Misconceptions surrounding NFTs

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Executive Summary

NFTs ensure transactions' authenticity and uniqueness. They have the potential to dramatically expand circulation of digital assets. However, they currently do not necessarily ensure the uniqueness or authenticity of their underlying digital assets because only a portion of their data is recorded on a blockchain. Additionally, legal rights in Japan are fuzzy with respect to transferring IP and title to NFTs. Widespread adoption of NFTs will likely require standardized licensing terms and expansion of NFT standards.

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NFTs' functionality and structure

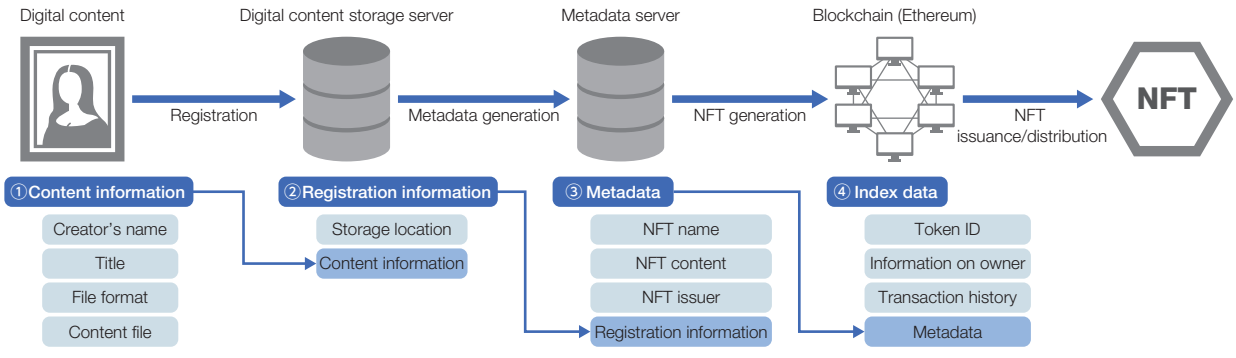
NFTs are one-of-one (nonfungible) tokens minted on a non-falsifiable blockchain. Endowing a digital asset with nonfungibility ensures the asset is uniquely identifiable. Meanwhile, NFTs' transaction history is preserved on a non-falsifiable blockchain as proof of the transactions' authenticity.

NFTs have a multilayer nested structure[1] (see diagram). The first layer contains information about the tokenized digital content itself (e.g., artwork, video clip or other collectible). The second contains the layer-one information plus registration information that points to where the layer-one data is stored. The third layer stores metadata pertaining to the NFT, together with the registration information. The fourth contains index data stored on a blockchain, in addition to the metadata layer. The key point is that only the index data is stored on chain (i.e., on a non-falsifiable blockchain) while the other three layers of data are stored off chain.

NOTE

1) The NFTs discussed herein are ones that conform to the ERC-721 Non-Fungible Token Standard, which governs token issuance on the Ethereum blockchain.

NFTs' structure



Source: NRI

Misconceptions surrounding NFTs

The main reason that only index data consisting mainly of token information is recorded on chain while the digital content and other data are stored off chain is that on-chain data storage capacity is limited. The information recorded in NFTs that ensures authenticity and uniqueness is limited to the transaction history and ownership information. In this sense, an NFT is merely a record of the fact that a certain digital asset was purchased by the party identified as its owner.

In other words, an NFT essentially functions as a receipt. Needless to add, a receipt does not contain the actual goods purchased in the transaction it documents. This point seems to have been lost on the vast majority of participants in the recent NFT boom. The following two misconceptions about NFTs are particularly common.

Misconception 1: NFTs ensure their content's uniqueness, authenticity and permanence

NFTs ensure only the authenticity and uniqueness of transactions involving a given digital asset. NFTs today can be issued in batches as copies of a digital asset (i.e., they are not necessarily individually unique from each other). Additionally, NFTs that illicitly copy third-party digital content can be issued as if they were the issuer's original content (i.e., authenticity is not guaranteed)[2]. Lastly, because the data files that constitute digital assets are stored off chain, not on chain, they may be overwritten, erased or otherwise lost (i.e., permanence is not guaranteed).

2) A major US NFT marketplace reported 80% of the NFTs minted on its platform were plagiarized or fake according to a June 27, 2022, Nikkei article.

Misconception 2: NFTs confer title and IP rights to the tokenized content

The transaction history recorded in NFTs is strictly limited to information on the current owner of the token. Title to the token's underlying digital asset does not automatically transfer to the NFT owner[3]. IP rights to digital content purchased through an NFT, including the rights to adapt/modify, copy and commercially use the content, are likewise retained by the creator unless the NFT contract expressly stipulates otherwise.

3) Under Japan's Civil Code, property ownership is limited to tangible property, which does not include digital data. Ownership of Bitcoin, for example, is not legally recognized in Japan because Bitcoin is not considered tangible property. The same applies to NFTs.

Toward mass adoption of NFTs

NFTs have the potential to dramatically expand circulation of digital assets.

However, the information contained in existing NFTs that ensures authenticity and unique identifiability is limited to information recorded on chain. Increasing on-chain storage capacity enough to be able to record digital content itself on chain is not practically feasible[4].

4) Expansion of current token standards, mainly ERC-721, has been variously discussed but no concrete solution has been identified yet.

It is therefore crucial to build infrastructure external to NFTs to compensate for NFTs' current limitations. One way to do so would be to expand existing means of ensuring digital assets' uniqueness, authenticity and permanence. Another would be to establish legal provisions for transferring title and IP rights via NFTs. Development of standardized NFT licenses is under discussion as one idea to address these two issues. VC firm Andreessen Horowitz has proposed a set of licenses for NFTs modeled after Creative Commons licensesi[5]. The proposed licenses define NFT purchasers' IP rights across a number of categories, including the rights to copy, display, distribute, commercially use and adapt/modify. They aim to also deter piracy by penalizing unauthorized use of third parties' creative works.

5) See https://cointelegraph.com/news/a16z-proposes-a-set-of-licenses-especially-for-nfts-based-on-creative-commons-model.

In Japan, the Ministry of Economy, Trade and Industry has established an NFT working group in response to a policy proposal by the Liberal Democratic Party's NFT Policy Project Team. Additionally, Japan's Digital Agency's Priority Policy Program for Realizing a Digital Society also addresses NFTs. We hope such initiatives gain momentum.

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