What is an NFT? (A Refresh)

NFT stands for **Non-Fungible Token**, a one-of-a-kind digital asset that can't be duplicated or forged thanks to the power of cryptography and blockchain platforms. Often, NFTs embody ownership of distinctive digital items like artwork, collectibles, and more.

On the blockchain, NFTs are securely stored and traded, enabling transparent tracking of ownership. Unlike conventional cryptocurrencies, which are interchangeable and usually possess a fixed supply, each NFT is a distinct entity with its own unique attributes.

The easiest way to understand NFTs is to view them as digital objects. That way, the potential use cases of NFTs also become clearer.

NFTs have revolutionised the digital landscape by enabling us to harness the power of blockchain to:

1. Establish ownership and provenance of unique items such as art, digital collectibles, game assets, and other digital content, which is by its nature very easy to duplicate and almost impossible to authenticate prior to NFTs.
2. Enable the seamless and transparent distribution of artists' royalties and percentage commissions on resales.
3. Authenticate identity documents and combat counterfeiting in products, tickets, and documents.
4. Trace physical items throughout supply chains, ensuring transparency and reliability.
5. Potentially facilitate a plethora of other use cases, such as real estate transactions, event ticketing and many others by representing ownership, streamlining transfers, and minimising fraud.

Additional Resources:

The Definition of NFT - Merriam-Webster [https://www.merriam-webster.com/dictionary/NFT]

Why Cardano?

Unlike other blockchains where NFTs exist as part of a smart contract, Cardano is a multi-asset network - NFTs are **native tokens**, the purest representation of a digital object. This means they coexist on the same level as ADA, the chain's base token, and don't require a separate smart contract for minting. This design not only reduces the potential for exploitation but also enhances the overall security of the NFT ecosystem. This is why Cardano stands out as a unique platform for NFTs, offering an unparalleled level of integration and security.

Furthermore, Cardano allows NFT metadata to be stored directly on the blockchain's base layer, ensuring an inseparable and secure connection between the NFT and its associated data. While there is a limit to the amount of data that can be stored in a single Cardano transaction, it is generally more than enough for most use cases. For example, our *Icons* collection, which was released alongside Cardano's smart contract introduction, contained the code for an entire token transaction and royalty payment smart contract within the NFT's metadata – fully functional and compilable.

To date, more than **9 million NFTs** have been minted across approximately 90,000 NFT collections on Cardano. While these numbers may initially seem significant, they represent just a fraction of the activity on the more established Ethereum NFT ecosystem. Thus, Cardano holds significant growth potential, not just of the NFT ecosystem, but for the entire platform. By joining the Cardano community now, you'll most likely be among the early adopters who help shape its future. The spirit of innovation and pioneering inherent to Cardano is reflected within its NFT space. Creators and projects continually try to introduce new features and ideas, and

while not all attempts succeed, innovation is rarely a straight line.

Moreover, Cardano boasts a vibrant and supportive NFT community, with collectors and developers eager to engage and answer questions, both technical and non-technical. As a result of this passionate community, there are multiple ongoing efforts to develop and grow Cardano's NFT infrastructure, as demonstrated by the multiple NFT focused **Cardano Improvement Proposals (CIPs)**. This collaborative ethos is also exemplified by the **NFT Guild**, an organization dedicated to empowering NFT creators and developers by promoting the development of standards and tools for the Cardano NFT community. To learn more about the NFT Guild and its initiatives, visit https://www.nft-guild.io , or to find out more about the current NFT related CIPs and initiatives, visit the NFT Guild Rountables section [https://www.nft-guild.io/the-nft-roundtable] .

Additional Resources:
Pool.pm NFT Tracker [https://pool.pm/nfts]
Cardano Improvement Proposals (CIPs) Homepage [https://cips.cardano.org]

What is Cardano?

Decentralisation is at the core of blockchain technology, without decentralisation a blockchain is just a cumbersome database. Cardano is one of the world's most decentralized blockchains, a cryptographic ledger supported by over **3,000** independent network validators, also known as stake pools. This robust infrastructure guarantees an immutable record of ownership and indisputable provenance that is 100% verifiable, trackable, and public.

Cardano is an **eUTxO blockchain**, which takes the revolutionary UTxO model of

Bitcoin (Unspent Transaction Output) and extends it with key properties, such as the ability to handle multiple assets natively, both fungible and non-fungible (NFTs).
Cardano was launched in 2017 by Input Output Hong Kong - IOHK (currently Input Output Global - IOG), a technology company founded by Charles Hoskinson, who is also one of the co-founders of Ethereum. IOG, in collaboration with the Cardano Foundation and Emurgo, has played a pivotal role in the development and growth of the Cardano ecosystem. Unlike many other blockchain projects, Cardano is built on a foundation of academic rigor and peer-reviewed research, employing a methodical, research-driven approach to overcome challenges and develop innovative solutions. This commitment to scientific research and collaboration with renowned institutions worldwide has enabled Cardano to set itself apart from other blockchain platforms, as it continuously strives to enhance its technology and expand its capabilities.

To better understand the basic principle of the (e)UTxO model, consider the "bundles of cash" analogy. Imagine 10 bundles of cash (10 UTxOs) representing the total amount of ADA in the system, shared among five people (five wallet addresses). The Cardano ledger doesn't move cash (ADA and tokens) between users; instead, it records who the bundles of cash belong to and creates new bundles to facilitate new transactions. The ledger generates "change" bundles to account for all the ADA involved in a transaction. The remaining ADA after a transaction becomes the new UTxOs, distributed according to the data in the transaction.

For example, if you want to send 8 ADA from your wallet, which holds a total of 10 ADA in two separate bundles (UTxOs) of 5 each, both UTxOs will be required as inputs for the transaction. This is similar to paying someone $8 using two $5 bills – you would need to provide both bills to cover the $8 and would receive $2 as change. In a similar manner, the blockchain consumes both 5 ADA UTxOs, sends 8 ADA to the recipient, and creates a new UTxO with 2 ADA as change, that is sent back to your wallet. However, "sending" or "moving tokens" in a digital ledger doesn't involve a physical transfer; it means deducting tokens from the sender's balance and allocating them to the recipient.

Much like a physical wallet can contain multiple types of currency, a Cardano wallet can hold various types of tokens, both fungible and non-fungible. This versatility allows Cardano transactions to have unique capabilities, such as sending multiple tokens (FTs and NFTs) in a single transaction, accommodating dozens of

tokens and ADA, and enabling a single transaction to have multiple recipients. In practice, this means that a single transaction – requiring only one fee – can send ADA and 100 different NFTs from various collections to 20 different people, each receiving a unique combination of ADA and NFTs.

Cardano's smart contract capabilities bring additional versatility to the platform, enabling the creation of decentralized applications (dApps) that can cater to a wide range of use cases, including NFTs. With the introduction of smart contracts, artists and creators can develop more complex and interactive NFT experiences, such as programmable art and even NFT-based games. Plus NFT creators can benefit from the growing ecosystem of smart contract powered dApps built specifically for NFT use cases, such as decentralised marketplaces, NFT based authentication and voting platforms and many others (more details later in the guide). For instance we are currently building a smart contract powered NFT swapping pool for collectors. This flexibility empowers artists and developers to explore new creative horizons and unlock the true potential of the NFT ecosystem on Cardano.

Cardano stands out as a third-generation blockchain, designed with the aim of tackling the scalability, security, and sustainability issues that earlier blockchains like Bitcoin and Ethereum faced. With its unique architecture and layered approach, Cardano can handle a larger number of transactions without sacrificing security or decentralization. Plus, its energy-efficient consensus mechanism, Ouroboros, makes Cardano a sustainable option for the growing NFT ecosystem. By choosing to build on top of the decentralised and secure Cardano infrastructure artists and creators can ensure a reliable and scalable foundation.

Additional Resources:

Why We are Building Cardano - Charles Hoskinson [https://whitepaper.io/document/581/cardano-whitepaper]

What is a Stake Pool? [https://cardano.org/stake-pool-operation#stake-pool]

Why Create These Guides?

As the Cardano NFT ecosystem continues to grow, it's becoming increasingly important for artists and creators to have access to reliable, accurate, and easily digestible information. These guides are designed to fill that need, offering a comprehensive and easily accessible resource for those looking to navigate the ever-evolving Cardano NFT landscape.

By providing a central hub of knowledge, we aim to empower artists and creators to make informed decisions. From understanding the unique aspects of Cardano's blockchain to exploring the most relevant tools and services, the guides try to cover all aspects of Cardano NFTs.

By sharing our own experiences and insights, we hope to inspire others to explore new creative possibilities and contribute to the growth and success of the Cardano NFT ecosystem. We have been active in the space since early 2021, when native assets were still an unreleased feature. We released our first NFT collection in May of 2021, and have launched several more since. We have been core members of the NFT Guild since January 2022, which has enabled and required us to stay up to date with most major developments in the space.

Who are These Guides for?

Everyone is welcome to learn from these guides and possibly uncover new aspects of the Cardano NFT ecosystem, however they are primarily designed for artists and project creators who already have some experience with NFTs on other blockchains (Ethereum, Tezos, etc.). These guides aim to provide valuable insights and guidance for those looking to delve deeper into the Cardano NFT landscape and expand their creative horizons in this rapidly growing ecosystem.