightweight C++ virtual machine where the applications are run. This virtual machine is independent of the underlying operating system and it can be run on any mobile devices or computers, and guarantee end-to-end security and integrity across the internet. DApps built based on Elastos infrastructure are run in the Elastos Runtime layer, where processes are isolated and communications exchange with the outside is limited. Accessing digital media or retrieving any form of content would be on this closed runtime environment. The sandbox environment prevents any unauthorized, malicious data or program to enter the local OS. Even if the local device is infected with a virus or malware, user data would not be sent out into the network.

DApps that run in Elastos Runtime have isolated processes and limited external communications.

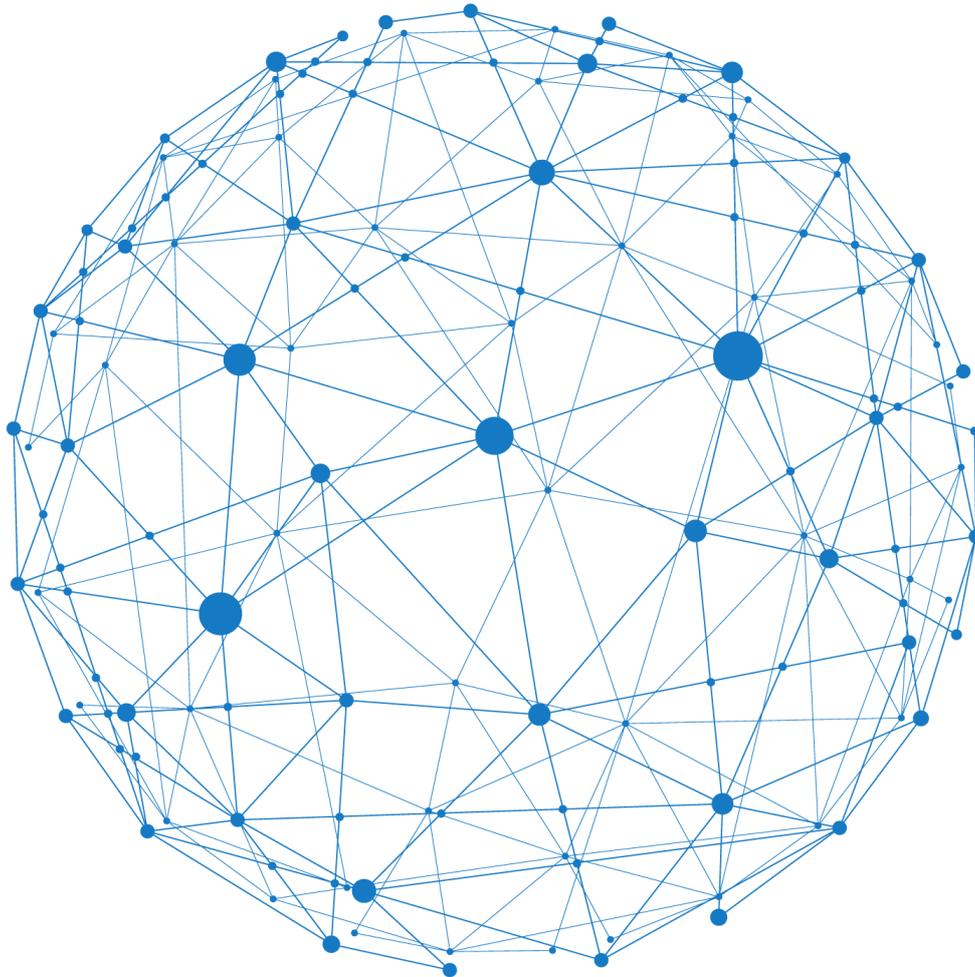
In the Elastos environment, each terminal device is set up as a “personal cloud peripheral”, such that each terminal is seen as a remote external device. And these devices can only operate in their own cloud computing environment, which means that users can browse websites, chat and play media but are unable to transmit any information to other devices. Data exchange is restricted due to Elastos Runtime not being equipped with a socket interface or any network port, practically limiting the local platform from sending any IP data packets. This makes any form of DDoS attacks virtually impossible as well. Moreover, Elastos Runtime does not allow any applications to access or tamper with the Portable Operating System Interface (POSIX) of the physical device, for example, the Java Native Interface (JNI), essentially leaving no way for a virus to infect the system.

Elastos Carrier

The Elastos Carrier is a decentralized peer-to-peer (P2P) platform that handles all network traffic between virtual machines. P2P refers to the relationship between entities which is identified with a decentralized ID, rather than physical computers to computers. This layer enables all network data to be transmitted over secure, trusted and identifiable P2P channels, which eliminates MiMA. The identities and authentication are enabled by the Elastos Blockchain.

Elastos Carrier transmits data over secured, trusted and identifiable P2P channels, eliminating malicious attacks.

Conventionally, attaining direct communication between network nodes was difficult due to the complex network environment, multiple routers, and dynamic IP. This was facilitated by a central service provider, who handles all data transmission within the network. If node A wants to speak to node B, node A have to first transmit to the central servers, from there, it would be forwarded to node B. Software providers preferred this system, since the central servers could collect user data freely. For DApps to be truly decentralized, direct P2P connections are necessary. And these connections need a network support of their own, hence, the introduction of Elastos Carrier.



Distributed Peer-to-Peer Network

With the Elastos Carrier in place, multiple intermediaries can be removed. For example, using Wechat for communicating with other users requires Tencent being the centralized carrier. Similarly, if someone made an international call from the UK to China, the intermediaries will be the two local service providers, like Vodafone and China Mobile respectively.

Removing these centralized agencies, who act as intermediaries, to form a decentralized and distributed network, means that a replacement carrier is necessary – an automated robotic carrier. The Elastos Carrier fits this role and

has multiple advantages over traditional TCP/IP network systems, including safe and reliable communication and exchange of data among the distributed network of nodes. The table below shows a brief comparison between the two systems.

Elastos Carrier	Internet TCP/IP
Authentication required before establishing connection	Packets can be intercepted
Content is encrypted and immutable	Security flaws such as sequence number spoofing, routing attacks, source address spoofing, and authentication attacks.
Decentralized relay through the use of peer-to-peer network. Data routing is unpredictable	Centralized services responsible for sending, receiving and forwarding data
No spam, zero cost	High costs involved due to Denial of Service prevention.
Privacy protection	All traffic is readily traceable to a source address

Elastos SDK

Non-Elastos applications would need to make use of the Elastos SDK to access the Elastos Smart Web for using the DIDs and Elastos Carrier services. Users will be able to log in to traditional applications based on Android or iOS platforms using their Elastos Smart Web ID and keep their data on the Elastos cloud storage.

Github

The Elastos team has openly sourced more than ten million lines of source code, including four million lines of original source code. This has been uploaded to Github for open community review and verification. Looking at the history of activity of Elastos on Github, it is apparent that the team has been consistently submitting huge amounts of code. The below charts obtained from Github, shows the activity level by months. In the past months, many coding developments seem to have been made for the Elastos Runtime and ELA tokens. Notably, Elastos runtime, Elastos blockchain and Elastos carrier are the major source of development.

The Elastos team are constantly submitting extensive amounts of codes to improve the ecosystem.

Elastos Foundation
Blockchain Powered Internet
Beijing, Shanghai, California | <http://elastos.org> | contact@elastos.org

Repositories 33 | People 0 | Projects 0

Grow your team on GitHub
GitHub is home to over 28 million developers working together. Join them to grow your own development teams, manage permissions, and collaborate on projects.

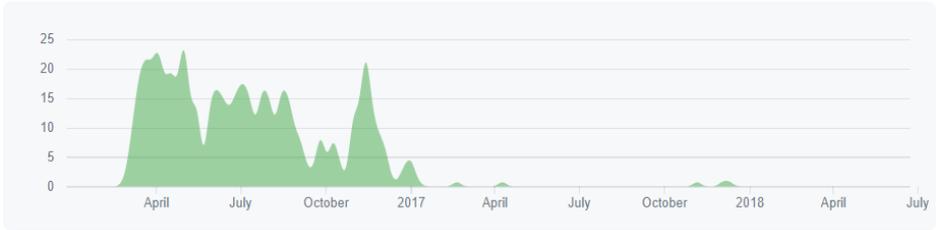
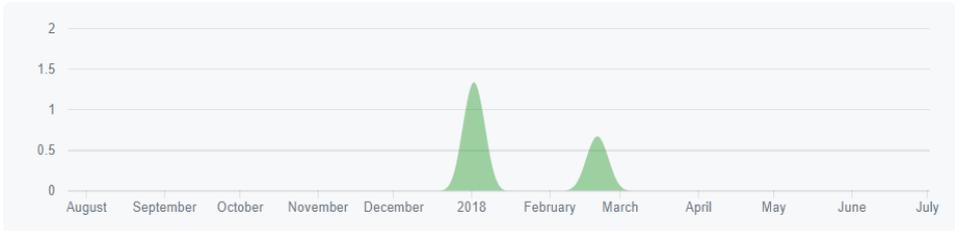
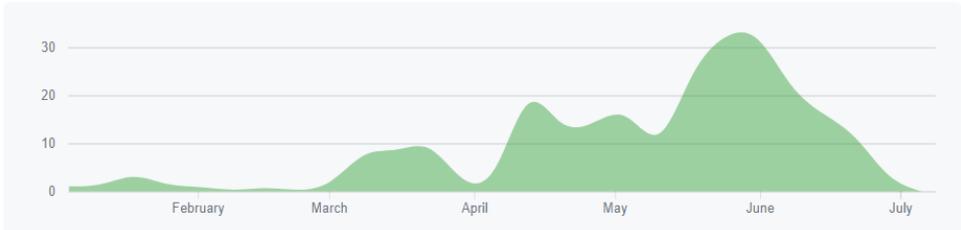
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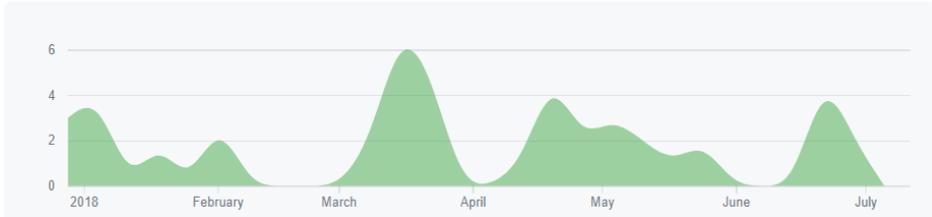
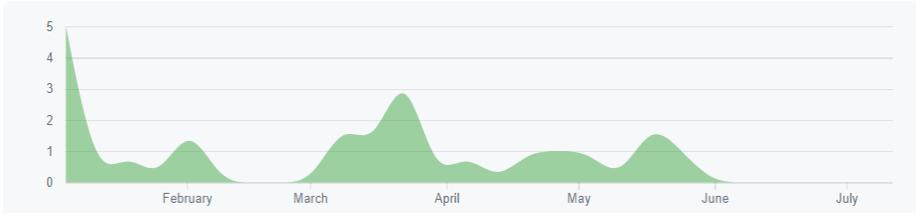
Pinned repositories

Elastos Repo introduction ★ 28 🍴 18	Elastos.OS Hosting Naked Devices ● C++ ★ 196 🍴 46	Elastos.RT Guest Runtime as an App Engine ● C++ ★ 31 🍴 27
Elastos.NET Blockchain Powered Internet ★ 19 🍴 10	Elastos.ELA Crypto Token ● Go ★ 47 🍴 27	

- Github activities/ key repository commits



<p>Elastos.OS</p>	<p>Jan 10, 2016 – Jul 7, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 
<p>Elastos.RT</p>	<p>Mar 12, 2017 – Jul 11, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 
<p>Elastos.NET</p>	<p>Jul 30, 2017 – Jul 7, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 
<p>Elastos.ELA</p>	<p>Jan 7, 2018 – Jul 11, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 

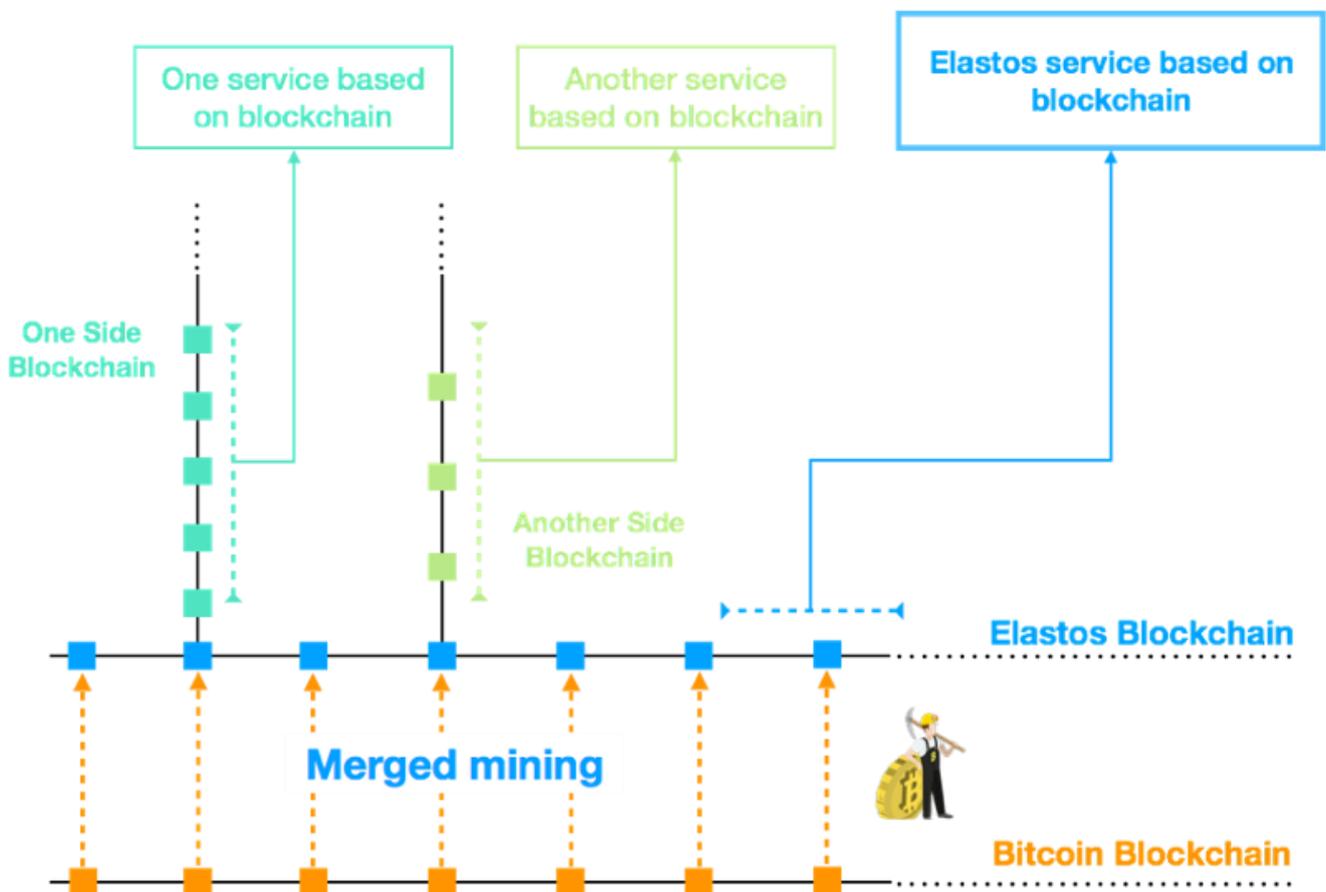
<p>Elastos.NET.C arrier.Native.S DK</p>	<p>Dec 17, 2017 – Jul 21, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 
<p>Elastos.NET.C arrier.Nodesjs.S DK</p>	<p>Mar 18, 2018 – Jul 14, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 
<p>Elastos.NET.C arrier.Android. SDK</p>	<p>Dec 31, 2017 – Jul 14, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 
<p>Elastos.NET.C arrier.iOS.SDK</p>	<p>Jan 7, 2018 – Jul 14, 2018 Contributions: Commits ▾</p> <p>Contributions to master, excluding merge commits</p> 

Governance Model

Hybrid Consensus Model

- Merged-mining

The Elastos Blockchain employs a merged-mining model with the Bitcoin blockchain, where the Bitcoin blockchain will perform the role of the parent blockchain and the Elastos Blockchain will be the auxiliary blockchain. Since Elastos main chain employs a PoW consensus mechanism, which is the same as for Bitcoin, mining pools can deploy merged-mining code and miners can submit PoW to both blockchains simultaneously. Hence, consensus can be achieved on both blockchains concurrently.



Source: Elastos

Merged-mining brings multiple benefits not just to the Elastos Blockchain but to the mining community as well. Computing power and energy utilization does not change under this model; rather, the resources consumed would be the same as either one of the blockchains being mined alone. Miners get the

rewards from both blockchains for power consumption of a single chain, on top of it being an environmentally friendly mining structure.

It benefits the blockchain by enabling (i) transfer of trust over multiple chains, and (ii) isolated nodes-based consensus. When the Elastos main chain is merged-mined together with the Bitcoin blockchain, Elastos side chains that use the same consensus mechanism as the main chain can also be merged-mined together with the main chain. Hence, multiple layers of chains can be mined repeatedly, where the quality of trust is passed down from Bitcoin blockchain to Elastos main chain, then to various Elastos side chains.

Additionally, a supplementary chain, which is merged-mined together with a parent or main chain, does not require a full consensus of multiple nodes like normal blockchains. Confirmation from a few nodes or even one single node would suffice to provide consensus for the entire chain, and the integrity of the ledger data on the main chain or other side chains would not be affected. This merged-mining design is unique in that no other consensus algorithm has been able to provide these benefits to any blockchain network.

- Delegated Proof-of-Stake (DPoS)

By the end of 2018, the Elastos team will have a layer of DPoS consensus mechanism added to the Elastos main chain on top of the existing PoW method. DPoS is a consensus mechanism that involves a selected number of nodes or witnesses to provide network confirmations and secure the network, hence, the delegation. These nodes are elected by the community members – the token holders – and their votes are weighed in proportion to the number of tokens voters hold, hence, the stake.

Elected witnesses who have been delegated by the stakeholders have the responsibility to perform a quality job at securing the network in return for being rewarded. Since only the top voted witnesses are paid for the mining work, as the network grows the competition increases as well. And witnesses can be voted out in favor of new nodes if they fail to meet the standards of the community.

Relying entirely on the PoW mechanism would mean partial participation in the consensus – it provides an incentive to large miners who have the most advanced mining equipment to be more active. This would go against the principle of decentralization where few holds power. The combination of PoW and DPoS would mean power is equally divided among the actual miners and

DPoS implements a layer of technological democracy to offset any potential negative effects of mining centralization.

PoW miners and DPoS are allocated 35% of the ELA tokens each and the Cyber Republic fund 30%.

users who can stake. That is why out of the 4% inflation mechanism, PoW miners and DPoS are each equally allocated 35%. The remaining 30% goes to the Cyber Republic fund.

Sustainability

For long term sustainability of any blockchain there must be enough strength in computing power and distributed number of nodes to keep the network alive. With that in mind, the Elastos team has designed an incentive mechanism for staking ELA tokens as well as providing mining power.

- Staking

All DApps built on the Elastos network have to lock up an amount of ELA tokens equivalent to 2% to 5% of the DApp tokens. 80% of these tokens will be airdropped to the Elastos community depending on their stake in the network. When the DPoS layer is added to the Elastos main chain, community members who want to have a say in choosing the delegates or witnesses would build a stake of significant ELA tokens to influence the network.

- Mining rewards

The mining rewards from the PoW consensus mechanisms employed in the Elastos main chain will be shared in the fashion of 70% towards the community members who support the network – miners (35%) and stalkers (35%) – and the remaining 30% towards rewarding development of the ecosystem.

There is currently no tangible rewards scheme for the super nodes in the P2P network. Instead, the super nodes will be rewarded with ELA for its efforts in supporting the ecosystem. The responsibilities of these super nodes are helping with distributed storage, the bandwidth for streaming of movies, music and so on, along with hosting any data in the system. Running in the decentralized ecology, sufficient incentives are necessary to encourage users to contribute with their hardware. Only in this way can Elastos continue to host all activities and run autonomously in a decentralized manner.

- Cyber Republic

The Cyber Republic is a new initiative by Elastos to increase its global presence and gather solutions to past, existing and future problems, with the

Running in a decentralized ecology, sufficient incentives are necessary to encourage and reward the community for their contributions and participations.

help of a community. Anyone who is keen to contribute to the project can apply for developer and non-developer tasks, as well as to organize community events.



We are a diverse democratic group of leaders, developers, organizers and designers formed to promote Elastos in our communities. Membership is open to everyone.

Source: [Cyberrepublic.org](https://cyberrepublic.org)

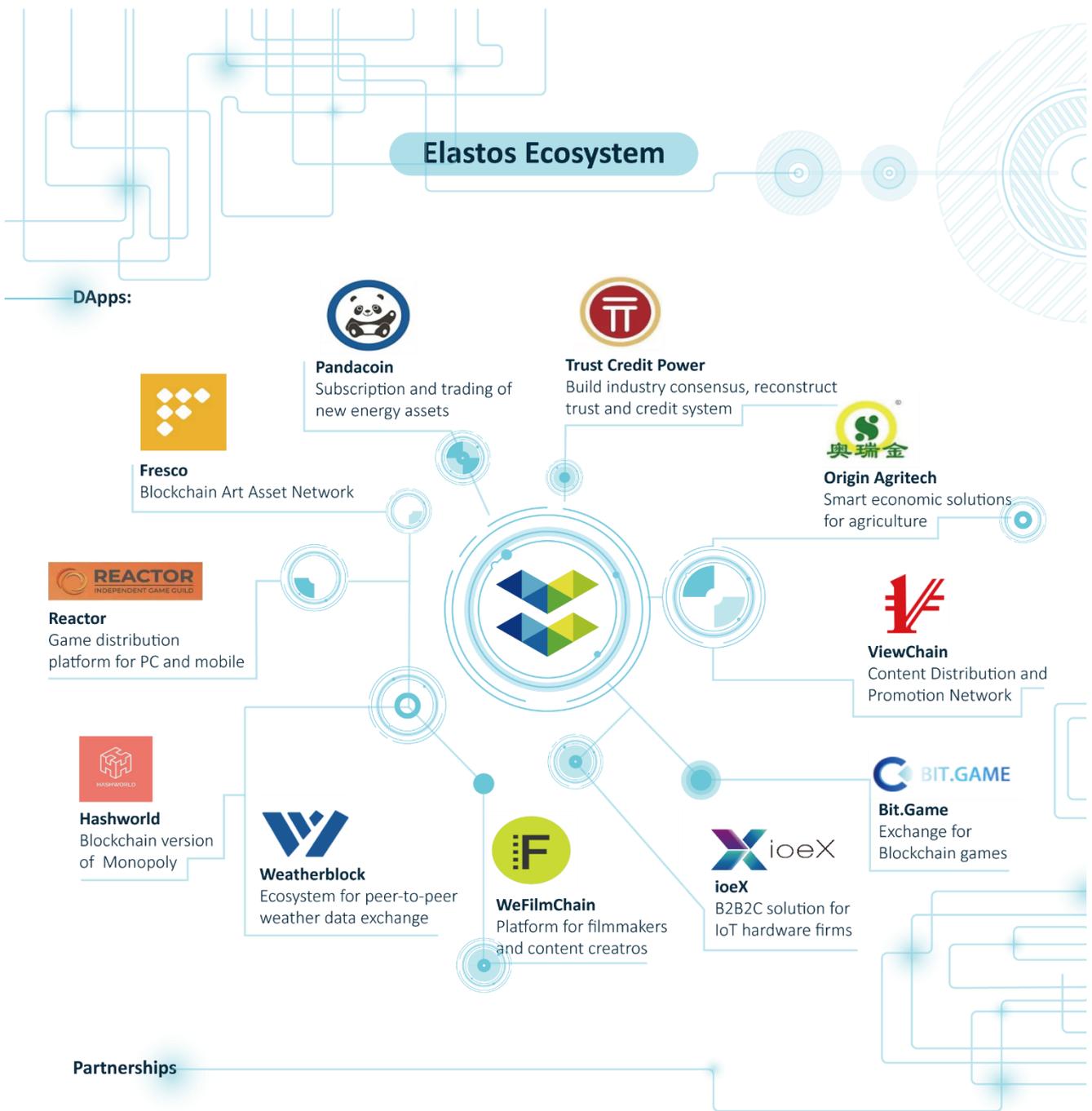
The goal of the initiative is to be decentralized and people-oriented – removing tyranny and control, and to involve the community where people get behind the idea, provide solutions and help to shape it by being personally involved. And eventually, Elastos hopes to hand over the power to this community and allow the project to run autonomously and democratically.

Developers will mainly write codes, fix bugs and enhance the Elastos ecosystem like contributing with applications to enterprise DApps developments. For non-developers like organizers and contributors, organizing meetups and events like hackathons, promoting Elastos online, locally or worldwide, identifying bugs, submitting issues and even referring potential

Elastos hopes to hand over the power to its community and allow an autonomously and democratically run project in the long run.

contributors are some of the creative ways they can contribute. They will in turn be awarded ELA for the work they do.

The project is currently in its infant stages with no confirmed time of an official launch, despite a soft launch in July 2018. However, it is a sure-go as the Elastos Foundation has dedicated almost half of its ELA tokens to fund the Cyber Republic project. This is a one-of-a-kind model that has never been adopted before and if successful, has the potential to revolutionize how blockchain projects operate and increase participation of its users.



BITMAIN

Bitmain
A bitcoin miner, designer of ASIC chips, and operator of one of the largest Bitcoin mining pools



Huafu Enterprise & Far East Air
Huafu Group's business include construction, travel agencies, aviation and business hotels



SAIC Motor
One of the "Big Four" Chinese state-owned automotive enterprise



Foxconn
The world's largest contract electronics manufacturer



NEO
An Open Network For Smart Economy
A blockchain platform



Urban Catalyst & UK China Catalyst
Exploring and developing the Elastos Foundation ecosystem in the UK & EU



New Energy Exchange
A green energy exchange focused on the new ecology of energy internet



A8
A digital music company providing music and culture content to mobile users



Newton
Infrastructure for the protocol-based economy. Joint ecological construction with Elastos



Distributed Credit Chain
Distributed banking public blockchain to establish a ecosystem for financial service



META Union Alliance
Blockchain research union that facilitate innovation, transform ideas into real world utilities

Ecosystem Development

Partnerships

The partnerships with Elastos and the DApps that are being built on its platform are a great number and many others partnerships are continuously being made by the team. As seen from the existing partnerships listed below, they are mostly mutually beneficial.

The engagements range from traditional to new technology corporations, blockchain-based companies, automotive and aviation, commodities, real estate, agriculture biotechnology and so on. Be it working on combined research and development, offering the blockchain expertise, providing an operating system or platform or developing DApps, these projects have practical aims and targets. The collaborations aim to (i) introduce changes and to improve on current systems, (ii) provide a better user experience; (iii) enhance the way people consume goods and services.

The partners of Elastos opt to build their ecosystems in the Elastos Smart Web due to its unique architecture and revolutionary features of its internet operating system; while Elastos gains widespread adoption in numerous industries, hence, expanding its network.

- Bitmain

Bitmain is one the largest, Bitcoin mining companies in terms of hashing power. Based in China, they own three mining pools, namely BTC.com, AntPool and ConnectBTC. Bitmain's partnership with Elastos is two-fold: (i) the Bitcoin mining power of Bitmain ensures that Elastos will have the same level of strength in trust and security as the Bitcoin blockchain itself through the merged-mining feature of the Elastos main chain; Elastos will receive the same hashing power as Bitcoin receives. (ii) Jihan Wu, the co-founder and CEO of Bitmain, is also on the advisory board of the Elastos team.

BITMAIN

- NEO

NEO is a blockchain platform and cryptocurrency designed to build a scalable network of decentralized applications. NEO is part of G3, which is a co-operation between NEO, Elastos and Bitmain with a shared vision of decentralized economy and smart web. Key features of the smart web include



the virtual machine, runtime environments and trust zone, provided by Elastos and Bitmain. The current G3 aims to invite other organizations with the same vision onboard.

- Foxconn Group

The Foxconn Technology Group is a multinational company based in Taiwan and is the largest electronics contract manufacturing company in the world by revenue. It manufactures products for various companies worldwide, including Apple, Sony, Nokia and Microsoft. They sponsored the Elastos project with over US\$31 million (RMB 200 million) for research and development. Though there is not much coverage on this partnership, one can make a logical guess as to the potential. Elastos gets the opportunity to conduct research and develop its infrastructure with respect to how it would operate on devices as it is intended. And when Elastos network is fully launched and adoption increases, Foxconn's products can be sold with Elastos Runtime and other essentials pre-installed in the devices. Think IoT (Internet of Things).



- SAIC Motor

Based in Shanghai, SAIC Motor is one of the top four Chinese state-owned automotive design and manufacturing company with operations in many countries. The company has signed a development collaboration agreement with the Elastos team where the possibility of smart cars will be researched and applications will be implemented into the central control system of vehicles. On top of revolutionizing the automotive industry through intelligent driving and smart cars, Elastos can also provide added benefits with: (i) ID verification for car services like rental or taxi, (ii) data generation from car sensors for IoT applications, and (iii) supply chain finance process from obtaining loan approval for a car to having the car delivered to buyer.



- Huafu Group & Far Eastern Air Transport (FAT)

Taiwan-based Huafu Group and FAT, which is owned by the former, has established a mutually beneficial partnership with Elastos. Huafu Group and FAT already have their own digital currency ALLN (Airline and Life Networking) that was launched with the goal of having a digital currency for physical commodity consumption. As per the partnership agreement, they will accept ELA token as payment method for its commodities, real estate and services, and their public chain would become a side chain to the Elastos main chain.



- FRESCO

The world's first blockchain art digital asset network FRESCO is a DApp on the Elastos operating system that "enables liquidation, promotion, and provenance of artworks at a global scale." It basically allows the digitization of artworks, offering art piece valuation and trading opportunities, thereby bringing investments and collectors into the Elastos system. Elastos can offer secure, transparent and decentralized ecosystem for the art industry.



- Zapy / ViewChain

Zapy is one of the top file sharing applications that has more than 570 million users spread over 178 countries. It allows sharing of applications, photos, videos, music and various other file formats across operating platforms, for example, between Android, iOS and Windows. ViewChain is a DApp that will be built on Elastos that utilizes blockchain, Inter Planetary File System (IPFS) and Zapy to exponentially increase content storage, copyright tracking, access to connect, and incentives given. IPFS is a protocol and network designed to function as a peer-to-peer distributed file storing and sharing system.



- Urban Catalyst & UK China Catalyst

Urban Catalyst is a real estate development firm and UK China Catalyst is a company with businesses in real estate, sports, medicine, technology, education, media, blockchain companies and cryptocurrency investments. These two companies will develop the Elastos Foundation ecosystem in the UK and EU. They will also be promoting Elastos and the usage of its token ecosystem in business settings.



- BIT.GAME & META Union Alliance

BIT.GAME is the world's first digital asset exchange for blockchain games. Their partnership with Elastos is with a goal of creating an ecosystem for blockchain games and for future developments. Elastos is also a member of META Union, an alliance of four other blockchain projects – Matrix AI Network (MAN), TrustNote (TTT), Achain and Aurora – with a focus on conducting blockchain research together and innovating and transforming ideas into real world applications and support mass adoption of blockchain technology.



- ioeX

ioeX is an IoT platform based on the Elastos infrastructure that allows software and firmware updates to be sent to the smart devices equipped with IoT technology without using an Over-The-Air (OTA) server. Utilizing OTA servers to release updates costs the IoT industry billions of dollars each year; by having a decentralized peer-to-peer network among existing servers and smart devices, updates can be sent much more efficiently. With this partnership, Elastos and ioeX could provide IoT solutions to every IoT side chain that would be a part of the Elastos environment.



- Weatherblock

Weatherblock is the first weather data exchange platform to be based on blockchain technology. The existing public data used to forecast weather is based on readings at high altitudes. To formulate a more accurate forecasting model, Weatherblock believes in obtaining readings on ground level. Their business model empowers users to own the weather data that they gather from running smart devices and being able to sell it to companies who deem it valuable. Users could put devices that collect weather data at their homes and cars, and then choose to sell it to the scientific community or commercial businesses. Weatherblock will cover all IoT systems related to weather, including irrigation, thermostats, air quality, etc.



- HashWorld

HashWorld is a blockchain-based game where users can educate themselves about the blockchain technology and industry and earn various cryptocurrencies at the same time. It was made by Yinghao Jia from Tsinghua University to educate more people on blockchain technology, so that innovation and adoption would increase in the blockchain industry. To do so, it was designed as a game based on the model of the board game Monopoly. It currently has a community of more than a million people. The game allows users to mine cryptocurrencies, and players can buy virtual lands and buildings based on augmented reality, and be able to earn revenue from leasing those digital real estate properties. The Hash Future Foundation, the team behind HashWorld, would work together with Elastos to educate the masses on blockchain and conduct industry research jointly.



- Reactor Independent Game Guild (RIGG)

RIGG is a decentralized game distribution platform for PC and mobile gaming. The partnership with Elastos would allow game developers: (i) to distribute games directly to consumers without an intermediary, (ii) take protection of

game copyrights and digital contents to a whole new level, (iii) include smart contracts in the game distribution model that open new channels of revenue for developers as well as consumers, especially in the second-hand market.

For example, a game developer could release their latest game through RIGG on the Elastos OS in limited numbers and sell it directly to consumers, without having to go through any middlemen or distribution agencies, like physical game shops. Since the game is run on Elastos Runtime, it cannot be copied or tampered with and the copyrights are preserved. When a user sells his game to another gamer on the resale market, they would be able to obtain a price depending on the popularity of the game. The game's ownership is then passed on to the buyer, and the original game developer would receive a small portion of the total transaction fee. Game developers can receive a small fee each time the game is resold while users get to buy a game, play it or hold it as an asset and sell it for profit or recoup their initial investment.



- Panda Green Energy (New Energy Exchange, NEX)

NEX is a Hong Kong-based blockchain technology company that provides sustainable and renewable energy exchange on the internet. It is owned by Panda Green, a company that has multiple green energy projects mainly in China and acts as a global platform for sharing renewable energy sources. Their joint blockchain partnership with Elastos focus on clean energy generation and consumption using the features of traceability as well as decentralization. Currently, the plan is to harvest the electricity produced from their power stations in Shekou area, Shenzhen China, to support virtual exchange of clean energy. This will raise awareness and push innovation in the sustainable energy industry.



- Trust Credit Power (TCP)

TCP hopes to reform the housing rental sector by using blockchain to create a consensus-based platform, introduce trust into the ecosystem and build a credit system for leases within. Houses for leasing will have reviews based on community feedback that will enable tenants to find suitable houses without the complexity of middlemen being involved or uncertainties regarding to the house's condition. Reviews by the community for properties to be leased will enable tenants to find something that suits their needs, without the involvement of property agents or concerns over the property's conditions. Smart contracts bring trust to both parties and the credit-based leasing system allows flexibility to tenants while preserving security of revenue for landlords. For example, a



tenant who initially took a leasing contract for one year might decide to move out after six months. She could transfer the leasing contract to a new tenant, who can continue for another six months before the contract expires and a new lease would have to be made.

- Origin Agritech Ltd

Origin Agritech is a leading agricultural biotechnology firm based in China that specializes in research, development and breeding of crop seeds. For several years, they have been working on creating a system to track crop seeds and enhance the related e-commerce market. By building a DApp on the Elastos Smart Web, Origin hopes to use the ID issuing feature of the Elastos Blockchain to track seeds as well as information about its source. Piracy of crop seeds can be minimized and intellectual properties behind the developed seeds can also be protected under the power of blockchain technology. Additionally, Elastos can provide the infrastructure to support the related e-commerce system and its large transaction volumes.



- WeFilmChain

WeFilmChain develops a decentralized blockchain-based platform that allows filmmakers and content creators realize their dreams for success in media or film production. The smart contract technology empowers not just content creators, but also film fans and investors by providing a level of transparency that has not previously been possible.



Roadmap

Roadmap beyond December 2018 will be decided and voted by ELA holders/community members in cyber republic.



Team

Review of Team and Advisor Board

The Elastos team mainly comprise of experienced individuals with vast technological and research expertise. They are thought leaders in their fields and experts in operating system development. The team also comprises of many academics from Tsinghua University of China, research consultants from Alibaba Research Institute and founders of blockchain and data computing platform COOIX. This project, unlike many other blockchain projects, was not started in the past year or two. It is an accumulation of 18 years of experience in building various operating system platforms with continuous research and development. Rong Chen was developing operating

systems at Microsoft for eight years – an experience that is totally relevant and a requisite for the execution of grand project that is Elastos.

The advisor board for Elastos is also something worth highlighting. Other than industrial giants Jihan Wu and Hongfei Da, we believe the entire board can contribute abundantly to the project with their expertise, accelerating its development and expansion of the current network. Perhaps the highest value comes from Jihan Wu, by means of the hashing power provided for the merged-mining architecture, which is one of the prominent features of the Elastos Blockchain. Together with Hongfei Da, forming the G3 cooperation provides essential support for the development of the Elastos infrastructure. One might be concerned that an advisor who is specialized in operating systems is not present, but Rong Chen's and the team's research knowledge and experience covers for it.

Overall, the team is highly capable and reliable; they seem to have the necessary expertise to deliver project updates in accordance with their road map. Each team is led by someone who has substantial experience in their relevant field. The good mix of technical, academics and marketing experts indicate that there is high possibility that the entire Elastos project will be successfully executed. Additionally, the large of partnerships and DApps that are already working with Elastos is added proof of their conviction in the team to deliver on their plans.

Team Profile

➤ Rong Chen (Founder; Chairman of Elastos Foundation)

From 1992 to 2000, Rong Chen worked at Microsoft on various operating systems related projects such as Research OS Kernel, IE 3, ActiveX, Ole Automation, DCOM and .NET. After which, he returned to China and founded his own company, Kortide Ltd. and started working on building his very own operating system. His project on Elastos operating system received funding from Foxconn. In 2016, he founded the Elastos Foundation with Feng Han to incorporate blockchain technology into his vision of Smart Web. He is a graduate of Tsinghua University and University of Illinois.



➤ Feng Han (Co-founder; Board Member)

One of the most reputed and respected members of the blockchain society, Feng Han is a visiting scholar and research associate at Columbia University. He had a teaching portfolio of graduate courses on blockchain at Tsinghua University. He also sits on the blockchain advisory board to Huawei Central Institute and as Secretary General of blockchain association Distributed Autonomous Coalition Asia (DACA). He was the Chinese partner for the Oracle Education Foundation. He also wrote the book “Blockchain: Quantum Wealth Outlook”. He was instrumental in designing the blockchain architectures of the Elastos, including the merged mining with Bitcoin. Notably, he insisted on foregoing the concept of a single main chain, and to instead adopt compatible side chains design with the flexibility to accommodate various consensus mechanisms. The idea of using AuxPoW+DPoS governance model can also be accredited to him.



➤ Yipeng Su (Chief Engineer; Board Member)

He is the chief architect of the Elastos infrastructure and the chief engineer. He was once the main architect and led the team to develop Elastos operating system version 2.0.



Advisors

➤ Jihan Wu (Union Chief Advisor)

He is the co-founder of Bitmain, the largest Bitcoin mining company by revenue. His company owns AntPool, which has the largest hash rate distribution. This makes him one of the highly influential members in Bitcoin space. He will be working with Elastos to setup a foundation to invest in DApps that operate on the Elastos platform. He plans to invest personally on these DApps as well.

➤ Hongfei Da (Independent Director)

Along with being the founder of NEO, a blockchain platform for distributed apps, Hongfei Da is also the founder and CEO of Onchain, a blockchain development company. He is well-respected within the blockchain space, especially in China, where he maintained good communications and relations with the Chinese government despite the crackdown on cryptocurrencies and ICOs by the government. He sits as an independent director on Elastos.

➤ Jingyu Niu (Technical Advisor)

Former chief engineer and developer of the Elastos project.

➤ Xueyong Gu (Advisor)

Professor at Tsinghua University. Director of International Relations at iCenter.

➤ Runde Wang (Technical Advisor)

Founder of Cooix

➤ Dadi Xing (Technical Advisor)

Co-director of Blockchain Lab of Purdue University.

➤ Ziheng Zhou (Advisor)

Member of the Academic Committee for Alibaba Research Institute.

➤ Joey Lee (Advisor)

Joey Lee is a Lecture Professor of Technology and Education and the Director of the Games Research Lab at Columbia University. He designs, develops and studies games and gaming experiences for education and social purposes. His projects include both digital and non-digital games for climate change, science and cross-cultural education as well as language learning.

➤ Luis Llovera (Advisor)

Luis is the current Managing Director at Bosch Ventures where he has worked since 2008. With over 17 years of experience in the technology industry. Luis possess a vast range of expertise, working with and investing in industries such as IoT, autonomous vehicles and big data. Sitting on the board as advisor, Luis can value-add with his extensive connections in the Silicon Valley, and valuable connections forged by his company's international reach in all areas of tech. His ability to evaluate and invest in projects at the highest level of the tech industry makes him an asset. His expertise will aid Elastos as they aim to grow internationally.

Team Growth

There is an extensive and elaborate team working on the Elastos project. This is understandable given the sizable partnerships and development of DApps, and the many areas of unprecedented development that requires focus on.

The team breakdown is as follows: more than 56 full-time staff; more than 80 part-time staff, where at least 45 are developers and engineers.

Commitment

At present, approximately 15.7 million ELA (46.7% of total supply) are reserved for the Cyber Republic project. This is quite a remarkable sum and indicates the dedication of the team towards rewarding the Elastos community for their contributions - developers or not. The Cyber Republic contributors own rights to the fund and it is at their sole disposal to determine how the tokens would be used, instead of the foundation.

Rank	Address	Balance	Percentage
1	8KNrJAyF4M67HT5tma7ZE4Rx9N9YzaUbtM	15776652.9059	46.7306%
2	8K9gkit8NPM5bD84wJuE5n71S9Rdski5uB	5000000	14.81005%
3	8S7JTjYjqBhJpS9DxaZEbBLfAhvvyGypKx	3128576.36297	9.26687%
4	8cTn9JAGXfqGgu8kVUaPBjXrhSjoJR9ymG	2016740.7355	5.97361%
5	8Pdv2cnsRd7UEHkMg82r85ARQL5CC1S9hG	1631573.41206	4.83274%
6	8VYXVxKKSAXkmRrfmGpQR2Kc66XhG6m3ta	749344.335788	2.21957%
7	EPmMUerdgtgeGN2ZuRFuF2aGUIT1mahF92u	155999.999951	0.46207%
8	EfSWQSjaD4ZHYys6ZkFdmacsQqy2i7aeJ4	60010	0.17775%
9	EUvnZsMI9AAMe3oZk7SBfJUPmftd1sNQX	54454.4104115	0.16129%
10	EU8CgkS4QiiyrHVXbKC57y9kcPMccDE1Pb	49134.98	0.14554%

Moat – Competitive Dynamics

The competitive dynamics of Elastos are the features that gives it an edge over its competitors - the ability to more than conquer its market share and stay relevant in the long run.

Data Security

Using the sandbox environment provided by Elastos Runtime, data is only shared through the Elastos Carrier network after proper ID verification. Separation of DApps from the network prevents hacking, DDoS attacks, phishing, malware, virus, etc. from corrupting the system or leak of user data, since no data can flow directly to the internet.

Scalability

The main chain-side chain infrastructure improves the computational ability of the blockchain technology as well as flexibility of application. Each DApp or smart contract can have its own side chain with the consensus mechanism that it desires. Regardless of the transaction volume in a particular side chain or even congestion, the main chain or other side chains will not be affected. The use case scenarios are increased exponentially.

Safety & Reliability

Merged-mining with the Bitcoin blockchain lends the Elastos main chain (and its side chains that are using the same consensus mechanism) the same level of hashing power and reliability as the Bitcoin network. Among the thousands of blockchain projects, only Bitcoin and Ethereum have enough network nodes and supporting hashing power to keep their respective networks safe and almost impossible to hack. Elastos is given that same level of safety and reliability. No other blockchain project has this unique advantage.

Technical Expertise

The Elastos operating system is a project that has been in development for almost 18 years, albeit in different forms and stages. That amount of technical research and development experience of the founder and the team is rare, if not unique, among projects trying to do anything at the level Elastos is attempting.

The Elastos operating system has been developing in different forms and stages for the past 18 years.

Visualizing Elastos – Commercial Integration

This could be the future state of mobile devices, where Elastos DApps integrate into different operating systems perfectly.



“The world of Elastos Smart Web at your fingertips.”

- Visionz Capital

Catalysts

These are the events that could potentially lead to an appreciation in the ELA coin price either by increasing awareness, restoring confidence or increasing project value.

- Exchange Listings
- Announcement of Partnerships
- Ecosystem Development Initiatives
- Ramp-up in Marketing Activities
- Development Progress Updates

Competition & Comparisons

Elastos seeks to differentiate itself and partner its market counterparts to improve on existing technologies instead of regarding them as competitors. They too innovate and invent cutting edge technology to stay ahead.

“We don’t consider Elastos as Bitcoin’s competitor because of merged-mining. We don’t consider Elastos as Ethereum’s competitor either, because in future, it will be possible to port their existing smart contract virtual machines to work on Elastos.”

- Rong Chen

Improved Mechanisms in a Non-Competitive Race

Elastos Runtime is similar to Ethereum’s VM. Runtime mainly serves the running of DApps as to EVM for running smart contracts. The fundamental difference lies in smart contract runs on nodes of the blockchain, while DApps runs on computing devices and other user terminals. Runtime acts as a sandbox to prevent sending of any network packet, thereby avoiding network attacks and leaking of private information.

Smart contracts run on nodes, DApps runs on computing devices and other terminals.

Applications on Ethereum are smart contracts instead of DApps. Henceforth, Ethereum would not be classified as an operating system in terms of the traditional operating system on Android or iOS. It is an operating system on a device not directly in contact with consumers.

The existence of smart contracts instead of DApps might lead to data redundancy and network congestion. The setting of smart contracts being exposed to DApps and how all data and code are stored on the main chain leads to data redundancy in the main storage. As DApps are not connected to the external operating systems, there is a difference in ecology fulfilment. The nature of the structural design makes it difficult for real world applications to connect to DApps on the Ethereum platform, disallowing it to achieve functions similar to these applications. It can be noticed that in the current Ethereum application ecology, commercialized applications are hard to come by.

As the scale of Ethereum data widens, network congestions, like that of the Cryptokitties incident creates congestions and slows the system. Data transaction speeds are limited by individual nodes in the chain. Ethereum has only one single chain as opposed to thousands of computation nodes. It might not be sustainable in the long run with only one chain serving the entire system. Elastos adopts a flexible main chain and side chain design structure.

Additionally, data exposure risks are present. DApps run on the user frontend after extracting data, causing possible data exposure. With safety as its core, DApps on the Elastos Blockchain are not connected to the internet network, preventing DDoS attacks. The absence of IP addresses also means reduced chances of successful hacking.

Building off the foundation of the Ethereum network, EOS has enhanced scalability. EOS adopts a concurrency mechanism that extends the network, reaching up to millions of transactions per second. This would support thousands of commercial-scale DApps.

In an advancement to that, Elastos is building a blockchain computer network operating system. The most essential difference is that EOS is a platform, like a dedicated computer, providing a functionality interface. It can be used for bookkeeping but does not provide an operating environment and means to support an ecosystem. It needs to be combined with an operating system like Android or iOS to provide an interface for the applications to run. The key of an operating system is to provide an operating environment for all applications.

EOS does not provide an operating system and interface for applications to run.

Elastos also provides an operating environment without the need to work with an external operating system. It is built on a distributed trusted and independent operating system. This makes it capable of hosting large-scale DApps.

EOS is a platform while Elastos is an operating system.

Elastos adopts a flexible main chain and side chain mechanism. Elastos Runtime conveys a trust function of the blockchain to the user's application on personal mobile devices, integrating the blockchain technology into the daily life of users. When necessary, the side chain can also be duplicated to further extend the side chain service capability, allowing an infinite extension of computing ability. EOS on the contrary is dependent on its main chain. The throughput will be limited under such circumstances, no matter how optimized the system is. It also adds pressure onto the main chain.

Elastos is developing a valuable alternative for content creators to distribute their content, maintain control and maximize opportunities to monetize it. Industrial counterparts like Po.et and Substratum have attempted to decentralize the internet and to use the blockchain to secure IP. However, Elastos was able to set itself apart by developing the Elastos Smart Web, which enables content to be exchanged peer-to-peer in a closed environment not connected to the internet.

- Blockchains solve the problems of trust, they do not solve the problems of the internet

	Traditional Internet	Private Blockchain	Ethereum (Public) Blockchain	Elastos Smart Web
Attributes				
Interoperability	✗	✗	✗	✓
Operating System	✗	✗	✗	✓
Decentralization	✗	✗	✓	✓
Trustless	✗	✗	✓	✓
Multiple-language programming	✓	✗	✗	✓
Distributed Storage	✗	✓	✗	✓
Security	✗	✓	✓	✓
Privacy Protection	✗	✓	✓	✓
DApps	✗	✓	✓	✓
Scalability	✓	✓	✗	✓

Source: Visionz Capital

Gaps to Fill In

There exist downsides to Elastos' blockchain ecosystem. Digital content often has a short shelf life and is highly saturated on the virtual platform. Elastos' closed environment is not 100% fool proof from content leaking. Users on the platform could screen-capture content and redirect them online. Under such circumstances, it might be virtually impossible for Elastos to prevent content from being leaked.

Furthermore, no one company has a solution to the verification of the actual owner of an original content. Multiple users might claim rights to the same content, or that the uploader who is assigned the ID, might not be the original creator. There also exist ambiguity in the revenue allocation model regarding derivative works or remixes. In spite of these possibilities, content creators looking for alternative means to monetize and maintain rights over their work can still see Elastos as the go-to platform for sharing their content.

As there is no single authority governing the sphere nor monitoring the content, it can mean an end to censorship. It does not matter what content is being accessed or the location being accessed as blocking out content and geo-restricted sites will cease to exist in the decentralized web.

Net neutrality also sets in on the Elastos platform. All sites are treated the same on the decentralized web, allowing users to enjoy the full online experience. It also prevents providers from abusing their market power to interfere in user access to competing applications or content. However, there exist grey areas like child pornography, hate content and spreading of terrorism.

Friend or Foe?

Elastos focuses on engagement and outreach. They are trying to increase their presence in the western market with engagements and talks in the Silicon Valley, MIT and Harvard. There is also a G3 alliance, a cooperation with Bitmain and NEO, who share the common vision of a decentralized economy and smart web. Also, the R3 Group, a network of over 200 financial institutions, trade associations, regulators and technology companies to develop its commerce distributed ledger platform.

In summary, Elastos has adopted an independent blockchain ecosystem that is not accessible by third parties. The ecosystem will complement other utilities

Possibilities of users taking screen captures and leaking content online exists for the Elastos Blockchain ecosystem.

Ambiguity remains for the verification of original creators and revenue allocation to derivative works.

Censorship is non-existent in a decentralized space.

Elastos engages in collaborations like the G3 alliance and R3 Group.

and no overload would occur since side chains are established in the system. The platform will also issue IDs and tokens to digital assets, verifying ownership and creating wealth through trading. And as applications are separated from the system, digital assets will not be leaked. Elastos also supports traditional programming while also allowing smart contracts and DApps to run on the platform.

There are multiple visions laid out by the Elastos team and it is one of the most unique projects in progress in the crypto sphere. If Elastos can achieve what they set out for, which they are already through the halfway mark, the impacts of the projects are significant and it has the potential to revolutionize our relationship with the internet and change the way we live, work and interact.

Imagine owning a digital asset, be it movies, books, songs, articles in an enclosed yet open sphere – all these contents will have their own ID and value, which can lead to wealth creation. That might not be far.

Blockchain Platform Comparison Study

While Elastos is an ambitious and unique project that aims to revamp and reinvent both the internet and blockchain, there too are other alternative solutions in the market with their own merits and edge.

Project	Elastos	Ethereum	Hyperledger Fabric	R3 Corda
Logo				
Founded Date	January 2018	Jul 2015	July 2017	September 2015
Platform	Generic Blockchain Platform	Generic Blockchain Platform	Modular Blockchain Platform	Financial Services
Ledger Type	Permissionless; Public or Private	Permissionless; Public or Private	Permissioned; Private	Permissioned; Private
Currency	ELA	ETH	None	None
Consensus Algorithm	Mainchain (Proof of Work+DPOS); Sidechain (Any Consensus)	Proof of Work	Pluggable Framework	Pluggable Framework
Governance	Cyber Republic (Community)	Ethereum Developers	Linux Foundation	R3 Consortium
Network Effect	Weak	Great	Good	Good
Decentralization	Yes	Yes	No	No
Security	Strong	Strong	Average	Average
Scalability	Node: High Performance: High	Node: High Performance: Low	Node: Low Performance: High	Node: Low Performance: High
Confidentiality	Transparent	Transparent	Confidential transactions	Confidential transactions
Smart Contract	Code Only; Not Legally Bounded	Code Only; Not Legally Bounded	Code Only; Not Legally Bounded	Can include legal prose
Programming Language	Multi-Language Support	Solidity	Golang or Java	Kotlin
Description	Elastos is a project that aims to create a new internet operating system – The Elastos Smart Web. With a new world wide web in sight, Elastos aim to create a safer and smarter ecosystem, one that can revolutionize and build an internet of wealth. As compared to the current internet system, widely known as the web of information, Elastos wants to create a web of applications – a safe and secured internet system where users will be able to own digital assets and generate wealth from these assets. Elastos anticipated the importance that could not be overstated as we move further into an age of digital assets and provides a level of security that is unrivalled in this space.	Ethereum is a decentralized platform that runs smart contracts: applications that run exactly as programmed without any possibility of downtime, censorship, fraud or third-party interference. These apps run on a custom built blockchain, an enormously powerful shared global infrastructure that can move value around and represent the ownership of property. This enables developers to create markets, store registries of debts or promises, move funds in accordance with instructions given long in the past (like a will or a futures contract) and many other things that have not been invented yet, all without a middleman or counterparty risk.	Hyperledger is an open-source collaborative effort to advance cross-industry blockchain technologies. One of its key goals is to create enterprise-grade distributed ledger frameworks and codebases. Hyperledger boasts 185+ collaborating enterprises across finance, banking, Internet of Things, supply chain, manufacturing and technology. Hyperledger Fabric is one of the 8 ongoing Hyperledger projects that was initially contributed by IBM and Digital Asset. It is an attractive blockchain framework for enterprise solutions, given its modular architecture, as it allows plug-and-play components around consensus and membership services.	R3 is a consortium of some of the world's biggest financial institutions that has created an open-source distributed ledger platform called Corda. It's partner network has grown to 60+ companies. While Corda was designed with banking in mind, other use cases in supply chain, healthcare, trade finance, and government are emerging. It is a permissioned blockchain as it restricts access to data within an agreement to only those explicitly entitled to it, rather than the entire network. Its consensus system takes into account the reality of managing complex financial agreements. It is also known for its focus on interoperability ease of integration with legacy systems.

Source: Visionz Capital

Risk Factors

Both the market risks and business risks are discussed in this section: factors that could potentially impede the growth of this project. It is in the best interests of investors to be fully aware of these factors.



Market Risks

- Regulations

National governments may decide to ban cryptocurrencies in their respective countries. There are precedent cases and there is every chance it may happen in future. Countries like China and Iran have banned cryptocurrencies, exchanges and any form of ICOs totally. The People's Bank of China, the country's regulatory authority seeks to eliminate cryptocurrency trading and mining activities in the country. The impact of banning the exchanges was felt globally exactly because cryptocurrencies are borderless and investors are global too. Exchanges had to relocate and cryptocurrency markets plummeted due to fear, uncertainty and doubt. Cryptocurrency ban in India and exchange

The impact of banning cryptocurrencies would be felt globally given its worldwide investors and borderless nature in the sphere.

ban in South Korea extracted similar market sentiment and price behavior. This does not inspire confidence in current and potential investors.

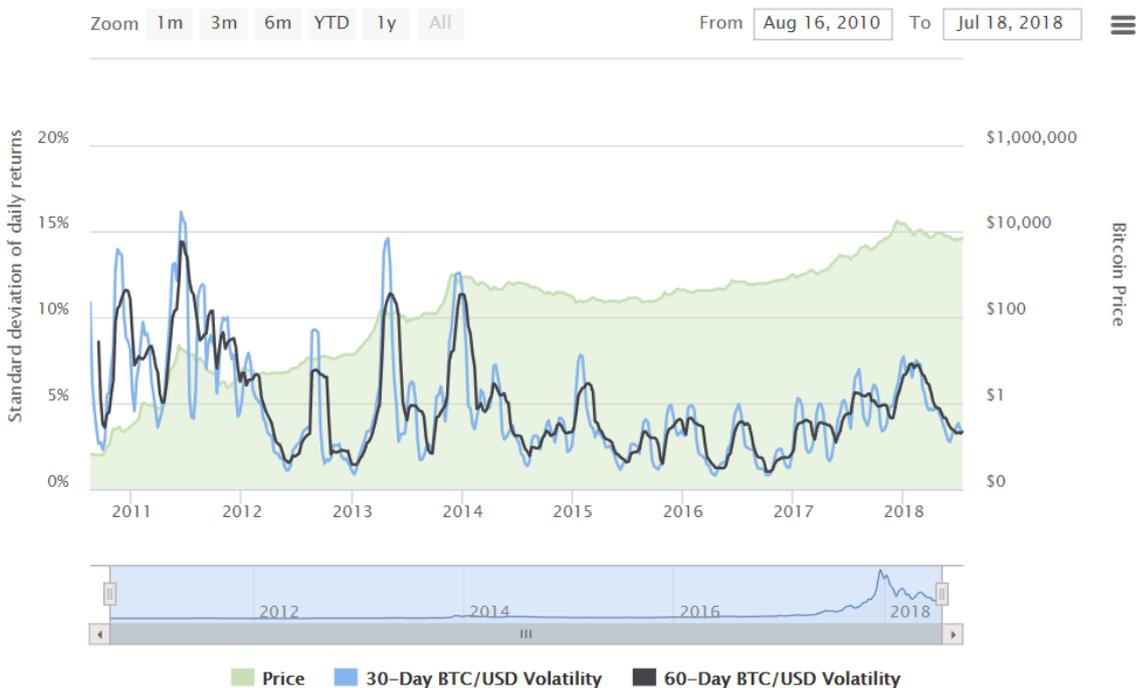
However, there are also many nations that are very supportive of cryptocurrencies like Australia, Switzerland, Russia, Japan and Canada. For China, several blockchain projects are actually being supported and developed in conjunction with the government itself despite being banned. Singapore is another example of a crypto-favoring country, and hence, many projects are based there. Overall, while certain countries have imposed bans on cryptocurrencies, a blanket ban would not be feasible without a concerted effort from most governments, which is unlikely given the diverging paths taken by different countries.

- Volatility

Cryptocurrency markets are volatile even in their daily price movements relative to traditional stock markets. The impact of any positive or negative news would cause significant movements in prices. Additionally, the market capitalization is relatively small with many individuals holding large positions. Hence, such “whales” are able to influence market prices with their trading activity.

Cryptocurrencies are high volatility investments. Prices would react significantly to news and speculations.

Bitcoin Price and Volatility



Source: Highchart.com

Also to be noted is the volatility of altcoins are on a different scale to that of Bitcoin. Many investors have delved into the realm of day trading, enticed by the potential gains they could make from the volatile markets. However, the market of altcoins is not mature enough to apply technical analysis and operates mostly on speculation, something any investor should avoid. That said, the volatility of the cryptocurrency market is not ideal for every investor and anyone who is looking to invest should be prepared for this.

Elastos has not yet commercialized and the sustainability of the system, on top of providing high quality user experience remains a question in the long run.

Business Risks

- Competition

Elastos will face competition not only from current blockchain projects but also from many up and coming blockchain startups hoping to get a piece of the pie in a market with immense potential. Some examples include EOS, Ethereum and NEO. These companies are continuously developing their infrastructures to keep up with the everchanging blockchain landscape.

The infrastructure that Elastos currently have is one of its kind and the sandbox interface is a distinct feature. While competition may be tough with more players entering the field, coupled with the sophistication of older industry players, there exist no imminent threat at the moment.

- Risk of Failure

There are more than 1600 cryptocurrencies available in the market but at least half of them are potential scams or will disappear due to poor technical foundation or the team's lack of business acumen. Poor execution of the project is a real possibility and investors might never see returns on their investment despite how promising it might have looked. In the case of Elastos, we have done our due diligence on the project and the team and are satisfied with their credentials. Sound technological ideas and technical team with academia and commercial exposure makes Elastos' success highly likely.

At least half of the 1600 cryptocurrencies are potential scams or will evaporate due to poor business plans.

However, the chance of poor execution still exists. There is a high level of difficulty in developing the blockchain technology and a joint operating system. Elastos might also want to make clear its position and measures in place

regarding the risks involved. Making known the precautionary measure or solutions established would boost users' confidence.

- Security Risks

Blockchain technology is known to be secure and almost impossible to hack. While that is generally the case for coins like Bitcoin and Ethereum, it is not necessarily true for most other altcoins. The security of the network lies in the adoption of the network and number of nodes in the network. The greater the number of nodes, the higher the number of verifications of the block, and hence, the harder it is to make any malicious attacks.

Elastos makes use of DApps instead of smart contract, hence chances of being infected with bugs are kept to a minimum. Additional features like an auxiliary chain, developing their own operating system and sandbox leaves it unlikely to be exploited by malicious attacks.

Conclusion

To summarize, Elastos has:

- An outstanding economic model to not just revamp and solve the issues of the internet, but also to solve the long-standing problem of the blockchain trilemma by virtue of its design
- An innovatively designed OS to keep virtual machines secure and communication networks distributed
- A robust governance model amalgamating PoW and DPoS, which along with merged-mining with Bitcoin, gives both the Elastos main chain and side chains the same level of security as Bitcoin
- A wide array of partnerships with industrial players and DApps development that validates this project for real world usage as well as extends its network
- A sophisticated team with experience in research and development knowledge in the relevant field of operating systems and blockchain
- A series of catalytic events that would increase awareness of Elastos and potentially invite appraisal for the ELA token

We favor this project for all points mentioned above. There lies potential to become the next Microsoft or Apple with no flaunting. Despite it being a trailblazing and large-scale project, Elastos is not marketed nor publicized unnecessarily to create hype or chatter. We believe it is deeply undervalued at its current price point.

The most beautiful feature about Elastos is that it could be a competitor to other blockchain projects, or not. It can compete, but it can also co-exist. The agnostic design of the Elastos Smart Web means that it can cater to all Elastos DApps and smart contracts through its side chain design, while concurrently accommodating DApps built on other platforms through its friend chain design. It is beautiful when one sees the big picture.

On a higher level, the Elastos Smart Web can be accessed on devices using its native operating system or on devices using other platforms like Android and iOS. It can compete, and it can also complement. It is one in all, and all in one. It is Elastos.

Appendices

Key terms

Airdrop: An airdrop for a cryptocurrency is a procedure of distributing tokens by awarding them to existing holders of a particular blockchain currency, such as Bitcoin or Ethereum.

Altcoin: An altcoin is the community accepted name for any coin that isn't Bitcoin.

Blockchain: A blockchain is a data system that allows for the creation of a digital ledger of transactions on a non-centralized network. Cryptography is the main operator that allows for users to engage with the ledger without the need for any central figurehead.

Computing power: The idea of computer "power" is somewhat vague. Sometimes people use it to mean "speed" and sometimes to mean "what a processor can compute." Usually it means a fuzzy combination of both.

Consensus protocol: A methodology used to reach agreement between all nodes on the blockchain without centralizing decision power. Consensus protocols currently include proof of work, proof of stake, proof of activity and others.

DAPPs: This is a short form for decentralized applications that are built using blockchain protocol. DAPPs use existing blockchain protocols and build on top rather than having to develop the blockchain technology from scratch. Ethereum's protocol has been purposed for DAPPs.

Delegated Proof of Stake (DPoS): Delegated Proof of Stake (DPOS) is a new method of securing a crypto-currency's network.

Digital asset: A digital asset, in essence, is anything that exists in a binary format and comes with the right to use. Data that do not possess that right are not considered assets.

Distributed & Central Ledger: A distributed ledger is an agreement of shared, replicable and synchronized data, in this case spread across multiple networks, across many CPU's. A central ledger is the opposite in that all of the data, while being synchronized and replicable is controlled by a singular network or individual.

Full node: A computer in the blockchain network that fully enforces consensus rules and helps to keep the entire network honest. Enforceable rules include block rewards, transaction signatures, formatting of blocks and the avoidance of double spending on any block. Miners are considered full nodes but full nodes do not have to be miners.

Gas: A term used in the Ethereum blockchain whereby each unit of gas corresponds to the execution of one atomic instruction (a computational step required to execute an order)

Hash: A random string of letters and numbers

Hashing power: The hash rate is the measurement unit of the processing power of the Bitcoin network. The Bitcoin network must make intensive mathematical and cryptography related operations for security purposes.

Hashrate: A hash is the output of a hash function and, as it relates to Bitcoin, the Hash Rate is the speed at which a compute is completing an operation in the Bitcoin code. A higher hash rate is better when mining as it increases your opportunity of finding the next block and receiving the reward.

Input/Output operation per second (IOPS): IOPS (input/output operations per second) is a common unit of measurement for storage system performance based on drive speed and workload type.

Inter Planetary File System (IPFS): A protocol and network designed to create a content-addressable, peer-to-peer method of storing and sharing hypermedia in a distributed file system. IPFS was initially designed by Juan Benet, and is now an open-source project developed with help from the community.

IoT: IoT is short for Internet of Things. The Internet of Things refers to the ever-growing network of physical objects that feature an IP address for internet connectivity, and the communication that occurs between these objects and other Internet-enabled devices and systems.

Merkle Tree: A way of summarizing all transactions in a block by producing a single digital fingerprint of the entire transaction set. The tree is constructed bottom up from hashes of individual transactions. It allows a user to verify whether or not a transaction is in a block. Using a Merkle tree reduces the amount of data that a trusted authority has to verify.

Mining: Mining is the term used for discovering and solving blocks along the blockchain. A reward is given for solving the algorithm and lengthening the chain, called a mining reward.

Node: A node is essentially a computer connected to the Bitcoin network. A node supports the network through validation and relaying of transactions while receiving a copy of the full blockchain itself.

Operating system (OS): System software that manages computer hardware and software resources and provides common services for computer programs.

Over-The-Air (OTA): a standard for the transmission and reception of application-related information in a wireless communications system.

P2P network: Peer-to-peer (P2P) computing or networking is a distributed application architecture that partitions tasks or workloads between peers. Peers are equally privileged, equipotent participants in the application. They are said to form a peer-to-peer network of nodes.

Portable Operating System Interface (POSIX): The Portable Operating System Interface (POSIX) is a family of standards specified by the IEEE Computer Society for maintaining compatibility between operating systems.

Proof of stake (PoS): An alternative consensus methodology to PoW. Rather than investing in computing resources to solve mathematical problems, validators demonstrate investment by purchasing the native coins of the blockchain's protocol. Rewards are no longer provided through mining (newly minted coins) but rather through transaction fees going to the validator with the largest stake.

Proof of work (PoW): A methodology used to reach both decentralized consensus and deter attackers from manipulating past results. This method requires miners to use computational energy to solve complex mathematical problems. Miners are rewarded via newly minted coins for their resources.

Signature: A signature is the mathematical operation that lets someone prove their sole ownership over their wallet, coin, data or on.

Simplified Payment Verification (SPV): A technique described in Satoshi Nakamoto's paper. SPV allows a lightweight client to verify that a transaction is included in the Bitcoin blockchain, without downloading the entire blockchain.

Smart contracts: Digital contracts that are built using blockchain technology. The contracts are irreversible and mathematically programmed to execute when conditions are met.

Tokens: Refers to the 'currency' of projects built on the ethereum network that have raised money via issuing their own tokens.

Universal Unique Identifier (UUID): A UUID (Universal Unique Identifier) is a 128-bit number used to uniquely identify some object or entity on the Internet. Depending on the specific mechanisms used, a UUID is either guaranteed to be different or is, at least, extremely likely to be different from any other UUID generated until 3400 A.D.

Whale: Someone that owns absurd amounts of crypto-currency.

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1. Blockchain can be a revolutionary tool for reshaping societies; a new institution of technology of governance, which could provide competition to current economic institutions of capitalism and enable new types of collective behavior and business models.

2. Blockchain could usher the return of truly public, open and decentralized internet that will redistribute the value of network away from listed internet giants to the broader public.

3. Cryptocurrency provides an alternative monetary system, especially for emerging economies that are struggling with hyper-inflation and poor governance. As the technology matures and volatility lowers with growing adoption, viability of cryptocurrencies being a worldwide digital currency should increase.

4. ICOs bring capitalist funding model to open source projects, where value created in the network is captured by tokens/coins and reflected in their price. Appropriate regulations are needed to foster organic growth and offer better investor protection.

5. While speculation remains the primary use of digital assets, merchant and institutional adoption have been proliferating as well. This is a huge opportunity to invest in the early stages of the next technological and economic paradigm shift.

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