



Ethos
The future is for **everyone.**



Balancing Decentralization

Value and Utility of Tokens Within
Inclusive Financial Ecosystems

THIS PAPER DOES NOT REQUIRE ANY BACKGROUND KNOWLEDGE.

Introduction

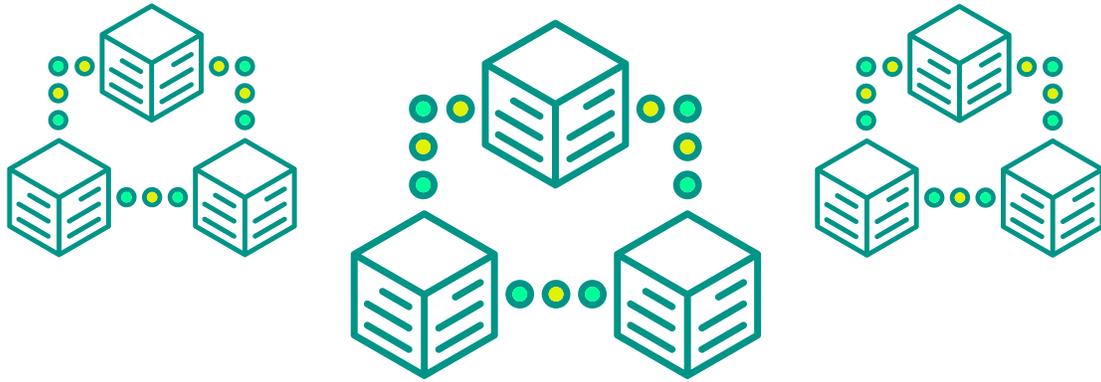
Blockchain technology is often treated like a “Sledgehammer.” As Abraham Maslow once said, “if all you have is a hammer, everything looks like a nail.” Right now the world has been given “The Blockchain” and everyone is trying to figure out what “nails” to hammer the blockchain with.

In reality, “The Blockchain” is much more of a “scalpel”. Blockchain technology should be seen as a precision tool which when used correctly, can prove to be quite powerful in solving difficult problems. As we begin to see all new financial ecosystems and models arise, it is important that we all operate from a common understanding of what the blockchain does and doesn’t do and how different types of tokens fit into the rapidly emerging “Internet of Value”.

This white paper expands on a blog post that Ethos released as part of an educational series for the general public. This paper is geared towards those who need a more in depth analysis of the industry and the technology behind it. This paper does not require any technical knowledge to understand. At Ethos, we believe that the concepts behind much of the industry are actually quite simple, but misconceptions, confusing terminology and even blatant misinformation have caused crypto to be widely misunderstood from those who operate outside it.

In this paper we will talk about four major topics.

1. **The Blockchain.** We will delve into the blockchain – what it is and isn’t and what it should and shouldn’t be used for.
2. **Ethereum as a General Purpose Blockchain.** We will delve into the Ethereum, the ERC20 standard and why these technologies are being chosen for protocols, access tokens, payments ecosystems and more.
3. **Token Classification.** In general there are three types of tokens – utility (functional tokens), transactional (cryptocurrency), representation (security)
4. **Token Utility and Marketplace Economies.** Why are things being tokenized, what this means, how it makes markets more efficient, the uses of tokens in general and the functional purpose of the ETHOS token.



1. The Blockchain – What is it?

The blockchain in its computer science definition is just a type of data structure. It is a unique structure in that it is much more immutable than other structures due to each block being secured by the previous one. This means that if a single block is changed, the entire chain after that block becomes invalid. The Bitcoin blockchain uses this property along with the “Proof of Work” concept to ensure that a certain amount of work or computational time is put into each block. This is done to ensure that if someone wanted to change a block (and all proceeding blocks), they would have to put in effort larger than the entire network combined.

Blockchains are Not Very Good Databases

The blockchain as a database is actually fairly bad. It is not nearly as fast as other data types, is fairly restrictive in the type of data that can be stored, and cannot store anything too large since all the nodes supporting it, which each have a full copy of the blockchain, would also have to store the data as well. In fact, the reason that Ethereum has the Ether token is to allocate the limited resources that are placed on the network due to the nature of the blockchain through a marketplace economy.

What Blockchains are Good At Doing

Blockchains are good for a few specific things however – notably:

1. Security and Decentralization at the Same Time

The Internet has demonstrated the power of decentralization, but is not particularly secure. Files can be copied at will and there is little control over how actors within the system behave. In a blockchain-based system, there are very rigid rules that are followed by network participants and an economic incentive to follow those rules. Assets can't be copied like files and records are immutable and secure.

2. A Common Provable History – “Repository of Truth”

One of the most interesting properties of blockchains is the idea of a “Repository of Truth”. Whenever there is a dispute, the blockchain acts as the highest court in the land, treating everyone fairly and equally within the system. This is especially important when we want to hold certain institutions

to very high regulatory standards and not simply “take their word for it”. Something exciting that blockchain technology can offer is the ability to create a system where all actors are acting ethically and no trust is required for consumers who are wary of financial institutions. When in doubt, see what the blockchain history says.

3. **No single point of failure for critical applications**

We have begun to see more and more applications that would result in disastrous consequences if they failed. What happens if a central securities depository records ownership for the wrong person? What happens if all your bank records are lost or changed? We have begun to trust computers with very sensitive tasks, but security in many cases has not caught up along with it. Blockchains can enable provable ownership of an asset, self-custody, more ethical and less strained financial firms, higher regulatory insight and applications that can't be stopped by malicious actors.

4. **Open platform for Innovation**

Financial institutions have historically operated in a black box, keeping outsiders from accessing their systems and shunning transparency for those not on the inside. Blockchain protocols are open by necessity and anyone can participate in them. Just like the internet, blockchain is a place where anyone can try out new ideas and innovate. A big part of the Ethos mission is making that innovative platform accessible to everyone through the Ethos Ecosystem and fueling a wave of new technologies like we saw in the digital revolution.

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**When in doubt, see what the
blockchain history says.**

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Healthy Regulation is Crucial for Industry Development

Regulation for the crypto market is needed, but also must be carefully constructed. If the crypto market and blockchain ecosystem are regulated incorrectly and development in the commercial area is stifled, the wave of innovation could miss the general public altogether and simply be used to innovate the next set of dark net markets for illicit actors. Right now, studies have shown that criminals still prefer using fiat - cash money - over cryptocurrency partially due to the traceability of blockchain-based payments¹. Consumers will always take the path of least resistance. If blockchain is regulated incorrectly, it could lead to a “prohibition-like” era where black markets boom and crypto markets become untraceable, untaxed, dark and unstoppable.

¹ Cdn2.hubspot.net. (2018). Available at: https://cdn2.hubspot.net/hubfs/3883533/downloads/Bitcoin%20Laundering.pdf?__hssc=222901956.3.1516201470218&__hstc=222901956.b7d6531ad164bec182c043c05b5510ba.1516201470217.1516201470217.1516201470217.1&__hsfp=3478668143&hsCtaTracking=66a034a3-865d-481a-8e56-f510419fde74%7C840a3208-7448-4fe6-ad03-a3731f462b7d [Accessed 27 Jan. 2018].

Healthy, progressive regulation will, however, be able to protect consumers from many of the things that happen in the crypto market. Ethos is building solutions and standards like ETHOS-VSF that will verify the source of funds and help consumers and businesses proactively meet regulatory burdens. The ideal crypto industry should be open, free and competitive where firms are free to innovate and imagine entirely new business models.

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Blockchain: Conclusion

Blockchain is an exciting new technology that has real demonstrable use cases. Blockchain technology, however, is not applicable to everything so consumers and businesses should think carefully about where it is being applied. Blockchains can enable provable histories that can help institutions and consumers meet high reporting and regulatory burdens. Healthy regulation is required for the industry, but needs to be supportive of the open and competitive nature of the blockchain. Blockchain technology has the potential to revolutionize capital markets and modernize its structure but only if solutions are introduced carefully with the full understanding of the problem it solves and the new ones it could create. The underlying technology represents an exciting step towards opening up what has been a historically closed financial system but it must be done with precision and a high level of care.

2. Ethereum as a General Purpose Blockchain

Ethereum is one of the most incredible pieces of technology since the birth of the internet. For the first time, there exists an open platform for innovative new financial technologies. There is a reason that so many crypto firms are choosing Ethereum as their platform of choice because it represents many of the things that Bitcoin idealized in its early days, but had not quite realized in its evolution and development.

Unstoppable Applications

Ethereum features a Turing-complete programming language that allows developers to build and deploy an entirely new breed of applications. For highly critical applications where billions, or even trillions, of dollars are at stake – Ethereum is the way to go. Ethereum features levels of security and immutability that are simply unprecedented and provides any developer the ability to access the same level of security and immutability as anyone else. Ethereum is the Ecosystem for Ecosystems – layer 4, the protocol layer, in the OSI model on top of which many other applications sit.

ERC20 – The First Open Standard for Tokens

One of the most popular, and powerful, features of the Ethereum Ecosystem is the ERC20 standard. ERC20 is a standard for making fungible, or identical, tokens that are secured by the Ethereum blockchain. ERC20 has been an ideal choice for many crypto firms due to the security and scalability that is offered by it. Layer 2 scaling solutions can enable ERC20 tokens to flow through payments channels that can reach millions or billions of transactions per second – all immutable.

Economic Requirements for Payment Ecosystems

In order to fully understand why ERC20 represents a quantum leap forward for alternative payments systems, consider how a payment ecosystem needs to operate. There are two major requirements for something to be considered an asset that can be used as payment – Value and Scarcity. In order to be considered an asset, something must have underlying value. As we will go into later, the three methods that tokens can derive their value from are through their utility, transactional nature, or representation of some other form of value. Secondly, the tokens must have a limited supply. If they had an infinite supply, then anyone could get ahold of them diminishing their value. In the case of the dollar, it has value backed by a central bank and government, and a limited supply determined by the Federal Reserve.

ERC20 Ideal for Financial Ecosystems

Due to the ideal nature of ERC20 tokens in their scalability, value and scarcity – they are perfect for creating marketplace economies and protocols that operate entirely or partially on the blockchain. In the fourth section we will elaborate more on the different things that tokenization makes sense for, but before that it is important to get a grasp on how tokens should be classified and how that impacts regulation and their usage.

3. Token Classification

At Ethos, we previously released a white paper that elaborated on the topic of how tokens should be classified. Simplifying that system, however, there are three main types of tokens - Utility or Functional Tokens, Cryptocurrencies and Tokenized Securities.



Class 1: Utility, Access or Functional Tokens

The first class of tokens is functional or utility tokens. The values of these tokens are derived from the thing that they provide access to. A bridge token that provides access to a bridge has a price derived by how much people are willing to pay to cross the bridge. Ether has a price that is derived by how much people are willing to pay for access to the Ethereum Virtual Machine or the distributed worldwide computer that runs Ethereum Applications. ETHOS is a ERC20 functional token spawn out of the Ethereum ecosystem that builds on the Ethereum Protocol Layer 4 as a set of applications providing access to the Ethos ecosystem. This ecosystem allows users, businesses and institutions the ability to create financial applications powered by open standards. These tokens are closest to virtual commodities like oil, gas, steel, grain or gold.



Class 2: Cryptocurrencies or Transactional Tokens

The second class of tokens is transactional tokens or cryptocurrencies. These tokens don't have any "inherent" value, but they derive value from the network effect and belief that these tokens have value. In a similar way that fiat currency is widely accepted as something that has value, Bitcoin has been widely accepted by people around the world to have value. Cryptocurrencies are harder to understand intuitively and are often criticized as being bubbles with no fundamental value backing them. These tokens are closest to virtual property since they are scarce, but unlike property you can't use them as a place to live. It is unclear whether currencies in this category should be regulated as property, commodities or even currencies.



Class 3: Representation – Tokenized Securities

The third type of token is tokenized securities. These tokens derive value by representing something else of value – the most common being a share of a company. The value proposition behind these tokens is very clear, but need to be highly regulated just like any securities market and exchange should be. Ethereum provides an incredibly powerful platform for tokenized securities and the means to regulate them if constructed properly. Tokens that fall under this category should be regulated as securities.

Conclusion

Regulation varies based on token classification. Many regulators in OECD jurisdictions realize this and are taking action accordingly. Tokens have many ways that they can derive value. It is important that every industry participant recognizes what kind of token any given digital asset is.

4. Token Utility and Marketplace Economies

One of the interesting properties of functional tokens is that they create what we like to call a "Marketplace Economy" where users can bid what they are willing to pay for a service that is quite common in the crypto world. For Example, Bitcoin users bid using transaction fees to incentivize miners to include their transaction

in the next block. On Ethereum, users bid on gas prices that fluctuates based on demand for the Ethereum platform. This concept is not unique to cryptocurrencies though. Uber uses a marketplace economy to match drivers and riders and Google uses a dynamic bidding system to let advertisers compete for ad space.

Marketplaces in general have been shown to be much more efficient at allocating resources in a scarce economy. In World War II, prisoner of war camps that allowed captives to trade using cigarettes for resources like food, water and medicine were shown to have much higher survival rates over camps that didn't allow trading².

What Bitcoin, Ethereum and other cryptocurrencies have demonstrated is that aligning financial incentives in a capitalist marketplace economy maximize consumer and producer surplus making an inefficient system of financial intermediaries extremely efficient. Blockchains have not scaled very much, but costs are still reasonably low due to the efficiency of marketplace economies. It is important to note that marketplace economies benefit both the producer and consumer of a service greatly by promoting competition.

ETHOS Marketplace Economy

In general there are 6 main functions that the ETHOS token provides to be a competitive financial service.

- 1. Reduce costs for consumers for crypto-related transactions.**
- 2. Reduce frictions in global financial services and capital markets that lock-out consumers.**
- 3. Enable low-cost blockchain applications for developers.**
- 4. Create a scalable micropayment transfer mechanism for all platform services.**
- 5. Support an open financial ecosystem that bridges traditional and crypto assets.**
- 6. Enable verified source of funds and identity for transactions through the Ethos ecosystem.**

We will delve into what each of these means and why they are not possible within a fiat only economy.

Reduce Costs for Consumers

Using USD for transactions generally has many intermediary fees associated with it. Withdrawing money from a bank account, using a credit card or wiring funds all require fees that add up to a significant percentage of the transaction. The transformative power of the blockchain means that for the first time there is a completely open financial ecosystem that has no prerequisites for participation or conflicts-of-interest. There are no intermediaries, which remove a lot of barriers and costs. This means that a tokenized system can provide consumers the "market price" of a product or service that is often marked up through inefficient

2 Holderness, Clifford G., and Jeffrey E. Pontiff. "Hierarchies and the Survival of POWs during WWII." SSRN Electronic Journal, 2012, doi:10.2139/ssrn.1345420

mechanisms or simply a profit motive. Markets are the most efficient way to allocate scarce resources in a way that is fair to everyone. Uber uses markets to pair riders and drivers and Google uses markets to match advertisers with ad spots to maximize consumer and producer surplus. The Ethos token is designed to match consumers to transactions for the lowest possible cost and promote competition between financial firms who operate on the Ethos Ecosystem.

Reduce Frictions in Global Financial Services and Capital Markets

Today financial and investment services are riddled with business and operational complexities that create numerous cost inefficiencies. These cost inefficiencies lead to frictions in the distribution of financial and investment services broadly as they result in excessive price inflation, which causes essential products and services to be priced too high for large percentages of the global population. The blockchain enables many of these frictions to be removed by empowering additional ecosystem layers, much like the Ethos ecosystem, that allows dynamic solutions to these cost inefficiencies to be introduced thus allowing billions of consumers to participate in the broader economy and global capital market system.

Enable Low-Cost Applications for Developers

In a similar vein to “Reduce Costs for Consumers”, the Ethos token provides prorated access to the Bedrock API. By enabling pro-rated access to an API, there are no over or under charges to developers, and participants in the Ethos Ecosystem can get exactly what they are entitled to. This is similar to an Amazon Web Services model, but even more thinly sliced to the API level, similar to how Ethereum uses Ether gas to power Smart Contracts with the added benefit of eliminating payment risk from the business and the consumer. This allows the ecosystem to operate much more efficiently - basically at the lowest possible cost the ecosystem will allow - and is beneficial to both businesses and consumers. Ethereum’s gas market has shown the power and potential of a computer system that can be “rented out” on a microscopic scale. We took many of the best ideas from Ethereum and expanded upon them for Ethos Bedrock.

Create a Scalable Micropayment Transfer System for all Platform Services

Ethereum, along with the many layer 2 scaling proposals for ERC20, enable highly scalable systems that can build the foundations for payments infrastructure and consumer application rails which are simply not possible in a USD world. ERC20 enables us to fully utilize the security and scalability of a tried and tested blockchain while at the same time providing a unique digital commodity to power an ecosystem. These applications span underserved unbanked populations to high throughput payment and settlement systems. Again, these sorts of applications are simply not possible without a unique digital asset. There is no way for an unbanked consumer to transfer a dollar without incurring significant fees. By using an near infinitely sub-dividable digital asset along with a micropayment transfer mechanism, any person in the world can be able to send micropayments securely and safely.

Support an Open Financial Ecosystem that Bridges Traditional and Crypto Assets

A huge part of our mission is making the financial ecosystem accessible and connected for consumers and institutions. Bridging the gap between traditional and crypto is an important part of this mission for Ethos. A digital asset simply makes a lot of sense when you want to begin establishing marketplaces that form an ecosystem linking both worlds. As more and more firms join the Ethos Ecosystem and begin operating within it—it becomes increasingly important to establish connections between the different marketplaces to support an all-inclusive capital market that can better serve individuals and institutions alike.

Enable Verified Source of Funds in the Blockchain

A major source of headaches for regulators is the perception that cryptocurrency can be used for money laundering, terrorist financing, drug transactions and the like. Even though there exists this perception, many studies have shown that illicit actors still prefer to use fiat over cryptocurrency due to the linkability and transparency of the blockchain. The blockchain is often more transparent than the existing fiat financial ecosystem, and can be used to create a safe and clean digital financial ecosystem.

Ethos is building standards that will help people stay on the “light side” with crypto and power all the transformative possibilities that crypto promises while at the same time maintaining the integrity of a clean financial system. This includes identity for all Ethos participants. Instead of sending funds to an anonymous address, Ethos users can link identity to funds. We see this starting with a “DNS-like” Wallet domain marketplace powered by the ETHOS token that enables verified users the ability to leverage the plethora of capabilities that are available in the crypto world. Additionally, ETHOS-VSF is a standard that proposes a way to encode verified source of funds into blockchain transactions powered by the Ethos ecosystem. A digital asset that powers a new, decentralized, inclusive and compliant future is something that should appeal to both users and regulators alike.

5. Conclusion

Blockchain technology has the power to change the way that our financial system has always operated. It has the power to empower individuals, open up a historically closed system and create marketplace economies where entirely new financial service models can be made more efficient and competitive. Blockchain has the power to bring financial access to people all around the world and provide additional consumer protections that are often absent in the traditional world. Despite all the misconceptions and associations that Bitcoin has with bad actors, blockchain technology can and should be recognized as a force for good that can foster a transparent, ethical and open economy. Blockchain has the power to create a better financial future - a future that is for everyone.