

# Blockchain Token Primer





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## Introduction to Blockchain

### **General Resources:**

[Smith + Crown](#) – the first think-tank/research institution dedicated to blockchain and blockchain tokens. Probably the single best resource for individuals already somewhat knowledgeable about blockchain technology.

[Coincenter](#) – a nonprofit focused on policy issues surrounding cryptocurrencies. Often publishes well thought out, detailed articles on blockchain technology.

[Bits on Blocks](#) – a blog that strives to “write accessible articles about blockchains, bitcoins, distributed ledgers and fintech, in plain English, for business people.” Provides excellent introductory content.

[Blockchain 101/Coindesk](#) – one of the major blockchain news websites. Their Blockchain 101 guide answers many of the questions people first have about Bitcoin, Ethereum, and blockchain technology.

[The Cointelegraph](#) – similar to Coindesk, another news website focused on blockchain that provides guides to Bitcoin and Ethereum.

[Blockchain News](#) – a news website that is newer than Coindesk and The Cointelegraph, with less of a focus on Bitcoin.

[Bitcoin Magazine](#) – as the name implies, a magazine dedicated to Bitcoin.

In addition to the websites listed above discussions within the blockchain community often take place on Reddit, Steem (a decentralized social media platform), and Medium as well as numerous blogs.

### **Key Articles:**

[The Great Chain of Being Sure About Things/The Trust Machine](#) by The Economist – Two articles published back in 2015 that, together, offer a very basic and digestible overview of blockchain technology and its potential for social change.

[What is “Blockchain” anyway?](#) by Peter Van Valkenburgh – The most important sentence in this piece is: “blockchain technology... should allow connected computers reach agreement over shared data.” Van Valkenburgh does an excellent job explaining the ‘what’ of blockchain technology.

[The ultimate, 3500-word, plain English guide to blockchain](#) by Mohit Mamoria – The title is self-explanatory, but in a way doesn't do this article justice. The author incorporates a series of graphics to aid the reading in understanding blockchain technology

[A Gentle Introduction to Blockchain](#) by Antony Lewis (from Bits on Blocks) – An excellent overview that explains what blockchain technology. This piece builds on its initial explanation in order to expand the reader's knowledge.

[A Beginner's Guide to Ethereum](#) by Linda Xie (Coinbase's Blog) – A blog post that provides an excellent overview of the Ethereum blockchain. Most articles seeking to explain blockchain, including many of the ones cited above, use Bitcoin as an explanatory example because it is the most widely known cryptocurrency. This post demystifies Ethereum through comparison with Bitcoin.

#### ***Additional Articles:***

[A Functional Nomenclature of Cryptographic Ledgers](#) by Arthur Breitman (founder of Tezos) – An article focused on explaining how to differentiate between different types of blockchains. Not every blockchain is a distributed, decentralized, permissionless, tokenized one like Ethereum and Bitcoin and this article explained what qualities differentiate a blockchain like Bitcoin's from Ripple's.

[Smart contracts: The good, the bad and the lazy](#) by Gideon Greenspan – A long piece which argues that smart contracts are not useful for private blockchains. (See a response from Vitalik Buterin, the founder of Ethereum, [here](#))

[A gentle introduction to The Hyperledger Project](#) by Antony Lewis (from Bits on Blocks) – This piece provides a brief overview of The Hyperledger Project, a project run by the Linux Foundation that promotes collaboration between private companies towards developing permissioned blockchains suitable for various business needs.

[Consensus-as-a-service: a brief report on the emergence of permissioned, distributed ledger Systems](#) by Tim Swanson – An academic paper that discusses the differences between permissionless and permissioned distributed ledgers and their applications for businesses.

## Understanding Blockchain Tokens

### *General Resources:*

[Coin Market Cap](#) – A website that collects trading information and market capitalization for cryptocurrencies.

A list of popular cryptocurrency exchanges:

- [GDAX](#)
- [Coinbase](#)
- [Poloniex](#)
- [Bitfinex](#)
- [Bittrex](#)
- [Kraken](#)
- [Bitstamp](#)
- [Shapeshift](#)

A list of popular cryptocurrency wallets:

Cold Storage (offline)

- [Trezor Wallet](#)
- [Ledger Wallet](#)
- And a few others

Hot Storage (online)

- [MyEtherWallet](#)
- [Parity](#) (just suffered a major hack, not recommended)
- [Jaxx](#)
- [Mycelium](#)
- [Blockchain.info](#)
- [Breadwallet](#)
- And many others

All of the resources cited in the prior section are valuable for learning more about blockchain tokens too.

### *Key Articles:*

[My Token / ICO / Blockchain Capital Markets Landscape](#) by Etienne Brunet – An overview of the cryptocurrency landscape that has sprung up due to the value generated by blockchain tokens.

[A gentle introduction to digital tokens](#) by Antony Lewis (from Bits on Blocks) – An introductory piece on blockchain tokens. The author does a good job drawing a distinction between utility tokens and asset tokens.

[Thoughts on Tokens](#) by Balaji S. Srinivasan – An excellent article that provides answers to common questions like: How did tokens come to be? What are tokens? And what are the benefits of tokens?


[Token Rights: Key considerations in crypto-economic design](#) by Matt Chwierut

Key Points:

1. Perhaps the central question for any company entertaining the idea of an ICO: “What is the role of the token being sold?”
2. Tokens are quite different from traditional stock. “First, most provide no voting rights at all. Even when tokens do entitle holders to a portion of profits, the amount distributed is calculated via algorithm: token holders don’t debate whether to distribute dividends and how much. Additionally, unlike shareholders, token holders have no legal rights and no obvious avenues for legal recourse. Finally, many tokens don’t involve profit distribution or group decision-making at all.”
3. Tokens confer different types of rights:

## Token Rights

Digital tokens being sold in ICOs confer a combination of rights to holders

<p><b>Payment</b></p> <p>Token is the only way to make payments on the network</p>  <p>GNT are the only way to pay for services on the network.</p>	<p><b>Access</b></p> <p>Token provide the ability to use the platform itself</p>  <p>LSK is needed to pay transaction fees on the network.</p>	<p><b>Profit or Fee</b></p> <p>Holders get a portion of revenues or profits</p>  <p>Holders of TIME earn the fees from Labour-hour tokens.</p>
<p><b>Contribution</b></p> <p>Tokens needed to play certain roles on the platform or app</p>  <p>1ST allow holders to determine who won gaming matches</p>	<p><b>Block Creation</b></p> <p>Tokens determine who secures the blockchain</p>  <p>KMD holders select the notary nodes who secure the blockchain</p>	<p><b>Governance</b></p> <p>Holders influence features, project direction, protocol details, or more</p>  <p>DGD holders determine how DigixDAO funds are spent</p>

Source: Smith + Crown

Importance: When thinking about a token it is essential to consider what ‘rights’ the token provides to holders. Payment, Access, Profit or Fee, Contribution, Block Creation, and Governance are the most common categories for these rights. This should also hammer home the idea that successful tokens are not created simply to make money via an ICO.

[Crypto Tokens: A Breakthrough in Open Network Design](#) by Chris Dixon

Key Points

1. “Bitcoin was really two innovations: 1) a store of value for people who wanted an alternative to the existing financial system, and 2) a new way to develop open networks. Tokens unbundle the latter innovation from the former, providing a general method for designing and growing open networks.”
2. “Token networks remove...friction (between different parties in a network) by aligning network participants to work together toward a common goal— the growth of the network and the appreciation of the token.”
3. “A well-designed token network carefully manages the distribution of tokens across all five groups of network participants (users, core developers, third-party developers, investors, service providers) to maximize the growth of the network.”

Importance: The main benefit of tokens is not that they function as alternatives to fiat currency (or can make a company money via an ICO). Rather tokens align incentives across an open, decentralized network to ensure that all the participants focus towards growth of that network.

[A Beginner’s Guide to Ethereum Tokens](#) by Linda Xie (Coinbase’s Blog) – Another blog post similar to the one linked above on the Ethereum blockchain. This piece explains the differences between Bitcoin tokens and Ethereum tokens.

***Additional Articles:***

[What is a Cryptocurrency Wallet?](#) by Crypto Compare/[Cryptocurrency Wallet Guide](#) by Blockgeeks – Two articles that explain what cryptocurrency wallets are, why they are important, and give examples of reliable ones.

[How to properly store Bitcoins and other cryptocurrencies](#) by Alexandr Nellson – A piece that informs the reader about proper precautions that must be followed when securely storing blockchain tokens

## Designing Blockchain Tokens

### *General Resources:*

Examples of White Papers with excellent token mechanisms:

- [Bitcoin White Paper](#)
- [Ethereum White Paper](#)
- [Ripple White Paper](#)
- [First Blood White Paper](#)
- [Storj White Paper](#)
- [Augur White Paper](#)
- [Golem White Paper](#)
- [Steem White Paper](#)
- Tezos [Position Paper/White Paper](#)
- [Adchain Whitepaper](#) (MetaX)

### *Beginner Articles:*

[A Token is Not a Short Term Carrot, Ceci N'est Pas Une Pipe](#) by William Mougayar

Key Points:

1. "Token Value Proposition Test: By whom will the token be used; how; for what benefit; and resulting in what valuable transactional activity?"
2. "...the working token is a hypothesis waiting to be proven. Initially, you assume that user behavior will be aided by the token. In practice, only real traction metrics tell you if you were right, wrong or need to iterate."
3. "The token itself is not your new business model. What the token enables for you and for your users is the key part to focus on."

Importance: The Token Value Proposition Test offers a great way to see if a company's token hypothesis is potentially valuable and is something any company wanting to do an ICO should have clear answers for. Creating tokens for a protocol or application is not the same thing as creating tokens that add value to said protocol or application.

[Discussing Cryptotoken Best Practices](#) by Nick Tomaino

Key Points:

1. "The founding team should demonstrate a strong technical reason for the protocol and token to exist...a whitepaper that demonstrates research and a clear reason to exist is essential."



2. “There should be transparent communication from the founding team to the community.”
3. “There should be a testnet or beta version of the protocol to demonstrate the founding team’s ability to execute.”
4. “A component of the token distribution should come directly from a blockchain if possible (distributed to any user that wants to participate in exchange for resources).”
5. “There should be a cap on funds raised (if the project is pre-product).”
6. “The founding team should own between 10% and 50% of the token and should not get liquidity in the first 3 years of the project.”

Importance: Rules to live by for the most part. Point 3 is often hard to achieve for decentralized protocols because the initial companies need resources to build a beta-version. Point 6 may be a bit overzealous in the 3 year lockup period, but the general idea of a long-term lockup period is a good one. In general, these points (taking into account the exceptions above) should be followed to the best of a company’s ability in every instance.

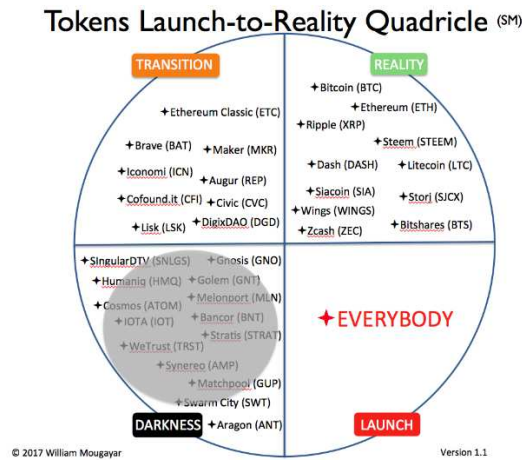
[The Darkness Side and Long Honeymoons of Token Sales \(Part I\)](#) and [The Reality Quadrant in ICO Projects and Token Sales \(Part II\)](#) by William Mougayar

Key Points:

1. The life cycle of a protocol or application that launches a token is as follows: Initial Launch, Development, Market Rollout.
  - a. Initial Launch: “steps include explaining the vision, writing a white paper, and obtaining funding via the initial crowd sale offering”
  - b. Development: “is primarily devoted to software development of the technology, protocol and capabilities, team buildout, and early testnet or beta usage”
  - c. Market Rollout: “focuses on entering the marketplace via user acquisition and growth, ecosystem development, user engagement and overall market acceptance”
2. “...most projects quickly step into a Darkness stage. Darkness relates to the scant amount of transparency that prevails, relating to exactly how they are doing.”
3. There are three different paths a company can take from token launch to market reality:
  - a. “Launch-Transition-Reality. This is the most desirable path. Projects can skip the darkness period if they launch their tokens when the product is almost ready, as they enables them to focus almost entirely on the transitional elements in a credible way.”
  - b. “Launch-Darkness-Transition-Reality. This path is also acceptable, as long as the darkness period doesn’t last more than 6–9 months. If the project isn’t able to show credible signs of transition past 6 months, typically it is not a good sign of things to come, due to loss of momentum, but there are exceptions.”
  - c. “Launch-Darkness-Darkness. Some projects will remain in the darkness period for a long time, while they attempt to get out of it. Given that some of these projects

have raised a lot of money, and have benefited by the rising tides in higher valuations, they could theoretically stay in the darkness for a long time, and continue giving fake or vanity signals about their activities. The longer a company stays in the darkness period, the harder it becomes to get out of it (based on anecdotal evidence).”

4. Companies can be organized into categories based on how far along in the process they are:



Importance: The initial launch of a blockchain token is just the beginning and in no way, shape, or form ensures the viability or success of a protocol or application. Ideally, every ICO would develop a beta-version of the proposed technology so the developers could easily move from launch to transition and then reality. When this is not the case it is essential that a company makes demonstrable progress and informs token holders about the progress and the coherent plan.

**Advanced Articles:**

[Cryoeconomics 101](#) by Nick Tomaino

Key points:

1. “Cryoeconomics the study of economic interaction in adversarial environments”
2. “Cryoeconomic approaches combine cryptography and economics to create robust decentralized P2P networks that thrive over time despite adversaries attempting to disrupt the network.”
3. “Decentralized P2P systems based on cryptography were not new in 2009 (you probably heard of Kazaa and Bittorrent prior). What these earlier decentralized systems lacked was economic incentives”

Importance: A properly designed token mechanism must consider how to create an incentive structure that both incentivizes adoption (point 3) and ensures security of the company's decentralized network against potential attackers (points 1 and 2).

[Cryptoeconomics is Hard](#) by Aleksandr Bulkin

Key Points:

1. "Cryptoeconomics of a token is a hybrid between rules programmatically implemented on a blockchain and the entire world of interactions real human beings have with it"
2. "Principle 1. The value of a cryptoasset is determined by an expectation of what participants can do with it."
  - a. It's worth reading the long anecdote above that explains why Bitcoin is more popular than cryptocurrencies that have technology-based advantages that helps lead the author to this conclusion.
3. "Principle 2. If you issue or pre-mine your own cryptoasset, you have just created something that has zero value."
4. "Principle 3. Value is relative. The only meaning of the price of a cryptoasset is to compare its value with that of the asset in which it is being priced. Absolute value does not exist."

Importance: Simply creating a token (Principle 2) is not enough to provide value to a user, company, etc. Rather, value is added via the utility of the token (Principle 1), and the potential future (speculative) utility of the token. "If one designs an economic system with a real value proposition one might expect a significant amount of both buy-in and momentum."

[Fat Protocols](#) by Joel Monegro

Key Points:

1. In contrast to Web 2.0 (Protocols such as HTTP, SMTP, etc. vs. Applications like Google, Facebook, etc.) in Web 3.0 "value concentrates at the shared protocol layer and only a fraction of that value is distributed along at the applications layer." Two reasons why:
  - a. "...by replicating and storing user data across an open and decentralized network rather than individual applications controlling access to disparate silos of information, we reduce the barriers to entry for new players and create a more vibrant and competitive ecosystem of products and services on top."
  - b. Token Feedback loop: "When a token appreciates in value, it draws the attention of early speculators, developers and entrepreneurs. They become stakeholders in the protocol itself and are financially invested in its success. Then some of these early adopters, perhaps financed in part by the profits of getting in at the start, build products and services around the protocol, recognizing that its success would further increase the value of their tokens. Then some of these become successful and bring in new users to the network and perhaps VCs and other kinds

of investors. This further increases the value of the tokens, which draws more attention from more entrepreneurs, which leads to more applications, and so on.”

- i. “Because most tokens are programmed to be scarce, as interest in the protocol grows so does the price per token and thus the market cap of the network. Sometimes interest grows a lot faster than the supply of tokens and it leads to bubble-style appreciation.”
  - ii. “When applications begin to emerge and show early signs of success...two things happen in the market for a protocol’s token: new users are drawn to the protocol, increasing demand for tokens...and existing investors hold onto their tokens anticipating future price increases, further constraining supply. The combination forces up the price (assuming sufficient scarcity in new token creation), the newly-increased market cap of the protocol attracts new entrepreneurs and new investors, and the loop repeats itself.”
2. “...the market cap of the protocol always grows faster than the combined value of the applications built on top, since the success of the application layer drives further speculation at the protocol layer.”

Importance: Value is centered on protocols in Web 3.0 because user data is stored in an open, decentralized network and tokens incentivize initial participation while creating a feedback loop of network effects and increased demand.

[Blockchain Tokens and the dawn of the Decentralized Business Model](#) by Fred Ehrsam

Key Points:

1. “More precisely, it is about an entirely new business model that is being created and tried for the first time: a decentralized business model. In this model there is no central controlling company, and has shared contributions and ownership by all involved. This business model is uniquely enabled by the combination of the internet and cryptocurrency.”
2. “Historically it has been difficult to incentivize the creation of new protocols as Albert Wenger points out. This has been because 1) there had been no direct way to monetize the creation and maintenance of these protocols and 2) it had been difficult to get a new protocol off the ground because of the chicken and the egg problem.”
  - a. Tokens “incentivize creators: if the protocol is successful, the token will go up in value”
  - b. “tokens help solve the classic chicken and the egg problem that many networks have...the value of being one of the first few users on the network was low (with traditional networks) (but if) you give people partial ownership of the network...it is more valuable to join the network early because you get more ownership. Decentralized applications do this by paying their contributors in their token. And

there is potential for that token (partial ownership of the network) to be worth more in the future.

Importance: Tokens incentivize adoption the most at early stages of development, helping decentralized economies surmount traditional challenges associated with network adoption.

[Value of the Token Model](#) by Fred Ehrsam

Key Points:

1. An author [argued](#) that “it’d be more efficient to port the smart contracts of a token to use Ether directly, eliminating the token. This is a legitimate alternative to crafting your own token. A token must provide advantages over this model.
  - a. Response 1: “A token is necessary for this sub-governance” of a community.
  - b. Response 2: A token would want to have its own monetary policy independent of Ethereum.
  - c. Response 3: “Tokens align incentives between developers, contributors, users, and investors. They allow everyone who wants to contribute to a project early the opportunity to get in on the ground floor.”

Importance: Although “the fundamentals of the token model are valuable and powerful that does not mean that a token is right for every decentralized idea. A token must not only add-value to a blockchain-based idea, but it also must be preferable to other alternatives like simply using Ethereum directly.

[Antifragile Cryptoeconomic Systems](#) by Nick Tomaino – A descriptive post on the threats, both technical and otherwise, that well-designed tokenized blockchains are made to overcome.

[The Pi + Epsilon Attack](#) by Vialik Buterin – A blog post by the founder of Ethereum that details a specific type of bribery-based attack that threatens certain token-based cryptoeconomic systems.

## Setting up a Token Launch

### *General Resources:*

Examples of token crowdsale documents that offer unique launch designs:

- [OmiseGo](#)
- [Gnosis](#) (See section 6)
- [AdChain](#) (See Token Launch Details section)
- [Basic Attention Token](#) (See section 5)

### *Key Articles:*

[Analyzing Token Sale Models](#) by Vitalik Buterin (the founder of Ethereum) – The best work out there on various differences in crowdsale designs and the issues that come up when trying to design the ideal token launch.

[ICO 2.0 – what is the ideal ICO?/The psychology behind ICO funding](#) by Zenet Batagelj and [Why ICOs fail](#) by Daniel Zakrisson (all published parts of ICONOMI’s series on ICO fundamentals) – A series of more theoretical articles delving into questions like: What is the ideal ICO, What makes an ICO fail, and What makes ICOs function? “Why ICOs fail” is particularly important because, much like “Analyzing Token Sale Models” it looks at actual ICOs that failed and tries to determine why.

[#Token Mania](#) by Autonomous Research (full report can be downloaded at the hyperlink) – “Autonomous is pleased to announce the release of ‘Token Mania,’ an in-depth look at Initial Coin Offerings: What they are, how they work, and the ways in which this new funding mechanism based on distributed-ledger technology stands to displace traditional markets for public and private investment. This 78-page document addresses many of the controversial issues that have surrounded the ICO phenomenon, including similarities to the dotcom bubble, the impact of ‘Bitcoin whales,’ the landscape of regulation, and other topics. The analysis includes key takeaways for startups, financial incumbents and investors, and is available freely from the link to the right.”

[All You Need to Know About Initial Coin Offerings](#) by Outlier Ventures Research (old report, but good analysis) – A report published by a firm with investments in cryptocurrencies. This report provides historical context for the seemingly sudden spike in ICOs in the last year, and offers some reasoning as to why the shift from venture capital to ICOs happened so quickly.

[The Adoption Process of Cryptocurrencies](#) by Hardwin Spenkeliink – An academic paper focused on answering the question: “What are factors influencing the adoption of cryptocurrencies in different usage scenarios for different stakeholders?” Very in-depth analysis, and worth a skim.

[A high level overview of ICOs](#) by Tim Swanson – A blog post by someone who is more skeptical of the ICO craze explaining what ICOs are and why investing in ICOs feels like a bubble to him.

[Initial Coin Offerings: What Happens When a Bubble Cannot Expand?](#) by Sviatoslav Rosov – An analysis of why the cryptocurrency market and the ICO market in particular have expanded exponentially in recent months. The author argues that ICOs are used to diversify risk of Bitcoin ‘Whales,’ that distort the market.

***Additional Articles:***

[Buyer Beware](#) by Fred Wilson – This blog post contextualizes the ICO phenomenon provides some investment advice. From the perspective of designing a token launch it is informative on how seasoned investors think about all of the financial and speculative activity surrounding blockchain tokens.

[Ethereum is the Forefront of Digital Currency](#) by Fred Ehrsam/[The Resolution of the Bitcoin Experiment](#) by Mike Hearn – Ehrsam argues that Ethereum is the most important blockchain because of innovative features like smart contracts, and none of the same problems surrounding modification of the blockchain that Bitcoin has/had. Similarly, Hearn, one of the most well-known Bitcoin Developers, articulates a series of issues facing Bitcoin that both drove him away from the community and threaten the Bitcoin Blockchain.

[ICO PROS & CONS: CUTTING THROUGH THE HYPE](#) by Jamie Burke (CEO of Outlier Ventures) – A critical analysis of the costs and benefits of ICOs both from an investor’s perspective. Very well thought out arguments behind the points made.