Taxonomy of Tokens

An introduction to the types of tokens that make up the Web3 space.

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Acknowledgements and disclaimers

This ebook aims to provide readers with a high-level summary of tokens as products or tools that can be used in different situations to achieve particular outcomes. This work is not intended to be a comprehensive summary or evaluation of all the token types that are out there. It would be hugely impractical to log everything that does or could exist. The field of Web3 develops at such a rapid pace that it would be impossible for any individual or group to maintain the knowledge in this ebook without the ongoing help of a very large group of people.

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Introduction

Just as the industrial revolution of the 20th century saw a rise in the specialization and proliferation of new tools purpose built for commerce in physical space (e.g., the steam engine), we are currently witnessing an acceleration in the tools used to accelerate commerce in cyberspace.

In particular, the notion of tokenization—that specific objects and interactions might be programmed to reflect the values and norms of a community or group—has been a chief accelerant in this emerging frontier. Emerging from the open-source ethos, tokenization functions as a soft legal mechanism by which individuals are able to imbue digital and physical properties with programmed rights. Paralleling the rise of Bitcoin in 2008, tokenization can be seen as a direct response to a rejection of the types of behaviors that led to the 2008 financial crisis. And while many rules and norms exist in this new wild west—cyberspace—there are glaring weaknesses in the emerging system: a lack of standardization, high incidence of predatory behavior and grifting, theft, collusion, and more.

Yet, there is hope. Standardization of novel architectures means it is now easier and safer than ever to deploy certain types of tokens. This eBook, a result of the efforts of many, is a chance to understand how the products within Web3 have developed so far and provides a glimpse into what the future might hold.

Thank you for joining us on this journey.

/Security Tokens

Every person interested in tokenization may be interested in a different aspect of the technology. For example, think about the concept of a website. There are lots of different websites out there. There's social media, there are marketplaces, there are content repositories, there are whistleblower sites, etc. And, critically, in the same way that each website has to abide by different laws and regulations, so too do different token types. Someone issuing securities will have to abide by securities regulations. Someone selling goods will have to abide by the Uniform Commercial Code. And someone starting a business will have to abide with the laws governing corporations. **It is the same when it comes to launching a token.**

When navigating how to design, launch, and maintain a token, these distinctions can make a break a token. There are as many horror stories about failed token launches as there are success stories for major token take offs. A key distinction is whether or not a token is a **Security Token or a Utility Token.** This distinction will impact the timeline from ideation to launch for a token, the cost of conducting a token launch, and the ongoing compliance required.

To better understand which token is right for a project, we will unpack the key features and examples for both Security Tokens and Utility Tokens.

Intro to Security Tokens

A Security Token is similar to owning stock or an equity interest in an asset, but it can also be a debt instrument. As the name indicates, so-called Security Tokens are themselves securities. This means they demand a more rigorous set of protections for issuers (the people creating and selling the securities) and investors (the people buying the securities). To give you an idea of what securities are meant to protect and why we even have this legal distinction, securities law in the US was catalyzed by the **financial crash of 1929** when, among other things, investors were led astray by issuers through rampant financial speculation in the roaring 20s. In the aftermath of that crisis, Congress enacted the **Securities Act of 1933** and the **Securities Exchange Act of 1934**. From then on, securities law in the US has been periodically updated in order to evolve the regulations in a way that keeps investors protected and ensures issuers are sophisticated and trustworthy enough to be issuing securities.

The Howey Test

The test used by the SEC to determine whether a given digital asset is a security is the **Howey Test** analysis of "investment contracts." Per the SEC's **Framework for "Investment Contract" Analysis of Digital Assets**, under the *Howey Test*, a digital asset will be a security if there is "a reasonable expectation of profits to be derived from the efforts of others" and this "applies to any contract, scheme, or transaction regardless of whether it has any of the characteristics of typical securities." Interpreting *Howey* in relation to the application of securities law to digital assets, William Hinman (the SEC's Director for the division of Corporate Finance), **made the following statement**: "If the network on which the token or coin is to function is sufficiently decentralized—where purchasers would no longer reasonably expect a person or group to carry out essential managerial or entrepreneurial efforts—the assets may not represent an investment contract." As a result, for purposes of the Howey test, the more centralized a community is, **the greater the risk that sales of a crypto-asset are deemed sales of securities**.

Investments, Fundraising, and Security Tokens

" **In the context of crypto, Securities Tokens are helpful for raising funds for an investment or democratizing ownership of a project.** "

Launching a Security Token in the crypto community can in itself be a strength because it signals to investors that you are sophisticated enough to be pulling off your project (because you are sophisticated enough to navigate securities filings). Security tokens are typically issued via a **Security Token Offering** (STO). These offerings come in several different types, each with a different limit on the amount that can be raised, jurisdiction where it may be offered, filing requirements, and requirements for investors.

Reg D (506b, 506c)
- Unlimited money raised
- U.S. Companies only
- No S.E.C. filing
- Only accredited and institutional investors

Reg CF
- Raise up to $5 million
- U.S. Companies only
- S.E.C. filing required
- All U.S. investors

Reg A Tier 2
- Raise up to $75 million
- U.S. Companies only
- S.E.C. filing required
- All U.S. investors

Reg A Tier 1
- Raise up to $20 million
- U.S. Companies only
- S.E.C. filing required
- All U.S. investors

Reg S
- Unlimited money raised
- U.S. and non-U.S. Companies
- S.E.C. filing required
- Only non-U.S. investors

It is important to note that securities laws will apply regardless of whether or not you call your token a security. If it looks like a security, behaves like a security, and is otherwise treated like a security, odds are the Securities and Exchange Commission (SEC) is going to consider your token a security. As a result, a number of tokens have been derailed after raising funds without entering the requisite paperwork and filings.

/Security Tokens

Location, Location, Location

When determining if a token is a security or not, it is important to note that regulators will apply laws based on the citizenship of the individual participants. These include purchasers of tokens, issuers of tokens, and investors of tokens. As a result of the United States' regulatory uncertainty relating to the classification of a token as either a security or a utility, it might be in the best interests of a business to launch a token in a different jurisdiction. Reasons for this include different jurisdictional approaches to addressing fraud and money laundering. This is also why many crypto apps (but not all) have different KYC/AML requirements.

A final note about the different types of securities and how they can be used to raise funds via a Security Token offering: some types of securities can be combined for the same offering. Perhaps the most common case will be when a token launches to United States-based investors via Reg D and international investors via Reg S. As the next example demonstrates, this can be an effective way to raise money for a project from the U.S. and other countries.

Examples of Security Tokens

The process for registering securities is a key part of understanding whether or not a token is a security. In these examples, the tokens were registered with the SEC under one of the five classifications shown above. Registrations happen when an applicant submits their documents via the **EDGAR portal**. These examples below help demonstrate the benefits of using a Security Token for various business cases:

- **Props:** launched a Security Token for accredited and non-accredited investors under Reg CF in the US via a **Token Debt Payable by Assets** (DPA) and raised $1.07m from 794 investors. (*Launched by Upside*)

- **Vevue:** launched a Security Token for a Wyoming Corporation for international investors and provided them with non-voting preferred equity shares. (*Launched by Upside*)

- **Curzio Equity Owners:** launched for accredited investors under Reg D in the US and international investors under Reg S.

These examples, like many Security Tokens, focus on fundraising and as such are subject to the rules related to fundraising. There are however other types of tokens that are not subject to securities law requirements: Utility Tokens.

Key Points To Know About Security Tokens

- They represents ownership or equity in an asset; or is a debt instrument
- They are subject to securities laws and require registration with the SEC
- The more centralized the control within a community is, the more likely the sales of crypto-assets will be classified as securities
- Location matters. The business, the issuers, the buyers—each factor in the SEC's determination of whether something is a security
- Different types of securities can be combined in the same offering

/Utility Tokens

Intro to Utility Tokens

Where Security Tokens have pretty well-defined parameters, the ideas underlying Utility Tokens are a more abstract convention. They are predominantly defined as the inverse of a Security Token. Explicitly, as we will use it in this document and for the purposes of distinguishing among our products, Utility Tokens do not require registration as a security with the SEC.

Utility Tokens represent some type of value to holders for some specific purpose. For example, Utility Tokens can be used by an organization to reward repeat customers (like airline miles), provide discounts for goods and services (like a coupon), receive access to special goods or services (like a membership program), or entitle members of a group to make non-financial decisions about an organization with a non-financial interest (like the way lots of DAOs such as Uniswap operate). As a practical matter, there can even be hybrid tokens that have features of both a Security Token and a Utility Token.

In 2014, Ethereum, at the time it was launched via ICO, would likely have met the threshold for an investment contract as set forth by the *Howey*-test (i.e. it would have been a security). A few years after launching and after Ethereum became sufficiently decentralized, per the **Hinman factors**—let's say around 2018—it would likely not have met the threshold for an investment contract as set forth by the *Howey*-test. Now, with **upgrades implemented in September 2022**, Ethereum's status as security **will likely again be up for debate**.

Trying to Take Flight

The squishiness of these definitions mean that it can be difficult to distinguish between Utility Tokens and Security Tokens because, in different contexts, a token can behave as either.

Consider the case of TurnKey Jet, mentioned in the previous section about Security Tokens. TurnKey Jet is a company that offered to sell **tokenized jet cards** to make it easier to fly on private jets—users with accounts could buy these tokenized jet cards and redeem them whenever they needed to fly. This is a utility for people who fly often because the settlement process for flying on private planes can sometimes be lengthy and the coordination offered by the tokenized jet cards speeds that process up in a trustworthy fashion. However, it is equally plausible to imagine a different scenario where the tokenized jet cards were a security. Consider if the tokenized jet cards were actually used to develop the platform before the token had launched. In that case, because the funds that were invested in the project were done with expectation of profit from work done by another, then the tokenized jet cards would likely fit under the *Howey Test* and can be a Security Token.

The SEC's System for No-Action Relief

Because all of this is complicated and can leave projects in a precarious position facing lots of uncertainty, the SEC has designed a mechanism that allows projects to submit requests for **No-Action Relief**. If a request is successful the SEC will publish a **No-Action Letter** which describes the reasoning that led to the decision. While the SEC's system for No-Action Relief seems like it *should* theoretically provide a mechanism for determining a token's status as a security or not, the system does not do very much to clear up which tokens are or are not securities. Through 2020 the SEC only issued three successful No-Action Letters—**Pocketful of Quarters**, **TurnKey Jet**, and **IMVU** each received No-Action Relief.

While the process of obtaining No-Action Relief could be more robust, the reasoning the SEC used to issue No-Action Relief is instructive for understanding the features for the types of tokens that would not be considered securities by the SEC.

No-Action Examples

Pocketful of Quarters :: created a token to resolve the inability to use gaming credits, coins or other units of value purchased in, or earned playing, one online video game in other online games.

Among the reasons listed in the **SEC's No-Action Letter are**: PoQ will not use any funds from Quarters sales to build the Quarters Platform, which has been fully developed and will be fully functional and operational immediately upon its launch and before any of the Quarters are sold; the Quarters will be immediately usable for their intended purpose (gaming) at the time they are sold; PoQ will implement technological and contractual provisions governing the Quarters and the Quarters Platform that restrict the transfer of Quarters to PoQ or to wallets on the Quarters Platform; gamers will only be able to transfer Quarters from their Quarters Hot Wallets for gameplay to addresses of Developers with Approved Accounts or to PoQ in connection with participation in e-sports tournaments; only Developers and Influencers with Approved Accounts will be capable of exchanging Quarters for ETH at pre-determined exchange rates by transferring their Quarters to the Quarters Smart Contract; to create an Approved Account, Developers and Influencers will be subject to KYC / AML checks at account initiation as well as on an ongoing basis; Quarters will be made continuously available to gamers in unlimited quantities at a fixed price; there will be a correlation between the purchase price of Quarters and the market price of accessing and interacting with Participating Games; and PoQ will market and sell Quarters to gamers solely for consumptive use as a means of accessing and interacting with Participating Games.

TurnKey Jet :: TurnKey Jet, Inc. provides interstate air charter services as a licensed United States air carrier and air taxi operator and created a token to resolve coordination problems by facilitating Token sales for air charter services on a private blockchain network.

Among the reasons listed in the **SEC's No-Action Letter are**: TKJ will not use any funds from Token sales to develop the TKJ Platform, Network, or App, and each of these will be fully developed and operational at the time any Tokens are sold; the Tokens will be immediately usable for their intended functionality (purchasing air charter services) at the time they are sold; TKJ will restrict transfers of Tokens to TKJ Wallets only, and not to wallets external to the Platform; TKJ will sell Tokens at a price of one USD per Token throughout the life of the Program, and each Token will represent a TKJ obligation to supply air charter services at a value of one USD per Token; If TKJ offers to repurchase Tokens, it will only do so at a discount to the face value of the Tokens (one USD per Token) that the holder seeks to resell to TKJ, unless a court within the United States orders TKJ to liquidate the Tokens; and the Token is marketed in a manner that emphasizes the functionality of the Token, and not the potential for the increase in the market value of the Token.

At a simplified level, the SEC has indicated in the past that they will look to the following features when determining whether a token is a security or not.

1. No funds from a token's launch are used to build the platform;

2. Tokens are immediately available for their intended use upon being sold;

3. The platform restricts the transfer of tokens to wallets registered with the platform;

4. There is a direct correlation between the purchase of the token and the market price of the token;

5. Tokens are only sold for consumptive use in the application; and

6. Tokens are marketed in a manner that emphasizes the functionality of the token and not the potential for the increase in market value of the token.

Examples of Utility Tokens

Unlike Security Tokens, there is no registration requirement for Utility Tokens. The behavior of Utility Tokens is intrinsic to their nature: do they behave like a security or do they provide a utility, according to the features identified by the SEC above? The examples below more thoroughly analyze the behavior of two tokens that are widely considered to be Utility tokens.

Filecoin :: Filecoin (FIL) is an application that allows users to pay FIL to store their file in a network. Miners, who store files, receive FIL each time a file is added to the network or the information from the file needs to be retrieved.

From their website: "Filecoin is a peer-to-peer network that stores files, with built-in economic incentives to ensure files are stored reliably over time. In Filecoin, users pay to store their files on storage providers. Storage providers are computers responsible for storing files and proving they have stored the files correctly over time. Anyone who wants to store their files or get paid for storing other users' files can join Filecoin. Available storage, and the price of that storage, is not controlled by any single company. Instead, Filecoin facilitates open markets for storing and retrieving files that anyone can participate in."

Basic Attention Token :: Basic Attention Token (BAT) is an application that allows users of the Brave browser to earn BAT for their attention, creators to be paid BAT for making great content, and Advertisers to get a better return on their ad spend.

From their website: Basic Attention Token is "based on the Ethereum technology that can also be used as a unit of account between advertisers, publishers, and users in a new, blockchain-based digital advertising and services platform." The "tokens are intended for use on the BAT platform, a new Blockchain-based digital advertising and services platform."

It is important to point out that at the time of publication, ***neither FIL nor BAT have received No-Action Letters***. They simply operate their sufficiently decentralized applications in a way that, by the application's design, reduces the likelihood that the SEC might consider their tokens to be securities. As the numbers indicate, obtaining a No-Action Letter is not something that happens frequently. Because of this uncertainty, many Utility Tokens that are being bootstrapped will choose to launch in countries, **such as Switzerland, Panama, British Virgin Island or the Cayman Islands**, where the regulatory landscape is more settled and channels have been created for the registration of different types of tokens.

/Utility Tokens

Distinguishing between Security Tokens and Utility Tokens

Security tokens require registration with the SEC, as well as compliance with local securities laws.

Tokens that are initially designed as Utility Tokens (i.e., as not having aspects which require registration with the SEC) may inadvertently become securities if they are treated like securities (e.g., money raised from the token launch becomes an investment contract under *Howey*, or the network is no longer sufficiently decentralized, etc.).

As such, it would seem that the most predictable trustworthy and reliable method for determining whether or not a token is a Utility Token in the United States is to seek No-Action relief from the SEC directly; however, this almost never happens, is time consuming, and can greatly increase the legal budget required to launch such a project.

Even after obtaining a No-Action letter, it would be possible for a Utility Token to become a Security Token if it starts to be treated like a security.

For this reason, it is important to acknowledge that there may be friendlier jurisdictions than the United States to launch a specific token project; this will all come down to a question of facts and is best discussed with your project's lawyer(s), financial advisor(s), and tax professional(s).

/Non Fungible Tokens

Over the last several years, Non-Fungible Tokens (NFTs) have soared in popularity (and market size) predominantly because of the fact that they are able to create digitally scarce items. Per an **analysis done by investment bank Jefferies**, the total NFT market-cap is forecasted to exceed $35 billion in 2022 and to over $80 billion for 2025. While there has been uproar to date related to collectible NFTs, there are multiple types of NFTs that make this technology incredibly interesting.

Introduction to NFTs

The term NFT stands for Non-Fungible Token. Non-fungible means that a token is unique and, according to the economics literature, items that are non-fungible may not be interchanged with other goods or assets of a similar type. The value of non-fungible items is always specific to the item because, at a fundamental level, there cannot be another one like it.

Examples of non-fungible items include interests in land, pieces of art, and access to certain clubs or groups. Unlike a bitcoin or a one dollar bill, which are functionally identical and interchangeable with one another, the value of non-fungible items derives from their scarcity and uniqueness.

The idea of NFTs began sometime around 2013, when **colored coins** were issued on the Bitcoin blockchain. However, it was not until 2017 that NFTs started to really make a mark, thanks to projects like '**Cryptopunks**' and '**Cryptokitties**', two different projects that brought NFT use into the mainstream.

In 2019, the inception of two marketplaces, **SuperRare** and **OpenSea**, fueled the growth of the NFT market amongst the public. In 2021, NFTs made news when "Beeple's Everydays: The First 5000 Days" was sold for a **whopping $69 million at a Christie's auction** in May. This was a watershed moment. NFTs were now in the public consciousness.

Conceptually, any one dollar bill is exchangeable for any other one dollar bill. This is because currency was designed to be fungible. It is not the case with NFTs. Any given NFT is provably unique from any other NFT. This is why many collectors are willing to pay a bunch of money for something that essentially amounts to a digital signature.

> **You would likely be ok trading any one dollar bill for another, because they are fungible (identical in value and nature). The same could not be said for an NFT. Each is one of a kind.**
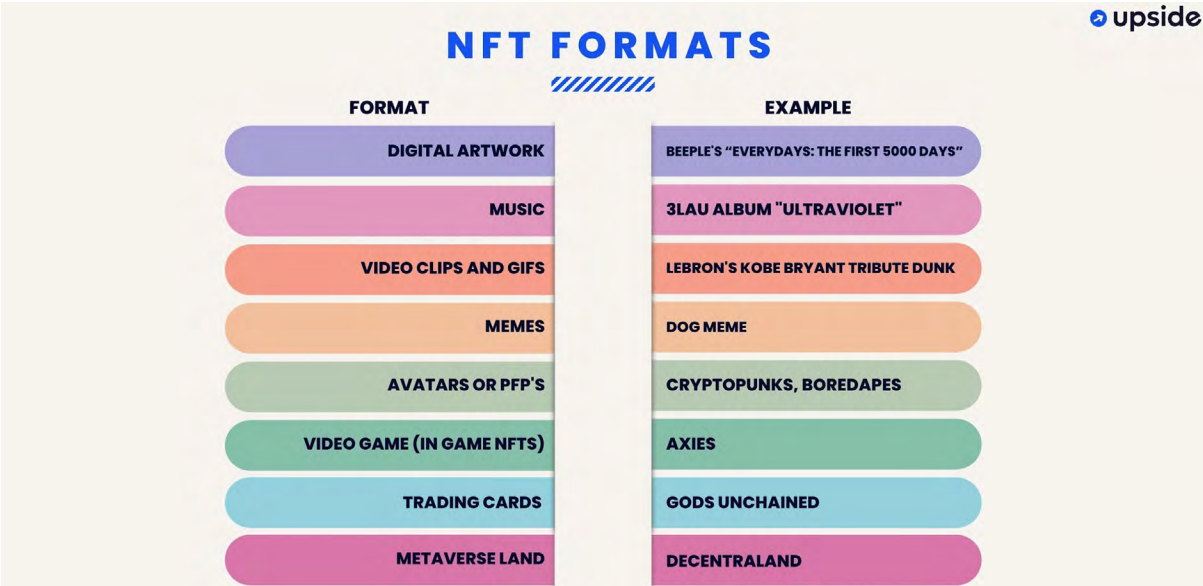
How Do NFTs Work?

NFTs cannot be duplicated; as a result, they enable the creation of unique digital assets. Therefore, they are often used as a tool to identify a piece of data, such as text, images, and other files in the same way that a passport identifies a non-fungible person. The unique features of an NFT that can demonstrate this uniqueness are encoded within smart contracts on a blockchain, making their ownership and details immutable. Most of the activity in Web3 marketplaces today is on the Ethereum blockchain, but that is beginning to change and diversify.

/Non Fungible Tokens

Because they rely on unique identifiers, the token standards for NFTs mostly include basic primitives such as ownership, transfer, and simple access control. As an example, check out the **ERC-721 standard**. However, because these items can be used to represent different types of rights and interests, it is possible to build additional features on top of a basic standard for rich display inside of applications, including creators shares and royalty payments to the original creators for new works. By way of example, **Lifeforms**, an NFT-art project by Sarah Friend, requires Lifeform NFTs to be given away within 90 days of receiving the Lifeform.

How Many Different Formats of NFTs Are There?

NFTs exist in many different formats. They can be:

NFT FORMATS

FORMAT	EXAMPLE
DIGITAL ARTWORK	BEEPLE'S "EVERYDAYS: THE FIRST 5000 DAYS"
MUSIC	3LAU ALBUM "ULTRAVIOLET"
VIDEO CLIPS AND GIFS	LEBRON'S KOBE BRYANT TRIBUTE DUNK
MEMES	DOG MEME
AVATARS OR PFP'S	CRYPTOPUNKS, BOREDAPES
VIDEO GAME (IN GAME NFTS)	AXIES
TRADING CARDS	GODS UNCHAINED
METAVERSE LAND	DECENTRALAND

The **Science journal Nature** analyzed data concerning 6.1 million trades of 4.7 million NFTs between June 23, 2017 and April 27, 2021, which underscored the changing diversity of NFT types and their transaction volume.

Description of the NFT landscape: (*a*) *Top 5 NFTs collections (by number of assets) organized by category. The size of each circle is proportional to the number of assets in each collection. (*b*) Daily volume (in USD) exchanged over time for each category and for all assets (see legend). Days with volume below 1000 USD are not shown. (*c*) Share of volume traded by category. (*d*) Share of transactions by category. Results in these panels are averaged over a rolling window of 30 days.* **Courtesy of nature.com**

/Non Fungible Tokens

Art-based NFTs have garnered most of the public's attention, so far, due to head-line-grabbing sale prices. It is important to note, however, that art-based NFTs only make up about 10 percent of the market, with collectibles and games comprising more than 80 percent. The reality is that art-based NFTs have risen in sale price but decreased in the number of transactions; the rising prices have reduced the number of people who are able or willing to transact in this category.

NFT Marketplaces

Key to any functioning market is a robust marketplace - an arena for buyers and sellers to connect. In the primary market, creators list their NFT for sale and collectors buy it. Afterward, collectors can trade amongst each other on the secondary market. In exchange for a fee, the NFT marketplace will typically handle the transfer of an NFT from one party to the other. Each NFT marketplace has its own system for how it operates. The types of NFTs available, fees, payment options, permitted blockchains and other rules will depend on the individual marketplace. Examples of robust marketplaces are **OpenSea** (general collectibles), **AirNFTs** (gaming), **NBA Top Shot** (sports collectibles), and **SuperRare** (digital art).

The NFT market is based on peer-to-peer activity and is therefore heavily dependent on secondary sales. The more popular an NFT is, the higher the demand and willingness to bid to claim ownership. Temporal patterns of secondary sales are unique for each collection and traders' activity is highly heterogeneous.

Number of active NFT buyers and sellers, Q1 2020 - Q2 2022 YTD
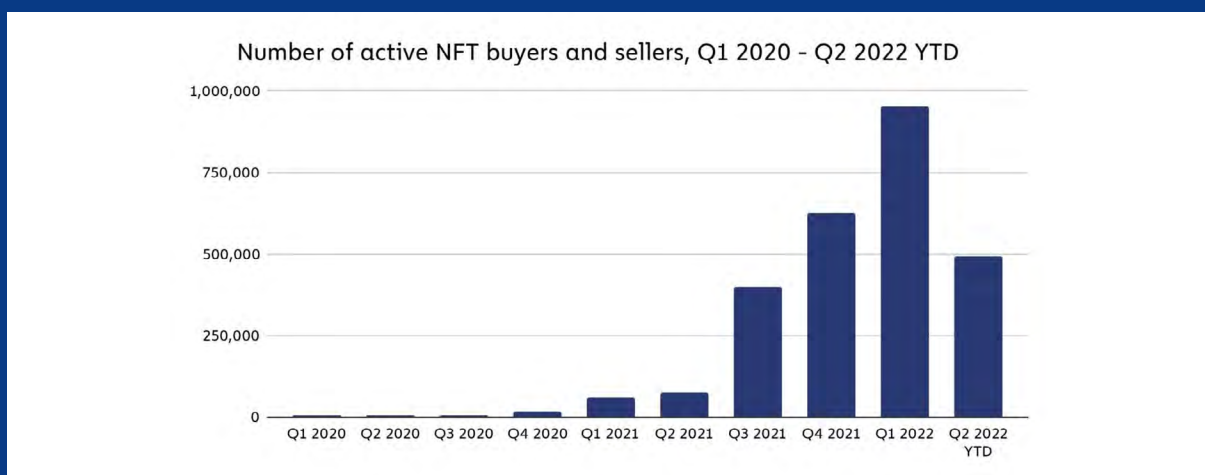
From ChainAnalysis

/Non Fungible Tokens

The Value of NFTs

Not to be overlooked in the value of NFTs is what they bring to the table for creators. For example, an artist selling their work in a gallery, in the traditional sense, will only ever earn revenue for their work on that one initial sale. Any further sales of that work, between two collectors in the future, will never be shared with the artist. NFTs change this.

NFTs enable artists to bypass third parties like top galleries, auction houses, music studios or streaming apps and grant artists direct access to their customers. It allows artists or creators to receive royalties, a percentage of all secondary sales of their creation, in a completely automated way, which is otherwise not an option in the traditional art world. When their work is sold in subsequent transactions, they will receive a percentage of the sale price and their earnings for their work continue on in perpetuity.

NFTs have real world value as well - the digital artworks can be displayed in physical or virtual art galleries, in-game purchases can be used as collaterals, trading cards can be used to earn tokens, in-game characters can be leased, etc. Since NFTs are simply digital representation of ownership, there might still be several unexplored value creation opportunities.

Apart from digital collectibles, there are several unconventional use cases for NFTs like identity authentication assets, tickets or coupons, certifications or credentials, fuel consumption tracking, patents, etc. Here are a few of the current use cases:

- **Membership:** Gated communities can provide memberships in the form of NFTs to create scarcity, as well as demand, through gated access. **Example: Proof Collective.**

- **Ticketing:** NFT ticketing provides secure secondary markets and allows connections to be built between artists, event organizers, and their audience. **Example: Ivy.Cash**

- **NFT-as-a-service:** NFTs used to outsource non-core tasks based on price with work conditions, time limits and other criteria set in the smart contract.

- **Physically-backed NFTs:** Similar to "SuperGucci" NFTs which also came with a physical ceramic figurine. Or NFTs can be attached to physical items to provide traceability and transparency. **Example: F.or Y.our R.eal E.ntertainment Painting**

- **Real Estate:** NFT-based ownership and titles are in the future, but currently held back by entrenched laws. But, NFT-based fractionalized investments and loyalty programs are already happening in the real estate sector. **Example**: **OXO Living in Bali**

- **Logistics:** Tracing the movement of goods in the supply chain can help to understand expiry date, confirm uniqueness of the product, provide visibility into materials and components, etc. **Example: Circulor**

The Landscape & Ecosystem

The NFT landscape has evolved into a multi-chain ecosystem with several layers consisting of specific characteristics, goals and functions. These unique digital assets enable an internet-native economy, accomplished by NFTs that have distinctive characteristics like uniqueness, authenticity, rarity, ownership, transferability, transparency and trust.

NFTs can be seen as digital representation of ownership or digital reflection of our physical life. There are various types of "experiential" NFTs that highlight these physical experiences and affiliations:

- **Collectible NFTs:** Scarce, digital items that may be traded, tracked, and displayed to others.

- **Credential NFTs:** Records exhibiting basic statistics.

- **Dynamic NFTs:** NFTs programmed for certain types of changes.

- **Fractional NFTs:** a single NFT that is co-owned by a large number of owners to help; often used to help with the financing and maintenance of an NFT project.

Collectible NFTs

Collectibles are the most popular form of NFTs. According to **NonFungible.com**, collectibles represent the largest share of the NFTs market with nearly 80% of the total volume traded. They were the major driver of the NFT boom in 2021. Collectible NFTs are very similar to physical collectibles like action figures, toys, game items, souvenirs, paintings, etc. but in a digital form.

Curio Cards :: Initially just 30 unique art collectible cards from seven different artists, Curio Cards were the first major NFT collectibles launched back in 2017. It was not until after this that other more popular collectibles such as Cryptopunks and CryptoKitties rose in popularity.

Bored Ape Yacht Club :: One of the most popular NFT art collections, known for its rich and detailed features is the 'Bored Ape Yacht Club'. BAYC consists of 10,000 different ape avatars, each unique as they are randomly generated from more than 170 possible traits like expressions, clothing, headgear, laser beams, accessories, etc. Launched in April 2021, the ape avatar as profile pic has become a popular trend now and is considered a prestige symbol, all thanks to its celebrity owners. BAYC sales are governed by the creators and the most popular secondary marketplace is "OpenSea". The members are offered additional perks like access to "THE BATHROOM", a communal graffiti board, access to the BAYC Discord, access to additional NFT collectibles such as Bored Ape Kennel Club dogs (for free) and also other future benefits yet to be unlocked. Coinbase is set to produce an animated Bored Ape Film Trilogy along with creators of BAYC, Yuga Labs.

Nike Cryptokicks :: Nike CryptoKicks is a digital sneakers collection of 20,000 NFTs, launched with **RTFKT**, a studio that has already sold millions of dollars in virtual sneakers. A pair of sneakers **was sold for $130K**. Launched in April 2022 with their iconic swoosh mark, these NFTs came with Skin Vials that allow users to customize the virtual sneaker NFTs according to their preference. In February 2022, RTFKT released 20,000 NFTs of a mysterious box called MNLTH, with the Nike Swoosh and RTFKT's lightning bolt logo. About 8,100 people who owned an NFT from one of RTFKT's earlier collections received a MNLTH for no additional cost. Others could buy on OpenSea, starting around 5 Ether (about $15,000 at the time), although no one knew, at that time, what was inside. Owners were randomly assigned one of eight skins, ranging from the most common, "Human," with its fuchsia and black colorway, to the rarest, "Alien," in purple and green. Users are hoping to wear these shoes in online games and metaverse.

Axies :: Axie Infinity, a popular play-to-earn game has nearly 2 million daily active players (DAU) and $5.5 billion in virtual assets. In this play-to-earn model, players can earn by winning battles or re-selling their 'Axies' in the marketplace. Axies are characters in the game, where the Axies themselves and the land they inhabit are actually NFTs. One of the rare NFTs costs about $800,000. It is possible to breed more Axies from existing ones, at a small token cost and the

/Non Fungible Tokens

newly bred Axies are in most cases more powerful. They can be sold in the marketplace but the number of Axies bred is limited. Axies can be sold as NFTs in exchange for Ethereum, using the Axie Infinity Marketplace. Axie Infinity's "play-to-earn" approach rewards players with crypto tokens that can be exchanged for money. Axie owners can also loan their NFTs to other players to use and earn with. Axie was launched by its parent company Sky Mavis in May 2018 but didn't pick up steam until the second half of 2021. It has already hit total NFT sales of $4 billion. Axie Infinity's Origin update on April 7, 2022, included a set of free starter Axie NFTs in an attempt to onboard new players.

Credential NFTs

These are non-transferable NFTs which have been under-explored so far. They go beyond the monetization of NFTs, making NFTs a digital representation of our physical self.Credential NFTs could be personal identity, certifications, passport, medical reports, insurance claims or even self-sovereignty. These NFTs can be used for digital identification and verification.

[0xcert] :: The first open protocol built to support the future of digital assets, powered by NFTs. Allows users to create, own, and validate unique assets on the blockchain. The 0xcert protocol offers tools for building powerful dApps, aimed at easy authentication and management of digital or real-world tangible assets (such as an ID, educational certificate, in-game item or a house) on the blockchain. Oxcert was founded as early as 2018 with a starting point as non-fungible tokens, specifically the ERC-721 Ethereum standard. In addition to common functions for transferring and managing standard non-fungible tokens, the 0xcert protocol provides another layer of conventions for creating certified non-fungible tokens for unique assets. With 0xcert protocol, it is possible to validate a proof of existence, authenticity and ownership of digital assets without third-party involvement. It enables developers to focus on the application layer and quickly build applications for issuing university certificates, KYC applications, applications for loyalty programs, warranties, badges, credits or even a decentralized non-fungible exchange. It uses ZXC Utility Tokens to perform user requests on the blockchain. 0xcert is building out a whole ecosystem of parties involved in the non-fungible space like specific application developers, companies from various verticals, researchers, organizations and communities.

Soul-Bound Tokens :: Vitalik along with his peers E. Glen Weyl and Puja Ohl-haver introduced the idea and theory behind Soul-Bound Tokens (SBT), which are non-transferable. The concept of SBTs here represents commitments, credentials and affiliations of 'Souls' (self), using the trust networks of the real economy to establish provenance and reputation. Education and on-chain resume projects like **101.xyz** and **Noox** issue online credentials as Soulbound NFTs. For example, a university could be a Soul that issues SBTs to graduates. A stadium could be a Soul that issues SBTs to longtime Dodgers baseball fans.

Soulbound tokens (SBT) are non-transferable, publicly-verifiable digital tokens that can act as a type of resume (CV) for Web3 users. SBTs improve upon the NFT concept to serve as a way for users to prove who they are and what they do. Lack of Web 3-native identity and reputation forces NFT artists to often rely on centralized platforms like OpenSea and Twitter (TWTR) to commit to scarcity and initial provenance, and prevents less than fully collateralized forms of lending. SBTs could provide the missing link to bridge the trust gap in Web3. With SBTs users can observe the immutable history of people before conducting business with them. While there are several distinctive advantages of SBTs, they also pose some threats as they may reveal too much sensitive information about a person. Additionally, implementing the tokens can prove challenging. A community recovery method has been suggested in case an SBT is lost.

NFT COVID-19 Vaccination Passports :: On July 1 2021, Principality of **San Marino** in partnership with **VeChain** pioneered digitized COVID-19 vaccine passports in the form of NFTs. The vaccination passport contains a record of past infections, negative test results, and also provides a digital vaccination certificate. The digital vaccination certificate is issued upon request from approved facilities by San Marino health authorities. It is recorded on the VeChainThor public blockchain, by linking an enterprise non-fungible token (eNFT) to an individual's COVID-related medical history. The certificate contains two QR codes – first code is in compliance with European Union requirements and standards and can be verified by approved member states and entities, second QR can be scanned by "anyone anywhere" outside of the European Union and directs users to a web-based app where the blockchain based eNFT certificates can be verified. There are limitations in the implementation of these credential NFTs. Apart from the technological issues, there are also trust issues like "shifting the mentality of trust" from centralized institutional trust to trusting networks. For example, would an academic certificate NFT be controlled by a centralized educational institution? If so, what is the point of storing these NFTs on a distributed ledger?

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Dynamic NFTs

These are configurable NFTs that can dynamically modify their appearance and functions based on triggers and inputs. Although NFTs are inherently programmable in nature, this feature has been heavily underutilized at the moment. Imagine an NFT that changes color based on the season, an in-game NFT that changes property based on your win or loss, a music NFT that plays track based on time of the day, a credibility NFT that blacks out when accessed by anyone other than the owner. These are some basic use cases of Dynamic NFTs.

Real Estate :: While the most popular examples of Dynamic NFTs are found in the art world, **Chainlink** (in a great resource on the subject) demonstrates how the programmability of Dynamic NFTs can be used as a way to track different features of an asset over a longer period of time. In the context of real estate, this can be used to track the value of a home, the repairs that have been made to the home, and more.

Async Art :: Async.Art's platform is specialized to support NFTs that have been tied to programmable artwork. Programmable art can be built with autonomous features, meaning that the art can change based on things like statistical data, geographic location, etc. It is possible to create a single piece of art with the potential to take on different forms. They introduced '**Async Music**' where NFT ownership privileges give their holders control over certain elements of the music piece: "they get to choose from a menu of options based on the composer's intent," which include elements such as tempo, timbre, and narrative. Users can create and then trade these 'Limited Editions' based on the piece's musical layers at any given time.

22 Racing Series :: Developed by GOATi, 22 Racing Series is a racing game, where players can collect and combine individual, immutable components to create futuristic vehicles. These NFTs can then be traded or swapped for other constituent parts. The constituent parts remain the same, but the end product is the result of the player's imagination.

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/LP Tokens

Liquidity Provider Tokens (LP Tokens) are a reward mechanism to help facilitate transactions between different types of cryptocurrencies. LP Tokens are popular throughout the landscape of Web3, and especially in the context of Decentralized Finance (DeFi), because of the way they facilitate transactions on exchanges. To understand Liquidity Provider tokens better, it is helpful to dive into their history—where did they originate from and what needs do they serve?

Introduction to Exchanges

To develop an adequate understanding of LP Tokens, it is necessary first to understand exchanges. Exchanges are typically marketplaces where large numbers of people buy and sell assets like currency, stocks, crypto coins, tokens, etc. In the past, if you were traveling from one country to another and needed to exchange your US Dollars for Euros, you would have to stop at an exchange to do so. The group hosting the exchange would need to have approximately equal amounts of US Dollars and Euros AND they would need an additional financial incentive to facilitate the transaction (typically a fee of some type). With Web3 applications, it is possible to design these exchanges in new and interesting ways. The wrinkle that Web3 brings to exchanges is that they can be either *centralized* (like a traditional currency exchange) or *decentralized*.

An Exchange on Exchanges

Centralized Exchanges (CEX) are similar to traditional exchanges where they act as a third party to facilitate trades and record buy and sell orders in a digital order book. These buy/sell orders are used to provide liquidity. Any CEX is a centralized entity, meaning, they have a certain degree of control over investor funds. Popular CEXs are **Binance**, **Coinbase** and **Kraken**. CEXs are more common than decentralized exchanges and account for **about 96% of exchange crypto trading**.

Decentralized Exchanges (DEX) are algorithms on a blockchain that facilitate trading of crypto assets between users automatically and without an intermediary. **Uniswap** is the largest Ethereum DEX with more than 50% market share and $5.95B TVL (Total Value Locked). DEXs discard order books and instead use liquidity pools to provide liquidity. **Liquidity pools** are collections of crypto assets, sourced from investors, which facilitate users to buy, sell, borrow, lend, and swap tokens. DEXs clear their sell or buy orders using assets within the liquidity pools. These pools help to convert one asset to another easily without causing a drastic change in the asset's price.

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Introduction to LP Tokens

> **Liquidity Providers (LPs) are investors who provide crypto assets to the liquidity pools and in turn benefit from the rewards earned.**

Think of LPs as people who decide to serve as an exchange for a certain set of tokens—we might stake a trading pair of 1 Bitcoin and 12.6 Ether—and in exchange for providing this service to people who need it, we are rewarded with Liquidity Provider Tokens like Uniswap.

A variety of liquidity pools exist, but the most common type is the trading liquidity pools used in DEXs. Liquidity Providers earn rewards through trading fees that traders pay to DEXs for every transaction. In addition, some DEXs reward Liquidity Providers with Governance Tokens for their contribution, based on their share of the total pool liquidity. This entire process is called liquidity mining.

Automated Market Makers

Most DEXs use **Automated Market Makers** (AMM) to facilitate transactions. AMMs are the protocols or trading mechanisms that eliminate intermediaries and order books.

> **Automated Market Makers bring a new form of programmatic control of incentives through the use of smart contracts to modulate the price of assets in order to achieve specified outcomes.**

For every trading pair of assets, there is an individual liquidity pool and, in theory, anyone could provide liquidity to a pool. Preset mathematical equations balance liquidity pools and eliminate drastic changes in price of assets. Typically, liquidity pools will rebalance to maintain an equal ratio of a given portfolio of assets. The price of assets is then determined based on the difference between a) the desired ratio, and b) the ratio at a given point in time.

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The Role of LP Tokens

Within DeFi, LP Tokens solve the problem of locked crypto liquidity. Before LP Tokens were introduced, crypto assets were locked or staked for certain mechanisms (including governance) and otherwise remained inaccessible during that time period. This led to low liquidity and lower activity in the crypto ecosystem. With the adoption of LP Tokens, it is possible to create larger pools of liquidity for assets contributed by users, improve the liquidity of the market, and financially incentivize LPs through the issuance of LP Tokens in exchange for the service they provide.

In exchange for ensuring liquidity, "liquidity mining protocols" provide Liquidity Providers with LP tokens. The LP Token represents the share of the pool owned by a liquidity provider. LPs have complete control over their tokens and can use LP Tokens to redeem their crypto assets from the pool at any time. LP Tokens act like a balancing mechanism and provide a sense of security to the investor for the assets deposited in the pool. It is possible to transfer ownership of LP Tokens, but the transfer mechanism is based on the conditions set in the smart contract (liquidity pool). LP Tokens can also be used as collateral for loans.

How It All Works

Imagine the following simplified example. You contribute $5 worth of a combinatino of Token A and Token B to a liquidity pool worth $100. As it stands, you would own 5% of the pool's LP tokens as participants swap between each different token and as long as proportional volumes of Token A and Token B are exchanged with one another. In this case, the LP Tokens function as a reward for providing a service to the liquidity pool.

Now, imagine that many more people want to trade Token A for Token B and that very few people want to complete the inverse transaction. This is where LP Tokens play a more interesting role. Here, where one side is trading much more than the other, the reward for LP Tokens can be modified in a way that helps to restore balance to the liquidity pool. In this case, the LP Tokens serve as an incentive mechanism for a complex transaction framework.

LP Tokens are similar to other tokens and can be transferred, traded or staked on other protocols. This indirectly gives liquidity providers complete control over their locked crypto assets in the liquidity pool. The LP Tokens determine the share of transaction fees accumulated as pay back for the liquidity providers.

Notably, LP Tokens are subject to the volatility of a concept known as slippage. When trading tokens on a DEX, slippage is the price difference between when you submit a transaction and when that transaction is finally confirmed on the blockchain. Slippage can be caused by differences in the confirmation times of various blockchains in various places (the difference in price between when you hit submit and when the blockchain actually confirms the transaction). Slippage can also be caused by low liquidity; this occurs when the liquidity pools become unbalanced and cause price distortions.

LP Tokens can be staked to earn further rewards (yield) in the form of new tokens.

> **Staking LP Tokens shows the willingness to commit to supporting the LP Token for an extended period of time and impacts market price.**

LP Tokens also play an essential role in an Initial DEX Offering (IDO). An IDO is a new fundraising model, where a new project or startup raises funds against their new tokens through a DEX. It is a token offering similar to an ICO, STO or IEO. In an IDO, LP Tokens are locked for new tokens offered by the startup or project.

Yield Farming

Credit market **Compound** kicked off the contemporary yield farming phenomenon by awarding its governance token COMP to all its users for borrowing and lending, thereby increasing their activity levels. Yield farming is an investment strategy where investors move their assets between different liquidity pools to maximize their returns or interest rates. "Yield" means returns and "farming" indicates exponential growth by planting "assets" in the pool. Liquidity providers earning returns from the transaction fees of users is a simple form of yield farming. But, in the case of Compound, even borrowers receive the governance token COMP, merely for using and making the protocol popular. This is similar to taking a loan for purchasing a house, where the value of the house will also grow. Similarly, liquidity providers also can 'grow' their interest rates for the LP Tokens in a yield farm.

Staking

Staking is a form of yield farming. Many platforms allow liquidity providers to stake their LP Tokens to earn even more interest on these tokens. Impermanent Loss is a risk associated with LP. It is the potential loss that could be incurred if the value of the assets in the liquidity pool is less than the value, if held in a wallet. This deters investors from providing liquidity. LP Staking helps to incentivize investors as it mitigates the risk of impermanent loss and compensates for the loss.

Let's say, 1 ETH = $100 and 'A' invests 10 ETH and $1000 in a liquidity pool (50:50 ratio for deposits in liquidity pool).

- Total value 'A' invests is $2000.

- Assume, the liquidity pool is worth $20,000, that is, it has $10,000 and 100 ETH.

- Then, the share of A is 10%.

If ETH price raises to $110,

- Liquidity pool rebalances (as per AMM model) to 95.347ETH with value of $10,488.

- The liquidity pool is now worth $20,976.

- A would get 10%, that is, $2097.60.

- A has earned $97.60 from her investment of $2000.

But, if A has held ETH in his wallet,

- The value would be (for 10 ETH) 10 x $110 = $1100.

- A would have $2100 in her wallet instead of $2097.60.

- So, A incurred a loss of $2.40 or 0.12%

This amount might be high if she invested more, say 50% or if the price of ETH raises more, say 20%. This is impermanent loss.

How does LP staking help reduce the risk of impermanent loss? 'A' receives LP Tokens to indicate 10% of their share in the liquidity pool. Instead of holding to the LP Tokens, A can stake them for a governance token. Assume, their share of the governance token value has raised by $5, then it helps mitigate their $2.40 loss from liquidity pool rebalancing. Although figures vary between projects, staking usually offers over 10% APY.

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Real World Examples

Some of the popular decentralized exchanges that distribute LP Tokens to liquidity providers are Uniswap, Sushi, Curve, PancakeSwap. We dive into the mechanics of Uniswap and Curve below.

Uniswap :: Uniswap is an automated liquidity protocol powered by a constant product formula and implemented in a system of non-upgradeable smart contracts on the Ethereum blockchain. Each Uniswap smart contract, or pair, manages a liquidity pool made up of reserves of two ERC-20 tokens. Anyone can become a liquidity provider (LP) for a pool by depositing an equivalent value of each underlying token in return for pool tokens. These tokens track pro-rata LP shares of the total reserves, and can be redeemed for the underlying assets at any time. Uniswap charges a 0.30% fee on all trades, which is added to the reserves. When the liquidity provider burns their liquidity token in order to reclaim their stake in the liquidity pool, ithey receive in return a proportionally distributed amount of the total fees accumulated while they were staking.
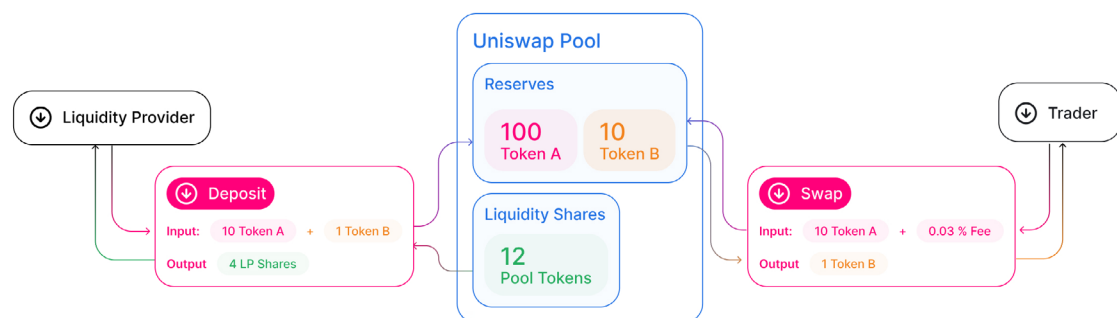
How Uniswap Works - The Uniswap ecosystem consists of liquidity providers who contribute to liquidity, traders who swap the tokens and developers who interact with smart contracts to develop new interactions for the tokens. There are at least one billion ERC 20 liquidity provider tokens issued with more than 297 thousand UNI token holders. Uniswap deals with different types of liquidity providers including passive LPs, professional LPs, LPs interested in token projects and DeFi pioneers.

There are currently three versions of the Uniswap protocol. Uniswap V1 is the first version of the protocol and because of its permissionless nature, it will exist for as long as Ethereum does. Although Uniswap has upgraded to Uniswap V3, it still offers Uniswap V2 which uses Ethereum-based ERC-20 tokens as LP Tokens. And the new version uses non-fungible tokens (NFTs) as liquidity provider tokens. Even though there are no direct markets for trading LP Tokens, Uniswap LP Tokens can be used as collateral in lending protocols.

The defining idea of Uniswap v3 is concentrated liquidity: liquidity that is allocated within a custom price range. In earlier versions, liquidity was distributed uniformly along the price curve between 0 and infinity. With v3, liquidity providers may concentrate their capital to smaller price intervals than $(0, \infty)$. It lets liquidity providers choose the price range of assets that they wish to provide liquidity. This custom price range is represented by an NFT which can be used to remove their share of liquidity at any time.

The features Uniswap v3 introduced are fairly complex and might prevent user-base growth due to a lack of understanding by ordinary crypto holders.

The most considerable risk with trading on UniSwap is buying scam tokens or falling for scam projects like rug pulls. A scam token is a token masquerading as belonging to a legitimate project. Rug pulls or scam tokens are common in DEXs as they can list new tokens free of charge and without audits, creating tokens in open source.

Curve :: Curve is an automated market maker which differentiates itself by allowing exchange between tokens at low fees and low slippage by only accommodating liquidity pools of similar nature assets. It originally started as StableSwap, a stable coin only DEX. By focusing on stablecoins, Curve allows investors to avoid more volatile crypto assets while still earning high interest rates from lending protocols. It favors stability over volatility by limiting the pools and the type of assets in each pool. Curve is a non-custodial platform meaning the Curve developers do not have access to any individual's tokens. Curve pools are also non-upgradable, which means the logic protecting the funds can never change.

When Curve launched it grew quickly by securing the underdeveloped stablecoin market. The three categories of Curve pool are Plain pool, Lending pool and Metapools. Curve Liquidity pool allows investors to get their new LP Tokens and stake them back in exchange for CRV tokens (Curve's governance token—Curve DAO Token) which can be bought and sold like other cryptocurrencies. These LP Tokens act to provide an additional layer of utility and profits to the initial investment. The main purposes of the Curve DAO token are to incentivize liquidity providers on the Curve Finance platform and get as many users involved as possible in the governance of the protocol. This ensures the protocol continues offering low fees and extremely low slippage. Currently CRV has three main uses: voting, staking and boosting. One of the main incentives for CRV is the ability to boost individual's rewards on provided liquidity.

Curve recently launched v2, allowing users to swap between uncorrelated (unpegged) assets. Similar to Uniswap v3, it allows concentrated liquidity, that is, liquidity at custom price range, but automated. Curve will automatically concentrate all liquidity from its LPs around the current price to reduce slippage and allow users to exchange large sums without majorly affecting the price of the asset. Curve integrates with other platforms to maximize investor profits, known as composability. But integration with another platform, for example with Compound, puts the assets that Curve has within that platform at risk. A fault within Compound would adversely affect Curve and its liquidity providers, causing a destructive chain reaction.

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/Governance Tokens

Perhaps the most exciting aspect of Governance Tokens is that they turn the concept of governance into a blank canvas that can be encoded to achieve certain types of outcomes. By coordinating what would otherwise be impractical, Governance Tokens simplify operations that would otherwise take lots of time and be susceptible to fraud.

For example, a governance token could facilitate lots of different types of voting, including:

- **Executive voting** (continuous evaluation of proposals),
- **Quadratic voting** (enabling the community to purchase more votes for certain issues),
- **Ranked choice voting** (proportional representation),
- **Holographic consensus** (approval by a small, representative group within a large organization).

Governance tokens also enable organizations to choose among several different methods to allocate votes, such as the **company model** (one vote per share), the **membership model** (one vote per person), or the **reputation model** (hybrid of the company model and membership model. Governance tokens can enable organizations to add incentives like **staking** to voting to increase or limit participation in the best interests of the organization. Governance tokens can be used to facilitate voting onchain or offchain using something like **Snapshot**.

By combining financial or community interests with programmable representations for decision-making, crypto innovators have found a way to use Governance Tokens to reduce the gaps between organizational set-up, implementation, and execution.

Uniquely, compared with other types of tokens, Governance Tokens may actually take many forms. There are Security Tokens, Utility Tokens, and LP staking tokens, that each perform a governance function. In this article, we will provide an overview of Governance Tokens by looking at the historical context of Governance Tokens and exploring the different ways they can be used to compose organizations, including DAOs.

Introduction to Governance Tokens

History has shown that the development of new technologies for rulemaking and governance enables new business models. From the Code of Hammurabi and stone contracts, to market monies and grain receipts, to the creation of land registries, to the advent of blockchain and smart contracts, each of these innovations makes it possible to identify parties in a transaction, set permissions based on different events, and execute the transfer of value based on rules that are predetermined and agreed upon by a group.

The creation of Governance Tokens has facilitated the rise of **Decentralized Autonomous Organizations** (DAOs), **Cybernetic Organizations** (cybOrgs), and **other digitally enabled business models**. They represent the next evolution of the ways that people can organize themselves, work on tasks, raise funds, or build communities. However, defining the attributes of these newfangled forms of governance has **proven particularly tricky**. This matters because the different architectures—or code—used to represent an organization require different safeguards to protect it.

As Web3 communities continue to experiment with Governance Tokens, certain trends and applications have emerged as stronger design patterns than others. Governance Tokens are beginning to see some standardization within three predominant flavors: Governance Tokens for the coordination of behavior, Governance Tokens for the financing of some investment, and hybrid Governance Tokens to coordinate behavior that is closely aligned with an investment. Effectively, these are the atomic structures of individual organizations. However, it is important to remember that, in the same way different atoms can combine to form molecules, different Governance Tokens can be combined to form bigger, nested governance structures.

The Strategies (and Pitfalls) of New Digital Platforms

Think about it this way: if you want to make rules that prevent a combustion engine from malfunctioning, the rules necessarily depend on what type of an engine you have—a combustion engine for a train will require different sets of rules than a combustion engine for a car, for example. A more relevant example, when thinking about the incorporation of a digital technology to a legacy business model, is ridesharing apps such as Uber and Lyft, and their subsequent impact on the Taxi industry. The use of digital platforms to facilitate marketplaces of drivers and riders is able to do things that their analog equivalents would simply be unable to accomplish. For example, digital platforms in ridesharing help to facilitate payments between parties leading to more trustworthy accounting; the rating of behavior for drivers and riders creates a new mechanism for reputation in these systems and improves trust in the app; and comprehensive records of transactions for all users ensures that there is accountability during the use of the application. However, there are also new risks associated with these new technologies. Uber and Lyft, for example, have been criticized for enabling the **algorithmic discrimination** of certain areas and groups based on race, **increased congestion in urban areas** and subsequently pollution, and reducing vetting and **identity theft in registration processes for drivers**.

And while Governance Tokens of the Web3 variety have not been around for very long, the sentiment motivating their precipitation has existed for a long while.

Bitcoin was created by Satoshi Nakamoto as a network that rewards people who maintain the network with mining rewards.

> **To some, the Bitcoin (BTC) network is the earliest example of a DAO there is. The network scales via community agreement, even though most network participants have never met each other. It also does not have an organized governance mechanism, and instead, miners and nodes have to signal support. However, Bitcoin is not seen as a DAO by today's standards. By current measures, Dash would be the first true DAO, as the project has a governance mechanism that allows stakeholders to vote on the use of its treasury.**
>
> - CoinTelegraph, "**What is a decentralized autonomous organization, and how does a DAO work?**"

/Governance Tokens

Drawing from the self-organizing nature of the network, the autonomy of its execution, and the miners, developers, and others who participate with the network, Bitcoin is arguably viewed as the first DAO. While the criteria for what comprises a DAO remains to be settled, Bitcoin is a distributed network. Bitcoin functions autonomously, per the instructions transcribed in the code. And Bitcoin is organized in a way that facilitates the governance of the network.

This is all to say that each container that is used to represent the various functions of an organization, such as membership, roles, permissions, decision-making, etc. has different strengths and weaknesses. DAOs and their ilk are no exception to this rule.

Exploring the Potential for Governance Tokens

The potential for Governance Tokens can be broken down into individual components. To start with, Governance Tokens can have a direct impact on the integration of legal rules into technical architectures. Then, it becomes easier to capture more sophisticated means of decision-making through tokenized architectures. Finally, Governance Tokens can also be used to dynamically enforce or adapt to specific types of behaviors.

Legal Integration

One of the biggest areas for opportunity with Governance Tokens is legal integration—the extent to which legal rules for governance might be embedded into a technical architecture. Some Governance Tokens will choose not to address this, in which case they would not be legally integrated. Other Governance Tokens will choose to directly address this, in which case they will be fully integrated. And still, there will be those who choose to address this to some partial extent, in which case they will be partially integrated. For purposes of this document, legal integration can take place in two ways: 1) Governance Tokens can be used to create a legal wrapper for an organization, such as a DAO, or 2) Governance Tokens can be used to create binding legal obligations through their use.

At its most basic level, a legal wrapper creates legal personhood for an organization. In the context of Governance Tokens, tokenization of a legal wrapper necessarily implies some type of DAO, cybOrg, or other Web3-native organization. The range and variety of these organizations is bigger than just DAOs, although DAOs are the most popular.

An organization would choose to adopt a legal wrapper instantiated by a governance token for reasons including the ability to easily engage with service providers like bankers, lawyers and consultants, and to be able to pay taxes. A legal wrapper will be jurisdiction specific and can include B-corps, C-corps, LLCs, or other legal entities in the United States.

Outside the US legal wrappers can include additional arrangements. A legal wrapper may be fully integrated (i.e., the authoritative bylaws of the organization as listed in the corporate filings link to code) or partially integrated (i.e., some component of the organization is referenced in corporate filings).

For a more in depth overview of Legal Wrappers and DAOs, we recommend checking out the below **DAO Entity Matrix from Paradigm** and the article **Legal Wrappers and DAOs** by Chris Brummer and Rodrigo Seira.

Decision-making

Governance Tokens also enable the ability to program increasingly sophisticated decision-making mechanisms in an organization. This is a huge innovation. Decision-making, in this context of governance, is analogous to corporate governance; **corporate governance** focuses on the question of how to motivate corporate board members to act in the interests of their stakeholders and formulates contractual and regulatory solutions. As tokenization enables new types of rules to be encoded into an organization's DNA, groups are able to determine the types of decision-making mechanisms that are most suited to their needs and literally embed them within the organization. Governance tokens improve upon legacy voting mechanisms by both enriching the process for voting and by making it more efficient.

In the same way that Bitcoin served as a direct response to the financial crisis of 2008, Governance Tokens can be seen as a direct response to the state of corporate governance. Traditionally, **corporate governance has eroded** into a dull ritual with procedural flaws that takes longer than it should and that is susceptible to fraud. Governance Tokens are by no means a panacea, but they do allow us to program interfaces for voting with the speed and trust of blockchain.

Behavior

A newfound ability to design an organization to achieve certain behaviors is the byproduct of legally and technically integrated organizations that can compose their decision-making processes and make them more efficient. This was the big realization from Vitalik Buterin's 2014 piece **DAOs, DACs, DAs and More: An Incomplete Terminology Guide**.
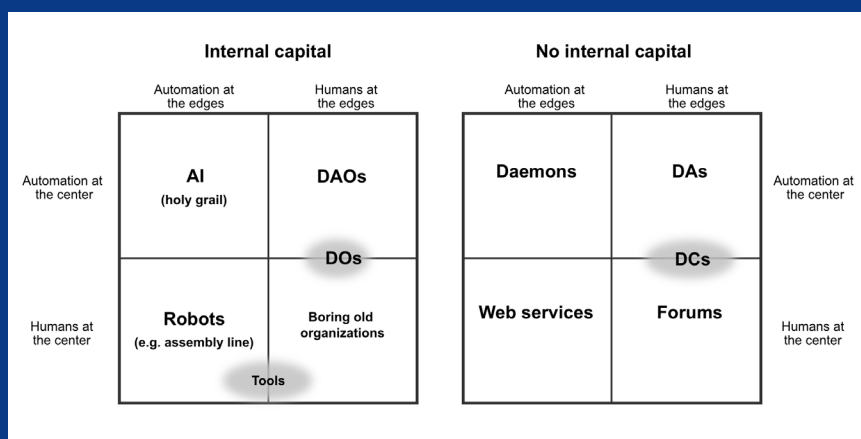
Vitalik Buterin, DAOs, DACs, DAs awnd More: An Incomplete Terminology Guide (2014)

Coordination DAOs

Generally speaking, Coordination DAOs serve to coordinate activity for a group of people without expecting returns. When a group of people seek to collectively perform a complex task, they need a coordination mechanism. Many strong examples of Coordination DAOs exist in the gaming space. Making games requires a high level of **coordination and alignment across large groups of people**. At a basic level, this makes sense because the practice of developing a game traditionally requires a heavy emphasis on user research and experience design, which heavily rely on the coordination of people who most care about a game—the gamers. By using Governance Tokens to coordinate the functions of a game's development a DAO can help ensure the products it is building are suited for the market it is targeting. Because these DAOs are not dealing with securities, it is typically common for these organizations to have less formal governance structures.

Investment DAOs

Investment DAOs are community governed groups that allow capital pooling and invest in projects with the goal of producing returns. As they deal with the

investment of money in a common enterprise with expectation of profits that relies on the work of others, the Governance Tokens used to deploy and Investment DAOs are typically going to be Security Tokens. Because these types of DAOs are dealing with securities, they are likely to be formed in a way that gives them a shield of liability. This means Investment DAOs will usually see a more robust governance structure in place to account for these needs.

The LAO is a great example of a project that allows members to pool capital, invest in projects, and share in any proceeds from the investment. The LAO is organized as a Delaware LLC, primarily administered via an online application and associated smart contracts.

Hybrid DAOs

Hybrid DAOs function with some combination of the above DAO tooling (e.g., a mechanism for coordinating and a mechanism for investing). These mechanisms could be blended into one organization that meets the heightened requirements of the SEC or the mechanisms could be stratified into two organizations that closely collaborate together. Hybrid DAOs can help minimize inefficiencies and reduce wasted energy while enabling companies to establish exactly which aspects of their governance should be decentralized and to what extent this should happen.

A great example of a Hybrid DAO is **LinksDAO**, a DAO attempting to purchase and provide access to golf courses all over the world. Members purchase NFTs to represent the type of membership that they have. The NFTs enable the member to vote on specific governance proposals and receive access to specific services and opportunities. The organization keeps all the money from the NFT sale on a platform called Gnosis Safe with a multi-sig. This means that the digital safe requires signatures from multiple people to move any funds. LinksDAO uses a separate operating entity called LinksDAO Inc. to manage the ownership of any physical assets, as well as serve as the day-to-day operating company for the prospective golf course. Pending legal nuances, LinksDAO also plans to give its DAO members the first opportunity to purchase into the operating company. If realized, some NFT purchasers could ostensibly receive equity ownership of a physical golf course and receive cash flows from the operation.

/Conclusion

While Web3 continues to develop, there remain a number of unanswered questions. Will the Securities market effectively balance consumer protection interests with financial inclusion? Can the regulators of the United States create a regulatory framework for Utility Tokens (i.e., tokens that are not Securities) so that fluctuations of a token's security status are not fatal to a project? Will NFTs overcome toxic marketplace behaviors and realize the full potential of the different types of NFTs that exist? Might LP Tokens become a tool for communities to self-regulate behaviors in a way that unlocks new value? Are governance tokens suited to the demands of financially mature and globally complex incumbent industries? These questions cannot be answered in this eBook, but they are fascinating to consider.

Additionally, there are some emerging developments and trends for each token identified in this taxonomy that merit further consideration in this conclusion. In the remainder of this section, we examine the future of these tokens – the interesting sub-categories within each token, some emerging trends developing with each token, and the regulatory developments.

The Future of Security Tokens

As a type of token that is regulated, Security Tokens offer a considerable degree of transparency in an otherwise opaque regulatory space. The increasing integration of securities with the TradFi market is a fertile area for new types of products that function with more efficiency than legacy instruments. However, from an economic standpoint, many of these financial products would benefit from an expanded scope and some new definitions. The 2012 JOBS Act demonstrated the potential impact of modernizing securities regulations when it created an expanded category for Crowdfunding. With the rise of tokenized real estate, tokenized debt, and Investment DAOs, a new category for tokenized securities could simultaneously improve financial inclusion and promote consumer protection in this space.

The Future of Utility Tokens

The future of utility tokens looks about as confusing as the past. That is to say, the future lacks clarity because there is still no real legal consensus about the definition of a Utility Token. Because there is no definition, some of the less innovative (and therefore safer) developments in the utility token space make up the most notable emerging innovations in the space. In particular, stablecoins, reward programs, and central bank digital currencies show more promise for mainstream adoption than some of the more exotic types of Utility Tokens that may actually be more innovative and exciting than the sub-types of Utility Tokens I listed. As it pertains to the *Howey Test* and the Hinman Factors, an interesting practical development to monitor is the use of DAOs to obtain "sufficient decentralization" of a token before while it is being developed and before raising money. This seems like a work-around that can, in limited circumstances, function as a bandaid for the regulatory issues plaguing these tokens.

The Future for NFTs

The explosion of interest and speculation in NFTs has led to increased awareness of the unique features of NFTs. However, a lack of clarity around what is actually owned in NFTs (e.g., the ways the intellectual property rights of the code match up to the intellectual property rights of the marketplace the code is being issued on and the intellectual property rights of the NFT administrators) plagues the space. Dynamic NFTs, Fractional NFTs, and NFT Tickets all show signs of promise and the creation of value that could do more than the non-tokenized equivalents of each of these. However, they remain largely unproven. As better design patterns emerge, better mechanisms of delivery are developed, and more safeguards are built up around NFTs, there are lots of interesting conceptual and commercial opportunities that will emerge.

The Future of LP Tokens

As the bedrock of DeFi innovations, LP Tokens offer a truly exciting mechanism by which incentives can be programmed into token economies. These are notably more sophisticated than many mainstream tokens because LP Tokens are a byproduct of transactions involving multiple tokens. As such, the emergence of bonding curves and automated market makers help advance the conversation about what Web3 is capable of—from a place where we are just launching one token, to a place where we can decide what types of outcomes we might program our communities to achieve. Due to the sophisticated nature of these

products and because they rely on the use of a decentralized exchange to fa-
cilitate transactions, many of the regulatory developments in this area relate
to trading securities, money transmission, and the trading of commodities and
derivatives.

The Future of Governance Tokens

The decentralization and tokenization of decision-making (i.e., the use of gov-
ernance tokens) has been one of the most fertile areas for innovation in web3.
Emerging governance design patterns, including NFTs as membership creden-
tials and the nested creation of DAOs, sub-DAOs, and so on, offer an interesting
glimpse into the future. The ability to distinguish between constituent organi-
zational components gives a sense of composability that means it is as easy
to spin up the governance of an investment DAO to finance a new venture as it
is to spin up the governance of a protocol DAO to help sufficiently decentralize
a utility token. This space will inevitably get more interesting as the market for
these products develops. As it develops, an interesting regulatory concept to
track emanates from the age-old arena of jurisdictional arbitrage. From a more
local perspective, issues remain relating to **piercing the corporate veil** and
other questions of corporations and business organizations that, if addressed
without careful thought and nuance, could have a chilling impact on the future
of Web3.

Closing Remarks

Thinking back to Stuart Haber and Scott Stornetta's 1991 article, **How to Time-
stamp a Digital Document**, a driving focus of the invention of blockchain was to
verify digital claims in such a way that enabled us to bring trust to digital trans-
actions. As we look at the ways tokenization can be helped to achieve digital
trust, it is more important than ever to do so in a way that is responsible.

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token, select "Learn More" at: **https://www.upside.gg/**.