



Exploring the Potential of Institutional NFTs Technology in the Emerging Digital Ecosystems of Web3

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Abstract: The emerging technologies in the Web3, Blockchain, NFT and Artificial Intelligence domains have become a true dynamic environment in the last years. Numerous projects are in continuous development and new challenges are being resolved with the introduction of decentralized ecosystems and immutable ledgers at a global scale. Therefore, a trust-based dynamic communication system is required to facilitate the interactions and enhance the knowledge between citizens and institutions and how their interactions will be shaped by the emerging NFT (Non-Fungible Tokens) technology. One of the promising innovative technologies in blockchain technology which enables transparent, secure, real-time trading of digital assets exchange and automation through smart contracts, in a distributed technological ecosystem, are the NFTs and their slow adoption by institutions. This study aims to explore and analyze the application of NFT technology on the resilience of the institutional management through compliance, innovation and potential of creating new business models for the emerging Web3 markets.

Keywords: Blockchain technology, institutional NFT (Non-Fungible Tokens), digital assets, institutional NFT Marketplace, Web3, DeFi (Decentralized Finance).

INTRODUCTION TO INSTITUTIONAL NFTs AND THEIR POTENTIAL IMPACT ON WEB3 ECOSYSTEMS

In the last years, the world of digital ecosystems and digital assets has experienced an incredible growth, thanks to the emergence of Non-Fungible Tokens (NFTs). NFTs are a type of digital assets that are unique and cannot be replicated or replaced. They are built and minted on

blockchain technology networks, which allows for the creation of digital assets that are secure, transparent and verifiable. (ConsenSys, 2020)

The global NFT market has expanded rapidly since 2020, with a rising number of retail investors buying and selling digital collectibles, art, and other digital assets that have a real-life utility added to it. However, the NFT market is still in its infancy but has yet to see the full potential of institutional adoption of NFTs.

Institutional NFTs are a new type of digital assets, designed to meet the needs of institutional investors and are to be listed and traded on institutional NFT marketplaces, with governmental endorsement and compliance. These NFTs are built on blockchain technology, which enables them to become more compliant than traditional digital assets, by having KYC (Know Your Customer) and AML (Anti Money Laundry) compliance requirements.

Institutional NFTs and regular NFTs differ in their intended audience and purpose. Institutional NFTs are designed for institutions such as museums, galleries, and other institutions, while regular NFTs are typically marketed to individual collectors or fans of a particular artist or creator. Institutional NFTs are often created to showcase important artworks, cultural artifacts, or historical objects, and may be used for educational purposes or as part of an exhibition. Regular NFTs, on the other hand, can represent a wide range of digital assets, such as music, videos, or graphics.

Institutional NFT marketplaces and regular marketplaces also differ in their focus and scope. Institutional NFT marketplaces are often curated by experts in the field, and may feature only high-quality, historically significant works. These marketplaces may also feature educational resources and information about the artworks or cultural objects being sold. Regular marketplaces, on the other hand, tend to be more open and democratic, allowing

anyone to buy and sell NFTs, regardless of their background or expertise. (Allison, 2021)

Another key difference between institutional NFTs and regular NFTs is the level of verification and authentication that is required. Institutional NFTs often require rigorous authentication and provenance checks to ensure that the artwork or cultural object being sold is genuine and has not been tampered with. Regular NFTs, on the other hand, may not require the same level of authentication, and may be more susceptible to fraud or manipulation.

Overall, the differences between institutional NFTs and regular NFTs reflect the diverse ways in which these digital assets are being used and marketed, and the unique needs of different audiences and institutions. Whether you are an individual collector or a cultural institution, there are a range of NFTs and marketplaces available to suit your needs and interests.

NFTs have the fundamental capability to offer increased liquidity and market depth, which is decisive for institutional investors who need to be able to buy and sell large volumes of assets quickly and efficiently (Gonserkewitz et al., 2022).

At a systemic, architectural and implementation level, institutional NFTs have the competence to bring more transparency, security, and efficiency to the blockchain ecosystem, by uniting the activities of the private sector with the public sector, through immutable ledgers, digital assets and interconnected digital compliant entities, by being redefined as dataNFTs (see Figure 1).



Figure 1. Data NFT infrastructure for unlocking value in data (Itheum, 2023)

What is a dataNFT and what does it enable?

- Highly personal or sensitive datasets can essentially function as a NFT allowing for uniqueness and limited availability;
- Limit the distribution of your highly sensitive or protected datasets to a smaller, controlled circulatory amount;
- Allow for resale in secondary markets and earn royalties if your data is resold. i.e. if a buyer resells your data, you can earn a % as royalty;
- Your unique data will be minted with an aesthetic “generative art wrapper” created using the unique signature of the data. E.g.

your DNA data can be represented as piece of unique generative art (similar to Autoglyphs) which is sort after as it has rarity, creativity and actual utility (Itheum, 2023).

They can also create new financial instruments, such as NFT-based derivatives, which can be used to hedge risk and manage exposure to digital assets but also to develop new markets with circular economies (Gogo, 2021).

Overview of the current state of web3 finance and how institutional NFTs fit into the emerging ecosystem

A global view on NFT global investments interest, until 2022, can be seen in Figure 2.

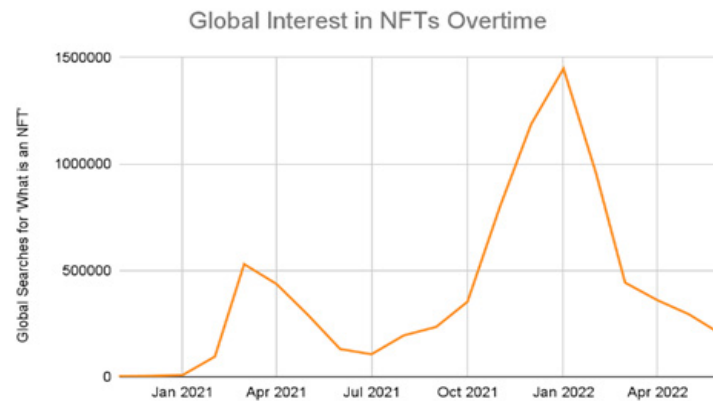


Figure 2. Global Interest in NFT technology until 2022 (Bybit, 2021)

Since 2020, after the introduction phase of the traditional NFTs technology and their Marketplace platforms, the applicability of this technology raised the interest to new market players and studies show that the format of an institutional NFTs can also be used to tokenize real-world assets, such as bank assets, real estate, art, collectibles and many others. This would allow for the creation of new digital assets that are backed by real-world assets that can increase their value and make them more attractive to institutional investors who, by definition, operate in compliant architectures (Paige, 2022).

As a conclusion, an institutional NFT concept is a new type of NFT that can gain attention from the markets and could be designed to meet the general needs of institutional investors like banks, institutions, governmental authorities and public administration. They have the potential to innovate the world of Web3 finance by creating new financial instruments,

tokenizing real-world assets and bringing more transparency, security, and efficiency to the users of the digital ecosystems.

NFTs ADOPTION AT INSTITUTIONAL LEVEL AND USE CASES

What is a dataNFT and what does it enable?

The procedure by which an issuer generates digital tokens on a blockchain network, and which are characterized as digital or physical assets, is called Asset Tokenization (see Figure 3). Distributed ledgers assure that once you buy tokens representing an asset like physical – digital, equity, funds, services etc., no single authority can remove or alter your ownership - the ownership of your asset remains fully immutable and monetizable through Royalties (Hedera Bulletin, 2022).

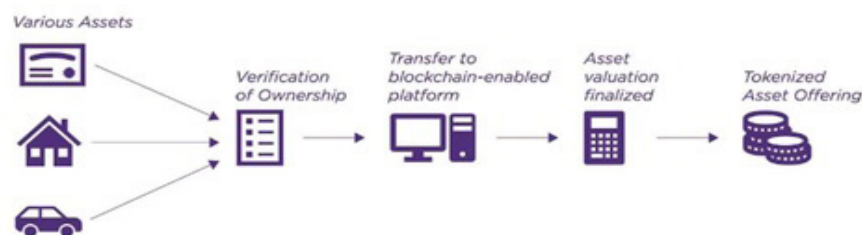


Figure 3. Asset Tokenization procedure (Kingston Computer Consultancy, n. d.)

Tokenization of real-world assets (e.g., real estate, art, collectibles)

At the moment, the tokenization of real-world backed objects like real estate or art collectibles, like paintings and sculptures, can permit for fractional ownership of properties by one or many investors through automated smart contracts, fact that facilitates distinct investors to invest in this kind of assets with crypto or fiat, that are under legal and governmental management with special NFT technology and DeFi (Decentralized Finance), called Security Tokens.

The upcoming European Union / European Commission regulation, MiCA (Markets in Crypto Assets Regulation) will embed new opportunities

to increase the liquidity of the real estate market, making it easier for owners to sell their properties, and for buyers to find properties to purchase, based on digital asset technologies solutions (European Commission, 2022).

Additionally, tokenization allows for the conception of digital assets that are endorsed by real-world assets, which can increase their value and make them more attractive to institutional investors like regulating financial institutions, insurances and others alike. This fact enables a more efficient and secure trading of real estate assets within decentralized and compliant ecosystems and institutional endorsed markets. As well, it can facilitate transborder investments in digital assets with complete transparency and ownership (see Figure 4).

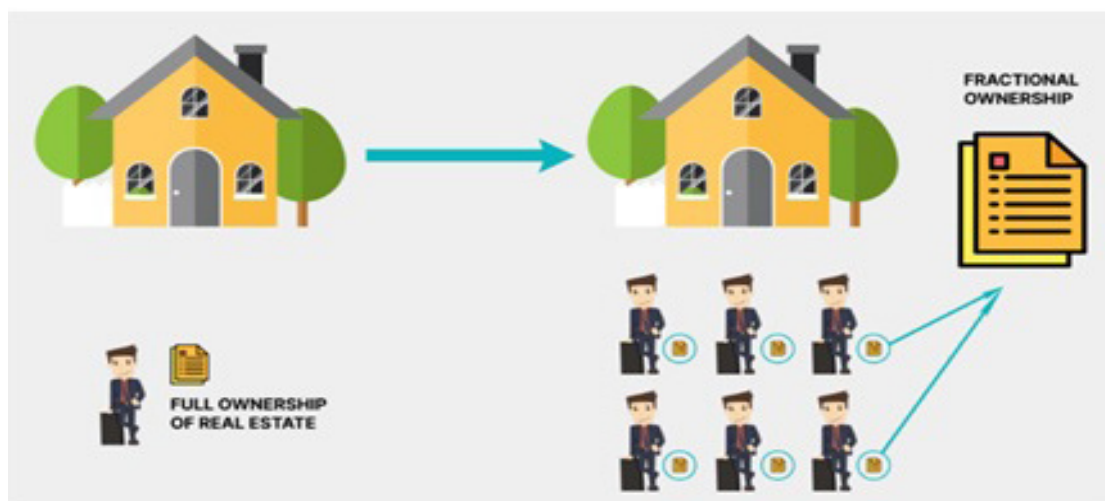


Figure 4. Real Estate Example of Asset Tokenization and Fractional Ownership (Perzhanovskiy, 2022)

Use cases for institutional NFT in the public administration domain

One of the most important utilities that institutional NFT technology and institutional NFT marketplaces can implement into market activities is the automatic management of digital assets at the national level, from Government, authorities and institutions in areas such as (Blanco, 2022):

- **Tokenizing public land:** tokenize public land and sell fractional ownership to investors, thereby raising funds for public projects while also democratizing access to real estate;
- **Digital Identity:** create secure digital identities for citizens, which could be used for voting, accessing public services, and more;
- **Digital Certificates:** create digital certificates for things like licenses, permits, and educational degrees. A circumstance like this will benefit the citizens to demonstrate their qualifications, but also government

- agencies or other international institutions to verify them;
- **Digital Art and Collectibles:** create digital art and collectibles that could be sold to raise funds for public projects;
 - **Public Auctions:** conduct public auctions for things like public contracts, licenses, and public land, making the notarial and juridical processes more efficient and transparent;
 - **Supply Chain Management:** track goods and products as they move through a supply chain, making it easier to identify and address issues related to fraud and counterfeiting;
 - **Public Service Delivery:** create digital proof-of-delivery for public services, such as health care, education and social welfare, making the process more efficient and transparent;
 - **Digital Voting:** create secure digital voting systems that could be used for elections and other public votes;
 - **Digital Taxation:** create efficient digital tax systems that could be used for things like property taxes, sales taxes, and more;
 - **Public Asset Management:** create a national digital register of public assets, facilitating institutional tracking and management.

Benefits and Innovation of Asset Tokenization

Blockchain distributed ledgers have numerous attributes that could be very appealing to the investors, especially in the institutional space. Digital assets tokenized on blockchain or DLTs (Digital Ledger Technology) are technologically founded upon (Crypto Futurist, 2022):

- **Immutability:** Once an investor buys tokens (digital assets), nobody can „remove” the ownership;
- **Compliance:** The tokens with which the investors will trade on institutional NFT Marketplaces are digital assets certified by institutions with special governmental permissions (legal and financial), to

operate with real-life assets in partnership with other afferent institutions;

- **Transparency:** Tokens eliminate asymmetry of information present during the transfer of ownerships;
- **Accessibility:** Tokens can be accessed from any place in a world, at any time, via smartphone app or web wallet portals;
- **Cost-efficiency:** Tokens eliminate the „middlemen”, situation which often limits the investment accessibility by e.g., restricting investments only to accredited investors, charging high fees and demanding access to stock-trading accounts;
- **Divisibility:** Tokens hold a capacity of greater liquidity which increases the expected value from trade and eliminates the need for minimum investments.

Institutional NFTs have many potential use cases in public administration, and these examples show that compliance technologies (KYC, AML and legal frameworks) can be used to make citizen and public administration interactions more efficient, transparent, and secure.

Creating new financial instruments (e.g. NFT-based derivatives)

Another perspective for NFTs application in institutions is the creation of new financial instruments and business models, such as NFT-based derivatives. In the decentralized ecosystems, derivatives are financial smart contracts that derive their value from an underlying asset (tangible or intangible), such as commodities or stocks, traded daily by market players. (Mishra, 2022).

NFT-based derivatives will find their utility in hedging risk and managing exposure to digital assets. This can be particularly beneficial for institutional investors who are looking for ways to manage the risks associated with their investments in digital assets.

Institutional NFTs can empower a more efficient and secure trading of digital assets on emerging Web3 technology platforms and markets and one of the key benefits of blockchain technology is

that it allows the creation of digital assets that are owned by institutions or citizens, trading them at national or international level, being particularly beneficial for institutional investors who need to be able to buy and sell large volumes of digital assets quickly and efficiently.

Within the topic of adoption at an institutional level, the transparency and security offered by the blockchain technology can also help to decrease online fraud and improve the overall trust in the digital assets market, through compliant and regulatory norms for each country that will study and implement this kind of emerging standards.

Enabling more efficient and secure trading of digital assets

NFTs have several use cases in Web3 finance. Tokenization of real-world assets can allow for fractional ownership, increased liquidity, and more efficient and secure trading of assets.

The creation of new financial instruments like NFT-based derivatives have the economic capabilities to provide institutional investors with numerous ways to hedge risk and manage exposure to digital assets and expand their own business models by creating circular economies.

The above presented use cases make institutional NFTs an exciting opportunity for the future of Web3 and the approach between citizens and public administration. (Public, 2023)

ADVANTAGES OF INSTITUTIONAL NFTs FOR WEB3 IN THE FINANCIAL DOMAIN

Institutional NFTs offer several advantages for Web3 financial developments within national authorities, including (Upyo, 2023):

Increased liquidity and market depth for institutions

NFTs used in institutional affairs may increase the liquidity and market depth of digital assets, making it more efficient for national and international institutional investors to list, buy and sell large volumes of assets quickly and efficiently, through special institutional NFT marketplaces, compliant with the legal framework of each particular country. This fact can be principally useful for existing real-life assets that have historically been illiquid, such as real estate, collectibles, certificates, land ownership any many other areas of institutional products that are subject to digitization (see Figure 5).

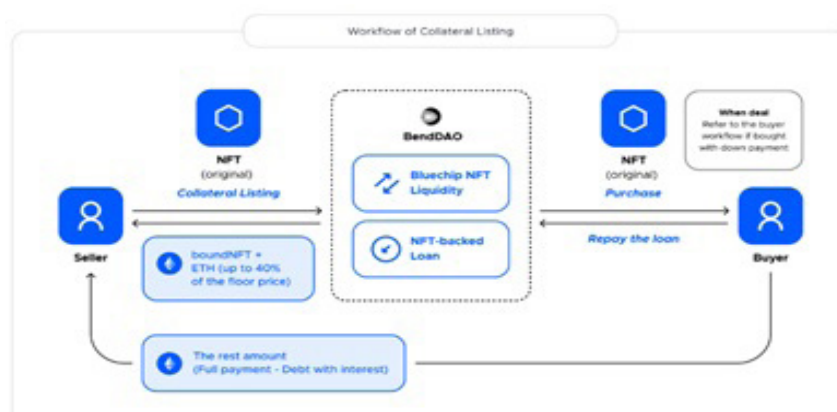


Figure 5. Market Liquidity creation in NFT Technology (BendDAO, n. d.)

Greater transparency and regulatory compliance

Institutional NFTs projects are subject to be built on immutable blockchain technology,

which enables the creation of unique digital assets and can help increase trust in digital assets markets and facilitate compliance with regulations and legal frameworks for institutional investors.

Improved security and fraud prevention

The embedded transparency and security provided natively by the blockchain technology through immutability can fundamentally help reduce fraud and improve the overall trust in the digital asset markets, due to a regulated market

that they will be launched upon, with KYC and AML certifications. This fact can be particularly beneficial for institutional investors who are concerned about the risks associated with investing in digital assets and developing own compliant designed systems or market places (see Figure 6).

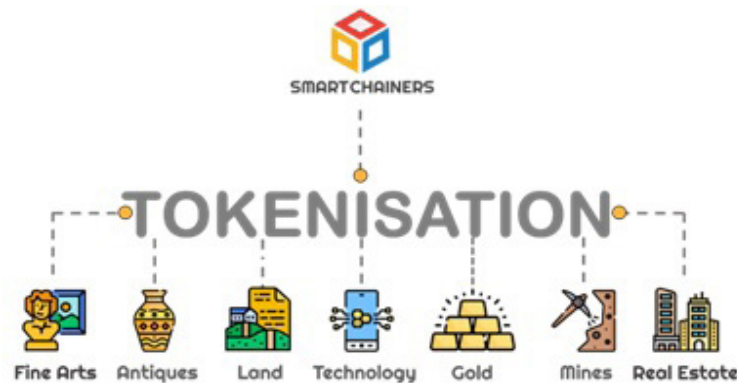


Figure 6. Blockchain based asset tokenization and use cases (Smart Chainers, n.d.)

Reduced operational costs and increased operational efficiency

Institutional NFT technology can assist to reduce operational costs and increase operational efficiency in various domains such as real estate, art, education, health, insurances, logistics, state authorities and many others that are capable of digitization. It will create the opportunity to lower the barriers to the integration of the institutional investors in a compliant ecosystem and will make it easier for them to invest in digital assets or use them for interacting with citizens or other governmental authorities in an efficient way.

As a conclusion, institutional NFTs offer numerous advantages for financial applications on Web3. They can increase liquidity and market depth, provide greater transparency and regulatory compliance, improve security and fraud prevention, reduce operational costs and increase operational efficiency. These advantages on so many domains can make institutional NFTs an attractive option for institutions that are

looking to research, develop and invest in innovative digital asset technologies (Ernst & Young Global Ltd., 2023).

CHALLENGES FACING THE ADOPTION OF INSTITUTIONAL NFTs IN WEB3

While institutional NFTs have the potential to revolutionize financial Web3 applications, there are also several challenges and limitations that need to be addressed. Some of the most relevant aspects of the challenges that NFT technologies are facing towards institutional adoption are (Omar et al., 2023):

- Lack of infrastructure and standardization in the NFT markets;
- Regulatory uncertainty and legal framework;
- Scalability issues and high transaction fees on blockchain;
- Limited understanding and awareness among institutional investors;
- Global markets situations periods, like bull or bear markets.

Need of regulatory clarity and regional legal frameworks for intersecting the private and the public sector

The regulatory landscape for NFTs is still in its early stages and there is still a need to clarify the consensus around how they should be regulated. It is essential to create as much certainty as possible for all the users and institutional investors and enhance the growth of institutional NFTs concepts.

Along the last years, a substantial work has been done at international level in designing and adapting institutional regulations to the new emerging business models of the decentralized technology, and a lot of pioneering has already been done.

The upcoming MiCA (Markets in Crypto Assets Regulation) regulation of the European Commission is about to be launched in 2023 with a substantial potential for developments in the crypto space and will encourage the adoption of countries within EU and its institutions to invest, develop particular solutions and operate on these new emerging decentralized technologies, like Blockchain, Web3, NFT, AI (Artificial Intelligence) and many more to come.

Volatility and lack of standardization in the NFT market – MiCA and national regulations

The NFT technology marketplaces are still relatively new, and there is a lack of standardization in terms of pricing and valuation. This temporary lack of clarity can make it difficult for institutional investors in different periods of global market conditions to accurately value and assess the risk associated with NFT investments. Additionally, the NFT market is well-known for its volatility, which can make it a risky investment for institutional investors.

MiCA (Markets in Crypto Assets Regulation) is the upcoming regulation of the European Parliament and the Council of the European Union, presenting a set of legislation conferred to all companies having their business model in the crypto assets space, and which will be

operable within the territory of all states of the European Union. When this legal framework will come into force, it is expected that all digital asset service providers (including crypto) will be recommended to comply with this set of rules for a better communication with state authorities.

The rules are a kind of guidelines, because each member state of the European Union will have the right to adapt itself to the mix of implementation of different chapters of MiCA, to its own national regulations.

Everyone operating as a business or institutions needs to study the MiCA's (Markets in Crypto Assets Regulation) upcoming regulations and here are some of the most important aspects of decentralized markets regulations that will approach the following questions and requirements (Regulated United Europe, 2023):

- What is MiCA?
- What will MiCA regulate?
- What will MiCA NOT adjust?
- What is MiFID II and what does it apply to?
- Who will supervise the execution of MiCA?
- Who will regulate MiCA?
- White paper requirements.
- Regulation of Crypto Currency Services.
- Transitional provisions for crypto service providers.
- Customer-driven service only/reverse application.

Scalability issues and high transaction fees on the blockchain – Finding a solution

As the NFT market grows, scalability issues on the blockchain may arise, leading to slower transaction times and higher transaction fees. This can make it difficult for institutional investors to buy and sell bulky volumes of NFTs quickly and efficiently, which can impact liquidity and market depth.

The main solution already exists, because there are new existent Layer 1 blockchain ecosystems that run on a negative carbon print and low transaction fees, due to their non-mining operability and Adaptive State Sharding for superior Scalability and Speed requirements,

where NFT technologies can be run upon and be used at institutional levels at convenient costs and compliant management.

At the present time, the institutional NFTs concept faces several challenges and limitations in Web3, including regulatory uncertainty, lack of standardization, volatility, and scalability issues of

blockchain architectures and financial bear market.

While these challenges need to be addressed, the potential benefits of institutional NFTs are significant, and they are able to transform the way institutional investors access, invest and use digital assets or services between public administration and citizens (see Figure 7).

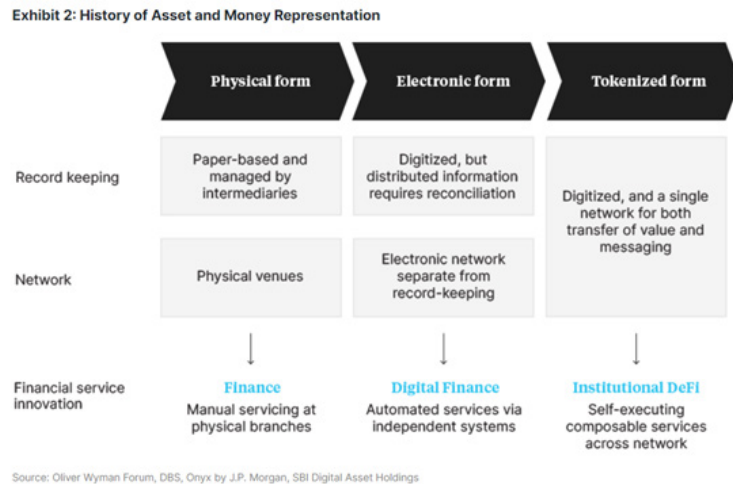


Figure 7. History of Asset and Money Representation (Ekberg et al., 2022)

NFTs system architectures that are developed and run on Layer 1 blockchains can have a significant impact on the research and development in the Web3 space at a governmental level and they are likely to change the way institutional investors interact with digital assets. Some of the key benefits of institutional NFTs include:

- **Access to new investment opportunities:** open up new investment opportunities for institutional investors, such as tokenization of real estate, art, and collectibles. This can help diversify their investment portfolios and access new markets;
- **Improved risk management:** The creation of new financial instruments, such as NFT-based derivatives, can provide institutional investors with more ways to hedge risk and manage exposure to digital assets. This can help reduce the overall risk of investing in digital assets;
- **Increased transparency and security:** Institutional NFTs are built on blockchain technology, which allows for the creation

of transparent, secure, and verifiable digital assets. This can increase the trust in the digital asset market and make it easier for institutional investors to comply with regulations;

- **Superior efficiency in trading and ownership of assets:** enable a more efficient and secure trading of digital assets. The transparency and security provided by the blockchain technology can also help reduce fraud and improve the overall trust of institutional users in the digital asset market;
- **Lower barriers to market entry:** help to lower the barriers to market entry for institutional investors and make it easier for them to invest in digital assets and use the decentralized digital markets. The reduction of operational costs and increase in operational efficiency can help in this regard.

According to the above-mentioned benefits, the NFT technology can have a significant impact on the development of Web3 applications

for public administration by introducing new investment opportunities, improving risk management, increasing transparency and security, and lower the barriers to entry for institutional investors and citizens.

This has the ability to enhance the way institutional investors interact through digital assets with citizens, making them more accessible and secure than ever before (Ekberg et al., 2022).

CONCLUSION AND OUTLOOK FOR THE FUTURE OF INSTITUTIONAL NFTs IN EMERGING WEB3 ECOSYSTEMS

Institutional NFTs projects can have a significant impact on the development of Web3 and they are likely to change the way institutional investors and citizens will interact with digital assets. Here are some key points as summary of this article:

- **Democratization of access to high-value assets**

Institutional NFTs can make it possible for a wider range of investors to access high-value assets, such as real estate, land and cadasters, fine art, certificates and many more, by enabling fractional ownership and liquidity. This can democratize access to these types of assets and provide more opportunities for individuals to invest in them.

- **Potential for increased economic growth**

The tokenization of assets and the creation of new financial instruments can lead to increased economic growth as it can rise liquidity, efficiency, and transparency through compliance mechanisms. This can also lead to the creation of new jobs and businesses in the tokenization, trading and management of these assets.

- **Improved transparency and regulatory compliance**

The transparency and security provided by the blockchain technology can help

increase trust in the digital asset markets and make it easier for institutional investors to comply with regulations. This can lead to a greater level of confidence in the market and attract more institutional investors to this space.

- **Organic growth of institutional circular economies**

Through an immutable and decentralized way of harmonizing the interaction between digital and physical world for citizens and institutions, it is imperative that the research and development of all institutions that will adopt the institutional NFT technologies will also invest in ethically engagement of private and public investors to join their projects responsibly. This opportunity will decide everyone's will to get involved in remunerating meaningful institutional projects to be supported and financed by them. By ethically fulfilling the investment agreement between citizens and institution, this fact will organically start developing institutional circular economies which can be used for further internal project developments. A transparent, compliant and harmonized way to design institutional projects based on this kind of rules will, as well, help the organic growth of national budgets.

All the above-explored information represents just an overview of the advantages and technological facts that can make institutional NFTs an exciting opportunity to study and create new tools based on Web3 technology, for future business ecosystems defined by citizen and institutional interaction. It will be interesting to see how they will be adopted and utilized in the coming years, within the upcoming legal frameworks, by institutions in direct cooperation with the private sector, with their own global trends and dynamics.

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